Better Crops

he Pocket Book of Agriculture

March 1926 10 Cents

eware the Moods of March—Surveying the Nation's Soils
-Rat Control and the County Agent—in this issue

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

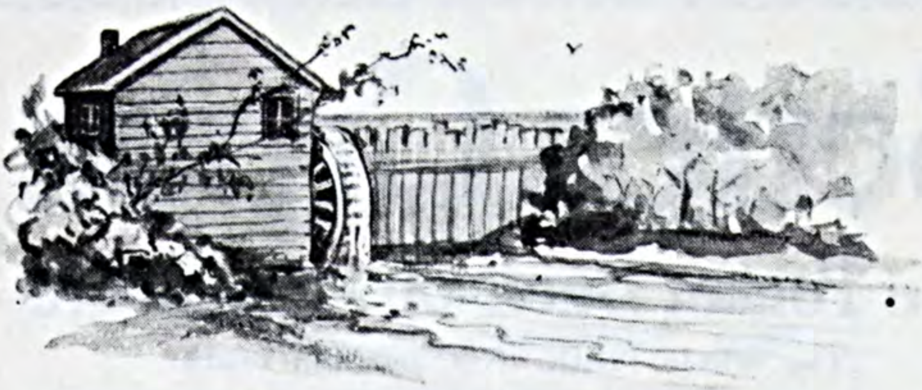
VOLUME VI — NUMBER ONE

Table of Contents for March, 1926

Who's Who of BETTER CROPS

EDITOR........R. H. STINCHFIELD
CONTRIBUTING EDITOR........JEFF McDERMID
MANAGING EDITOR........G. J. CALLISTER
PRESIDENT........E. K. HOWE
VICE-PRESIDENT AND TREASURER........H. A. FORBES

Editorial Office: 10 Bridge Street, New York



The height of bravery

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, A SUBSIDIARY OF THE POTASH IMPORTING CORPORATION OF AMERICA, 10 BRIDGE STREET, NEW YORK. SUBSCRIPTION, $0.50 PER YEAR; 10c PER COPY.

VOL. VI NEW YORK, MARCH, 1926 No. 1

¶ *A timely essay on a little studied subject*

Beware the Moods of March

By Jeff McDermid

ON a certain morning in March, 1911, I arose in a wonderful mood.

The bright sun and cloudless sky matched perfectly my unusually exultant mood—I gloried in a strange sense of power that thrilled and throbbed throughout my being and lent to me for the hour the wild spirit of a superman.

I admit here and now that this mood has been a stranger to me since—and that it was foreign to me on that fateful bright morning when the entire course of my life was changed. And, lest it be misunderstood, let me hasten to say that the mood was induced by neither love, liquor nor levity—it was simon pure and natural.

I was simply the innocent victim of a rare and seldom duplicated mood. I owned the world and planned with ill-concealed excitement and delight to shake it loose of all it possessed of value.

In this mood I approached my work. Before an hour had passed

I had unconsciously offended a wonderful old soul who, unfortunately for me had arisen that morning in a mood the opposite of mine —he felt himself growing old; and the sight of me cavorting around full of the essence of strong youth offended him to tears. The result was, as he was the man who signed my pay-check, that, in the vernacular, I received the "grand bounce"— was out of employment on the very day that I felt most able to cope with this world and its serious problems.

There I was—"a peacock one day, and a feather duster the next!" A victim of two rare moods indeed, and of a strange move of fate. The course of my life was changed, (although I later was glad that Fate had taken this seemingly unkind way of shaking me loose from a connection that ill suited me.) My whole philosophy was upset and my conception of the race of man sadly warped—all because a wildly excited mood, a pure stranger to me, had the whim to settle down upon my gay, youthful shoulders without invitation!

Next day, my throbbing head in my hands, I pondered over this matter of moods and resolved to study it. Peculiarly enough I was unable to find that any intelligent writer had given the subject the attention its importance deserved and I discovered that I was forced to study out the facts in a field where little research was available to the student.

For fifteen years I have been carefully observing and making notes on moods in myself and others with whom I have come in contact—how certain moods are induced, when they come, why they go, what effect they have had on my life and upon those of others. I have reached several interesting conclusions.

* * *

Of one man we are accustomed to say, "He is very moody," and of another, "He is always the same," as if to divide the world into two different groups, here the victims of moods and there those singularly free.

As a matter of fact, it has been my observation that no man is free from the devastating effects of certain moods—all of us here below are subject to fluctuation in the mental stock-market, being never twice the same. Some, of course, are better able to conceal from the world the effects of their moods, and it is to these we pay the undeserved compliment, "They are always the same," when, if their private thoughts were made public we should suddenly discover that they were strangely akin to those of the visible moods.

One should not be ashamed to admit that he is visibly affected by certain phenomena—that he has certain moods, for to admit this openly is to prove that one is attuned to one of Nature's strongest laws.

I have often publicly admitted that my mind follows the sun; I am more or less gloomy on dull, cloudy days and become more natural and free when the sun shines. I had always thought that everyone, to a greater or lesser degree was similarly affected, when to my delight, a great psychologist told me that, should the sun not shine again for a year, we in that time would degenerate into a race of gloomy, despondent people!

And I am now sure that if the sun was completely hidden by clouds for as much as six months we would forget how to laugh, artists would find to their bitter disappointment that beauty had disappeared from the earth, inventors become wrapped in deadly inertia, their brains sterile of creative ideas and that writers would find their joyous ink soured into a dyspeptic bile!

(*Turn to page 62*)

Brains determined that an application of 1000 pounds of fertilizer per acre paid better than 500 pounds

Pooling Brains

By

T. K. *Wolfe, Agronomist*
Virginia Agricultural Experiment Station

IN this day and time when we hear so much about cooperation among farmers and the pooling of farm products the agricultural scientists can well afford to cooperate and pool their knowledge.

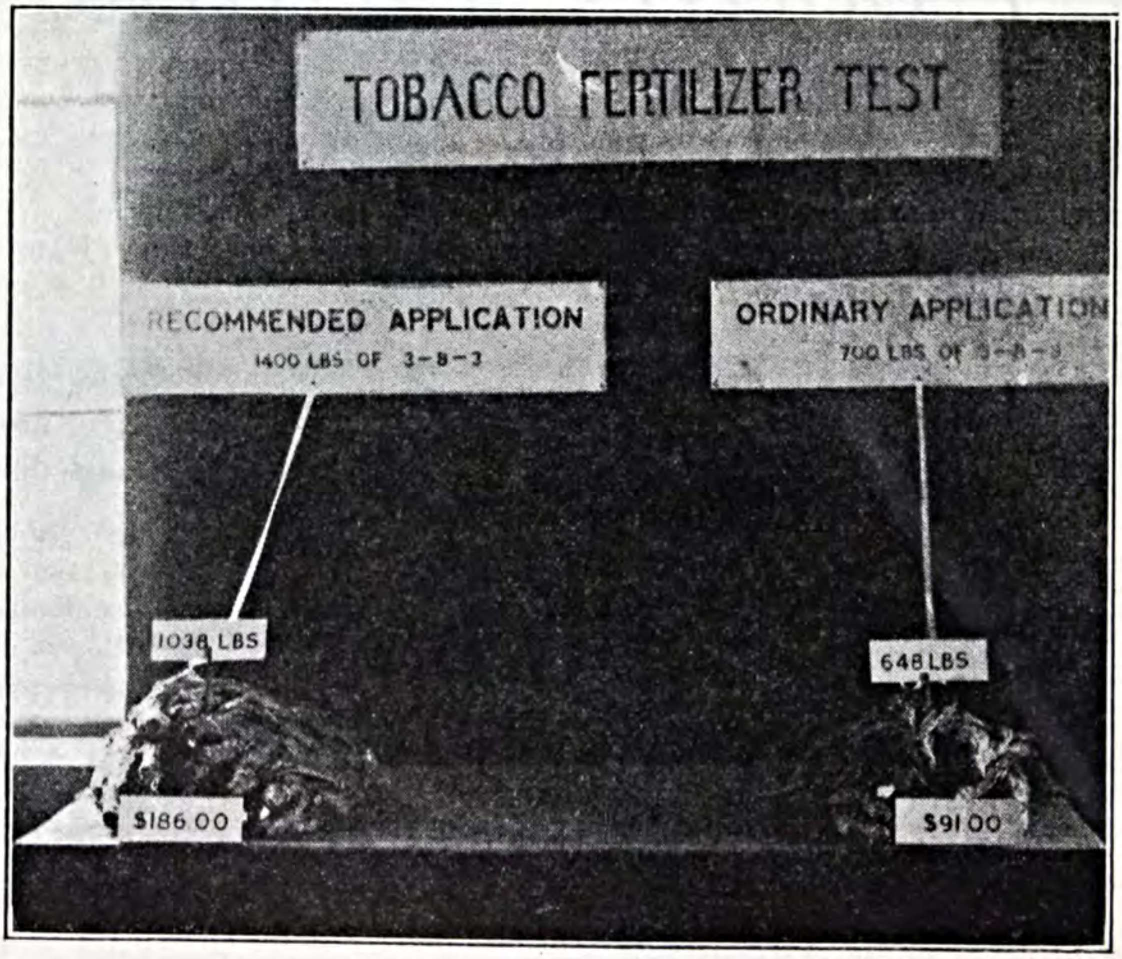
In fact the United States Department of Agriculture and the experiment stations of Virginia and North Carolina have cooperated and pooled their knowledge concerning the proper kind and amount of fertilizer to use on tobacco. In October a committee composed of Dr. W. W. Garner of the United States Department of Agriculture, Professor T. B. Hutcheson of the Virginia experiment station, and Professors E. G. Moss, L. G. Willis, W. F. Pate, and C. B. Williams of the North Carolina experiment station met in Raleigh, North Carolina and studied the fertilizer results which had been secured in Virginia and North Carolina with the different types of tobaccos. After a thorough consideration of the available data the committee made certain recommendations with reference to the fertilization of the tobacco crop to be grown on average soils in Virginia and North Carolina in 1926.

The committee first considered the fertilization of bright tobacco. This type of tobacco is grown on rather poor soils and in rotations which do not have a great tendency to build up the productivity of the soil. These conditions are necessary because the amount of ammonia must be limited for bright tobacco in order that a yellow color may be produced, and it is easier to give the proper amount of ammonia in a commercial fertilizer than through ordinary soil improvement.

THE committee recommended that where bright tobacco was to be grown on the relatively heavy bright tobacco soils such as are found in the Piedmont area that a fertilizer be used containing 8 per cent available phosphoric acid, 3 per cent ammonia, and 3 per cent potash. However, on very thin soils a fertilizer with the following analysis was recommended: 10 per cent available phosphoric acid, 4 per cent ammonia, and 4 per cent potash. On the lighter bright tobacco soils such as are found in the Coastal Plain section, it was recommended that the analysis of the fertilizer be as follows: 8 per cent phosphoric acid, 4 per cent ammonia, and 4 per cent potash. It was thought advisable on sandy loam soils containing considerable organic matter to reduce the ammonia about 1 per cent; and for very sandy soils to increase the potash 2 or 3 per cent.

In certain sections tobacco is sometimes affected with "sand-drown", a condition which is evidenced by yellowing of the leaves. In sections where "sand-drown" is

(*Turn to page* 48)



Increasing the fertilizer application from 700 to 1400 pounds increased returns $95 an acre

Nebraska's Corn Contest

By

Y. P. Bhosale

E. C. NOYES, Valley, Nebraska, won the state championship by growing 101 bushels of corn per acre in the contest conducted by the Nebraska Crop Growers Association. Mr. Noyes was the high man in the Central division, and W. R. Nicholson of Beaver City and Gerald Wilcox of McCook were the high men in the Western and Eastern divisions respectively.

The state is divided into three sections, the eastern, central and western, for the purpose of this contest. Each person entering the contest is required to enter one piece of 10 acres of ground and the winners are judged from the yields. Out of the 153 who entered the contest, only 87 completed it.

Mr. Noyes did not cultivate his piece of ground any more, or give it any more attention, than he did the rest of the 95 acres of corn he grew.

The land on which Mr. Noyes grew this corn has been farmed for the last 40 years, and has been in alfalfa for about five years. He ploughed the ground, disked it, harrowed and then the corn was listed in rows 16 inches apart. He chose Reed's Yellow Dent variety and the seed was home-grown. He cultivated this plat of land four times with a single row sulky cultivator.

Mr. Noyes spent 69 hours in taking care of the ten acres, and this includes manuring, plowing, harrowing, disking, planting and other necessary operations. The number of horse hours required was 319. A horse hour is one horse working for an hour, or two horses working for 30 minutes each. Human labor was charged at 30 cents an hour, and horse labor at 20 cents an hour. Husking was charged at the rate of 10 cents a bushel. It cost him $185.58 for labor, in addition to $2 for seed, to grow the ten acres of corn.

A charge was also made for the use of the land, this being based on the rent. After deducting all the charges, a profit of $17.64 was left for Mr. Noyes.

This is the first time Mr. Noyes has entered the contest. He has saved some of this year's seed and may try to grow at least 110 bushels of corn next year where only 101 bushels grew this year.

W. R. Nicholson was the high man in the western section, with an average production of 89.4 bushels per acre. This is not the best crop he had, for in 1923 he raised an average of 107 bushels to the acre. Mr. Nicholson double dises his ground about the 15th of April, and then lists the corn 13 inches apart in its row any time between the 1st and 10th of May. He subsoils his corn about 3 inches deep. When the crop is about 6 inches high, and the stand is good, he cultivates it with a two-row machine and throws the row out. When the corn is about 18 inches high, he throws back the dirt, which has been thrown away from the plants by previous cultivations. When the corn is ready to lay by, he cultivates it with a one-row cultivator.

He plowed under a crop of alfalfa to a depth of 9 inches in 1922, but the yields obtained were only fair. In 1923 he got the best yield, 107 bushels to the acre. This year his average production was three times the normal yield in that section of the state. He used 62.5 man hours and 226 horse hours, the total labor cost being $153.66, in addition to $2.50 for seed. His profit per acre was $20.14.

Gerald Wilcox was the high man in the Eastern section of the state with a production of 100 bushels to the acre. He irrigated his corn crop. His total labor cost was $138.30, in addition to the $3 which he paid for seed. He made a profit of $25.20 per acre. The normal yield in the eastern section of the state is 45 bushels. The growers expect to raise 99 bushels per acre this year.

When the corn is above the ground, Mr. Wilcox goes through with a sled machine which is drawn by four horses. He cultivates the crop with a single row, or four shovel cultivator, two times during the growing season.

He draws water out of a well on his farm for irrigating the crop. He is able to draw about 800 gallons of water per minute with the aid of his 10 horse power motor. He irrigates two times in July, and he thinks that it costs him fifty cents per acre for flooding, in each irrigation.

Left to right—W. R. Nicholson, E. C. Noyes, Gerald Wilcox

Tune in on This

By

P. M. Farmer

Sam Pickard

ARRR-RR-RK! Ziz-zz-z-z! Wh-eee-ee-e-e! Station SAM broadcasting: "Hello farmers of the U. S. A. and Canada! Uncle Sam announces that one of his nephews of the same name has begun providing regular and interesting programs on agriculture from Washington to be broadcast from important stations in all parts of the country. This chief of the new Radio Service, in the office of Information, Department of Agriculture, is Sam Pickard, the same who developed the 'college of the air' at the Kansas State Agricultural College. He has been at Washington since the first of the year gradually getting programs arranged and fixing up contracts with broadcasting stations.

"The first of a series of programs which will be developed by the Radio Service was started by Mr. Pickard February 1 and will be available twice a week under the title 'Farm News Digest.' It consists of short items of agricultural news selected from current publications, most of them not accessible to the average farm reader.

"ON February 15, a daily service called 'Fifty Farm Flashes' was put on by twenty broadcasting stations. It is made up of 50 questions asked by farmers and answered in a few pithy sentences by specialists in the various bureaus of the department. This service is prepared so as to fill the needs of farm people in the various regions and different phases of farming will be treated on certain days. For instance, on Monday the questions

(*Turn to page 56*)

Making the base map

Surveying

Uncle Sam looks around his farm

THE soil survey of the United States has become one of the most valuable pieces of work undertaken cooperatively by Federal and State agencies. This project, begun in 1889 by the United States Department of Agriculture has reached the point where more than one-third the soil area of Continental United States has been analyzed and mapped in detailed and general surveys. At the present rate of progress the entire country will be covered by 1950.

Dire things were said in the early days of the soil survey regarding the soil of this country—that before long it would lose its power to produce crops and that then fertile fields would become barren wastes. Research and analysis of thousands of samples of soils collected by the Bureau of Soils show, on the contrary, that the soil cannot be exhausted, although it may become fatigued and impaired by improper use.

Soil is a living thing; it breathes; it has a circulatory system, and digestive apparatus. To prevent this living thing from becoming sick, say the Government soil experts, it must be properly fed and exercised. Its diet consists of the remains of animals and plants; a change in diet through crop rotation. It needs stimulants in the form of commercial fertilizers. It must be exercised by plowing and cultivation.

Collecting the soil samples

the Nation's Soils

By
Frank George
United States Department of Agriculture

IT is now generally recognized that scientific identification and mapping of soils are needed to prescribe a proper course of treatment and to determine the best use to which they should be put. Cooperative agreements for soil surveys are therefore in effect in 30 states, surveys having been completed in the entire states of Maryland, New Jersey, Delaware, and Rhode Island, and almost completed in West Virginia, Alabama, and Mississippi. From 50 to 60 counties a year are surveyed in detail.

Many of these states have established test farms on the more important soils in their territory so as to be able to advise farmers on a certain soil on the basis of results of tests on that soil. Time was when it was considered sufficient to have a central experiment station in a state where experiments were made on only a few types of soil and to advise farmers in all parts of the state, located on widely different soil types, on the basis of these tests.

The Bureau of Soils has demonstrated, however, that soils may be texturally the same, they may occur in the same territory under similar climatic influences, be similarly well drained, and yet produce crops of different quality. A case in point is in connection with the production of bright tobacco used for pipe tobacco and cigarettes. Such tobacco produced on Durham fine sandy loam has been found to be superior to that from Norfolk fine sandy loam, although the two types of soil are almost identical.

A SIMILAR example illustrating the practical value of recognizing the finer distinction in soils is with regard to the production of Greening apples in New York state. It was found that certain soils in the same district produce a green Rhode Island Greening whereas certain other soils produce a yellow Rhode Island Greening. Orchardists were not making this distinction in setting out trees, although the two kinds of Greening are favored in different markets. The tests showed further that the best soils for the Greening are not the best soils for the Baldwin and some other varieties—information of value to orchardists in determining planting varieties.

Soils were formerly classified merely as sandy soils, loams, or clays, and what constituted one or another class was merely a matter of individual opinion. They are now classified on the basis of texture into 12 distinct classes, scientifically determined, and uniformly applied to soils throughout the country, so that a fine sand in Maine is the same as a fine sand in Oregon, and a silt loam is a silt loam, and a clay a clay, no matter in what part of the country it may occur.

The Tropical Plant Foundation made a cooperative agreement with the Bureau of Soils during the past year to study the soils of Cuba in connection with establishing test farms for sugar cane experiments. Heretofore the lands of the island have been known as red, mulatto, black, savana, and coco soils, all of which terms are too broad to define any specific type. Nearly 50 distinct types of soils were classified in the survey, on the basis of which large areas of land which had become low producers are being brought back to greater productivity. Most planters now appreciate the need of soil studies so as to adjust fertilizer practices, soil management, and crop varieties.

SIMILAR work is being done in Haiti, and Scotland last year engaged the services of a prominent member of the Bureau of Soils to organize a soil survey in that country. In pursuance of a sound reclamation policy, Secretary Work of the Department of Interior has ordered that no additional engineering work shall be done on reclamation projects until the soils have been carefully studied and their suitability for farming passed upon by soil men of broad experience.

Counties in which soil surveys are to be made are selected by joint agreement between the Bureau of Soils and either the State Geological Survey or State Extension Officials. The soil maps are plotted and colored in the field, each map covering an entire county. Base maps are used showing salient natural features of the area, upon which are outlined and colored the various areas of the different types of soils.

THE surveying party usually consists of two men who visit every part of the area, trace and locate the soil boundaries, and take samples of the soil and subsoil to the depth of the parent material. The work is later reviewed by inspectors.

The soil samples, meantime, are sent to Washington where they are identified and subjected to physical and chemical analysis and the results furnished to the state agricultural authorities for use in connection with the operation of test farms. The samples are then indexed and filed for future reference and comparison. There has been added to this collection recently more than 250 samples of soil collected by Dr. Curtis F. Marbut, chief of the Bureau of Soils, from 100 different localities in leading European agricultural areas.

SOIL surveys have been practically completed in 1,147 counties, detailed reports having been published on 1,015 counties. The report for each county includes a colored soil map on which the various types of soil are identified. The text of the report gives a detailed topographical description of the area, the county's history and development, road conditions and transportation facilities. A chapter is included on climatic conditions such as seasonal precipitation and temperature.

ANOTHER chapter gives the agricultural history of the county and statistics on the various agricultural enterprises, including crop yields and land values. Each of the soil types are described in great detail so that the prospective purchaser of a farm may know precisely the kind of crops which may be grown in any given section. The reports are sold at 15 to 20 cents each by the Government Printing Office to pay the cost of printing.

Mimeographed lists by states of the counties for which reports have been prepared may be obtained upon request to the Bureau of Soils, Washington, D. C.

Soils are analyzed to determine the relative proportion of the different sized soil grains of which they are composed. The separations are made by means of sedimentation, centrifuging, and sieving, controlled by microscopic examinations

Celery a mile long

The Montezuma Marsh

By G. H. Brainard

County Agent, Wayne County, Sodus, N. Y.

TO the geologist, the Montezuma Marsh might spell an evidence of ancient glacial action, but, to the grower of muck crops, it forces forth the fact that it is a vast and fertile area, capable of producing a large acreage of vegetables.

The Montezuma Marsh, in its entirety, comprises some 20,000 acres of land in corners of Cayuga, Seneca and Wayne counties in New York State. The portion with which this article deals, lies between Savannah on the west and Port Byron on the east. This area can be observed from the state highway which bisects it.

This muck is now being cropped for the third consecutive year. From a wilderness of waving rush or flag, as it is called, it has responded to the touch of some mystic magic, and this world of reed has disappeared, to be replaced by vast distances of celery, onions, lettuce, carrots and other crops.

The development of this section was brought about by the standardization of the New York State Barge Canal, which skirts the eastern boundary of the swamp. This standardization called for an increased depth and width of the canal, which made possible the drainage of the adjacent marsh. There was no deliberate attempt to drain this; it was an incident in the state's program for a better system of inland waterways.

To make the situation a more desirable one, again the program of state road building entered into the development of the land, and a ribbon of concrete was built across the marsh, which allows the easy movement of supplies and crops by motor trucks to shipping points.

A few men with a vision, backed by confidence and courage secured locations on this swamp from the original holder, The Solvay Process Company. A man by the name of Perkins was first interested and from him another gentleman by the name of Snyder secured a portion of the land. J. H. Snyder was a grower of considerable experience in producing crops on muck for he had been operating on rather an extensive scale near Sodus, New York.

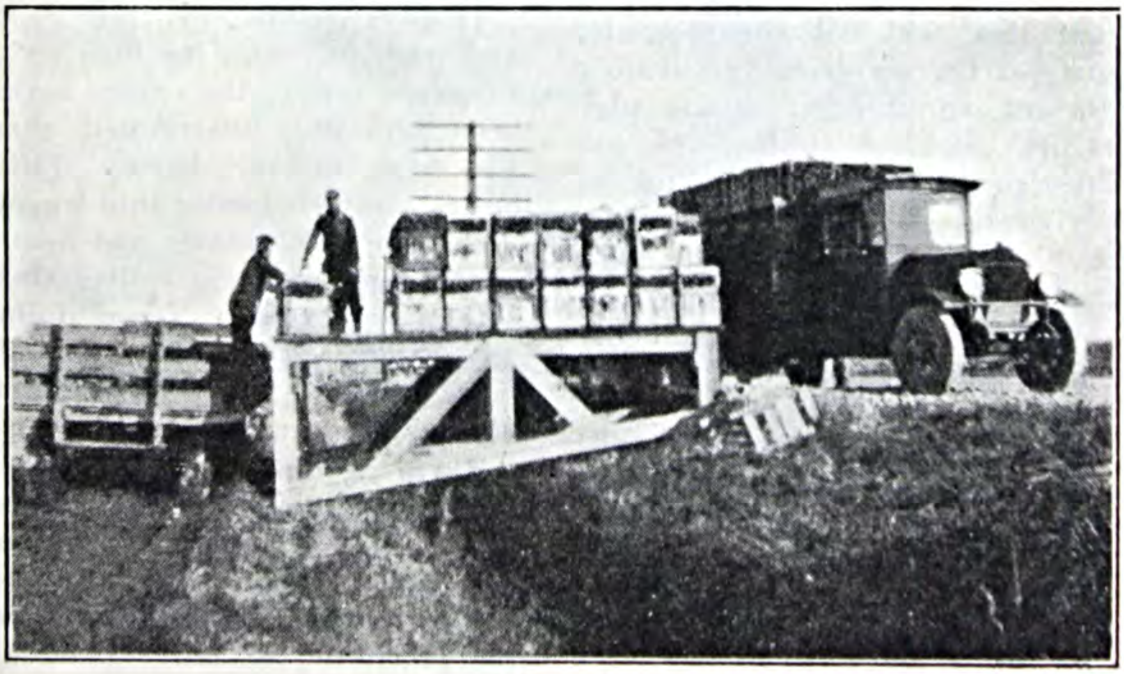
These men proceeded to ditch their holdings and subdue the vegetation. They tell of the time when one tractor man could not see a like equipment 18 feet in front of him, so dense was the flag that they were plowing under.

At the present time, the majority of the land cropped is on the north side of the highway. The muck at this point is about a mile wide. The ditches are extensive and the slope ample enough so that they clean themselves.

From a piece of timberland on the extreme western edge of the marsh, to the Barge Canal, a mile away, the fall is 13 feet. The amount of water standing in the ditches at any time during the year is negligible, while at the terminal of the main ditches one can observe large piles of silt that have been carried down by the water, seeking an outlet.

One grower has under cultivation 400 acres, this being one of the largest enterprises in this section. Of this 400 acres, 110 are in celery, 60 in carrots, 130 in lettuce and 60 in onions. Also smaller acreages of spinach, Chinese cabbage, beets, and other crops.

The first step in cultivating this



To market via trucks

virgin soil, after plowing under the primeval vegetation, was to plant corn and potatoes. The tilling of these crops aided materially in fitting the soil for the future.

The following table of fertilizers shows how great is the amount of plant food needed per acre for the economical production of the various crops:

Celery, 1 ton	4-8-7
Onions, 1 ton	4-8-12
Lettuce, ½ to ¾ ton	4-8-7
Carrots, ¾ ton	4-8-12
Sweet corn, ½ ton	5-10-5
Potatoes, 1200 lbs	2-8-10

Snyder's operations, alone, are so large that he is an individual buyer of 300 tons of commercial fertilizer. This, in itself, is a small train load, without considering what the other growers use.

As one drives across this concrete highway, over which the supplies attendant to crop production are brought in, and the resultant harvest moved to market, a glance to the north reveals rows of celery so long that they seem to meet in the distance.

One sees a multitude of people busily engaged in caring for the crops. Motor cultivators, tractors with extension on wheels so that they will not sink into the soft earth, one-horse cultivators, dusters, spray rigs, loading platforms, packing sheds, and pile after pile of lettuce boxes and celery crates awaiting the maturing of the crop, give evidence of a huge enterprise.

The labor comes from the neighboring villages and towns. Port Byron, Savannah, Montezuma, Auburn, Clyde, and Lyons furnish the bulk of the workers. Many of them are women, especially during the harvest season. The clothing worn is, to a very large extent, overalls made of waterproof material.

Snyder, being the largest grower, regularly employs, during the season, about 60 persons. This number is augmented during harvest until 100 people are on his payroll. At harvest time the work is done by the piece.

Every precaution is taken to insure a successful crop. During a critical blight period, three spray rigs were going constantly for a duration of 10 days with no intermission except to load up. At another time when an early freeze was imminent, it was "all hands on deck" to bank the celery.

When darkness naturally would put a stop to operations, autos were placed along the highway so that the head-lights would play on the section to be banked, and the work continued far into the night until it was completed and the danger from freezing was eliminated.

When the celery is harvested, a block of the celery is laid out and a horse knife cuts each row. This horseknife shears off the roots just below the surface of the ground. Strippers then follow through and rip off the stalks that have been bruised or are otherwise damaged, and which would not allow a quality pack to be put up.

Helpers follow in their wake and pack in crates the bunches of prepared celery, the crates having been previously distributed along the edge of the block. Filled crates are then loaded into wagons with wide tired wheels and hauled by tractors with caterpillar tread or extra wide rims. These wagons are hauled to the edge of the muck where the concrete road borders the area.

There are nine loading platforms distributed along the edge of the muck. The loading stations are substantially built, the roadbed being made of crushed stone and the platforms of heavy planking.

(*Turn to page 54*)

Why Farm Electrification Drags

By *Arthur P. Chew*

United States Department of Agriculture

Editor's Note:—*Last month Mr. Chew told some of the reasons why more rural communities are not enjoying the convenience of electricity. In this continuance of his article he sees possible means of making it practical for more farms.*

SINCE the only solution is to increase the quantity of current consumed by the average customer, interest centers in what can be done along this line. Electric power, of course, is already widely used for light stationary work, particularly in the farm home. But the utmost conceivable expansion in the home use of electricity, according to the experts, will not call for enough current to justify large extensions of rural electrical facilities at rates that will be at once reasonable to the farmer and remunerative to the utility companies. It is necessary therefore to explore the field for the application of electricity in farm operations.

A "bright" farm family circle

Heavy expenditure for larger motors and increased capacity in transmission lines and transformers would be necessary to extend the use of electric power in heavy stationary work generally. Yet experts believe the operation would pay, especially if ways could be found for avoiding the concentration of peak loads within a short time.

When such concentration takes place, a high capacity plant which

(*Turn to page* 51)

An S. O. S. *for* Corn

By A. A. *Burger*

Ex-County Agent, Iowa

MORE than once have the county agents saved the day for the farmer. In cooperation with the colleges and extension departments, they can do it again this year if they can succeed in locating plenty of good seed corn and can then get the farmers busy to test it. This is the immediately important job before them in the corn belt states. We are far short of a sufficient supply of good seed corn for our needs.

Here, corn is our principal crop. Why should not every farmer know that the seed for the principal source of his income is insured, so far, at least, as it is in his power to provide plenty of it and to know that it is safe. As if there were not already enough hazards in the business of growing corn, there will be plenty of farmers who will gamble that their corn will grow. The county agent can do much to change this attitude of mind.

38 *good ears, 797 poor ones—a disappointing inventory*

Poor seed corn is the greatest single factor, outside of the soil, in holding down the yield. Fifteen average size ears will plant an acre; a bushel will plant seven acres. One weak, or dead, or moldy ear may reduce the yield from five to ten bushels per acre. How can we prevent it? It will cost a cent to a cent and a half to test each ear—15 to 25 cents to test enough for an acre. Why guess when testing is so cheap? —the cheapest kind of insurance. Corn at $10 per bushel will cost about $1.35 for seed per acre; oats at 50 cents, $1.50, yet it is not a money crop.

IF I were a county agent I should ask each farmer these questions: Do you have plenty of good seed for your own farm? If not, where are you going to get it? Will what you have grow? Have you carefully given each ear the 6-kernel germination test? If not, you may have another guess coming. My dear sir, listen to this report from Grundy county, Iowa. (It is typical of many counties of Iowa and many other counties of the corn belt.) These tests were reported by rural schools, Dike and Grundy Center high schools cooperating with the local farm bureau. Corn picked before frost: 6,500 ears tested 78 per cent strong, 9 per cent weak, and 13 per cent dead. This is the best seed corn.

Eighty-three hundred ears saved after frost tested 43 per cent strong, 7 per cent weak, and 50 per cent dead. This is seed corn.

Twenty-five hundred bushels of crib corn tested 23 per cent strong, 7 per cent weak, and 70 per cent dead. This test included many cribs. The corn in these cribs is getting poorer every day.

The worst feature about the whole seed corn situation is that too many farmers do not realize it, or else they refuse to believe it. Here is the chance for the county agent. Later these men may be in trouble; some of them were in 1915 and in 1918; then some of them woke up too late. Some replanted, some had a crop failure. What a wonderful opportunity has presented itself here in the corn belt for a splendid piece of cooperative work on the part of the agricultural forces.

Reading the test is easy and accurate with this tester

Representative C. A. Hollis, Cedar Falls, chairman of the agricultural committee of the Iowa House of Representatives, has made the suggestion that a seed corn testing station should be established and operated by the county agent for the farm bureau in every county of the state. The suggestion may apply to other states. I think that with the proper cooperation the county agent could prevail upon the local banks in every community to write a letter to the farm patrons calling attention to the seriousness of the situation and the need for immediate action.

Local meetings conducted through the cooperation of the county agent with the extension departments can accomplish much more than the independent effort of each county alone. If there was ever a time for holding local corn shows, this is the year when they should be held. Everybody should cooperate to make it a success.

At the recent corn show at Shellrock, Iowa, the people woke up, as if by a thunder bolt, and they got busy at once. They found they had no seed corn. The same thing has happened at many other shows. It is surprising how much more folks are interested when they find out that their best sample out of their best seed corn is poor,—perhaps too poor to plant. Various organizations may furnish corn testers, either free or at a nominal cost,—a very commendable practice. The local farm bureaus could be of assistance here. The responsibility finally rests with the farmer, but the county agent can do much to get him to act.

Three of the fundamental suggestions in the seed corn commandments of Professor P. G. Holden, the father of better seed corn in the corn belt, were these: Get your seed corn near home,—plenty of it—then test every ear. He was strong in his condemnation of buying shelled corn.

In a series of 26 experiments which he conducted during six years in 26 counties of Iowa, he found that the average yield on 2,715 local farmers' samples was 54 bushels per acre; the yield on 387 imported farmers' samples was 53 bushels, while the yield on 281 seed house samples was 46 bushels,—eight bushels less than the corn secured in the same neighborhood. And he found by making a germination test on this corn and selecting 10 per cent of the highest germinating samples, that the yield was increased by 11 bushels, or 20 per cent.

In some recent tests conducted along the line of the Illinois Central railway through Iowa, Professor H. D. Hughes, Ames, found that corn could not be moved far east or west in the same latitude without reducing the yield. He concluded that home grown seed was best, that it yielded better and was safer. Every experiment that has ever been conducted furnishes proof that a careful ear germination test increases the yield. Much can be done in the way of locating the better seed at home.

OUR experience in operating a testing station during the bad seed corn years of 1915 and 1918 and testing several thousand bushels of corn for the farmers has convinced us that it was one of the most important and convincing arguments that we could use. They learned of the seed corn situation, and they saw with their own eyes. Thousands visited the station.

We bought cribs of corn, selected it at the crib, brought it in

(*Turn to page* 55)

FERTILIZERS *for* COTTON

By D. J. *Burleson*

Extension Agronomist, University of Arkansas

THE original home of the cotton plant is in a tropical climate. In its native home the plant lives for several years, and grows to be quite a tree. Under those conditions, however, the plant produces very little fruit, because it keeps on growing a long time, and goes mainly to stalk.

Our climate is not so well adapted to producing a big stalk, but is better adapted to making a quick growth of fruit. That is why we have the best climate in the world for cotton, but climate alone will not make cotton. Since cotton, as we grow it, must produce a crop in a much shorter time than it does in its native home, there must be a good supply of available plant food, in the soil. This is one reason why cotton gives a better response to fertilizer than any other of our common field crops.

In order that we may get the full benefit of our unsurpassed cotton climate, we should fertilize our cotton in such a way as to have our climate and fertilizer work together in producing a big proportion of fruit to plant. To do this, the fertilizer must produce a quick growth, then a stimulation of fruiting, which will check the plant growth and cause the plant food to go to the production of fruit.

For nearly all the soils of Arkansas a cotton fertilizer should contain all three of the common fertilizer elements, which are phosphoric acid, nitrogen, and potash.

Phosphoric acid stimulates early growth and fruiting, and hastens maturity of the plant. It has a tendency to check the growth of the plant when it reaches the fruiting stage.

Nitrogen stimulates the growth of the plant. A large amount of available nitrogen makes the plant grow fast and gives it a dark green color. The cotton plant needs a good supply of soluble nitrogen early in its growth, so as to hasten plant growth.

Potash aids the healthy condition of the plant. It helps the plant to resist diseases such as rust and wilt. Since the advent of the boll weevil the proportion of plant foods are important to make sure the cotton ripens at the right time.

(*Turn to page 58*)

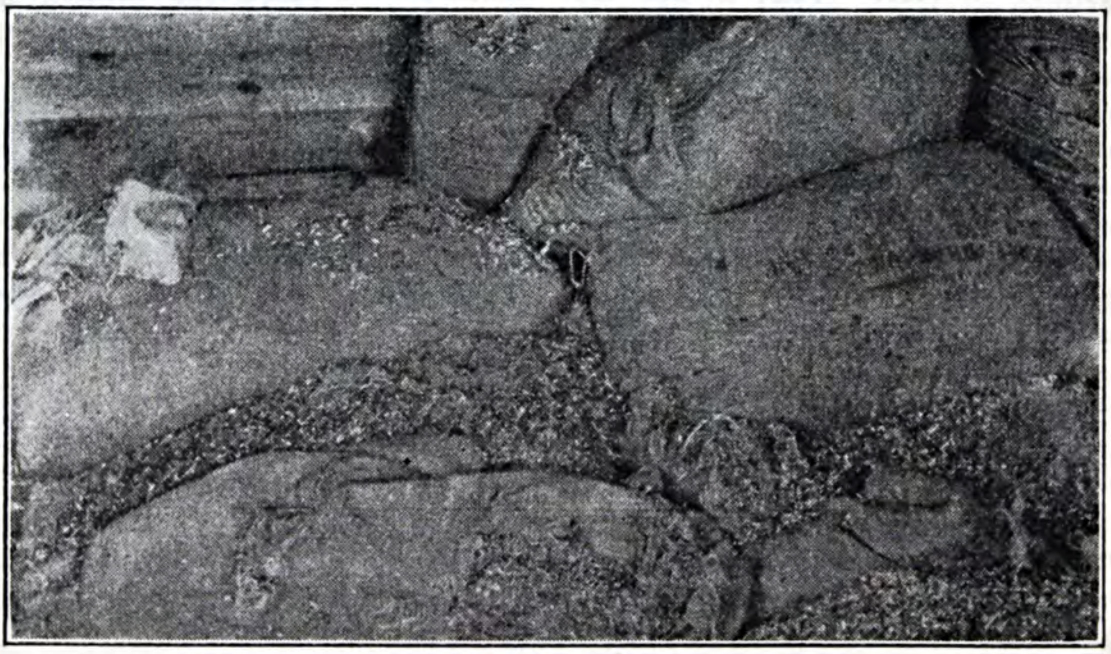
The County Agent *and* Rat Control

By *James Silver*

Biological Survey, United States Department of Agriculture

HOUSE or barn rats have penetrated into every state of the Union except Montana, and because of their destructiveness have made rat control a popular project with county agents throughout the country during recent years. Control measures have usually taken the form of short, intensive drives, not over one week in duration and are commonly referred to as anti-rat campaigns. Four principal reasons for the popularity of anti-rat campaigns among county agents are outstanding:

1. Rats are an economic burden and a menace to the health of a large percentage of the human inhabitants both of country districts and of towns and cities, and cam-



Rats destroy by contamination 10 times what they eat

Poultry losses alone warrant an anti-rat campaign

paigns against them, therefore, present an opportunity for rendering a greatly and widely needed public service.

2. Rat campaigns conducted with the aid of a federal specialist, who has systematized methods, procedure, and publicity materials, may be conducted with maximum effectiveness in proportion to the efforts expended.

3. The results of a rat campaign are immediate, apparent, worthwhile and therefore are usually appreciated and give impetus to the county agent's work in his territory.

4. News created by a rat campaign is much sought after by editors and provides a channel for legitimate publicity for the activities of the county agent. It also attracts the helpful cooperation of individuals and organizations with whom the county agent seldom comes in contact.

A recent contributor to Better Crops* made the pointed remark that in educational work lies the greatest field of usefulness of the county agent system and perhaps also its greatest weakness for all too often the efforts of the county agent are not appreciated by the people. The success of anti-rat campaigns is due to the fact that it combines educational effort with immediate action. The active phase of a campaign is merely the means to the end and is designed to attract attention, stimulate popular interest, and enlist the support of the press through which the more important and far-reaching educational material can be presented.

THE popular conception of successful rat control is the wholesale destruction of rats by simple and effective methods. In reality, however, the killing off of rats does no more to control these pests than does the swatting of flies control flies. As it is necessary not only to provide screens to shut the flies from buildings but also to remove

* *Burger, A. A., "Education—The County Agent's Life Saver,"* Better Crops, *Volume V, No.* 5, *p.* 51. *January,* 1926.

garbage and filth to prevent their multiplication, so is it necessary to real rat control to build out the rat wherever possible and to eliminate its food and breeding places. The farmer and householder must be taught to know what there is about his premises that is responsible for the occurrence and maintenance of rats, and be urged to remove them.

Fly swatting is necessary to eliminate those flies that will get into a house in spite of all precautions that can be taken; and it is likewise necessary to teach methods of rat destruction that will be applicable under all conditions likely to be encountered, for an occasional rat will gain entrance into the most rat-proof of structures. It is also necessary to recognize that on many premises the conditions are such that the removal of foods and places attractive to rats is not practicable.

POISONING is undoubtedly the most practical method of destroying rats in most cases, but where rat burrows may be found in the open ground or where a concentration of gas may be obtained under floors, fumigation with calcium cyanide dust is more efficient. There are also conditions where the use of poisons is inadvisable and where traps are preferable or where use should be made of a certain kind of poison which will not endanger livestock. These methods furnish the basis of valuable and interesting demonstrations which should be conducted in anti-rat campaigns.

The extent of the anti-rat campaign may be arranged to meet the conditions as the county agent sees them. It may be carried on in the country districts only or it may be made county-wide. It may consist of a simple series of well-advertised demonstrations, or of demonstrations supported by limited preliminary publicity. On the other hand, there may be an intensive publicity campaign involving the free distribution of poisoned bait, the awarding of prizes for rat tails, lectures in the public schools, the extensive distribution of posters, handbills, circular letters, and stickers, the showing of lantern slides, window exhibits, motion-picture films, street banners, and other forms of publicity on the depredations and control of rats.

This type of campaign involves the raising of funds and is usually conducted under the cooperative effort of the county agent and the more active organization of the county, particularly the farm bureau, the chamber of commerce, the civic or businessmen's clubs, and women's clubs.

THE basis of the intensive publicity campaign has been the free distribution of barium carbonate rat poison, usually through drug stores in towns and through general stores throughout the county. Barium carbonate is purchased in bulk at very low cost and is put up in small envelopes, with directions printed upon them, often by the boy scouts. Giving away the poisoned bait enlists the interest of the newspapers, and the publicity is given a good start.

This type of campaign should have the backing of interested and influential citizens. A meeting should be called at the start at which a plan of action should be adopted by them, and officers and committeemen selected. Separate committees are usually needed to obtain funds and supplies, to arrange for all publicity, to attend to the distribution of poisoned bait, posters, handbills, etc., and to obtain and award prizes.

A more restricted type of campaign can be handled by the county agent without assistance other than

(*Turn to page 50*)

Looking Ahead

By A. B. Genung,

Economist, United States Department of Agriculture

This authority tells us what to expect in 1926

ANYONE can be a prophet. The almanac proves that. And whatever one prophesies, there is a definite mathematical chance that he will be right. Also, ditto that he will be wrong.

As a usual thing, the more a man really knows about a given situation, the less likely he is to set himself up as a seer. That is one reason why most forecasts may be taken with a liberal grain of salt. This is no exception.

One lesson, however, is gradually sinking home to farmers. This is that it is not the price of the crop when it goes into the ground but the price when it comes out of the ground that counts. The current price of cows may influence a man to expand the breeding program. But it is the price of cows three years later, when the new heifer has come into milk, that tells whether he used good judgment. Paying 10 cents for a nice red apple on the fruit stand may make me think seriously about planting some apple trees. But if I plant them, it is the price of apples 15 years hence that will let me know how big a fool I am —or otherwise. Good farmers are always looking ahead.

It does not follow, however, that the good farmer is continually switching from one thing to another. Careful analysis of the business of successful farmers all over the country, covering a period of a dozen years, proves quite the opposite. The men who make the most money over a period of years are those who adhere to a fairly stable plan of operations. They vary the acreages of cash crops and the output of animal enterprises in line with changing conditions but they keep to some central scheme of organization and management. The successful farmer is a successful forecaster but on top of that he is a conservative.

HOW about the outlook at present? What seems to be the situation for the coming year in the principal lines of farming?

In general, considering agriculture as a whole, its position grows a little stronger all the while. The readjustments made in crop acreages and finally in livestock production have brought farmers up to within speaking distance, at least, of other great productive groups. The index of purchasing power of farm products has moved upward about 5 points per year from the low 1921 average of 69 until last year it averaged 89 (the 5 years immediately preceding the war being considered as 100). While farm products as a whole still stand at a disparity in exchange for industrial goods and services, the trend has been steadily toward improvement of this exchange position.

AMONG the major lines of production, the outlook may be very briefly sketched as follows:

In the case of wheat the probabilities favor a rather larger production of hard wheat in this country than we had last year. The hard winter wheat States put in about 4 per cent larger acreage last fall than the previous fall. The seeding has gone through the winter in fairly good condition, for the most part. On the other hand, the production of soft winter wheat may not be any larger than the short crop of 1925 as the acreage in the principal soft winter wheat States was reduced about 6 per cent and the crop went into winter in poor condition.

If the spring wheat territory increases or maintains last year's acreage and the yield comes up to average it is probable that we shall have a surplus for export. In that event prices will have to follow the world level without much benefit of tariff. The present prospects for 1926, aside from the uncertain Russian situation, indicate that the crop outside the United States may not be as large as in 1925. But the expected foreign decrease may be largely offset by an increase in our crop. In general, however, it will probably be good business for spring wheat growers to plan about as usual.

The corn situation has been the subject of more or less agitation. Portions of the Corn Belt had a very heavy crop last year and some cash corn growers were forced to sell their grain at around 50 cents and in some cases less. Viewed in the large, however, we have had only about an average supply of corn during the last year.

The real point is that fewer head of livestock have reduced the feeding requirements. Corn is, after all, almost entirely a feed grain. For the coming season there seems little to say other than that corn growers should follow just about their normal planting program. The weather is the determining factor in the corn crop and that can not be foreseen. Taking agriculture as a whole it is usually a great advantage to have abundant feed stuffs. An average corn crop ought to be good business this year.

OBSERVERS of the cotton situation are inclined to be bearish as to this next year's outlook. They point out that for two seasons the rate of world cotton production has exceeded the rate of world consumption with a consequent increase in stocks. Should last year's acreage in this country be repeated this season and the yield per acre average that of recent years the crop would approach 14 million bales. This, together with the carryover, might lead to a substantially lower level of prices on cotton.

However, as in the case of other cash crops, this involves a question of alternatives. If the man in the Cotton Belt is to reduce his acreage of cotton, what shall be substituted on the same land?

(*Turn to page* 53)

Budding *and* Grafting Apple Trees

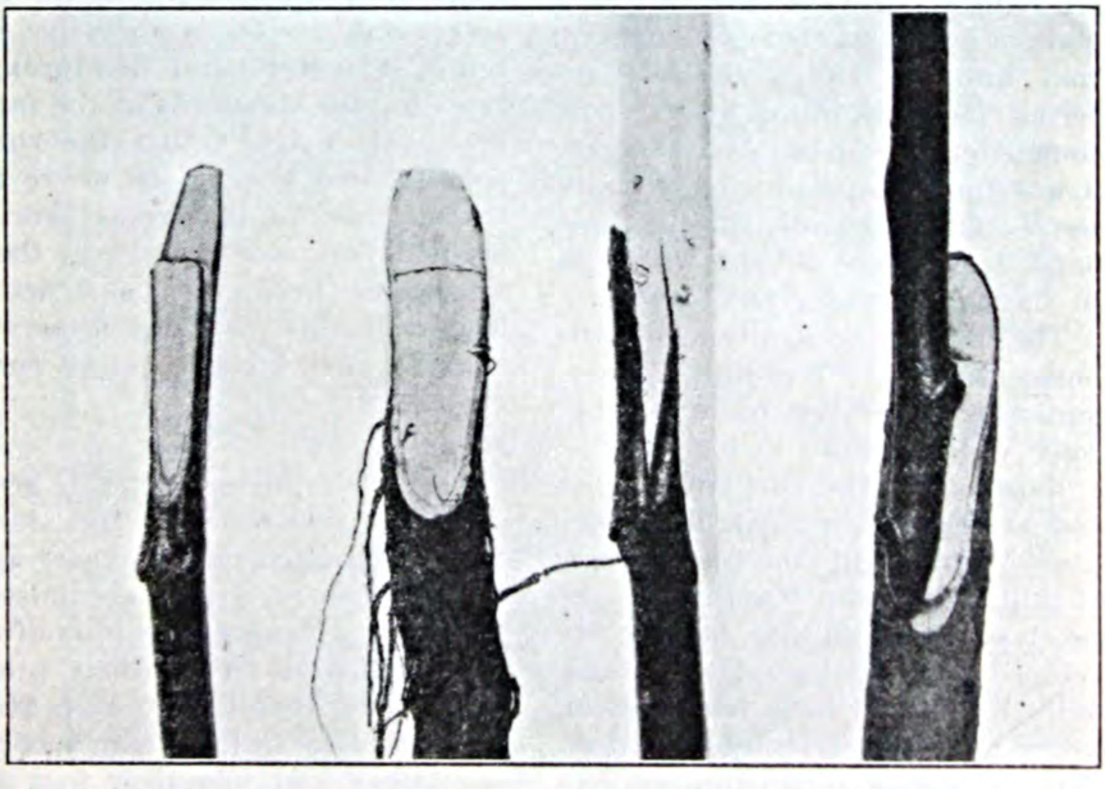
By T. J. Talbert

Prof. of Horticulture, University of Missouri

THE propagation of fruit trees by grafting and budding has been practiced for many centuries. Pliny, the historian, believed the art of grafting was taught to man by nature. Many fanciful and superstitious allusions to grafting may be found in Volume 3 of Pliny's Natural History. Those who practiced the art generally endeavored to shroud it in mystery.

The fruit grower was often led to believe that one had to be endowed with special faculties to be able to propagate fruits successfully by budding and grafting. A touch of magic appeared necessary to grow buds of the pear upon the apple or buds of the peach upon the plum. The propagation of fruit trees by graftage is now, however, well understood by many

(*Turn to page* 59)



A—Long sloping cut and slit made in scion
B—Stock prepared in a similar manner
C—Scion and stock pushed together—tongues interlocking
D—Scion placed to one side to secure cambial contact

PARTNERS *in* HONOR

By V. T. Bartle,

University of Wisconsin

A NEW precedent had to be set when Wesson J. Dougan of Beloit, Wisconsin and his wife, Eunice T. Dougan were given honorary recognition by the University of Wisconsin during Wisconsin Farmers' Week. It was the first time since 1909, the beginning of the practice of awarding honors to men of the field and furrow and to homemakers in and of the open country, that husband and wife have received the recognition. When the committee considered Mr. Dougan, it was found impossible to separate the accomplishments of the husband from those of the wife and so the award was given to both.

The official recognition of the husband read, "Wesson J. Dougan, a native of Wisconsin, has become widely known in his work as a dairyman. He has striven for and achieved high ideals in an unusual degree. By the combination of skillful husbandry with the highest type of rural life he has developed one of the state's finest dairy farms and farm homes. Ever using the most scientific methods that he could command, he has built up and maintained the soil fertility of his farm, equipped it in a modern manner, and produced a product of the highest quality."

And the citation of his mate contained this summary: "Eunice T. Dougan spent her early years on a farm in Calumet county, Wisconsin. After her college course and teaching experience in Wisconsin schools she returned, 20 years ago, to farm life at her present farm home near Beloit, where she has built an outstandingly useful career. She has taken an active interest in better rural life through elevating the standards of the farm home. Her belief that the rural home should be a place where all the members of the family love to be, and that nowhere else is there a greater need for constructive leadership, has made her home one that may well be held up as a rural ideal."

THESE statements tell a great deal, but not near all the story. They do not tell how 20 years ago Mr. Dougan gave up the ministry to become a farmer, how soon after they settled down on their small farm near Beloit Mr. and Mrs. Dougan drove to town with a horse and buggy and sold their first six quarts of milk, the beginning of their present business, as the "Babies' Milkman." Although Mr.

(*Turn to page* 44)

Better Crops' ART GALLERY of the month

Mr. and Mrs. Wesson J. Dougan—the first husband and wife to receive honorary recognition from the University of Wisconsin for outstanding work in agriculture

Secretary Jardine conferring with representatives of American Agricultural Editors Association on the agricultural situation

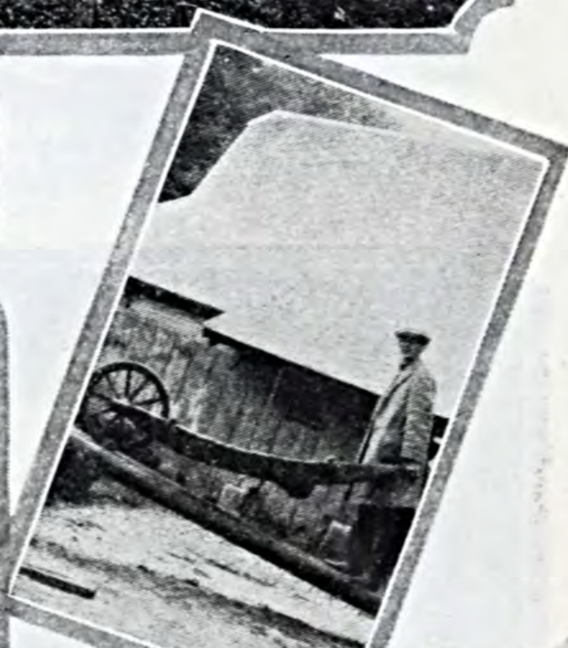
James J. Jeffries, the boilermaker who became heavyweight champion of the world, is now and has been for some years living as a farmer on his ranch near Burbank, California

Forty years on forty acres without horse, mule or ox—this Florida farmer uses his wife and daughters at the plow. All work on the farm is done by hand

Mrs. C. B. Allen, famous artist, Department of Interior, Washington, whose paintings have helped materially in planning for the improvement of waste lands

Farming in

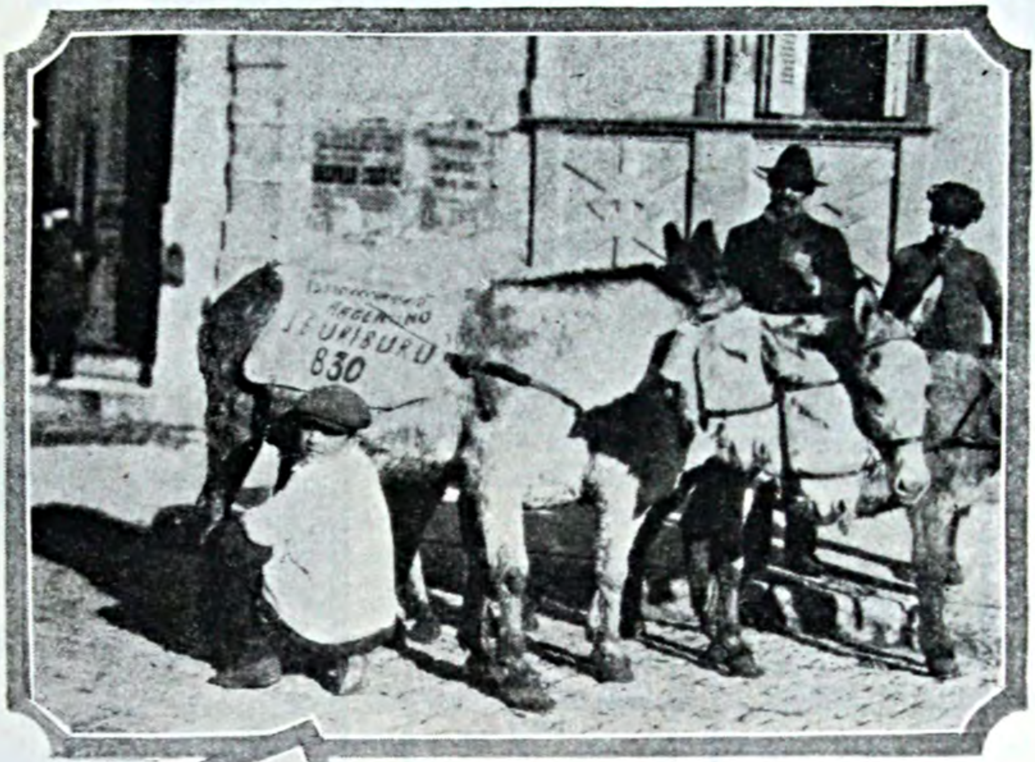
Switzerland, where the cows fall out of the pasture if the fences are not kept well repaired



A home-made wheelbarrow in Switzerland where every effort is made to save litter for rebuilding soil fertility

Dress, manners and customs in Irak, Persia, date back to biblical days. This aged native harvests crops with the same crude implements used by his forefathers

other Lands—



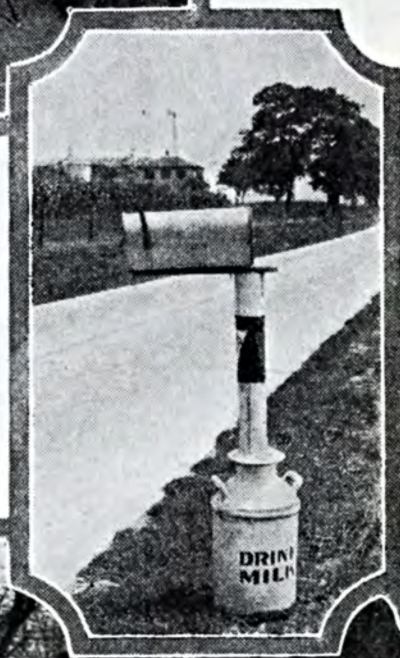
Milk from contented burros can be had from this portable dairy in Buenos Aires. (Photo by Ewing Galloway, N. Y.)

His Royal Highness Madhavsinhui, enroute to California, where he is to study American agricultural methods

Sowing grain by hand—a method of by-gone days in the greater agricultural areas—which is still practised in primitive places. (Photo by Ewing Galloway, N. Y.)

Indiana farmers examining farm and home labor saving equipment that may be run by a small portable one-fourth horse power motor

Dairymen near Belvidere, Illinois, find economic advertising in filling old milk cans with concrete and using them for mail box bases



Crowned Corn King of Indiana—left to right, L. M. Vogler, who won grand championship at International, John Barnes, Jr., who grew 144 bu. per A., and Victor C. Lux, junior champion at the International

The Editors Talk

COTTON—1926 The note of alarm sounded by the officials of the United States Department of Agriculture, and others interested in the economic welfare of the south, over the fear of over-production of cotton this year is well founded. It is based largely on the tendency of increased acreage throughout the cotton section, in the first place, and in the second place because of the well-nigh universal control of the boll weevil last year by weather conditions due to the excessive heat prevailing during July and August, eliminating to a very large degree this pest in much of the cotton area.

In addition to these two factors, we should not underestimate the value of rains which have just recently fallen over much of the cotton area of Texas, the value of which in terms of cotton production would have amounted to an estimated yield of at least 2,000,000 additional bales to the 1925 crop, if these rains had fallen by this date last season.

But the greatest menace to the cotton grower, and to business generally throughout the cotton section, is coming from the possibility of over-production due to the prospective acreage for 1926. The tendency to increase the acreage has grown markedly since 1920, both east and west of the Mississippi river, the greatest increase, however, coming from the western territory, in which territory the acreage has increased almost 75 per cent since 1920. In the eastern territory, comprising all the states east of the river, the acreage has increased only 22 per cent.

While the tendency to increase cotton acreage has been manifested in all the states west of the river, the increase has been most marked in Texas, where the acreage has gone up approximately 8,000,000 acres during the past three years. Just what the acreage will be in 1926 no one can foretell, but it seems now as if there will be as much land planted to cotton east of the river this year as was planted in 1925, and there is no reason why as much, and possibly more, will not be planted west of the river this year as was planted last season. Should we plant as much in the belt as was planted last year, and if reasonably good seasons prevail throughout the territory, and we should get a fair yield from these 46,000,000 acres, the possibility is that the price will be much less, and the south would be in much poorer condition financially than at the present time.

Certainly, if cotton, our main cash crop, should have a slump in price, and we should continue to have to buy necessities, such as foods, feeds, and other commodities on the basis of present levels, then the cotton belt would be in a very serious condition financially speaking.

It is the fear that this may come to pass that has prompted far-seeing men in various positions to make statements regarding the inadvisability of planting too much cotton, and of the campaign to reduce the acreage in this crop for 1926.

The table below shows the cotton acreage, by sections, from 1921 to 1925, inclusive, both east and west of the river, along with the per cent of the total crop in each of the territories, as well as the per cent of total crop in Texas alone; all of which data will be of interest to those who wish to study this question of cotton acreage, and the tendency to plant more land to cotton in the part of the belt where this tendency is most marked:

COTTON ACREAGE, 1921-1925.

	East of Mississippi River:	Per cent of total:	West of Mississippi River:	Per cent of total:	Texas Per cent of total:
1921	13,742,000	45.3	16,604,000	54.7	35.4
1922	13,898,000	42.3	18,926,000	57.7	36.2
1923	14,707,000	40.0	22,133,000	60.0	38.4
1924	14,669,000	35.9	26,239,000	64.1	42.0
1925	16,784,000	37.0	28,683,000	63.0	*38.2

* *Large acreage abandoned.*

THE VOCATIONAL IDEA

With the passage of the Smith-Hughes Act, in 1917, a new era in agricultural education dawned. Hundreds of agricultural schools with modern equipment and laboratories were built. Today, as a result of the rapid increase in our population and enormous growth of cities and their industries, with their consequent greater dependence upon the farmer than ever, the number of colleges and schools teaching agriculture has increased to something over four thousand.

Every effort to teach young boys and girls the fundamentals of agriculture and home building in the most practical manner is being made. This influence is being felt in industrial work and with this new training has come a greater prosperity and more satisfying life on the farm for all who believe that to be the owner of a small farm scientifically managed, is a greater privilege than the highest honor one can hope for in the business world.

The real secret of vocational training, whether it be in an agricultural or industrial school is that the boy or girl is taught in terms of action. His interest in his work is maintained. He is taught in terms of practical everyday things. His judgment, will and natural senses rapidly develop into right thinking, planning and working. In short, he works out real problems in worth while things, and is steered clear of work dealing with artificial situations.

The acid test after all is not the attendance in any school, nor the honor students, but the number who go out prepared to render real service. The Vocational Agricultural School is truly a factory for making farmers—super-farmers—men who can till the soil intelligently and get maximum results from their efforts. This is the type of farmer that takes agriculture out of the doldrums—out of the luck column, elevating it to its proper place among the several activities of everyday life.

Comparing the prosperity of the farmer today with twenty years ago, it is evident there has been a tremendous improvement. Periods of depression have visited the farmer, but in spite of these bad years occasionally, conditions today are infinitely better than a decade ago.

Many of the possible reasons for improved conditions obviously can be traced to the splendid work of the United States Department of Agriculture, the Colleges of Agriculture, the Agricultural Experiment Stations, the farm press, and the Agricultural Service Bureaus maintained by many industries. There is little doubt but that this prosperity is due to adoption of better farming methods, and authorities frankly state that in this improved state of affairs among farmers, the Vocational Agricultural School has played a very important part.

The statement that "Any Civilization that will endure must be based on a prosperous and permanent Agriculture," is a significant one. The Vocational Agricultural School is a potent influence in accomplishing just this, because it starts with the embryo farmer—the real foundation for the important national structure—A Permanent Agriculture.

HEROES This is a tribute to the Unknown Heroes who die; to the Unnamed Multitude who by toil and sweat of their brows carry the world onward, and erect the house of fame for the heralded heroes of their time; to the Unknown Soldiers of Life "unhonored and unsung" whose bodies form the steps to glory for generals behind the lines.

The heroes we have in mind as illustrating life's inequalities of praise are the men who died and those who actually took the risk of death in the rescue of the crew of the Steamer "Antinoe"—the men of the Steamer "President Roosevelt," who took their places in the boat, that others might be saved. Without regard to title, they are:

Adolph Albertz	Morris Jacobowitz
Juan Arenada	Robert Miller
Johannes Bauer	Herman Riedel
Wilson Beers	Frank Roberts
D. Caldwell	Thomas Sloane
Charles Diaz	Fritz Steger
Sam Fisher	Frank Upton
Cosmo Franelich	Alfred Wall
Alex Fugelsang	Otto Wilke
John Hahn	Uno Witanen

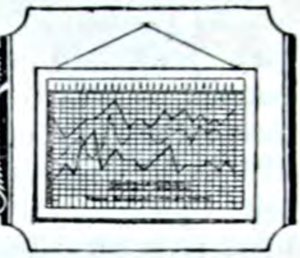
These are the real heroes of the rescue. Two of them, Steger and Witanen, made the Supreme Sacrifice. It is fitting that their loss should ennoble our recollection of this disaster of the sea and cause us to place them upon a throne above mere hero worship.

They and their comrades who took an equal chance typify the unrequited heroes of a hundred thousand years of time. They are the symbol of men who do the actual deeds of life, whose straining backs and tired arms till the soil, build our homes and clothe our bodies; who fight our wars and keep our peace; who live, and do, and die unknown while others reap the praise and gain.

But there shall come a time towards which we are hurling when the real doer of deeds shall come into his own; when the Tomb of the Unknown Soldier shall no longer hide the slaughtered and unnamed victim of life's inequalities; shall cease to be the charnel house at which we mourn the broken and discarded tool of man's ambition, but shall be the coronation hall where we may crown the Heroes who man the boats.

E K Howe

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Area Plan Cuts TB

Ever since the area plan of eradicating tuberculosis was inaugurated it has increased in importance, and during the past few years the number of counties taking up the work has increased by leaps and bounds. Of the 98 counties having more than 15 per cent of tuberculosis infection of cattle the area plan is now being conducted in 34. Of the 165 counties where there is between 7 and 15 per cent of tuberculosis in cattle the area plan is now being carried on in 54 of them.

Two of the counties once very seriously affected have cut down the disease to ½ of one per cent and are now in the modified accredited area class. About 1/3 of the badly infected counties in the country are now carrying on a campaign. At the beginning of the year there were 149 counties in which the disease has been cut down to less than ½ of one per cent.

Cotton Needs Potash

According to work done at the South Carolina Experiment Station while potash may not have the same importance in relation to large cotton yields as do nitrogen and phosphoric acid, still potash is needed. The investigator found that where 800 pounds of complete fertilizer were used the best results were obtained when the mixture contained 4 per cent of potash. When no potash was used the yield of seed cotton was 692 pounds to the acre; 818 pounds when 2 per cent potash was used; and 848 pounds when 4 per cent was used.

These tests were carried on in the Coastal Plain Region. In the Piedmont Section tests showed that a little less potash was needed, 3 per cent being the most desirable when 600 pounds of complete fertilizer was used per acre. When the rate of application is lowered the percentage of potash must be increased, according to the test.

Dairy Cooperation in Minnesota

The Minnesota Cooperative Creameries Association, Inc., is one of the best demonstrations of the good results of cooperative work. This concern, which puts out Land O'Lakes butter, last year sold 80,000,000 pounds, total sales approximating $40,000,00. There are 450 member units with 73,000 dairy farmers as patrons.

Gypsum for Alfalfa

In experiments carried on in 10 Iowa counties the value of gypsum for alfalfa, red clover and oats was studied. Of these crops alfalfa was the only one that showed uniformity in increased yield. Gypsum supplies sulphur in readily available form and since alfalfa is a heavy user of the element this factor is thought to have been an important one in increasing the yield.

Red clover was benefited in some of the tests and a few of the oat plots seemed to be improved by gypsum. Iowa soil scientists say that since the average crop takes out 50 pounds of sulphur an acre each year and receives only 15 pounds in return through precipitation the time is coming when it will be a limiting factor on some soils in that State. In some sections it is already needed.

Changes in Crop Report Date

Acreage estimates for spring wheat, barley, oats and other crops, except cotton, will be issued by the Department of Agriculture on July 10 this year instead of June 9 as heretofore. The first report on acreage condition and probable production of cotton will be put out July 2. The June 2nd condition report will be eliminated. A preliminary estimate of wool production in 1926 will be issued July 29, a new addition to the schedule. The report on revised acreage yield of cotton in 1925 will come out May 15 instead of June 2. There will be an extensive acreage survey in June, carried on through rural mail carriers. In previous years this survey has been made in October, the result being used in December acreage revisions.

Finally Got There

From the Congressional Record: The Vice-President also laid before the Senate a message from the President of the United States, transmitting a report by the Secretary of State concerning a request made by the Secretary of Agriculture that legislation be enacted that will give Congressional sanction to the holding of an international conference on soil science in the United States in 1927. This report was referred to the Committee on Agriculture and Forestry. The message was also laid before the House during the course of the afternoon and referred to the Committee on Foreign Affairs.

"Wild" Tobacco Stronger

New York fruit growers using nicotine sprays have been informed by the Agricultural Experiment Station at Geneva that a "wild" type of tobacco, which grows well on the station grounds, contains much more nicotine than the cultivated kinds and could be grown profitably for this special purpose. The percentage of nicotine, it is said, can be made still higher by special methods of cultivation, by topping the plants, and by care in curing the leaves.

Farmers who have equipment for growing cabbage, says the station, could grow this tobacco without any additional equipment. They could make the crop directly into a good insecticide or sell it to manufacturers.

Earth Houses

Houses of rammed earth have been used in past ages and some of them have stood from about the beginning of the Christian era, but little use is made of this material now. Recently, however, the North Dakota Agricultural College decided to study the soils of that State from this standpoint. Various soils will be tested under many conditions, some of them tamped more thoroughly than others, some cured inside, some outside in the sun, and some not at all. It is recommended that those wishing to try this sort of construction, where labor is relatively cheap, should start in with some small structure such as a hog house or garage.

Dr. H. B. Humphrey of the Bureau of Plant Industry, United States Department of Agriculture, built a rammed clay house near Washington a few years ago and finds it satisfactory. In the city of Washington there is a house of this material which has stood for more than a century.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

Erich Lierke

Dean of the Agricultural Department, German Potash Syndicate

It is now quite a common practice for agricultural business organizations to maintain agricultural service departments. Especially have fertilizer companies in the last few years organized soil improvement committees and technical departments of various types. It is of particular interest, therefore, to give a short account of the work of Mr. Lierke who in his capacity of assistant manager of the potash factory of Consolidierte Alkaliwerke, Westeregeln, in 1885, was one of the first to organize an agricultural department for a large business organization, namely the Potash Syndicate. Besides the distinction of being one of the first organizers of such work, Mr. Lierke has made valuable contributions to the agriculture of Germany and other countries, especially in the fields of horticulture, of vine growing, forestry, and statistics. We are particularly gratified, therefore, to be able to give the following short account of the life and work of Mr. Lierke, the present Dean of the Agricultural Department of the German Potash Syndicate.—The Editors.

ERICH LIERKE, who is the son of a clergyman, was born in Schuellewalde in Upper Silesia, on the 3rd of October, 1861. After spending some time in gathering practical experience in agriculture, on a farm, he entered the Agricultural High School, Berlin, in 1881, where he studied Chemistry and Agriculture till 1884. During the years he spent at the High School, Mr. Lierke worked principally in the laboratories of the Institute of the Beet Sugar Industry and became assistant manager in a sugar beet factory, where he worked for two consecutive seasons.

In May, 1885, Mr. Lierke entered the services of the

Consolidierte Alkaliwerke, Westergeln where he occupied a position in the laboratory, and at the same time, acted as assistant manager in the potash factory.

At this time there were only seven potash mines in existence, namely: Königliche Berginspektien zu Stassfurt; Herzogliche Salzwerksdirektion, Leopoldshall; Consolidierte Alkeliwerke, Westeregeln; Salzbergwerk Neustassfurt Kaliwerke Aschersleben; Gewerkschaft Ludwig II; Gewerkschaft Hercynia, Vienenburg.

These concerns were quite independent of one another but combined by mutual agreement to control the output of Carnallit for industrial purposes and of Kainit for agriculture. The factories producing muriate of potash were, on the other hand, under the control of the Verkaufs-Syndicat der Chlorkaliumfabriken, which controlled the sale of this product since 1883.

THE first steps towards the establishment of an organized educational program were made after the founding of the Deutsche Landwirtschafts-Gesellschaft (German Agricultural Society) in December, 1885, though the Kainit-Department of this society had been at work before this selling kainit, having entered into a contract with the potash mines in February, 1885. In the same year basic slag (Thomasphosphat) came on the market and was recognized as being an efficient phosphatic fertilizer and the use of kainit and basic slag increased continually from this on, under the influence of the educational work done among the farmers by the Kainit-Department of the Deutsche Landwirtschafts-Gesellschaft (German Agricultural Society), supported by the Experiment Stations.

In 1887 Mr. Lierke wrote his first book on manuring "Praktische Düngetafeln", which dealt with the amounts of plant food removed by the different crops from the soil. The sending of an English translation of this book to the United States marks the beginning of an educational program in this country, which was afterwards followed by the founding of the Agricultural Office of the German Kali Works in New York.

In January, 1889, the seven above-mentioned mines combined to form the first Potash Syndicate (Verkaufssyndikat der Kaliwerke) to control the sale and output of all potash salts. Mr. Lierke entered the services of this corporation and opened the Agricultural Office in Stassfurt, on his transfer there, after the Syndicate's building was finished in 1891. The work of this office gradually increased, necessitating it being divided into sub-departments. Branches, managed by agriculturalists, were opened in Germany and other countries in order to keep in close touch with the agricultural world. In 1910 the number of agricultural offices was 40 with a total staff, including clerks of 132.

In the meanwhile the number of mines had increased to 69 and the output of potash salts, which in 1885 was equivalent to 9,030 amounted, in 1910, to 359,516 tons.

On May 25, 1910, therefore, the first law regulating all matters concerning the Potash Industry was passed. The offices of the Syndicate were shortly afterwards moved to Berlin, the present building in the Dessauer Strasse 28/29 being then acquired. In 1914 the Central Agricultural Office in Berlin, together with its 52 branches, in all parts of the world, gave employment to a staff of 231 clerical and technical employees.

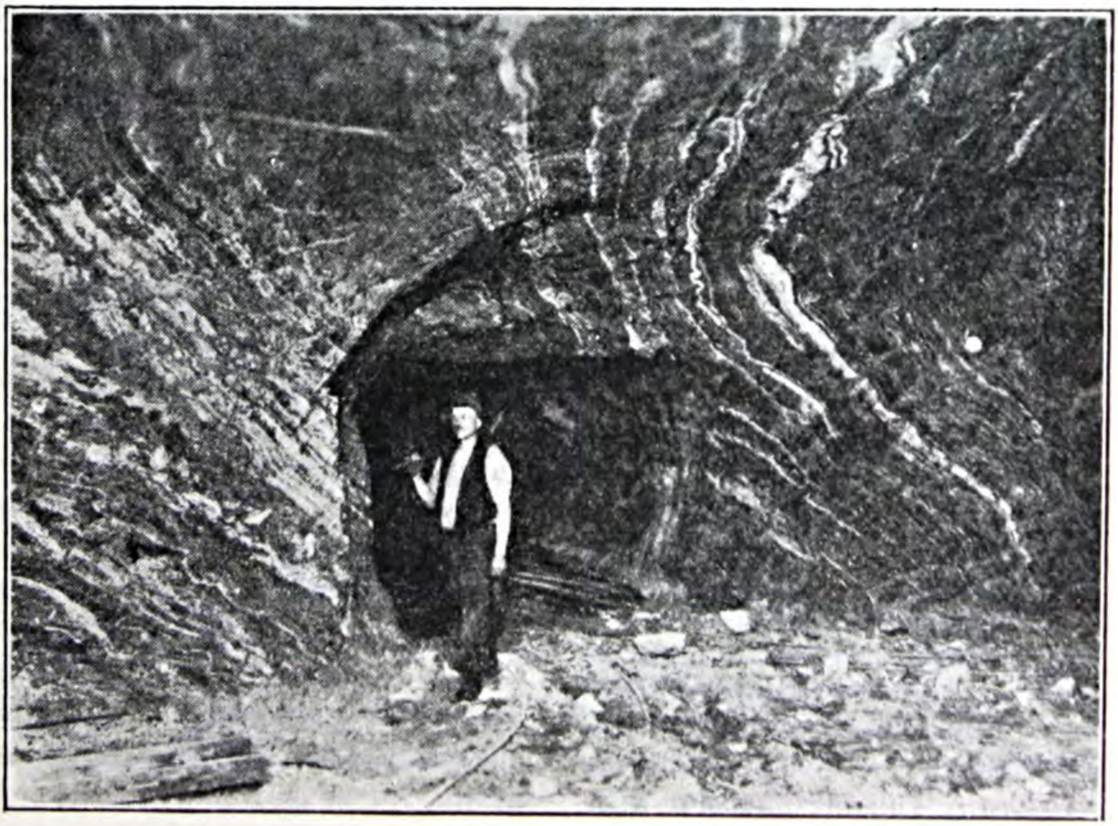
After the War 17 mines situated in Alsace were lost and it became necessary to give up some of the agricultural branch offices owing to trade depression. In April, 1919, a second law was passed which altered the provisions of the Potash Law of 1910, so as to make them suit the altered conditions in Germany.

Mr. Lierke is one of the managers in the present agricultural department of the Potash Syndicate. He not only supervises the work in a definite area in Germany but also administers agricultural work undertaken by the Syndicate in some foreign countries. In addition to the foregoing Mr. Lierke attends to all matters concerning horticulture, vine-growing, forestry, and statistics.

In Westergeln he possessed a small farm, where he grew vegetables and seeds and in Leopoldshall he devoted his spare time to carrying out experiments on fruit trees and vegetables in a three-acre garden, which yielded very interesting results and provided the Agricultural Office with much valuable material for its work.

On the occasion of his 25th anniversary in the services of the Potash Syndicate, Mr. Lierke received the title of Oekonomierat from the King of Prussia.

Mr. Lierke is a member of many agricultural and scientific organizations, being elected an honorary member of the Gartenbau-Verein Stassfurt, the Anhaltischer Gartenbau-Verein, Dessau and the Obstbau-Verein, Werder and a corresponding member of the Deutsche Obstbau-Gesellschaft. As an old member of the Deutsche Landwirtschafts-Gesellschaft he was presented on the occasion of the Society's 40th anniversary, with the Max Eyth Silver Medal, in recognition of his many years' cooperation with the Society. Mr. Lierke has also been presented with the Vermeil Medal by the Deutsche Gartenbau-Gesellschaft and with a bronze medal by the Nederlandische Matschappij voor Tuimbouw en Plantkunde, on their 50th anniversary, on which occasion Mr. Lierke was invited to give a lecture before the International Horticultural Congress in Amsterdam, 1923.



A German potash mine

Partners in Honor

(*From page 28*)

Dougan now cools his milk by electricity, and has a thoroughly modern milk room and barn for the handling of his milk, his first six quarts of milk were as clean and free from bacteria as his present 300 to 400 quarts a day, which is practically always well below the certified requirement. If he can not produce the best quality possible, he will stop producing.

WHEN some one asked Mrs. Dougan what she received the award for, she characteristically replied "for making raisin pies and puddings and roasts." She not only produces good "raisin pies" but also maintains a happy home and extends a welcome to friend or stranger. Her hospitality is always remembered by any person having visited her home.

Mr. Dougan's thoroughness in determining what course is best to follow was very well shown by his discussion of milking machines at one of the farmers' sessions. He felt that he needed machines on his farm, and after inquiring around finally installed them, but did not decide that they were a good thing until he had used them for a year and compared his records with the herd records of the three years previous to be sure that the cows stood the change. He found that it was better for his cows to be milked by machines. He found also that very little total labor is saved by machine, but that it merely evens up the labor better. He believes in using machines for his farm, but not for all farms.

Mr. Dougan attributes much of his success to advertising. He has tried various forms of advertising and is convinced that he could not successfully run his business without it, but he still is trying different kinds. One of the most outstanding things he has done was a milk contest that he held among his customers one summer. He picked out August when it was warm and offered a card of milk tickets to every customer who could keep a quart of milk sweet a week, and more than 50 of his customers won the prize.

THE Dougan Guernsey Farm is a farm well-worth seeing. It has a large round barn holding over 40 cows with a 56-foot silo in the center, and the up-stairs full of alfalfa hay. In order to help solve the labor and horse problem, which is quite big on a large farm such as his has become, electricity is used wherever possible. The silo is filled and the hay put in by electricity. In the milk room electricity cools the milk, caps the bottles and washes the bottles. Mrs. Dougan has as much if not more electrical equipment in the house than most city homes have.

SOMEBODY has said that the man with a handicap is the man who gets ahead in the world. Mr. Dougan is not without his handicap as he is so deaf that he is very seldom spoken to, and then only by members of his family. He has talked over the radio in Chicago, and at many farmers' gatherings in the middle west, and always has to be spoken to in writing.

REVIEWS

Fertilizers

The State Fertilizer Department of the University of Maryland has published a bulletin, the object of which is to furnish prospective fertilizer consumers with advance information relative to the composition of the various brands offered for sale in Maryland in 1926. The bulletin, No. 115 "Commercial Fertilizers for 1926," came out in January as a continuance of a new plan adopted in January, 1925. This idea of publishing information in advance is a clear realization of the sound economic principle that furnishing the farmer with a guide to intelligent buying will react to the benefit of the fertilizer industry as a whole.

The "Potato News Bulletin" December, 1925, is a fertilizer number and contains some interesting articles on the status of potato fertilization in New York, the usage of fertilizers in potato production, quality in fertilizers and an especially instructive article on "How shall Fertilizers be Applied?"

The Extension Service of the United States Department of Agriculture has recently published two interesting briefs concerning fertilizers. No. 3 discusses "Fertilizers for Citrus Fruits" and No. 24 "Cotton Fertilizer." The briefs are excerpts from the annual reports of County Extension Workers.

The State Colleges of Athens, Georgia, and Clemson Agricultural College, South Carolina, have published two practical circulars on the use of fertilizers in their respective States. Both circulars contain maps showing the chief soil regions together with definite recommendations for the use of fertilizers.

The Farm Bureau, Franklin County, Vermont, is arranging for fertilizer tests in cooperation with farmers in the county. The County Agent of Franklin County has also successfully aided in increasing the proper use of lime, both in the stables and on the land. We are always glad to hear of the work of the different Farm Bureaus.

"The Nutrient Requirements of the Strawberry." Agricultural Experiment Station, Michigan State College of Agriculture and Applied Sciences, Horticultural Section, East Lansing. Technical Bulletin No. 70, October, 1925. R. E. Loree.

Soils

The rapidity with which plant residues decay in a soil is a factor of considerable importance in any study of value of sod in rotation. "An Explanation for the Relative Effects of Timothy and Clover Residues in the Soil on Nitrate Depression" is ably presented by B. D. Wilson and J. K. Wilson in Memoir 95, Cornell University Agricultural Experiment Station. Publications of noted soil chemists are carefully reviewed, and appropriate abstracts from their works are presented. The results of the work at Cornell University point to a more rapid oxidation in the soil of the organic matter of clover than that of timothy.

"Prevention of Crop Injury by Windstorms on Muck Land." In a reprint from the Michigan Agricultural Experiment Station Quarterly Bulletin, Nov., 1925, Dr. Paul M. Harmer gives some valuable information on the use of water, heavy rolling and windbreaks in the prevention of crop destruction by winds on muck lands. The increasing use of muck lands for production of truck crops and the fact that wind is capable of causing great losses during dry seasons, made this discussion by Dr. Harmer very worth while.

"The Bimonthly Bulletin," Ohio Agricultural Experiment Station, Wooster, Vol. X, No. 9, Whole No. 117, Nov.-Dec., 1925.

Crops

A new inroad upon the "much-tooted" independence of the American farmer has been made by the march of Greater Agriculture. Out in California, laws are now being enacted which tell the farmers of certain communities just which variety of crop they may grow. The first news of the restriction by law to the growing of one variety of cotton in certain areas of the Golden State came to BETTER CROPS in a story by County Agent Laurence W. Taylor, published in the December issue. The Editors are now in receipt of Circular 357 of the United States Department of Agriculture, "Production of Acala Cotton in the San Joaquin Valley of California" by Wofford B. Camp. The circular contains a very interesting treatise of the advantages in developing one-variety communities, as well as many helpful suggestions on planting, cultivation, irrigation, and marketing of cotton in that section of the country.

The Department of Soils, Ohio State University, is "up in the air." It is labeling its Timely Soil Topics, No. 92, January, 1926—*"Radio Lecture No. 1"*. The leaflet, written by Dr. Firman E. Bear, treats in an easy-to-follow style some of the more important factors in the science of crop growing. In speaking of the 20-year fertilizer tests on the Wooster Experimental Farm, Dr. Bear says that even though yields fluctuate enormously because of wind and weather and by reason of the attacks of insects and disease organisms, yet they never fall so low on well-managed soils as they do on those poorly farmed.

Other bulletins include:

"Rose Culture," Michigan State College, East Lansing, Circular Bulletin No. 84, December, 1925, Alex Laurie.

Crop Talk, No. 30, "The Place of Alfalfa in Ohio," Ohio State University, January, 1926, Wallace E. Hanger.

"Vegetable Planting Guide for Western North Carolina," North Carolina State College of Agriculture and Engineering, Raleigh. Extension Circular No. 152, December, 1925. H. R. Niswonger and Robert Schmidt.

"Crop Sequences at Davis," University of California, College of Agricultural Experiment Station, Berkeley, California. Bulletin No. 393, October, 1925. John W. Gilmore.

"Cereal Hay Production in California" by Geo. W. Hendry, "Feeding Trials with Cereal Hays" by F. W. Woll. University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California, Bulletin No. 394, October, 1925.

"The Mat Bean, Phaseolus Aconitifolius," University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California. Bulletin No. 396, November, 1925. P. B. Kennedy and B. A. Madson.

"Winter Rye in North Dakota," Agricultural Experiment Station, North Dakota Agricultural College. Bulletin No. 193. T. E. Stoa.

"Colsess Barley," Colorado Experiment Station, Agricultural Division, Fort Collins. Bulletin No. 303, October, 1925. D. W. Robertson and Alvin Kezer.

"Composition and Maturity of Corn," Agricultural Experiment Station, North Dakota Agricultural College, Bulletin No. 192. T. H. Hopper.

Economics

The Extension Department, Michigan State College, has recently published a bulletin No. 45 entitled "A Statement of Policy Towards Agricultural Cooperation." The Michigan State College believes that cooperation should be encouraged and that there are certain advantages which come from it, which are given in detail in the bulletin. The authors also give their opinion regarding agriculture and marketing and the relation of the State College to agricultural organizations.

The Bureau of Agricultural Economics, United States Department of Agriculture, New Orleans, Louisiana, publishes interesting bulletins on the "actual market conditions" of cotton under the United States Cotton Futures Act, as observed by representatives of this Bureau or reported to it. This service, published periodically, is maintained free for anyone who requests it and is of great economic importance.

Diseases

In these days of strict attention to cutting costs of production in agriculture, any new prevention or cure of disease in either plant or animal assumes an unusual importance. Of particular interest, therefore, is a new circular, No. 376, from the United States Department of Agriculture — "A Method for the Control of Crown Gall in the Apple Industry," by M. B. Waite and E. A. Siegler, issued in January.

The circular makes mention of great losses—commonly 25 to 50 per cent and in extreme cases 95 pre cent, occurring in root-grafted apple nurseries from crown gall infection, and explains its purpose in making immediately available to nurserymen and others the new method of greatly reducing the attacks of crown gall.

For the past three years the pathologists have been experimenting with an organic-mercury compound, sold on the market under the trade name "Semesan" and have found it very effective in controlling crown gall without injuring the apple grafts. In addition they find greater convenience in disinfecting with this compound over methods previously employed.

Details of the experiments and recommendations for the control of crown gall with the new disinfectant are attractively set forth in the circular which is available through the Department to all interested agriculturists.

"Blight Resistance in Pears and Characteristics of Pear Species and Stocks," Oregon Agricultural College Experiment Station, Station Bulletin 214. *F. C. Reimer.*

"Perennial Canker of Apple Trees," Oregon Agricultural College Experiment Station, Station Bulletin No. 217, *S. M. Zeller and Leroy Childs.*

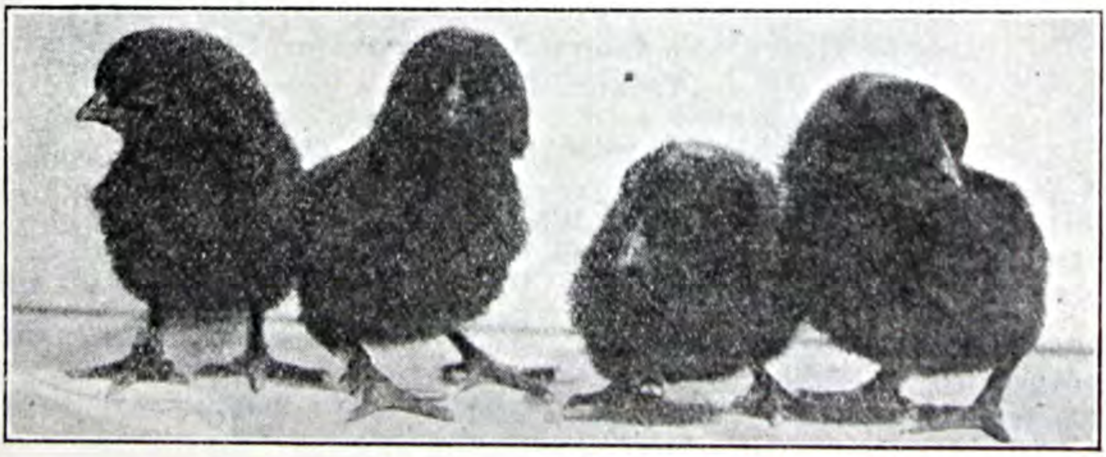
Insects

"Control Methods for Peach Insects," North Carolina State College of Agriculture and Engineering and U. S. Department of Agriculture, Cooperating N. C. Agricultural Extension Service, I. O. Schaub, Director State College Station, Raleigh, Extension Circular No. 153, *December,* 1925.

"The Blackberry Mite, The Cause of Redberry Disease of the Himalaya Blackberry, and its Control," University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California, Bulletin 399, *December,* 1925, E. O. Essig.

"Spray Bulletin," Connecticut Agricultural Experiment Station, New Haven, Connecticut, Bulletin 271, *January,* 1926, *W. E. Britton and G. P. Clinton.*

"Report on Commercial Insecticides and Fungicides 1925," *Connecticut Agricultural Experiment Station, New Haven, Connecticut, Bulletin* 272, *December,* 1925.



The first Spring birds

Pooling Brains

(*From page 6*)

prevalent the committee advised the use of fertilizers carrying 2 per cent of magnesia (MgO) in addition to the phosphoric acid, ammonia and potash. The magnesia may be derived from sulfate of potash magnesia, dolomitic limestone, or any other material carrying magnesia in forms known to be available to plants.

IN reference to the amount of fertilizer to use it was advised that applications of 800 to 1200 pounds per acre be made in the drill at or before planting. The importance of liberal applications of fertilizer in tobacco is well shown by the results secured in Virginia. One of the most striking results from the fertilizer tests at the Virginia Experiment Station has been the large increase in yields from heavy applications of fertilizer. The quality of the leaf has also been improved by the heavier applications. These results are shown in the table. These figures are for bright tobacco, but similar results have been obtained with both the sun-cured and shipping types. This table represents the average of 10 tobacco crops, 9 wheat crops, 14 hay crops and 7 corn crops. The tobacco was the only crop fertilized in the rotation, the others getting only the residual effects of the fertilizers.

Increasing the amount of fertilizers used from 700 to 1,400 pounds has increased the returns from tobacco $95 an acre. This would leave a handsome profit from the use of the additional fertilizer after paying for hauling and distributing the fertilizer, and handling the increased crop, when only tobacco is considered. However, each of the other crops in the rotation was materially increased following the heavier application of fertilizer. If corn and wheat are valued at $1 a bushel and hay at $20 a ton, the total returns from the use of an additional 700 pounds to the acre, through the rotation, amounts to $112.87.

A RECENT survey of the cost of producing tobacco in a part of the bright tobacco belt shows that the average amount of fertilizer used was about 700 pounds to the acre. These figures indicate that materially increasing the average amount of fertilizer used is profitable.

EFFECTS OF HEAVY AND LIGHT APPLICATIONS OF FERTILIZERS IN TOBACCO ROTATION.

Yield and value per acre of crops

Amount of fertilizer applied per acre	Tobacco Yield, lbs.	Tobacco Value	Wheat Yield, bus.	Wheat Value	Hay Yield, lbs.	Hay Value	Corn Yield, bus.	Corn Value
1400 pounds 8-3-3	1038	186	9.0	$9.00	1040	$10.40	31	$31
700 pounds 8-3-3	648	91	5.3	5.30	623	6.23	21	21
Difference	390	95	3.7	3.70	417	4.17	10	10

As to the sources of the plant food constituents, the committee recommended that the phosphoric acid be derived from acid phosphate and the potash from sulfate of potash magnesia, muriate of potash or sulfate of potash. There has been considerable discussion as to the relative value of potash in the form of sulfate as that in the form of muriate for tobacco. The committee studied this question very carefully and came to the following conclusion: "Available experimental data at this time from bright tobacco sections of North Carolina and Virginia have shown that muriate of potash generally produces tobacco of equal or better yield and market value than that produced by sulfate of potash. In view of the fact, however, that experiments have shown that an excessive amount of chlorine in fertilizers used on tobacco injures its burning quality, it is recommended that such fertilizers to be compounded with the above named sources of potash in such proportions that the fertilizers shall contain not more than one unit of chlorine for two units of potash."

It may be said that when one-half of the potash is secured from muriate of potash and the other half from either sulfate of potash or sulfate of potash magnesia that the fertilizer will contain approximately one unit of chlorine and two units of potash.

The sources of ammonia for bright tobacco demand careful attention. The market value of the crop depends to a great extent on the form in which the ammonia is supplied. The recommendation of the committee in regard to the sources of ammonia was as follows:

For the Coastal Plain section: "One-half of the ammonia should be derived from organic sources; preferably cottonseed meal, tankage or fish scrap, and one-half from nitrate of soda or sulfate of ammonia; provided that at least one-half of the inorganic nitrogen be derived from nitrate of soda." For the Piedmont section: "One-third of the ammonia should be derived from organic sources; preferably cottonseed meal, tankage or fish scrap; and two-thirds from nitrate of soda or sulfate of ammonia, at least one-half of the inorganic nitrogen being derived from nitrate of soda."

THE sun-cured and shipping types of tobacco, unlike the bright type, are commonly grown on the most productive fields of the farms. They are not greatly injured by an excess of ammonia, and legumes and manure may be supplied in liberal quantities with good results. But these types also must have a liberal quantity of plant nutrients available at all times and, therefore, require fertilizer in addition to good soil building practices. The committee recommended for ordinary soils 600 to 800 pounds per acre, in the drill at or just before planting, of a fertilizer containing 8 per cent available phosphoric acid, 3 per cent ammonia, and 3 per cent potash.

However, it is sometimes advisable to use a different analysis, as on a sandy soil, low in organic matter. Under such conditions a 8-4-4 fertilizer could be used with profit. In the production of sun-cured and shipping tobaccos the ammonia and potash may be reduced on the red soils which have been made very productive by the use of manure and legumes and sometimes under these conditions only acid phosphate is necessary. However, where one is not sure of the soil conditions, the standard

8-3-3 fertilizer will usually give the best results.

In reference to the sources of the plant food constituents the committee advised that the phosphoric acid be obtained from acid phosphate, and the potash from muriate of potash, sulfate of potash or sulfate of potash-magnesia. The same recommendation in regard to the use of the potash salts for bright tobacco will hold good for the dark tobaccos. In regard to the source of ammonia the following recommendation was given. "Two-thirds of the ammonia from organic sources, preferably from cottonseed meal, tankage or fish scrap; and one-third from nitrate of soda or sulfate of ammonia, provided that at least one-half of the inorganic nitrogen be derived from nitrate of soda."

In conclusion, it may be said when the available data on tobacco experiments are studied one of the striking features revealed is the ready response of this crop to liberal applications of fertilizers. This condition is probably due to the fact that tobacco makes a comparatively large growth in a very short time and in order to secure the best production there must be a liberal quantity of available nutrients accessible at all times.

* * *

Rat Control

(*From page 24*)

that supplied by a rodent specialist and possibly by the school board and boy scouts, or other single organization. No funds are necessary unless the farm bureau or other organization desires to distribute poison free. Local organizations should not be asked to cooperate unless they are of the live-wire variety and sufficiently interested to lend active and dependable assistance.

Usually in a county where rats are abundant and destructive the people will be found apathetic toward their control and then very little cooperation can be expected. Yet it is in just such counties that rat control measures are most needed and the greatest good can be accomplished. Under these conditions it is advisable to begin the campaign in the schools, where instruction on the destructiveness of the rat and its relation to the public health is more apt to bear fruit than with the adult members of the community.

A simple and effective way of reaching the children is to address a circular letter to all school teachers of the county, with the permission of the county superintendent of schools, outlining a talk on rats and inclosing a bulletin on the subject, together with the request that each teacher give the talk in the school room. This talk may be supplemented by an invitation to the rural schools to attend a nearby rat-control demonstration.

In exceptionally progressive counties rats will be found relatively scarce, yet keen interest will be shown in getting rid of the few that are there. Most successful campaigns may be conducted in such counties.

Regardless of local conditions, however, a rat campaign will be of benefit to virtually every county in the United States and a plan of operation adapted to the needs of each county can be devised with the assistance of specialists in rodent control.

Why Farm Electrification Drags

(From page 17)

is used only occasionally is required. This means excessive overhead. Experiments have been started in several states to determine whether such operations as threshing and shelling could be extended over a longer period, so that they might be done by electric power with small motors.

GRINDING feed is a job that lends itself to the continued and regular use of electric power. In Iowa investigators have found it handy to grind feed electrically with a small grinder supplied by a magazine bin. It is likewise feasible to regulate pumping so that current can be consumed when other electrical equipment is idle.

As yet, invention has not gone far in solving the problem of electric traction on the farm. Experiments with both cable outfits and motor driven by storage batteries are under way, and while promising have not yet produced anything fully practical. Wireless transmission of power has been acomplished under laboratory conditions, and the field here opened is tremendous. But even if the problem of electric traction is not solved for many years, there is wide scope for the increased use of electricity in agriculture.

A few of the opportunities may be cited. They have recently been assayed by the Department of Agriculture, and what follows is according to that authority. House heating and cooking by electricity are not yet generally economical. They may be in the near future, however, should increasing fuel problems spur inventive genius to devise improved electric heating and cooking equipment.

Motors developing from one to eight horsepower will do all the ordinary power work on the farm, such as pumping and light stationary jobs. For threshing, silo filling, feed grinding, etc., motors developing at least 20 horse power are usually required.

Mother's work is fun in this modern farm kitchen

One experiment, however, showed that a small thresher having a 28-inch cylinder and 42-inch separator could be driven by a 15 horsepower motor with a power consumption of 2.62, 2.36, and 2.7 kilowatt hours per ton of oats, barley and wheat respectively. Silo filling has been done cheaper by electricity than by steam.

Electricity has been found useful in the production of certain crops. Experiments at the New York Cornell station showed that the influence of the electric arc light on greenhouse plants promoted assimilation, hastened growth and maturity, produced natural flavors and colors in fruits, and increased the production of flowers. Lettuce was greatly benefited, and radishes, beets and spinach were somewhat benefited by electric treatment.

The investigators concluded that the artificial illuminaton of certain crops by electricity as a means of hastening maturity offered considerable possibilities. Electricity in dairying and poultry rasing is no longer a novelty. In dairying its uses are manifold and are increasing. Extremely promising results have been obtained from the use of electric light for increasing egg production, since it stimulates the birds to greater activity and food consumption.

Electric heaters and smudges for the prevention of frost injury in orchards have shown that when electric heaters are distributed about in the same manner as smudge pots, the conversion of 100 horsepower of electrical energy into heat in the open air will cause a temperature rise of 20 degrees Fahrenheit with an outside temperature of 70 degrees. In large fruit producing regions this use of electricity may be very valuable. A use for electricity has been found in the dusting of cotton fields by airplane in the fight against the boll weevil. Drainage and irrigation pumping by electricity is well developed.

It would take a book to list all the practicable and possible uses of electricity in farming. Though the use of electricity in agriculture is only in its experimental stages, it holds out extraordinary prospects. But to realize these prospects, the farmers and the power companies will have to cooperate.

THE problem, in short, is to create new motives for farm electrification. It is not for himself that the farmer chiefly wants electric service, but for his wife, since man's work on the farm can be lightened by other means. But the emancipation of the farm wife from needless drudgery depends on her sharing the instrument of that emancipation with her husband, because housework alone does not call for enough current to make the business of supplying it profitable. Eventually, no doubt, electrical progress and invention will make electricity an economical source of power for farm work.

Meantime, faith that the goal will finally be reached seems to be necessary. With such faith, the farmer for certain jobs might be willing to pay a little more for electric power than he would have to pay for other kinds of power, so that his wife could have the benefit of it.

On the other hand, the power companies might find it good business not to press their demand for a full economic return from farm electrification right at the start. They might make an investment in the future, in the shape of a rate system calculated to promote a more liberal use of current on the farm. Longer chances have been taken by American business, without bad results.

Looking Ahead

(*From page 26*)

Probably this is a year to slow up the process of converting western sod into cotton fields. It may be advisable to reduce cotton acreage all along the line. But those who take that view must consider that question of what to plant instead.

Potatoes have been a headliner in prices this last season. The acreage in 1924 was by no means large but the record yield of 127 bushels per acre swamped the country with potatoes. In 1925 growers cut the acreage 7 per cent further and this was followed by an 18 per cent reduction in the yield per acre (it being 103.8 bushels). It seems entirely reasonable that potato acreage might be increased 10 per cent this spring. A yield per acre of 110 bushels, which would represent a not unreasonable expectation, would then produce a crop of 377 million bushels which ought to be absorbed at profitable prices.

The trouble is that after a year of high potato prices growers are apt to plunge into an extensive acreage and so smash the market the following year. So far as I can size it up there is no particular danger in increasing potato acreage this spring say 10 per cent but if it goes much beyond that and the growing season proves favorable, look out for the potato market next fall.

The hog situation supplies a distinct note of optimism. The number of hogs in the areas of commercial production is the smallest since 1921 and for the entire country the smallest in many years. Stocks of pork and lard are the second smallest in 10 years. The number of hogs in sight for slaughter from next June to October is estimated at from 1½ to 2 million head fewer than in the same period last year.

Since there is some indicated increase in the number of sows bred for spring farrowing, it is probable that the supplies available for market next winter (November 1, 1926, to May 31, 1927) may be about like or slightly larger than during the winter of 1925-26. Although top prices may not reach the peak of last year it is probable that hogs will still sell at very profitable prices for a year yet to come.

THE beef cattle outlook is, in a nutshell, better. Just what that means for prices within the next year is difficult to say. It may not mean so very much. The breeding herds in the West have apparently been about maintained. But the number of steers has been declining at the rate of about half a million head a year for the last six years and is now more than 30 per cent smaller than in 1920. Without discussing the statistics of various beef and dairy classes in detail it may simply be said that the beef cattle industry has turned a corner from its long fit of depression and is now apparently headed toward an equally long period of improvement.

The dairy industry is in reasonably strong position. During the last year there has been some contraction in eastern market-milk herds. This is especially evident in calves and young stock. The number of dairy heifers was about 9 per cent fewer on January 1, 1926, than a year previous and likewise about 9 per cent fewer calves were raised last year than in 1924. This means that there is not likely to be much increase in the number of milk cows for at least two years to come. Of course, production of milk and butter is already heavy enough, from the standpoint of maintaining a profitable price level. But the industry is in good adjustment, everything considered.

THE sheep industry has been remarkably prosperous for four years and flocks have expanded both in the range country and on farms. It may be that we shall not go along forever with such relatively high prices for wool and lambs. A marked industrial slump, for instance, with unemployment and less prosperous times in the cities would probably hurt the market for both lambs and wool. However, there is nothing in sight to discourage those men who are raising sheep as a permanent and carefully handled proposition. Men who are tempted now to plunge into the sheep game in a sort of speculative mood might do well to think twice. Prices of ewes now are pretty high.

GOING down the line of the major agricultural enterprises, as I said in the first place, this is not a year for discouragement. That is more than could have been said of any year between 1920 and 1924. We are back within hailing distance of moderately prosperous times. What is more important, we are back where real daylight begins to show ahead for those years when today's young men will be the farmers.

Meanwhile, it will be good business to remember that it is not the price of the seed that will tell the story of this season's profits but the price of the crop that comes out of the ground next fall.

* * *

The Montezuma Marsh

(*From page* 16)

Here, huge motor trucks are lined up, waiting for the crates to be brought in from the muck. These trucks bear the celery away to the cold storages at Savannah, North Rose, Wallington and Lyons.

Snyder personally supervises all his operations, although his home is a number of miles away. During harvest, his presence speeds up the clearing of each block by one-half hour. This means that 50 actual labor hours are saved on each block and is a striking example of what the presence of the owner means in dollars and cents saved.

Snyder's holdings are known as the Waycony Gardens and the other holdings as the Montezuma Gardens.

Such is the story of one of the most important muck developments in recent years. This area is truly a garden from which goes forth food products to feed a hungry world. It is not exploitation; it is sound business.

An S. O. S. For Corn

(From page 20)

and tested it. We learned something about corn in the crib. We found that corn on top of the crib might germinate 90 per cent or better, yet the balance of the crib be so poor as to be unfit for seed. The best corn was on top, on the sides and in the corners where it had the chance to dry. The poorest corn was in the center, and this took the largest part of the crib. In checking a crib we always took 400 or 500 ears from every part and then gave these ears a six-kernel test. It pays to be careful.

We liked to get corn that tested above 75 per cent crib run. We never handled anything that ran lower. On 90 per cent crib run, by saving the "fives" and "sixes" we were able to get corn that would germinate close to 95 per cent. "Fours" were not saved. They are too low and under wet, cold or unfavorable conditions are likely to cause trouble.

PERHAPS the two best testers that can be used in a seed corn station are the rag doll and the 100-ear wood strip tester. The latter we like the best because it is very accurate, fool proof, is easily used under varying conditions, and where several men are at work, is beyond doubt the most satisfactory. In them corn grows uniformly and can be read out in the same way by different people. If the rag doll is used 70 pound water finish fiber paper should be rolled up with it to prevent the spread of mold through the cloth to other ears.

The box tester is two inches deep, 16 inches wide and 17 inches long, inside, and fitted with a galvanized tin bottom. It is fitted with 10 one and one-half inch wood strips each containing 10 one and one-quarter inch holes, making a capacity of 100 ears. We placed 1/4 of an inch of saturated, well rotted sawdust in the bottom, put in the sticks, then covered them level full with the saturated sawdust.

The testers were kept in what we called a "bungaloafer." This was a common hand truck 3 by 5 feet, on wheels with a frame built on top to support a canvas to hold in the heat. It could be easily moved about and was pulled over

Racks in testing station

the radiator in the evening, the amount of heat being regulated by the flap in front. Kept at a temperature of 100 to 110 degrees in the night the testers could be read out on the fifth or sixth day. The strips were removed to facilitate reading. Everything in the station was numbered from left to right, and everything was carefully checked and rechecked.

The men working in the station were instructed to stop their work to explain to all visitors just what we were doing. Occasionally some "cocksure" jackknifer would come in who knew all about seed corn without testing. But he always had the conceit taken out of him before he left because there was always plenty of corn on test and always some ready to read out. Relatively, perhaps only a small amount of seed corn can be handled at a testing station, yet the value of it as an educational demonstration large enough to attract the attention of all the people of the county is of the greatest value.

But there are other things that may be done, and some of them may not always fit in well with the situation in the county. These must be left to the judgment of those in charge. The seed corn situation is so bad in many counties of the corn belt that it should challenge the best thought of those who are entrusted with the execution of this educational movement. Our whole agricultural, educational organization in all of its branches from the county to the colleges, has here another splendid opportunity to demonstrate to the people the value of this service in times of such an emergency and to justify the expenditure of the funds which the people have willingly given to its support.

* * *

Tune in on This

(*From page* 9)

will deal with livestock, on Tuesday with crops and soils, on Wednesday with poultry, on Thursday with fruits and vegetables, and on Friday with dairying.

"A special program for farm women, known as the 'Housekeepers' Half Hours,' was started at the same time as the question feature. This will consist of chats on various home problems that have been cleared up by research in the department.

"On March 1, when many persons were looking over their garden tools and watching the buds for signs of green, many stations began introducing 'Uncle Bert, the Garden Expert,' a character Mr. Pickard has created to give boys and girls the best the department has to offer on gardening and nature study. The program will be carried on in dialogue, questions being asked by boys and girls and answered by 'Uncle Bert.' Boys and girls who enroll in the club by writing the department will be sent copies of the talks and other gardening information.

"SAM PICKARD had some experience with the air before he became a radio 'windjammer.' During the war he was a lieutenant in the air service and had many a brush with the Germans. He then took up commercial aviation for two years before going back to Kansas to finish his college course, becoming extension editor upon graduation from K. S. A. C. While in this work he developed the possibility of radio as a means of taking the college to the country by the air shortcut which made Kansas outstanding in this field."

A Boy Who Became President

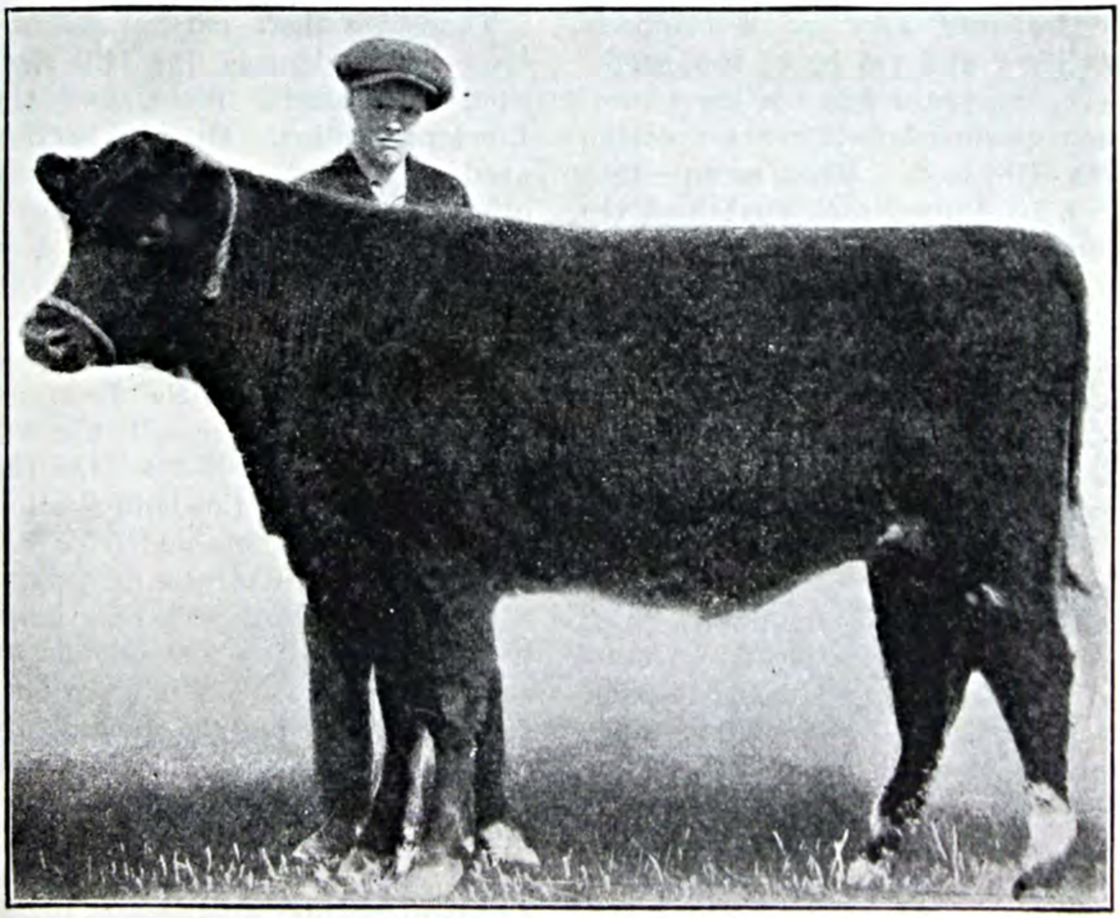
By *Allyn H. Tedman*

County Agent, Arapahoe County, Colo.

"GREAT trees from little acorns grow." Likewise great men from little boys grow. The greatest service that the Extension Worker can render is to help these little boys grow into great men. There is a reward in seeing a boy develop from an ordinary country boy into a community leader, then possibly on to greater heights, and all from the inspiration he derived from his club work.

At Bennett, Colorado, there once was a boys' calf club. The boys selected milking Shorthorns for their breed. Several of their fathers also bought into the same cattle. Eventually these local Shorthorn breeders organized under the name of the Tri-Valley Shorthorn Breeders Association. Fred W. Haupert, the father of one of the club boys, has since its birth, been the secretary of this organization. At its last annual meeting it elected as its president, his son, Millard W. Haupert, an eighteen-year-old boy and a calf club member.

Millard did some pig club work as far back as 1918, but did not get a start in his calf club work until 1921. This calf, that is his first calf, was bought by the County Agent and his father for him. Later he lost it when it reacted to a T.B. test. Then he got busy and sold some grade cows and calves he had raised and with this money he bought one purebred heifer. Today he owns six



Millard W. Haupert and Goldenbelt Mary real good ones. He won first in his class in 1925 at the Western at Denver, and with the same heifer, Goldenbelt Mary, he won Grand Championship at the Tri-Valley show held at Bennett.

In all his ups and downs he has had considerable loss, but he has the kind of stuff in him that wins in the end. At the recent annual Tri-Valley banquet and speech fest, Millard appeared for the first time as President of his organization. It meant a lot for a boy to win such a distinction among men, breeders, all of whom are many, many years his senior. And Club Work gave him his start. Club Work showed him the way, and the Extension Workers who originally opened the door of opportunity to Millard should feel a rich reward to see how well their seed has matured.

* * *

Fertilizers for Cotton

(*From page 21*)

It is not enough to say we need all three of the common fertilizer elements. The important things are: first, the proportion of the elements in the fertilizer, and second, the amount of fertilizer to use per acre. A great mistake which many make is to buy fertilizer by the ton rather than by the grade. A fertilizer may be a complete fertilizer and yet be of low grade.

A few years ago the most common grade of fertilizer for cotton was 10-1.65-2. This means that each 100-pound sack contained ten pounds of phosphoric acid, 1.65 pounds of nitrogen, and 2 pounds of potash. Such a fertilizer is very poor for cotton. Even if it sells as cheap as it should, it is a very expensive fertilizer, because it is too low in its nitrogen and potash content. Some farmers are still buying this low grade 10-1.65-2 fertilizer.

The grade of fertilizer which seems to be best adapted to most Arkansas soils, except the lowland sections, is a 10-4-4. The proper amount to use is about 400 pounds per acre. Since the grade shows the pounds of each plant food element in a 100-pound sack, it is seen that four sacks of 10-4-4 fertilizer would supply 40 pounds of phosphoric acid, 16 pounds of nitrogen, and 16 pounds of potash.

The old custom of using two sacks per acre of 10-1.65-2 fertilizer did not supply enough of anything, and especially not enough nitrogen. Even 400 pounds of 10-1.65-2 fertilizer would supply only 6.6 pounds of nitrogen per acre.

There are three natural soil divisions in Arkansas, the Hill Section, the Coastal Plain, and the Lowland Section. The Hill Section needs phosphate more than any other plant food. Four hundred pounds per acre of either 10-4-4 or 12-2-4 should be used for cotton in the Hill Section. In the Coastal Plain, use 400 pounds of either 10-4-4 or 8-4-4. In the Lowland Section on the lighter soils use 400 pounds of 8-4-4 or 8-5-4. On the heavy soils of the Lowland Section good results are obtained from 100 to 200 pounds of nitrate of soda.

A good standard cotton fertilizer is made by mixing 200 pounds of acid phosphate, 100 pounds of nitrate of soda, and 30 pounds of muriate of potash. This is about the right amount per acre. In the Hill Section a little more phosphate may be used, and in the Lowland Section a little less phosphate.

Budding and Grafting Apple Trees

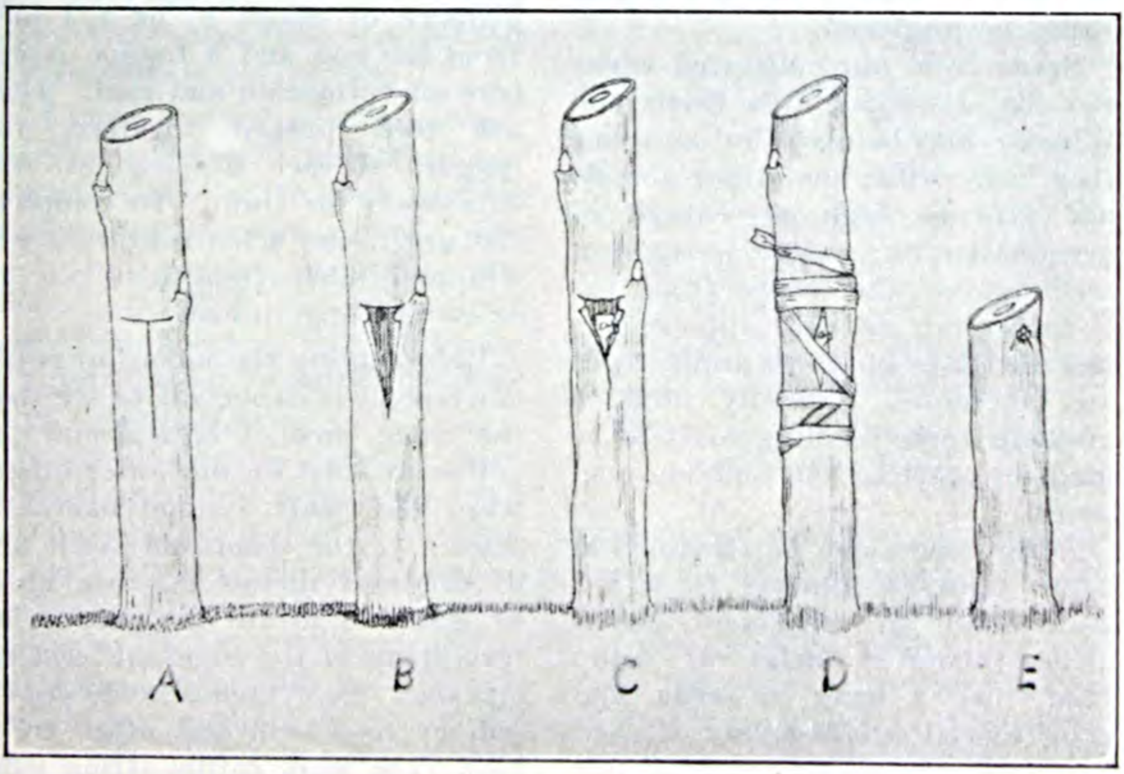
(*From page 27*)

and the methods are so simple that anyone of average intelligence can perform the work successfully if he so desires.

With proper training and experience the fruit grower may be able to propagate in a satisfactory way the fruit trees required for planting. Few, however, will take the time to follow directions and practice diligently enough to acquire the skill necessary for successful and economic propagation. The reliable nurseryman, therefore, who makes a specialty of the business of grafting and budding fruit trees is generally able to produce better stock at a lower cost than the average fruit grower or farmer. The grower will also save from one to two years' time in bringing the orchard into bearing by buying the fruit trees needed from a reliable nurseryman instead of endeavoring to propagate them himself.

The best trees which can be secured will in the end be the most economical and profitable. Success or failure may depend upon the vigor of the nursery stock used. Whether propagated at home or purchased from a commercial nurseryman, the importance of obtaining the best nursery stock cannot be overemphasized.

SCION WOOD is usually cut sometime during the late fall or early winter from unfrozen, well-matured wood of the last season's growth. One-year-old wood is preferred because experience has shown that its buds are more likely to grow successfully upon the stock than the buds from wood two or more years of age. The length of the scions will depend upon the amount of growth during the past season. This may range from 10 or 12 inches to 20 inches or more.



Shield Budding
A—T cut, B—bark spread, C—bud inserted, D—bud tied, E—top removed

Scions should not be cut too long for convenience in handling and storing.

Water sprouts may be used if the wood shows no winter injury, is firm, well-matured, and provided they do not originate below the graft. If the water sprouts used as scions come from the root below the graft, they produce seedling trees which are generally worthless or very inferior.

The scions should be tied in bunches of from 25 to 50, stored in damp sand or green sawdust and placed in a cool cellar or cold storage. When scions are kept in a room which is too warm they may start growth and be unfit for use; while if kept too wet they may rot or be severely injured.

THE natural method of propagating the apple is by means of apple seeds. The apple, however, like most of our cultivated fruits, does not come true from seeds. As many different varieties, therefore, as there are seeds planted will generally be produced.

Seeds from our cultivated varieties like Jonathan, Ben Davis and Winesap may be used; but as a rule they lack virility and vigor and do not give as high percentage of germination or produce as vigorous seedlings as the seeds from the French Crab or wild apple. The so-called French Crab apple seeds are, therefore, generally used in growing apple seedling roots to be used for grafting and budding purposes.

Apple seeds may be stratified in damp sand as follows: In a flat wooden box of convenient size is placed about 2 inches of damp sand, then a layer of seeds, and upon this alternate layers of sand and seeds are placed until the box is filled or the work is complete. The box containing the seeds may be placed flat on the ground outdoors and covered with strawy manure to a depth of about a foot in order to prevent severe alternate freezing and thawing. Since the seeds begin growth early in the spring, the soil in which they are to be planted should be prepared in the fall or early winter by deep plowing. It is important that the soil be deep and rich; otherwise straight, long roots of the kind convenient and suitable for grafting purposes cannot be produced.

While the seeds are generally planted in the spring, they may be planted in the nursery rows during the late fall or early winter, in which case they are likely to give just as good or better results than spring planting. By fall planting directly in the nursery row, the seed stratification work is eliminated.

In making the draft, a sloping cut about 1½ inches long is made on one side of the upper end of the seedling root. The same kind of sloping cut is made on the lower end of the scion. The knife is then placed on the sloping cut at a distance of about ¼ or 1/3 inch from the end and a tongue is cut here on both scion and root. They are then pushed together, the tongues of each slipping into the slits made for them. To complete the graft, the scion and root are wrapped fairly tight with No. 18 or 20 knitting thread.

Before tying the union or graft, however, it is important to see that the inner bark of both comes together at least on one side; otherwise, the graft is not likely to grow. If the scion and stock are of different diameters, care must be taken to insure the proper interlapping of the edges, at least on one side. Poor unions invite crown gall or root knot and other troubles. The weak cotton string with which the stock and scion are wrapped will decay rapidly and cause no injury when the grafts are set in the soil. The finished graft, including the scion and root, should be about $8\frac{1}{2}$ to 9 inches long.

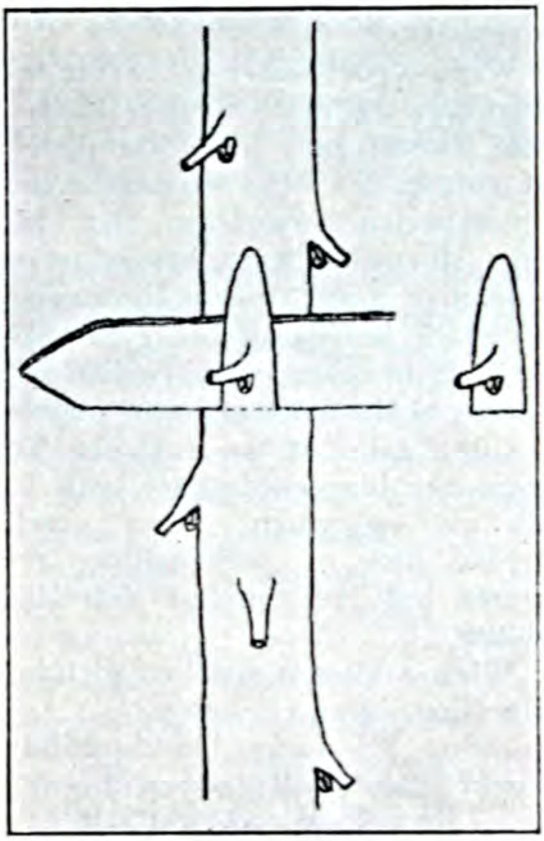
The grafts should be packed in bundles of 50 to 100 each and stored in damp sand or green sawdust and placed in cold storage, a cool cellar or a callus pit until they are set in the nursery row in the spring. The grafts may be planted either in holes made by a "dibble" or along the smooth, straight edge of a furrow made by a plow. In either case, it is important to leave only the top bud of the scion above ground and to pack the soil firmly around the base of the root or graft.

If the young trees receive frequent shallow cultivation throughout the spring and summer, they should grow to a height of $2\frac{1}{2}$ to 3 feet or more when they are considered large enough for transplanting as "one-year-olds" any time during the late fall, early winter or the following spring. They may also be dug and stored in moist sand or green sawdust. If the trees are not large enough in the fall for transplanting or if there is no ready sale, they may be left undisturbed in the nursery.

The apple may also be propagated by budding. The method employed is similar to that used in the propagation of stone fruits, such as peaches, cherries and plums. Seedling apple trees not more than one year old are generally best suited to shield budding.

The main budding work is usually done, however, during July, August and early September. The buds are placed within a few inches of the ground on the north side of the seedling to protect the bud from the sun. In about a week or ten days the string used in tying the bud to the seedling is cut on the south side. Nothing more is done to the inserted bud or seedling stock until early spring when the tops of the seedlings are cut off just above it. Sprouts which may arise at the base of the seedling are rubbed off at regular intervals and the inserted bud is forced. With good culture and growing conditions the budded trees should be large enough for sale or transplanting after one year's growth.

A budding stick consisting of a twig of the current season's growth having several buds is selected from the variety that is to be propagated. The leaves are removed, leaving a portion of the leaf stem or petiole to serve as a handle in inserting the bud. A T-shaped cut is then made as near the ground as possible. A shield-shaped piece of bark is cut away from the budding stick, including a bud in the center. The bud is inserted in the T-cut by carefully raising the bark from the wood and pushing the bud downward until it fits smoothly against the wood beneath the incision of the bark. After the bud is inserted it is tied in place with raffia or cotton twine.



Removing bud for insertion in stock

Beware the Moods of March

(*From page 4*)

A MAN'S mood is a mental state created, I am now positive, by some physical condition, either within himself or without, over which he has no or poor control.

What we call Fate is often no more and no less than a set of conditions put in motion by a mood. To study moods, therefore, is to study Fate.

Who can say, as they delve into History, how many sudden and abrupt changes in the course of the world's progress, were due to moods caused by a physical frailty in someone?

When a coal miner gets acute indigestion the matter interests, beside himself, only his doctor—and, of course, his wife who has come by experience to learn that his sour stomach always brings on a vindictive mood during the course of which he blacks her eye! She feels, in imagination, his sullen fist almost at the moment he announces the first gripe of the stomach. To trace her blackened optic back to his over-enjoyment of a great, greasy dish of porkpudding requires but the simplest detective ability.

When a king is stricken with indigestion, however, *beware!*

Unless it is lucky, the immediate world about will veer and sway from its accustomed orbit; it will swerve and tremble and have conniptions of a high order!

Ultimatums which issue from under his trembling, dyspeptic fist show the tenor of his malady—and his subjects undeservedly suffer. The upset organ may bring on a mood of despotic temper which distorts momentarily his customary good judgment, and his irritability may o'ernight wreck a great nation or change century-old habits of belief.

Marat's skin torture undoubtedly influenced his state of mind so strongly that to an inflamed epidermis can be traced the orgies and massacres at Abbeye Prison and at La Force!

Mary Tudor's childlessness, we now know, caused Phillip not only to lose interest in her, but to settle into a vindictive mood which caused him to rage against his enemies, taking out upon them the wrath he felt for Mary Tudor.

On the 19th of October, 1812, Napoleon, with a malady that precluded more than three hours' sleep at one time, found himself in an unenviable mental mood. He knew himself to be absolutely unfit to cope with the Russian peasants then uprising against him. So, with a feeble gesture of impatience, he ordered certain parts of the Kremlin to be blown up, and stole silently away in shame!

Drowsing and slumping—his ordinarily brilliant mind confused and distressed in its unaccustomed mood—he lost the chance that would have made Russia his slave.

THE greatest strength is to know your own weaknesses, see them clearly, look at them without fear, but with understanding—then throw safeguards around them as men erect a steel fence around the cage for a ferocious animal. Put barriers around your failings so they cannot harm you.

When you realize that you are the innocent and undeserving victim of natural moods from which there is no escape; when you realize that your mental states are variable through no voluntary motivation on your own part; when you understand that Nature's law of periodicity is being worked out within yourself—that you are affected as is all else in Nature—then you can knowingly plan against the effects of these mental states and intelligently erect bulwarks against their effects.

You cannot always prevent those moods induced by outside conditions; not always can you safeguard your mind against the inroads that your own body makes against it.

But you *can* study yourself and see to it that you make no abrupt decisions while in the wrong mood!

You will often be the victim of another man's moods. This you cannot help. It is a part of life. The most you can do is to build yourself fences which keep his moods from tearing out at you, file his claws and dull his teeth.

I know a captain of industry—the head of a great enterprise and employer of thousands of men. He can seldom see all of his branches nor all of his men; he is dependent, therefore, upon reports sent in to him from all parts of the country. Part of his success lies in the keen manner in which he analyzes these reports and takes the action for which the information so compiled seems to call.

But, when he receives a report he does not act immediately upon it. Instead he has a private secretary who investigates for him, not the facts in the report, but the *mood* of the man who made it out! He trusts his men to give the correct information, but he has intelligence to know that the moods of men form their motives, and that moods can color facts until they are unrecognizable!

A discouraging report from his Kansas City branch recently set forth figures which tended to prove that the branch was not only unsuccessful, but that for certain reasons duly set forth it could never be successful. The investigation by the secretary, however, showed that the branch manager had been in a very despondent mood for weeks while working on the report—had had family trouble at home, wanted to get out of Kansas City and be transferred to another branch.

This branch manager had not falsified his report exactly—he had merely made the bad facts look worse, and hidden the good facts in a "mess of verbiage."

Had my friend, the President of the Company, acted upon the report alone, without investigating the *mood* and the motive behind it, he might have closed up a branch which has since become one of the most profitable he has. Instead, he continued the branch under other management, transferred the man and endeavored to patch up the fellow's family difficulties.

IT is my observation that moods visit all; that they can be partially avoided by adopting strenuous mental methods; and that the *bad effects* of moods of any kind can be eliminated by carefully avoiding any decisions or any work while in the wrong mood.

Do not decide to leave your job while you have indigestion. Tomorrow the sun will shine brightly, your stomach will behave, and you will wish you had your job back.

Do not fire a valuable employee in a fit of temper. Tomorrow, your mood will be different and you will give your right hand to get him back.

Watch your moods. Especially watch them in March. For doctors tell us, and insurance statistics prove, that during this month your vitality is lower than at any other month. You are tired of winter, your blood is thick, your muscles are weak, your brain is worn out. Make no moves in March that you will regret in April.

Beware the Moods of March!

Bill Wallace, who spent most of his last month in New York City, gave a complete report of his experience immediately upon his return

"It may surprise you to find it out," he declared, "but them city fellers is plumb afraid of a little snow. Soon's the first few flakes begins to come down, they beat it fer their shovels an' begin scrapin' like mad, actin' like they thought the stuff was pizen.

"After a half hour they're runnin' funny lookin' scrapers along the streets, rollin' the snow up in big piles. In another twenty minutes about a million men comes out an' begin to load the piles into trucks. I never seen such darn foolishness. Just imagine me haulin' all the snow off'n my place with a truck!

"The most interestin' thing I seen though was a lot of machines like hay tedders mounted on little tractors, scoopin' up the snow an' dumpin' it in trucks with a conveyor chain. A lot of women was standin' around on the sidewalks, watchin' an' gaspin', 'Ain't that wonderful!'

"That shows how dumb them city people are. If they think a snow-handlin' hay tedder's wonderful they ought to see somethin' really wonderful, like a grain binder, or a p'tater digger, or a thrashin' machine. That's the trouble with city folks: they ain't never been anywhere, an' they ain't never seen nothin'!"

Looks like a great social season coming at Hooper's Corners. Lem Hawkins, the county clerk, has just got in a nice fresh supply of marriage licenses.

* * *

Old Man Curtiss, who retired from active farming last year, says spring can't come any too soon to suit him. This will be the first year he's ever been in position to enjoy the spring fever thoroughly.

* * *

Matt Peasley says you can't be sure that spring is here until you've surprised the hired man throwing horseshoes in the cowlot for practice, when he was supposed to be planting the garden.

Caleb Pertwitt says you can't be sure that spring is here until the tourists begin going by, headed for California with seven kids piled in the back seat of a five-passenger flivver and a hound dog tied to the running board.

* * *

Ike Womble says you can't be sure spring is here until you get a price-list and a notice that the price of seed corn has suddenly gone sky high just as you've got to buy some.

* * *

But it's Lon Seegrist who says that the only sure sign is when the boys come home from school by the river road with their hair all wet, but vigorously denying they've been in swimming.

When cotton sticks in the burs—

POTASH

When your soil contains sufficient potash—the boll is large and burs open normally. Your profit is greater. Potash Pays!

NO POTASH

When your soil is deficient in potash—the boll is small and burs do not open wide. Your profit is less.

FREE

You will find useful information in the newly revised booklet "Better Cotton." It shows how several growers have increased their profits. Just write to the address below for your free copy.

IF your cotton plants have shown a tendency to yield small-sized, poorly developed bolls with burs not opened wide—you will find the following information useful:

Adjoining plots on a fine sandy loam of the Coastal Plain were fertilized with different mixtures.

When no potash was used in the fertilizers the bolls were small, the burs did not open wide and pickers complained that the cotton was harder to pick.

On the no-potash plots it was also noted that in July the foliage began to change to an abnormally dark green color with many of the leaves showing signs of crinkling.

The crinkled leaves later turned a bronzed color and rust soon made its appearance, which is characteristic of potash hunger. Rust caused the cotton plants to shed their leaves and to stop putting on fruit—resulting in decreased yields.

When potash was added to the mixtures containing phosphoric acid and nitrogen the results were favorable. The foliage was of a normal green color, the leaves did not crinkle or rust. The bolls were larger and better developed and the burs opened wider—making it easier to pick the cotton.

POTASH IMPORTING CORPORATION OF AMERICA

Dept. BC 10 Bridge Street, New York

ATLANTA SAN JOSE BALTIMORE

Sales Agents—H. J. Baker & Bro., 81 Fulton St., New York

West of Rockies—Meyer, Wilson & Company, San Francisco, Cal.

Genuine German

POTASH

Better Crops

The Pocket Book of Agriculture.

April 1926 10 Cents

Read: Cheers and Jeers—Top-Dressing Alfalfa—Efficiency, and then What?—Kentucky Blue Grass

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

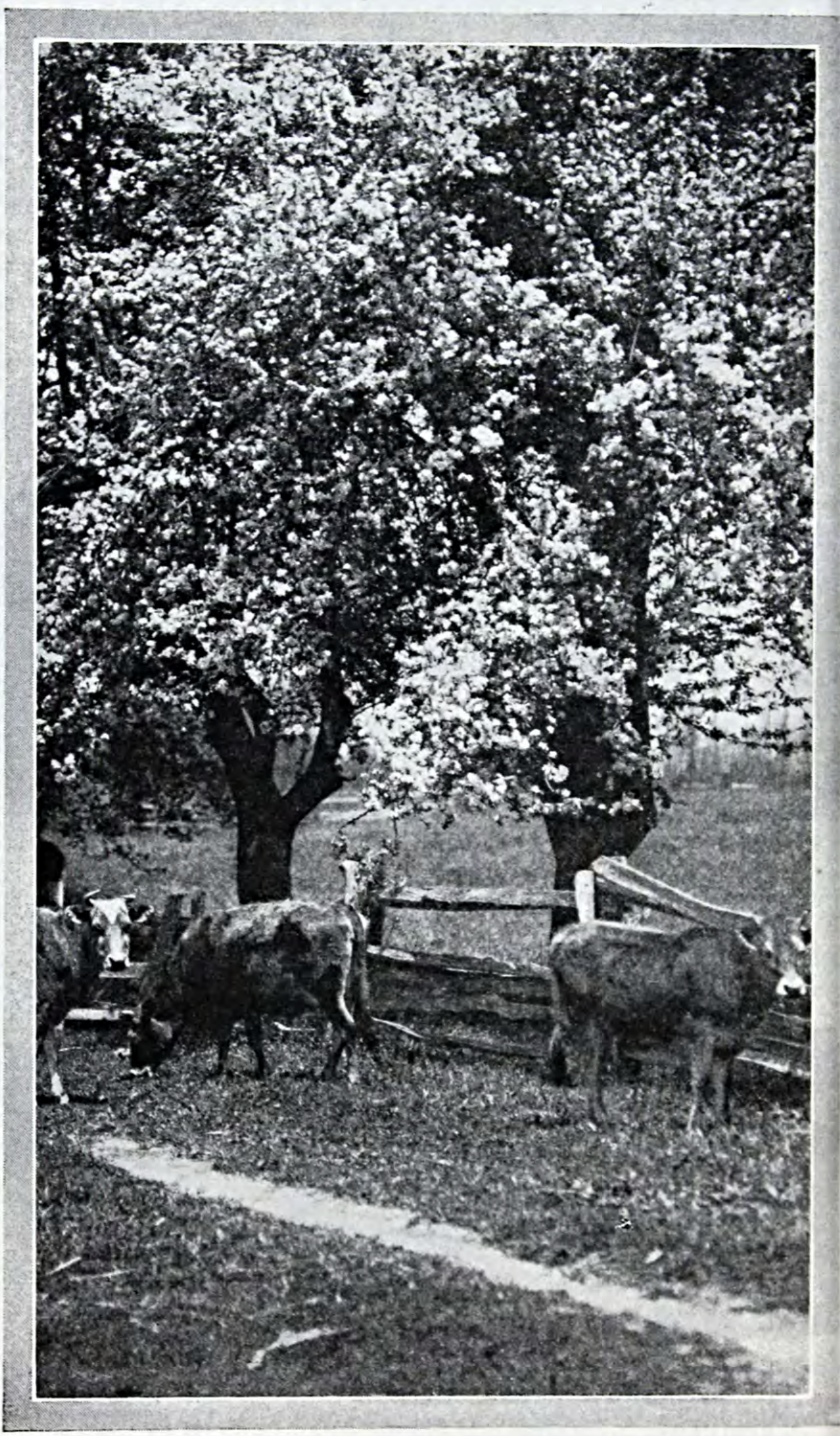
VOLUME VI NUMBER TWO

Table of Contents for April, 1926

Who's Who of BETTER CROPS

EDITOR.................R. H. STINCHFIELD
CONTRIBUTING EDITOR.................JEFF McDERMID
MANAGING EDITOR.................G. J. CALLISTER
PRESIDENT.................E. K. HOWE
VICE-PRESIDENT AND TREASURER.................H. A. FORBES

Editorial Office: 10 Bridge Street, New York



When well apparel'd April on the heel
of limping winter treads

—*Shakespeare.*

Better Crops

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, A SUBSIDIARY OF THE POTASH IMPORTING CORPORATION OF AMERICA, 10 BRIDGE STREET, NEW YORK. SUBSCRIPTION, $0.50 PER YEAR; 10c PER COPY.

VOL. VI NEW YORK, APRIL, 1926 No. 2

¶ *An unusual type of frankly honest essay on*

Cheers and Jeers

By Jeff McDermid

WE are just beginning to get the first inside glimpses into the workings of that most important machine—the human mind.

Alongside the feats performed by a brain which can not only remember in detail things that happened ten years ago, but which can, through observation of natural events, forecast the future, the tricks performed by any man-made machine of gears and wheels seem slow, ponderous and faulty.

The study of the mind—your mind and my mind—is important, because today most accomplishments are mental.

The leader is in the vanguard simply because he has learned how to dominate the minds of others. The salesman sells when he succeeds in swaying the other fellow's mind into the right mood to make a favorable decision. The writer must study psychology—the science of the mind—if he is to influence the multitudes.

And the matter of working harmoniously and successfully with other men is a mental matter—and thus is yet partly a mental mystery.

Handling men is a difficult art. Whether to *cheer* or *jeer* our superiors, inferiors, associates and equals is a problem. Or, to paraphrase Shakespeare, "to cheer or to jeer; that is the question. Whether it is nobler to jeer and by our opposition stir men into greater action, or whether to *cheer* them on when we know they have made errors, and by our cheers improve them!"

ONE day a few years ago a man strode angrily into a country editor's sanctum brandishing aloft a copy of the day's paper and demanding to know "what in blazes they meant by inserting the word 'applesauce' after every important point in the speech he had delivered the night before at a political meeting."

The editor was astonished and, adjusting his steel-rimmed spectacles, sent for the foreman. The foreman, looking over the offending article and comparing it with the reporter's original, explained, "That is only a typographical error, sir. The reporter wrote 'applause' in those places and we merely set it up 'applesauce!'"

Applause vs. *applesauce*—a sermon in variation!

We hear a great deal lately about "inferiority complex"—a feeling of inferiority which settles down upon the unfortunate few whom the boss bawls out. And whether criticism or praise is best to bestow upon the deserving is a matter of some moment.

"A man who does not love praise is not a full man," said Henry Ward Beecher; but did not say what effect the praise had on th man who loved it.

As I see it now, the decision t applaud or cry "applesauce!" i not so much a matter of whethe the performer likes or dislike praise. It is entirely a matter o its effect on his work for whic we are paying.

For an audience of intelligen folks to pay seven dollars a sea to see a show and then, by withholding applause, put the performers in that unenviable stat of mind which prevents their doing their best work has alway seemed to me like the process o cutting off your own nose to spit your face!

You are paying for the show Why not get the most for you money? And to those who, afte liberating themselves from th price of a seat, jeer and boo an hiss the actors, I have only the utmost contempt. For, unless they get more pleasure out of th strained situation they arouse than they would out of a perfect performance, I cannot see their wisdom.

EVEN if I do not think a performer is doing as well as he should, *I applaud him;* and by my mental attitude try to get others in the audience to applaud, all to the end that we may all enjoy ourselves more. I know that applause and praise is sweet to the ears of a creative spirit and that hand clapping stimulates an actor to better work if he has it in him.

And if I discern that the performer is so rotten that no amount of praise can bring out of him a presentable act, *I get up and leave.* I do not remain to jeer. I go entirely. For jeers do not help anyone.

(*Turn to page 62*)

Keller's Field Day

By

E. Bruce Brunson

County Agent, Cheyenne County, Kansas

THERE are two ways of getting information—one, from your own knowledge and experience; the other from the knowledge and experience of others. Henry Keller, Kansas farmer, is a strong advocate of both ways.

Last year Mr. Keller, who is also president of the Cheyenne County Farm Bureau, conducted an extensive variety test of corn on his farm in Lawn Ridge Township. On top of this, after he had satisfied himself with the results, he called in his neighbors and held a regular corn field day all of his own. So interesting did the day become, that there is every probability that some such get-together will become an annual affair. Cheyenne county is one of the best corn counties in Kansas.

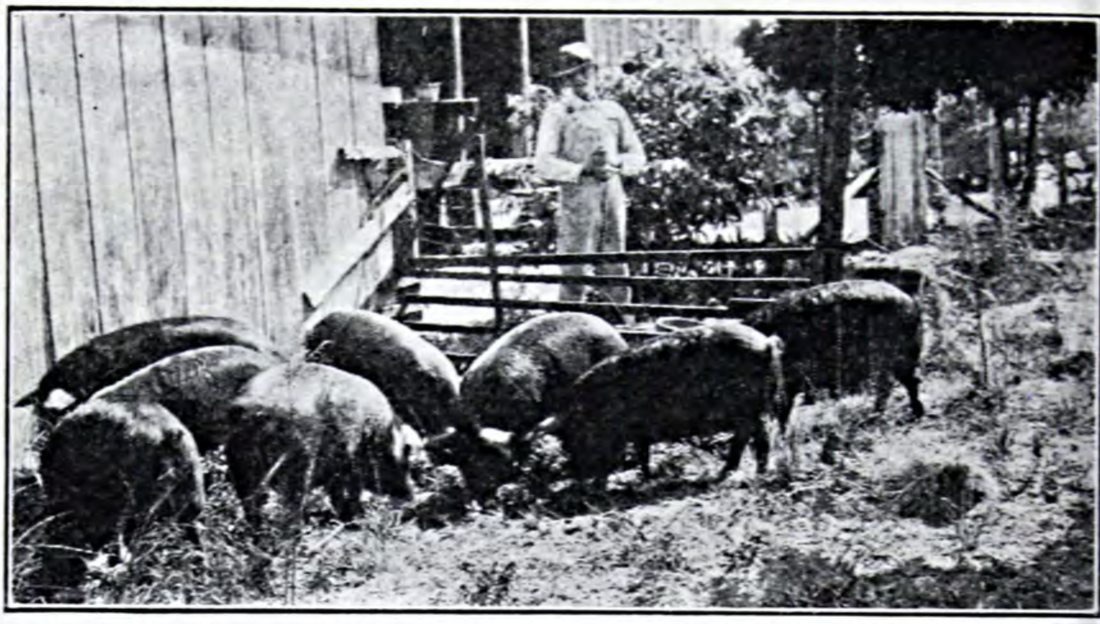
"Demonstrations Convince"

When Mr. Keller decided upon making his experiment, in addition to the six varieties of corn which were sent out from the college, he secured 21 samples of seed from various parts of Cheyenne county. All of these varieties were adapted, having been grown in the locality for not less than five years. He planted all of this seed, four rows of each, on May 22.

At harvest time and after this progressive farmer decided on holding his field day, he called his friends and neighbors together to profit by his findings. The crowd gathered at the Keller home a little before noon. The home was thrown open, and a fine basket dinner supplemented by barbecued beef furnished by Mr. Keller was served cafeteria style.

After the dinner everyone drove

(*Turn to page* 44)



Fourteen per cent of the family living from the farm is pork and lard

A LIVING

By

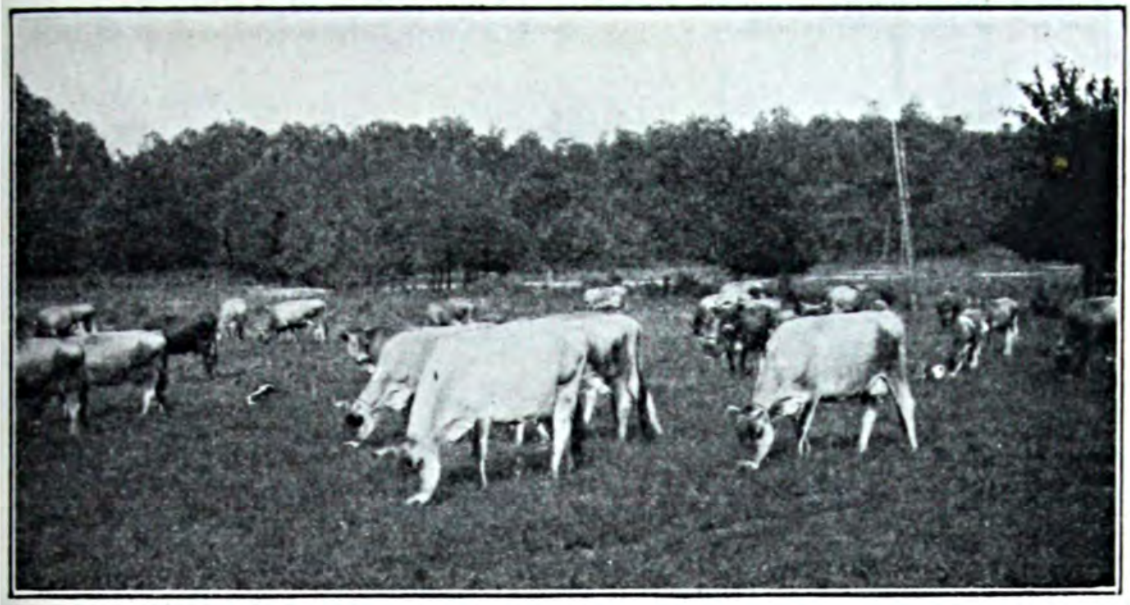
C. E. Trout

United States Department of Agriculture

THE farm gives many returns which add to the stability of the family and to the standard of living, but which are hard to measure in dollars and cents. One of the most important of these returns is "the family living from the farm." Many attempts have been and are being made to determine the money value of the part of the family living furnished by the farm.

It has been determined, however, that the farm greatly contributes to at least three essentials of life—food, fuel, and shelter, and that these returns generally do not show on the farmer's balance sheet. The family living from the farm is largely made up of the food products set aside from the year's production and the fuel and house rent furnished directly by the farm.

No farm plan seems complete without its family garden. A part of the day's supply of milk and a part of the day's collection of eggs is used in preparing meals for the family. Other food products go to the pantry, cellar, or smokehouse instead of being sent to town to be sold. The farm woodlot, condemned fruit trees and discarded fence rails and posts furnish fuel for cooking and heating.



Dairy cattle furnish nineteen per cent of the farm products used by the family

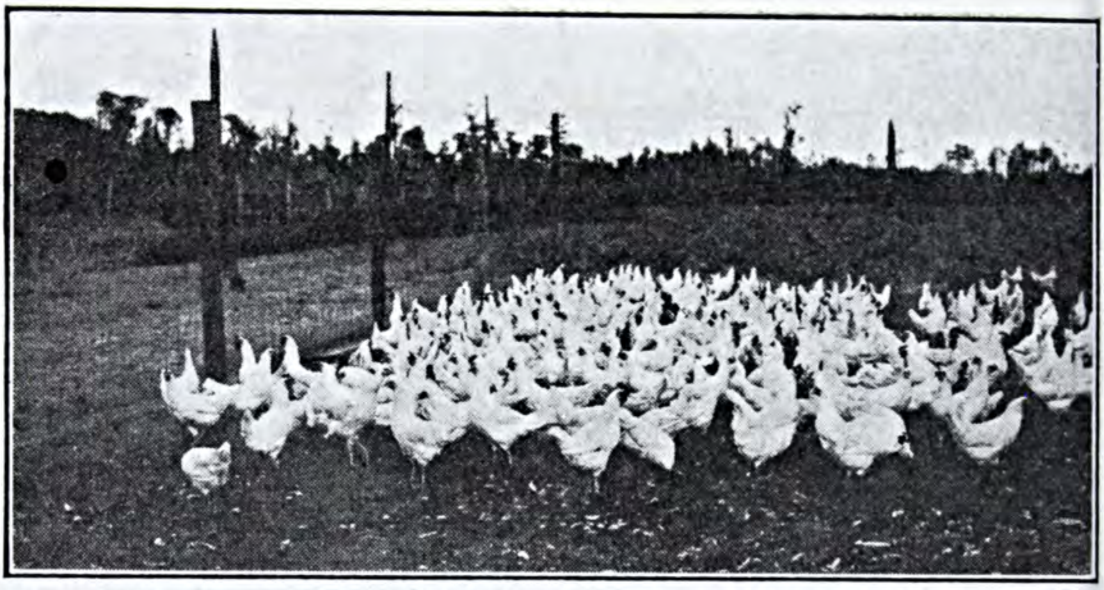
off the FARM

Helpful information for folks living on the farm.

These supplies are things that lend safety and stability to farm life. They enable the farmer to tide over hard times that would ruin him if he had to pay cash for everything. In the case of the man on a small farm, this income is often of as great importance to the farm family as the cash income. These perquisites are not altogether free of cost to the farmer. They represent labor and invested capital. The actual money cost, however, is usually insignificant.

Studies of several thousand farms made by the United States Department of Agriculture show that the value of the things the farm family gets from the farm averages about one-third the whole cost of the living for the family. It is about two-thirds of the cost of the food, fuel and house rent. While in 1918 and 1919 when everyone was prosperous, the value of the part of the family living coming directly from the farm was only about one-fifth as much as the farm income; in 1921 and 1922 when the depression was at its height, the living was fully one-third as much as the income, according to H. W. Hawthorne of the Department, who has worked out the meaning of the figures collected on this subject. The information on which he bases his conclusions was collected for the years 1918 to 1922.

All sections of the country were



Poultry and eggs furnish eleven per cent of the living

represented in the figures. Dairy farms in the hills of New England and in Wisconsin, the cotton plantations in the southern states, the citrus groves and early truck farms of Florida, the orchards of the Shenandoah Valley in Virginia and near Niagara Falls in New York, the grain and livestock farms of the Corn Belt, grain farms and grazing in the Great Plains region, extensive wheat farms in the Palouse country of Idaho and Washington and in northern Oregon, and farms under irrigation in the West and Northwest are all represented in the data.

The importance of the living from the farm is brought out by its actual value in money compared to the cash income from the farm. The families in Washington county, Ohio, Tama county, Iowa, and the Palouse country of Idaho and Washington had but little more cash to spend than a sum equal to the value of the family living from the farm in 1921 and 1922; while in the more prosperous years, 1918 and 1919, the families in Washington county had more than twice as much as the value of their family living from the farm to spend in cash, and the families in Tama county and those in the Palouse country had more than seven times as much.

(*Turn to page* 49)

The farm furnishes $14 worth of fuel to the family

This is a timely problem. Read this authority's experiences.

Top-Dressing Alfalfa

By A. R. Albert

Supt., Hancock, Wisconsin, Experimental Farm

THE necessity of growing a legume biennial or perennial hay in order to maintain the productivity of sandy soils is generally conceded.

Alfalfa is, of course, recognized as QUEEN of ALL HAYS for dairy cows. There is also no longer any dispute as to the importance of liming sour sandy soils before even attempting to secure stands of alfalfa. Having applied the lime, it still remains necessary to apply a top-dressing of manure in order to supply the quickly available plant food required by the alfalfa seedling until the nodules can develop upon the roots and perform their function.

The application of manure, while desirable, is not as important as the lime if the soil is in a fair state of fertility or if the field has already been in alfalfa or sweet clover. In connection with what follows, we must bear in mind that manure is a rather good potash fertilizer although most of the stress has been placed on the nitrogen it contains and to a smaller extent on its phosphorus.

In order to retain an established alfalfa stand for a considerable time, top-dressing with manure has been generally advocated, frequently with no consideration for the crying needs of the balance of the farm for the precious manure (speaking now and hereafter of the light soils). Even though we have known that we might use the alfalfa crop as the nitrogen collecting agency for the farm, we have not been fair in providing the crop with balanced working equipment so that it could collect yet more nitrogen.

Sometimes the attempt is made to do so through manure with the result that along with the phosphorus and potash in the manure, we have also applied the nitrogen, which the alfalfa crop could have secured from the air, while at the same time other fields and crops on the farm have stood in the direct need of just such a complete fertilizer as manure.

In order to determine what might be expected from the use of phosphates and potash when applied as a top-dressing on alfalfa fields, the writer began an experiment in 1922 and revised this in 1923. The results of this latter test are presented in this article, but have also served as a basis for still more comprehensive work which was begun in 1925.

An alfalfa stand had been established in 1920. Lime had been applied in 1919 and manure disked in before seeding. The stand was the best ever secured up to that time on the Hancock Farm. Yields were mediocre, however. Hay was cut once in 1921 (dry season) and twice in 1922.

EARLY in spring, 1923, the most uniform patch of alfalfa was selected and one application of the treatments shown below was made with a fertilizer drill. The yields of thoroughly cured hay are given by seasons. Nineteen hundred and twenty-three was another very dry year so that yields were secured on only one cutting although three were made. The second and third were even smaller than the first.

Yields of Well-Cured Alfalfa Hay in Lbs. per Acre

Treatment	1923	1924	1925	Total
None	806	2680	2327	5810
300 lbs. 0-16-0 .. Acid Phosphate	797	2920	2523	6240
300 lbs 0-16-10 .	960	3180	2829	6970
150 lbs. Muriate of Potash	951	3440	3328	7720

There was a barely profitable return from the acid phosphate treatment which would cost about $3.75. When 10 per cent of potash was added to the phosphate there was an increase of 1160 pounds of hay with a treatment costing $6.45. The increase for the potash alone was 730 pounds and it was brought about by the addition of $1.50 worth of potash to the phosphate. With the heavier 150 pound application of muriate of potash costing about $3.75, an increase of 1900 pounds of hay resulted.

We must accordingly conclude that potash alone will give splendid returns, but that phosphate and potash combinations will prove still more productive. A tentative proportioning of the two would seem to require from ½ to 1½ times as much potash as phosphoric acid depending on the degree of sandiness of the soil. The lighter the soil the greater should be the proportion of potash. The rate of application would vary from 300 to 500 pounds per acre depending on how frequently the applications were made, and when and how heavy manure applications were or are to be made.

The application should be made the year after the stand is established, so that the crop may derive benefit from it during the second and subsequent years. Be it observed that the effect upon the first cutting after the application was small indeed, and that the effect the third year was considerable.

In this connection it becomes clear that the total effect of a fertilizer application may extend over a period of three years or more, and disappointments await those who look for too immediate returns. In the case under discussion, the third year's effect was upon the fifth crop from this stand and was due in a large measure to reduced winter killing during the severe winter of 1924-25. Had the entire field carried

(*Turn to page 57*)

Rogueing potato field incident to certification

Profit—$269 *per* Acre

By

Sam D. Preston

County Agent, Rappahannock County, Virginia

IN the plans for the agricultural development of Rappahannock county, Virginia, there is one paragraph which reads as follows: "To double the yields per acre during the next five years, through the proper rotation of crops, in which one legume is to be used in each rotation, and by the increased use of lime and high analysis fertilizer."

This plan has been in operation only two years but there are some striking results to the credit of a number of demonstrators who have been busy trying to make the plan a reality. Not only have good results been obtained with potatoes, but many that are almost as striking have been gotten on corn, wheat and apples.

One of the most successful growers under this plan is C. D. Wood, Flint Hill, Va., who seeded one acre to certified V.P.I. Green Mountain potatoes last spring. He used 1800 pounds of 5-8-5 fertilizer, drilling it all in the row and mixing well with the soil before

(*Turn to page* 51)

EFFICIENCY—

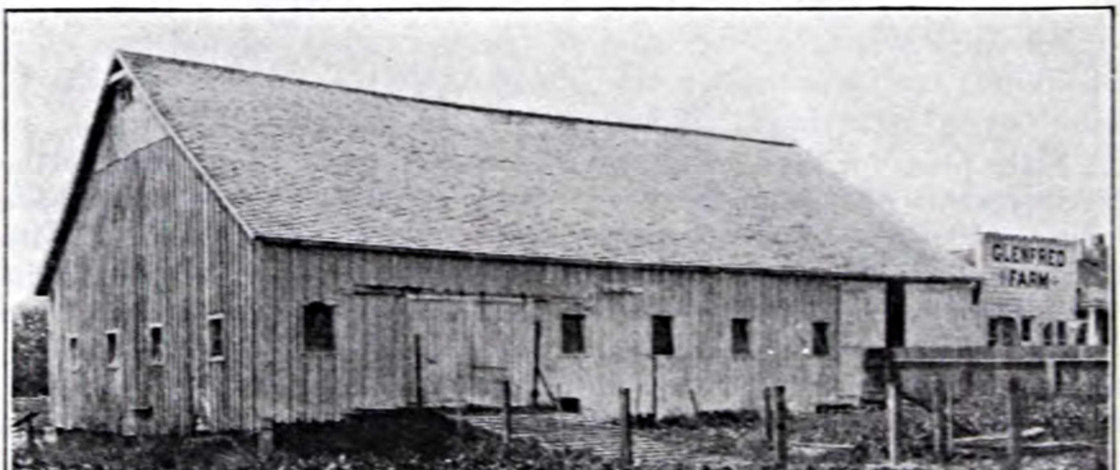
By

Arthur P. Chew

United States Department of Agriculture

WHEN I was a boy I worked for a succesful and scientific wheat farmer in the Red River valley of North Dakota. This man farmed 320 acres with exceptional efficiency. There was hardly a wild oat on the place, although the surrounding country was thick with them. In a one crop region he was a pioneer in mixed farming. He had purebred stock, fine barns and equipment, and well laid out fields. He put in experimental plots for the state agricultural college. It was said of him that he could make money in years when most farmers thought themselves lucky to keep out of debt.

I WAS in the habit of sending short pieces to a country newspaper, and I thought an interview with my boss might go well. You know the sort of thing. "Tell me, Mr. So and So, what you consider the secret of your success." Then the interviewed person relates how in his early days he worked longer and studied harder than other fellows; how he learned



A Tillamook county barn before efficiency

and then WHAT?

Can we be too efficient? See what this thinker thinks.

the importance of thrift and of industry; and how he got in the way of taking time by the forelock. Usually the narrative is sprinkled with anecdotes illustrating the brains and foresight of its hero. It is apt to wind up with the admonition, "Go thou and do likewise."

THAT wasn't the line my employer reeled off when I finally got him talking about himself. He might have done so with more justification than some successful men have when telling the story of their life. He had unusual ability, capacity for work, and character. But he also had a rare humility, that made him look without as well as within for the reason of his success in farming. And so, instead of attributing it primarily to his own energy and brains, he attributed it largely to the lack of those qualities in others.

"Do you see Brown's farm over there?" he said, pointing as we rode on a load of sheaves to a run down, weedy, ill-tended place whose owner was never more than two

A Tillamook county barn after efficiency jumps ahead of the sheriff. "It is farms like those that explain the extra profits of farms like mine. If every farmer ran his business as I do mine, the profits I get from raising cleaner and better wheat, and from carrying out a balanced production program, would be wiped out by lower prices. Efficiency in farming, as it becomes general, benefits the consumer more than it benefits the producer, because increased facility in production nearly always means more production and more production means lower prices."

THAT didn't seem very promising for my interview. In fact I thought my boss, who had a sense of humor, was joking. It upset all my notions of farming to be told that increased efficiency all round wouldn't necessarily mean increased profits for farmers. My employer, anticipating Einstein, began to talk about relativity. "Efficiency in farming," he said, "is a relative term. We call one man efficient by contrast with another who is not. But suppose we were all on the same level. How would you measure efficiency then? And what would our profits be? They would be just enough to keep us going, because every time they rose above that point increased production would bring them down. That is all agriculture as a whole gets now. The return to individual farmers, however, varies with their efficiency. That is where the idea starts that increased individual efficiency will solve all the problems of agriculture. There is no greater delusion."

In the 15 years that have passed since that talk, events have supported its main idea. Take a bit of evidence furnished by the Department of Agriculture. In the last decade or so the efficiency of the average American farmer, as measured by production per man, has gone up 15 per cent. But has the prosperity of agriculture increased proportionately? Not at all. Our farming business, speaking generally, was more prosperous before this increase in efficiency took place than it has been since. Farm earnings from 1896 to 1916 were unusually favorable. There is no prospect that the decade from 1916 to 1926 will show an equally good average result, despite the big returns that were made in the first few years of it.

WHAT conclusion are we to draw from this fact? That efficiency in farming isn't worth while? No indeed. Every wide-awake farmer knows he can't afford to be behind in the race for efficiency. When a man's production costs are materially above the average in his line, he is soon forced out of business. On the other hand, the profits made by those who are ahead of the procession furnish a standing demonstration that efficiency, under certain conditions, pays dividends. The lesson to be drawn from the fact that increased efficiency in agriculture as a whole has not always meant increased general agricultural prosperity is simply that what works out for the individual does not always work out for the group. Efficiency by itself, in other words, is not enough to ensure a prosperous agriculture.

My North Dakota employer 15 years ago knew why. When farmers increase their efficiency, they don't all do it at the same time and in the same degree. Those in the lead make special individual profits, derived from the margin between their production costs and the costs of farmers generally. But

(*Turn to page 52*)

Dewberries

By

A. E. *Schilletter*, Extension Horticulturist

Clemson Agricultural College, South Carolina

DEWBERRY culture—either as a phase of home gardening, with perhaps an eye to local sales from the surplus over household requirements, or as a commercial enterprise—engages just now the interest of many South Carolinians, especially in regions traversed by the long Sand Hill ridge.

Dewberries have increased from about 20 acres to more than 400 acres in the past three years. Chesterfield county, with 140 acres has by far the most extensive plantings although the dewberry industry there is small as yet compared with that in the same range of fruit hills farther north—in Moore county, North Carolina.

The plan is for a group of neighbors, 10, 20 or 30, to plant two to ten acres each, not enough seriously to embarrass the individual if the crop should not turn out so well as is hoped, yet sufficient in the community to benefit by carlot cooperative handling.

Lucretia is the only variety of the dewberry grown commercially in the Southeast. It was introduced about 35 years ago, having been developed in West Virginia. The dewberry is a sort of trailing blackberry, which in the wild state propagates itself by the tiprooting of the vines, while the blackberry forms new plants by suckers. The fruit is very much like that of the blackberry, but of distinctive flavor. The root lives 12 to 15 years in full vigor, but the canes on which the fruit is borne live only two seasons.

DEWBERRIES will grow on poor but not on wet soil, an elevated site is desirable for air drainage, and though a clay loam will serve, the commercial plantings are mostly in coarse sand or sandy loam, some of the most profitable over clay subsoil. Humus is necessary and liberal applications of high grade fertilizer pay well. These conditions, and the fact that the same plants remain in the ground for years, dictate a thorough fitting of the land before the plants are set. The planting of dewberries on ground which has not been at least a couple of seasons in cultivated crops is not recommended. One or two cover crops before dewberries yield excellent results. Fairly good dewberry production may be obtained from any well drained fertile soil well supplied with humus to retain moisture.

Plants may be set in this latitude either in winter or early spring. Winter sets will bear a light crop the next fruiting season. The soil should be firm, to prevent the drying out of the roots and enable them to draw at once on the soil moisture. The commercial practice in the Southeast is to set the plants 5 by 5 feet apart in checks, or 6 by 6 feet. The latter spacing facilitates cultivation and intercropping. Thorough cultivation is advised until the canes become so long as to interfere with plowing. Fertilization with a high grade mixture, rich in phosphoric acid, has been found uniformly profitable.

Intercrops of early vegetables that require frequent cultivation may be grown during the first season—lettuce, radishes, and early cabbage, for instance; but intercrops maturing later than the first of August can not be safely attempted, because by that time the young canes will have spread considerably and at this state they are easily injured. During the time when cultivation is practicable at all, it must be frequent; once a week when weather allows, but not more infrequently than once every 10 days.

During their first season, the vines are allowed to spread over the ground, but early in the following spring, before the canes become brittle they are tied up to stakes. A 2 or 3 inch pine stake, 7 or 7½ feet long is driven alongside each plant so that 5 feet or more is left projecting. The handler, wearing gloves to protect him from the thorns, gathers up the vines in a lose sheaf and wraps them spirally about the stake, a helper tying them in three places, with a strong but soft twine. The ends of the canes are then cut off about 6 inches above the upmost tie.

AT the last cultivation preceding the tying up, some growers sow a cover crop broadcast, to be turned under the following spring, or drill one or two rows of cowpeas between the dewberry rows to protect the canes during the winter, add humus to the soil, and prevent washing by heavy rains.

Successful North Carolina growers are using very heavy applications of fertilizer.

As soon as the plants have become established and are 2 or 3

(*Turn to page* 56)

Kentucky Blue Grass

By J. W. White

Soil Research Chemist, Pennsylvania State College

Start this unusual series with this — the first story.

THE purpose of this series of articles is to present in a brief manner some of the more important facts gleaned from a detailed study of pasture problems in the Keystone State. The subject matter deals primarily with Kentucky blue grass concerning which we have heard so much in song and story and so little from our experiment stations.

Previous pasture studies of the experiment stations have dealt largely with the rejuvenation of old pastures of extensive acreage in an attempt to stimulate the growth of existing grasses which vary in species and nutritive value in accordance with the particular soil conditions. Little attention has been given to the development of highly productive Kentucky blue grass pastures on land similar to that now occupied by cultivated crops.

Our lack of knowledge, therefore, concerning the economic value of intensive pasturage has been responsible for the general belief that the more fertile type of farm land can be utilized to better advantage in a rotation system. The data furnished by the Pennsylvania studies throw a new light on the subject and lead to the conclusion that highly developed Kentucky blue grass pastures are worthy of a more prominent place in the economic scheme of farm management.

SOME years ago the writer had the pleasure of a visit at the Kentucky Agricultural Experiment Station, located in the heart of the famous blue grass region. My genial host took great pride in acquainting me with many things (not all for this was prior to 1918) which have contributed to the everlasting fame of old Kentucky.

We first visited a famous dairy farm, located a few miles from the college station. Here we saw the last word in Jersey cattle—more than 1,200 head of purebred stock including several hundred milking cows, their udders taut with the product of the blue grass pasture.

WE next were privileged to pay homage to Lady Viola, the queen of the Elmendorf herd, a little Jersey wrapped in a costly blanket, groomed no doubt to the queen's taste, and attended, as it seemed to me, by a retinue of mere men. I doffed my hat to her, the ultimate, the last word of her kind. They told me she was valued at $15,000 and that there was a standing offer of $1,000 for each little princess offspring. As I listened to her illustrious record told by her chief attendant the words of the song "She was Bred in Old Kentucky" ran through my confused mind.

In a near-by enclosure we saw the monarchs of the herd, three wonderful sires, valued at $50,000, made doubly attractive to me by the presence of a strong fence between us.

AFTER lunch we visited several of the famous stables of Lexington. There one by one, the real pride of the blue grass country, the Kentucky thoroughbreds, were trotted out before me, each one doing his stuff—a magnificent sight, the fitting climax of an eventful day. But what has this to do with Kentucky blue grass? —everything; for is not the value of raw material judged by its finished product?

During the morning as we drove over the Elmendorf Farm I could not but contrast the beautiful prairie country abounding in a luxuriant growth of native blue grass, with that of the so-called pasture land of the states northeast of the great open country, and among them the Keystone State, if you please. I thought of our own 4,000,000 acres of Pennsylvania grazing land, a large portion of which is too rough for the plow and too steep for the cow, embracing as it does 33 per cent of the total "improved" farm land of the State.

THOUGHT of the great Volusia hills of the north tier counties which in the early spring give promise of ample pasture, but turn too soon from green to brown. I pictured the Holstein cow, the favorite up there, trying in vain to get her fill and at the same time keep her balance on the sloping hill.

Compare, if you please, the fortune of the little Jersey of Elmendorf, grazing contentedly knee-deep, perhaps, in succulent blue grass with the fate of the big Holstein, the one turning the rich nutrients into milk and the other into energy. The former grass fed the latter stall fed.

Why not also the level and fertile land for the Pennsylvania Holstein, and return the rough steep hillsides again into forest? And this is the theme of my story.

IN the succeeding issues of BETTER CROPS the following topics concerning Kentucky blue grass will be briefly discussed: (1) Nature of Pennsylvania Pasture Experiments, (2) Nutritive Value and Adaptability to Soil and Climate, (3) Response to Fertilizer Treatment, (4) Carrying Capacity and

(*Turn to page 48*)

Drugs *for* Bugs

Flat Grain Beetle

By Don B. *Whelan*

Entomologist, University of Nebraska

HAVE you gassed your bugs yet? If not, don't use formaldehyde. Formaldehyde is excellent in removing odors from dishes, refrigerators, and rooms as it acts chemically upon evil smelling gases forming others that have no odor. It is also useful in killing those minute bacteria, or "germs," that cause disease. But if you wish to kill insects don't use formaldehyde.

Formaldehyde itself is a gas having a very penetrating odor which is intensely irritating to the eyes, nose and throat, but generally speaking it is not a poison. Formaldehyde gas is bought by the pint, quart or gallon but not in the gaseous state. It is purchased as a water-white liquid and the odor disappears in the dilute form in which it is generally used.

Like ammonia formaldehyde is a solution of a gas in water and often sold under the name of formalin. When used in fumigation it has many desirable qualities, as it will not corrode metals, as sulphur does, with the possible exception of unpolished iron and steel. In fumigating a house after diseases it will not bleach or injure household fabrics, or highly colored wall paper.

If used in fumigating insects in stored grains veiy inferior results may be expected from formaldehyde as the hard shelled little pests do not die very easily. The weevil in beans and peas will doubtless outlive the efficiency of such control measures. The less hardy clothes moths do not seem to be affected by the gas.

Scientists have tried many experiments to determine whether this material would kill insects. Results show that very few have been killed even when unusually large quantities of the gas were liberated in an air-tight space.

The Public Health and Marine Hospital Service reports that formaldehyde did not possess insecticidal properties against mosquitos. Other experiments have

(*Turn to page* 61)

WHAT

Is Land Worth?

By Dr. Robert Stewart

Dean, College of Agriculture, University of Nevada

SECRETARY JARDINE recently said, "The American Farmer is a business man. He has greater capital investment than the average retail merchant. His business is vastly more complex than that of the average retail merchant."

There is a general agreement among agricultural leaders with the statement that the farmer is a business man. The full significance of the statement, however, is not fully realized.

WHAT is really meant by the statement that the farmer is a business man? Does it imply that he has large capital invested? Does it simply mean that he now buys and sells as does a retailer?

Formerly the farmer produced only that which he consumed himself; he had little to sell and less need to buy. The farmer now uses raw material and converts it into a finished product which he sell; as a business man, he is, therefore, comparable with a manufacturer rather than with a retailer.

In any successful manufacturing enterprise economic production is the first essential to success. If the cost of production is too high no possible system of marketing will succeed.

IN agriculture, the four factors of production are land, capital, labor and management. The right use of land, capital and labor by management makes for efficient production. Whether it costs \$0.50 or \$2.50 per bushel to raise wheat depends largely upon the *yield per acre.* No possible system of marketing wheat or price fixing will save the wheat farmer who produces only 8 or 9 bushels per acre.

The agricultural value of land, therefore, should be determined largely upon its ability to produce per acre. The yield of wheat in the United States as an average of the past five years is 14.2 bushels per acre. During the same period the average farm price was

$1.04 per bushel. What is the actual value of land which produces 14.2 bushels of wheat which sells for $1.04 per bushel? The gross value of such a crop is $14.77 per acre.

THE actual cost of producing crops varies within very wide limits not only on different farms but even on the same farm. In 1919 a government survey in the wheat belt indicated that the cost of producing wheat among 481 farmers varied from $1.00 to $5.00. A large corporation in California which keeps a very accurate record of cost of production found a very wide variation in the cost of producing barley even during a single year on different fields. The yield of barley on the several fields varied from 983 pounds to 5181 pounds per acre while the cost of production varied from $0.31 to $0.45 per hundredweight.

It is fully realized, therefore, that average cost of production data can be applied to individual farms only with grave danger, yet some calculations may be made so as to bring out certain principles which are sound.

The average cost of growing a wheat crop is $5.70 per acre for such necessary operations as plowing, harrowing, disking, seed and seeding. The average cost of harvesting and marketing the crop is $3.00, interest, depreciation on machinery, etc., $2.00. The average taxes on such land are $0.41. The total annual expense of growing wheat on such land not considering interest on the land is therefore $11.11. The land has returned $3.66 above cost of growing, which is five per cent interest on a land valuation of $73.20 per acre. If land which is used for wheat production produces the average yield of wheat and has a greater valuation than $73.20 per acre, the farmer is not making cost of production; if it has a less valuation he is making money.

SUCH data as this should not be taken as absolute but only as an indication of the basis upon which the value of land should be determined and calculations made.

It is important to emphasize the need of growing large crops. The statement is frequently made that the farmer cannot afford to grow

Sweet clover on soil rich in native limestone large crops for he gets less for a large crop than he does for a small one!

For example, Ely and Morehouse in a recent statement say, "A general good season may bring a bumper crop, a fact that is heralded by the metropolitan press as a sign of prosperity of the farmers and the nation. As a matter of fact a bumper crop usually brings ruinously low prices."

However, two potato growers of Salmon, Idaho, last fall sold their large crop of potatoes from 200 acres for $143,100, while a potato grower of Oakley, Idaho, produced an $800.00 an acre crop on a 75-acre field.

Whenever all growing conditions are extremely favorable and a large crop of any commodity is produced by everyone, the inefficient as well as the efficient, the composite *Farmer* does receive less for his large crop that he would for a smaller one.

The real problem, however, is for the *individual* farmer to study his methods of production and so control his production as to produce individually high yields all the time and thus reduce his cost of production as compared with the average of the neighborhood.

If the wheat farmer by a practical method of soil treatment is enabled to increase the crop producing power of his soil by the purchase of additional raw material as fertilizer and converts this into a finished product he may make money.

IF the yield of wheat is increased to 20 bushels per acre, the cost of plowing, harrowing, disking, seed and seeding remains the same, or $5.70 per acre. The cost of marketing and harvesting is perhaps $4.00, the depreciation on machinery is still $2.00, while taxes have increased to $0.97; the total annual expense is $12.35, while the total income is $20.80. The land has produced a return of $8.27 which is five per cent on a valuation of $165.45.

ON land producing 30 bushels of wheat the cost of growing the crop is still the same, $5.70 per acre, while the cost of marketing and harvesting is $5.00; interest and depreciation $2.00, and taxes are $1.66. The gross value of the crop is $31.20. The total expense is $14.36. The land has produced a return of $16.84 which is five per cent on a land valuation of $336.36.

On land producing 40 bushels of wheat per acre the growing cost is $5.70, the cost of harvesting and marketing is $6.00, interest and depreciation $2.00 and taxes $2.54 per acre. The total cost is $16.24, while the gross return is $41.60. The land has produced a return of $25.36 which is five per cent interest on a land valuation of $507.27.

From this basis the individual farmer not only can afford to grow large crops but he can not afford to grow anything else.

The problem then becomes one of so treating the soil as to secure the larger crop in an economic manner. There is now ample evidence from experimental station results to show that this can be done.

For example, the yield of wheat on the thin, cold soils on Strongville Farm of the Ohio Experiment Station without treatment averaged 13.09 bushels per acre as an average of 13 crops, which compares very favorably with the average yield of wheat in the United States. An application of 160 pounds of acid phosphate; 80 pounds of muriate of potash; 60

(*Turn to page* 61)

Brains *and* "Bone Dust"

The Champion—John Barnes, Jr.

By J. C. Allen

Purdue University, Lafayette, Indiana

GOOD seed, fertile creek bottom land, lots of hard work at the proper time with suitable implements, and 200 pounds per acre of "bone dust" (0-12-6) make John Barnes, Jr., of Brooksburg, Indiana's Champion Corn Grower for the 1925 season. The awards were announced at the recent Agricultural Conference at Purdue University and Mr. Barnes won the highest honors by producing 143.99 bushels per acre on a 5-acre plot. Telling how he did it, Mr. Barnes said:

"There were 11 acres in the entire field, which is flooded with the back water from the Ohio river that deposits sediment each year and maintains or even increases the fertility. This particular field has been planted to corn each year as long as the oldest resident can remember and this is the first year that any commercial fertilizer or manure has been applied.

"My son Loren entered five acres in the same field which averaged 129.19 bushels per acre. The only difference in the method of handling these two 5-acre plots was that I applied 200 pounds per acre of 'bone dust' with a wheat drill the day before planting." (Bone dust seems to be a common term in sections of southern Indiana and Kentucky, meaning a mixed commercial fertilizer.)

"THE difference in the yield between the two plots of 1.8 bushels per acre must be attributed to this fertilizer which brought my five acres up from the 129 bushel per acre class to the 144 bushel per acre yield and entitled me to the honor of being Indiana's Champion Corn Grower of 1925."

(Turn to page 55)

Check plot

100 *lbs. nitrate*
200 *lbs. acid phosphate*
75 *lbs. potash per A.*

Potash *and* Cotton

"YES, I believe we are discovering something good" announced County Agent A. J. "Pete" Renner as he forced his typical county agent flivver along the twisting sand roads of the southeastern corner of Scott county, Missouri. "We'll have time to take a look today. I want you to see something that you won't be apt to believe. The Presiding Judge of our county court is carrying on an experiment with fertilizers on cotton on his farm on the other side of the county near Morley that shows an increased yield of nearly 400 per cent from the use of potash. Of course, this field is on a particular kind of soil—muck or glade land, a black sandy loam—and the results there will not necessarily apply to the whole district."

After an hour of driving through a scorched and dusty countryside, scorched from a summer with only one rain, we pulled up alongside a field of cotton very uneven in appearance. Part was a fresh vigorous green, part had lost all its leaves, with the rest of the field presenting all shades of gradations between the two extremes. A large sign notified the passerby that this was an experi-

200 lbs. acid phosphate
75 lbs potash

75 lbs. potash

on Missouri Glades

By Cannon C. Hearne

State Extension Agent, University of Missouri

nental field of cotton being conducted on the farm of R. L. Harrison by the College of Agriculture in cooperation with Scott county under the direction of County Extension Agent A. J. Renner.

Renner first had me walk down the road across the end of the rows. "See if you can tell where one plot leaves off and the next begins", he instructed. Even the most casual observer could spot the places to the exact rows for differences were very marked in height of plant, stage of maturity, and quantity of cotton.

"Now then, over the fence", was the next order. In the field we examined all the plots with care. Renner then volunteered the information that I had been waiting for.

This black sandy type of lowland soil—commonly called glade—is rather common in the alluvial district of southeast Missouri. It is a muck like soil formed back in the days when all these lowlands were a part of a great swamp area. The Mississippi River in geological ages flowed many miles west of its present bed. As it gradually moved eastward it left a broad level delta-like bottom which became swamp from hill-runoff and back water from the river. Large areas were gradually formed into this glade land on which the Judge's land was located. The years of farming this rich virgin land have tended to reduce the original fertility until a need for some fertilizer for maximum profitable cotton production was felt. A rust trouble has also developed so that yields have been materially reduced.

In 1924, a fertilizer experiment was planned so as to bring out the effect of various treatments. The experiment was placed on the Harrison farm on the east and west base line road near Morley where it could be seen by hundreds of farmers each month. Judge Harrison was selected because of his recognized leadership and because he had been at one time a surveyor and was used to doing things accurately.

FIVE plots were used. Each plot consisted of exactly one-half acre of land and all were planted to the same variety of cotton and received the same treatment in every way except in the application of fertilizers. The two end plots were left untreated as checks.

Plot number two received a treatment of acid phosphate at the rate of 316 pounds per acre.

Plot number three was treated with acid phosphate at a rate of 250 pounds and muriate of potash at a rate of 40 pounds.

On plot number four, 62 pounds of muriate of potash was used.

These plots were all planted about May 15 but a severe sandstorm necessitated a second seeding on June 2. Observations were taken thereafter each week.

A boll count was made in September, 1924.

Plants	Plot	Bolls
189	First check	501
164	316 pound phosphate	389
160	Phosphate-potash	805
135	62 pounds potash	871
143	Second check	320

One hundred and twelve per cent increase was indicated for the straight potash area with a 96 per cent return on the combination plot of acid phosphate and muriate of potash. Thus far there seemed to be a heavy profit in the use of the proper fertilizer. Boll counts are not enough however, since it is the cotton in the gin that is paid for by the buyer.

On October 15, the field was picked with the above results. After subtracting the price of the fertilizer from the amount of the cotton sold from the first picking, the muriate of potash had increased the value of the cotton $2.68, while the muriate of potash-acid phosphate treatment showed a profit of $4.28. However on the

(*Turn to page* 60)

75 lbs. potash *Check*

These cows work for Mr. Critchlow

Lee Critchlow, Hustler

By
Hugh Fergus

Slippery Rock, Pa.

IN 1915 when Lee Critchlow bought his first farm he hardly expected that within 10 years he would have sold it, bought another, sold it, and finally bought the one he is on now. But it seems as though kind Providence was guiding his destinies for on his present location he has the prospects of having one of the best 60-acre farms in western Pennsylvania. In spite of the fact that it was run down when he bought it three years ago and some of the soil he plowed last Fall for this year's corn crop showed yellow subsoil at less than six inches of depth, Lee and his wife had a labor income of close to $2,000 for 1925.

Lee was raised on a farm, one of 13 children. This was where he acquired his liking for farming, even though his father and mother wondered sometimes how they were going to make both ends meet and raise their flock of 13.

WHEN he got large enough to earn money Lee worked in the oil fields. However this work was too irregular and by the time he was married and he and his wife had decided to try farming they had only $300 capital.

(Turn to page 58)

Woods to Washington

By

C. E. *Gapen*

Chief, Press Service, United States Department of Agriculture

DR. ALBERT F. WOODS, president of the University of Maryland, long an active factor in the improvement of American agriculture, has been selected by Secretary Jardine to fill the position of Director of Scientific Work, made vacant last August through the resignation of Dr. E. D. Ball. Dr. Woods will continue in his present work at College Park until the end of the school year. Dr. Raymond A. Pearson, president of Iowa State College, will succeed to the presidency of the Maryland school.

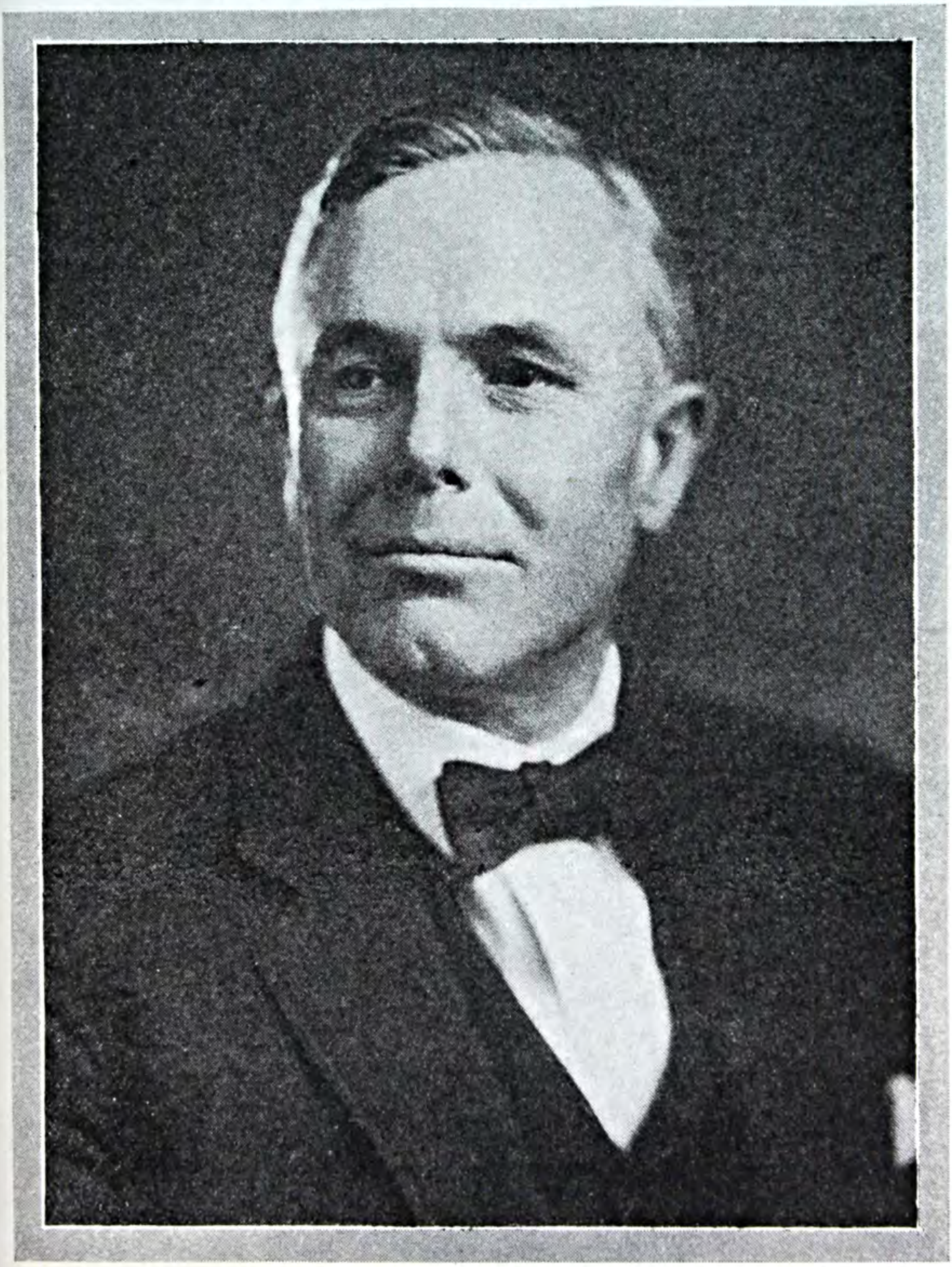
In common with a number of other men drawn into important posts in the department, the Secretary included, Dr. Woods comes to a place made familiar by earlier association. He spent 17 years in the Bureau of Plant Industry, rising from assistant pathologist in the Division of Vegetable Pathology to assistant chief of the bureau, which position he held in 1910 when he left to become dean of the college of agriculture and director of the experiment station at the University of Minnesota.

Until 1921, however, he still acted in a consulting capacity with the department giving great assistance in the development of plant-quarantine policies. He became president of the old Maryland Agricultural College and executive officer of the State Board of Agriculture in 1917. Three years later this school and other colleges were merged with the University of Maryland and Dr. Woods became president of the enlarged institution.

Dr. Woods was born at Belvidere, Illinois, in 1866. He attended the University of Nebraska where he received the bachelor of science degree in 1890 and master of arts degree two years later. He is the author of many technical articles and reports and is a member of numerous scientific societies. He has been a delegate to important conferences in other countries, including the International Institute of Agriculture at Rome. He was for a time president of the Association of Land Grant Colleges.

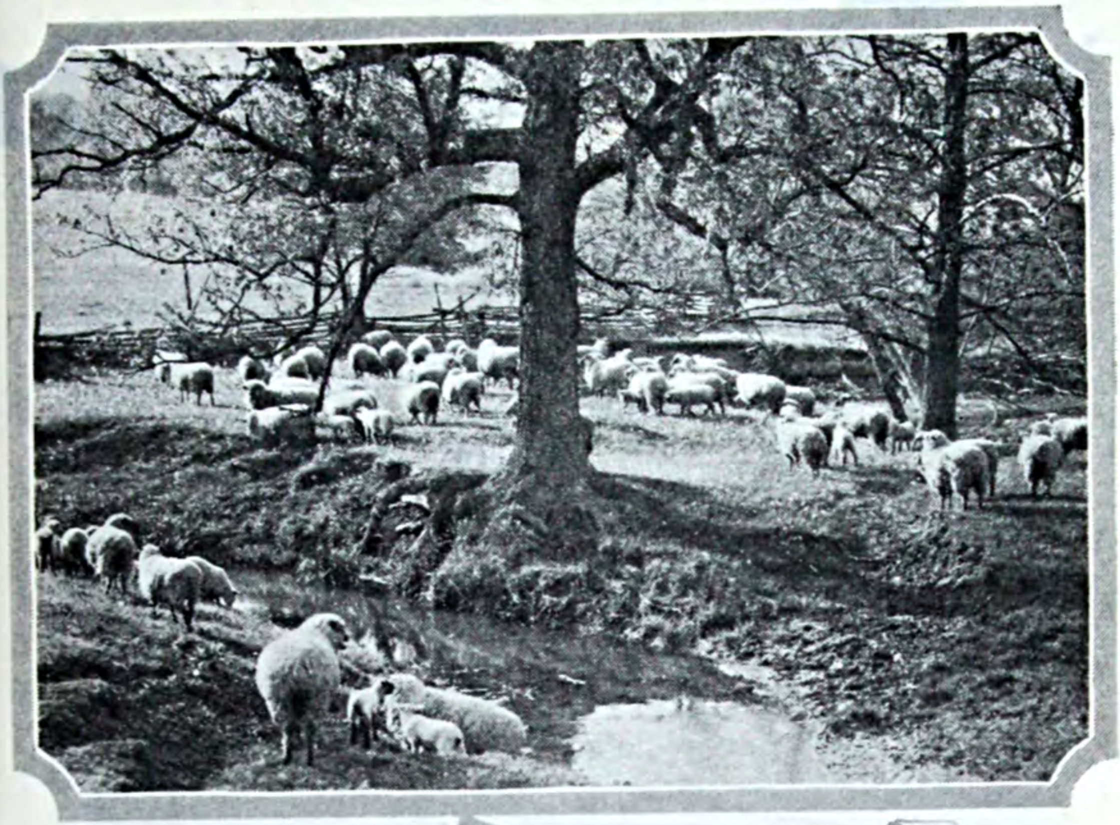
In selecting his new Director of Scientific Work, Secretary Jardine said: "Doctor Woods has a broad understanding of agriculture in this country. As president of the Association of Land Grant Colleges and in numerous other capacities he has been in intimate contact with scientific work in American agriculture and is eminently fitted to coordinate the scientific activities of the Department of Agriculture and the state agricultural colleges and experiment stations."

Better Crops' ART GALLERY of the month



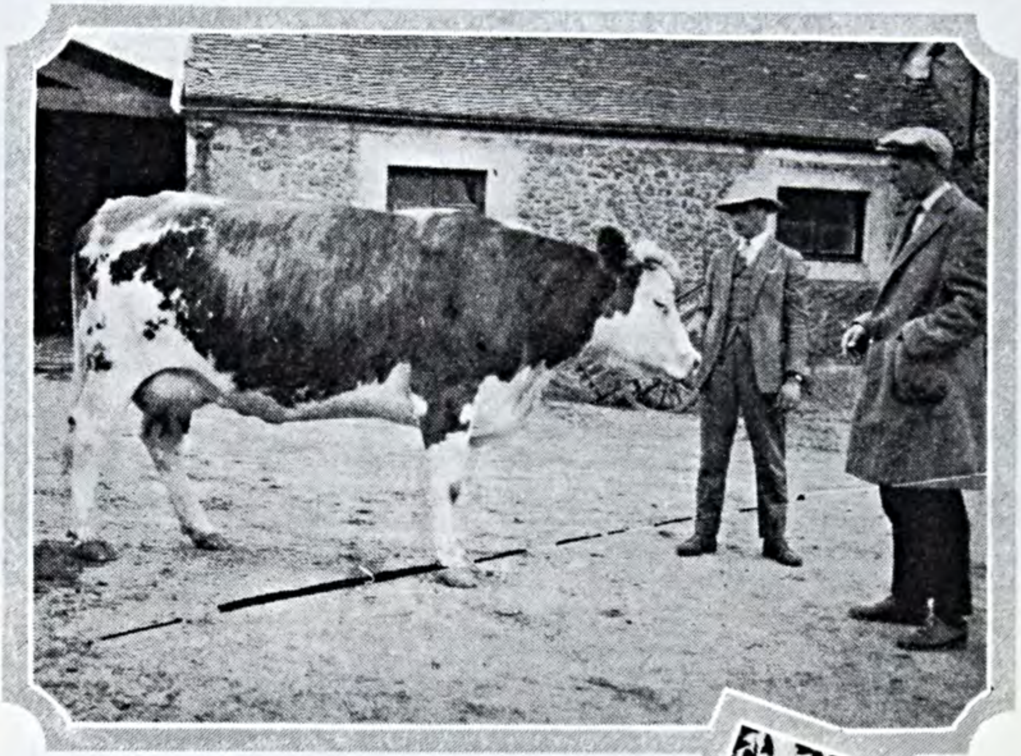
Dr. Albert F. Woods
Director of Scientific Work, United States Department of Agriculture

Spring would be but gloomy weather



If we had nothing else but Spring—*T. Moore.*

Farming in

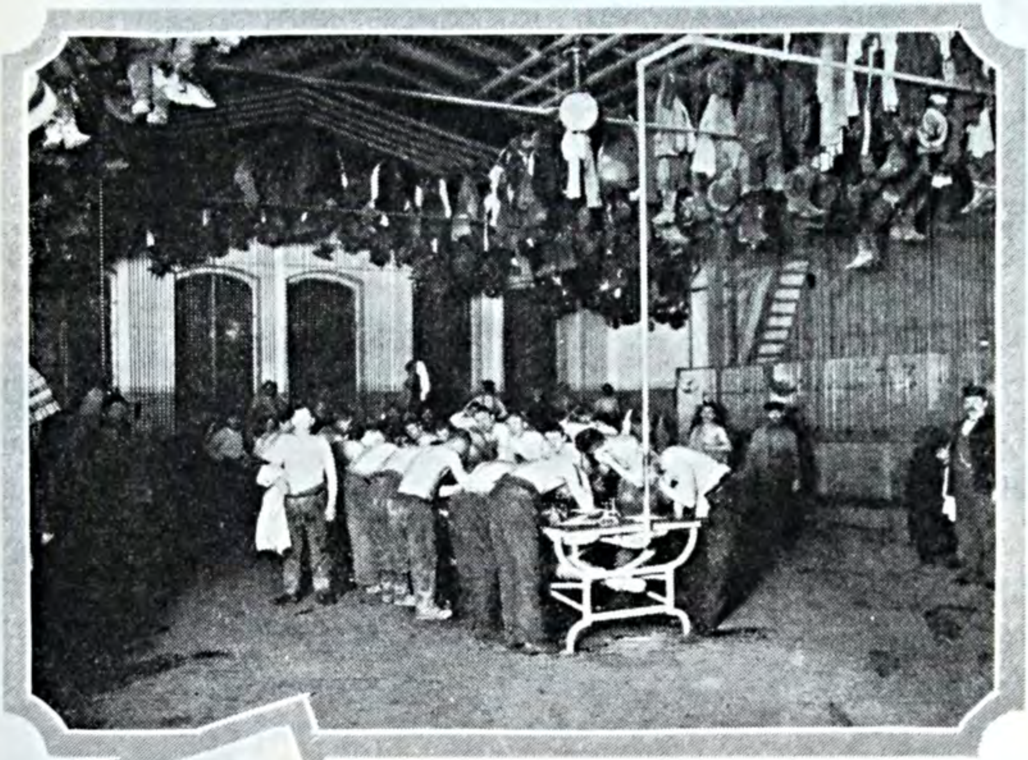


This Normandy cow won high recognition for two years, when exhibited at the Paris show.

This steep roof shelters a Danish farm family and a herd of Red Danish cattle.

A Swiss farmer carrying his load of Swiss Cheese to market. The making of this tasty cheese is one of the chief industries of Switzerland.

other Lands—



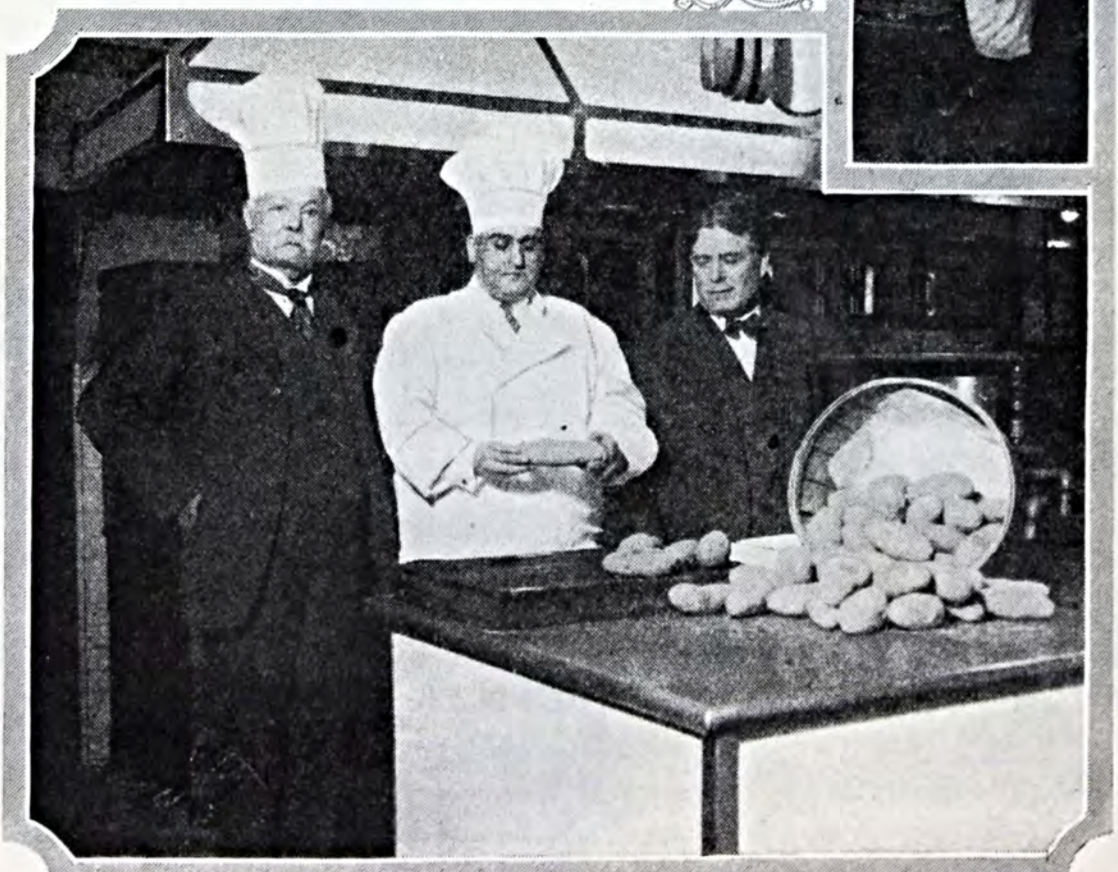
Workers in this potash mine in Germany enjoy this chance to remove the day's grime before going home.

At this English Forestry school young trees are protected by wire netting.

Scientists are at work in England on means for combatting the tomato spider. This pest causes losses to English growers amounting to $150,000 a year.

Our chance to print a picture of "Red Grange of football fame. Here he is with Luther Burbank, the plant wizard.

I. A. Abbott, Grand Island, Nebr., is regarded as the biggest farmer in the world. He weighs 640 pounds and stands 6 feet 10 inches.



Former Senator Fred Du Bois and Senator Borah from Idaho looking over some prize potatoes from their home state to be cooked for an Idaho banquet.

The Editors Talk

One who is ignorant of the history of science is ignorant of the struggle by which mankind has passed from routine and caprice, from superstitious subjection to nature, from efforts to see it magically, to intellectual self-possession.—John Dewey.

NAMING FERTILIZERS The plant nutrients commonly supplied in commercial fertilizers are three:—nitrogen, phosphorus and potassium. These names mean three elements:—that is, in each case, the simple substance not combined with any other substance.

These elements never exist singly,—only combined with other substances as compounds. In common fertilizer usage, therefore, the names of the compounds of these elements are often used. The percentage of nitrogen for instance is often expressed as its compound ammonia; phosphorus as phosphoric acid or in some countries as phosphate of lime, and potassium as potash and sometimes as other compounds as the chloride or sulfate of potassium.

But it is the simple substances—the elements—that are the plant nutrients, and that give the fertilizers their value.

Thus the question arose, particularly during the life of the late Professor C. Hopkins and since,—why use the names of the compounds? Why not always use the names, nitrogen, phosphorus and potassium?

In the case of nitrogen, in some states, this step has already been taken; the name of the compound ammonia cannot be used. The percentage of nitrogen must appear as nitrogen. Thus the fertilizer analysis may contain the name of one element—nitrogen—and two compounds.

Confusion is also sometimes caused by the form of the analysis. In the South phosphoric acid is placed first, nitrogen or ammonia second, and potash third. In the Northern States the first two are reversed. Again the question arises, why not have uniformity?

This possibility is being actively discussed. It is inevitable that greater efforts will be made to achieve a higher degree of uniformity in fertilizer nomenclature. No one will deny that simplification and uniformity are adding dividends to business in all directions. Can extra dividends be added in these cases? Or is present common usage of greater importance?

A great deal has been accomplished to improve practices in the use of fertilizers. These questions also demand careful study.

"Life is good when in the world we are a necessary link, and one with all the living."
—Maykov.

TAXATION A big stride in the right direction was made by the State of New York when it set out to match the reduction in the federal income tax with a like reduction in the state income tax. If there were more of such effort on the part of state legislatures to follow the federal government's program of economy, we would hear less of the recurrent cry from Agriculture for relief from the burden of taxation.

While it may be that the income tax reduction will not relieve the tax burden of a great many farmers—their burden being the property tax—it should open the eyes of every property holder. Taxes on farm property in the United States increased approximately 140 per cent from 1914 to 1923. The value of farm products, however, in 1923 was only 58 per cent more than in 1914, while the net business receipts of farmers were little if any greater in 1923 than in 1914. Of this tax burden approximately 4/7 went to satisfy state and local demands.

Plenty of room for complaint—but, whose fault is it? Who put impractical legislators in position to dig into our pocketbooks for money we can ill afford to spend? Who sponsor large appropriations which become so difficult to pay? It is high time the voters realize that they have the upper hand in this game. The recent income tax reduction should start a wiping of complaining tears, a dusting of mental cobwebs, and a determination to carry wise and practical taxation economy to the place it should start—home, the local and state governments.

The Scientific method must ultimately spread out to every human affair.—H. G. Wells.

SNOW FIGHTING In Minnesota recently, we found that the busses on the rural routes had been running without serious interruption all winter. No alibis, no excuses, if you wanted to go somewhere—100, 150, 200 miles—it was quite simple. Get a time table and be on the corner when the bus started and you got there in comfort.

No main highway has been blocked for more than 24 hours, even though in some places snow has been "piled at the side of the road nearly to the telephone wires." This work is an encouraging example of large scale snow fighting.

How was it done? By cooperation, forethought and energy. In this work, the State of Minnesota cooperated with the Minnesota Motor Bus Association. The two agencies got together last fall in St. Paul—they planned a combined campaign to fight snow on a larger scale than ever before, and keep the main roads open. The State has erected 166 miles of snow fence and operated much snow fighting equipment. The Bus association has operated as much or more equipment. The plan succeeded.

What did it accomplish? It made the winter more pleasant and profitable for everybody. It made the highways safe and comfortable. The full value of open roads can hardly be described.

Now is the time, as the snow is disappearing, to plan ahead, to study such examples as this, and determine next winter to fight the snow.

Prove all things; hold fast that which is good.
—St. Paul.

TABLE TO BOARD Respectability now dines at "tables." It has not always done so.

Our Anglo Saxon forefathers, men of sea and land, gathered round the "hearth" and "board"—sturdy, hospitable words. Into that Anglo Saxon land came the Normans. With them they brought new ideas and a romantic language. New words were added to the simple Anglo Saxon tongue—statelier words "descriptive of chivalry, luxury, honor and state."

Disdainful of "board," the Normans brought "table," and the table, especially at one period of their history, was very dear to their hearts. As the old chronicles tell us "they spread their cloths five or six times a day . . . They also brought in the custom of long and stately sitting at meat . . . exceeding all other men's feasting."

"Board" is Anglo Saxon—a simple word; "table," Norman, a more elegant word. In the intermingling of two peoples, two words meaning essentially the same thing could not survive. "Board" lost, "table" won.

Thus have new words been added to our basic Anglo Saxon tongue. Thus has the trend in the use of words gone from the plain to the elegant, from the simple to the complex, from a few words to many, and they are still increasing, as many school boys are sorrowfully aware.

Every world movement, whether of war or peace, every discovery, has added its quota of new words. Years ago Cicero added to the language many words we have inherited, "favor" for instance. And it is true to this day that there are men still spending hard hours, searching their minds and the dictionaries to coin new and needed words.

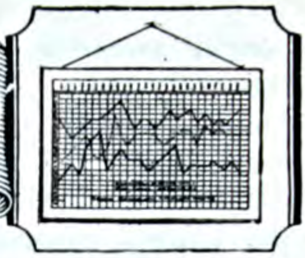
The work is not, and never will be, complete. To keep pace with our social and scientific developments, our language must grow. Old words will continue to take on new meanings and particularly will comprehensive words, words that express a great deal, be added to our language. All of this growth has its values beyond the power of the mind to properly imagine. It also has its dangers. The danger is not so much in the words, as in our attitude towards them.

Do we not need to remind ourselves, those of us whose duty it may be to write for the busy practical men, that the essential things of life are simple things, that the great thoughts that have moved the world have always been capable of expression in simple terms? Further, that simplicity has a value in itself, that simplicity must be one of the foundation stones on which any successful movement is founded?

If, therefore, we are agricultural scientists, much learned in the vocabularies, let us try and return now and again to the "hearth" and "board" of our forefathers. Let us heartily support the efforts of all those whose work it is to reduce many things to a few—the complex to the simple—and give a full measure of praise for good work well done.

It will tend to lessen the strain in many places, high and low, and to do both ourselves and our neighbors a lot of good.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Impertinent Investigator

A man named Lively (his name adding insult to injury), professor of rural sociology at Ohio State University, has been spying on the farmers of that State to find out whether or not they loaf and how much. He has even been making comparisons of one section with another, one of his detailed studies having been conducted in a southeastern county and another in a county in the northwestern section. He reports the country store still a haven for males exclusively and still attracting large numbers of so-called loafers.

In the southeastern county, of 83 "possible loafing places" 77 are stores, 19 of them in villages, 31 in hamlets, and 27 in the open country. The other county was not found to be so well blest with loafing places, having only 37, of which 21 were in villages, 12 in hamlets, and 4 in the open country. But apparently there was just as strong a tendency to loaf, for the attendance at these places averaged from 15 to 20, while in the southeastern county it averaged only 7 to 9. Professor Lively has the loaferies roughly classified on the percentage basis as to whether they are considered bad or of good repute. What can be done about this?

Fertilizer and Manure

Most persons interested in soil improvement know of the forty-year-old fertilizer experiments at the Pennsylvania State College, the oldest in the United States. Speaking before the Maryland Farm Bureau Federation meeting recently, Prof. F. D. Gardner of that college said that on these old plots complete fertilizers have maintained crop yields approximately as well as manure and just as economically if the cost of the manure is taken as $1.87 a ton.

New Poultry Parasite

A very small red worm, related to the parasitic roundworms, has recently been found in the stomachs of a number of chickens sent by New Jersey farmers and poultrymen to the state agricultural college. The parasite is thought to be new in this country. It embeds itself in the walls of the stomach, forming a little knot somewhat larger than the head of a pin, and a large number of them give the organ a lumpy appearance and cause its shape to be almost spherical instead of elongated as is usual.

The investigators believe the worm extracts considerable blood from the tissues and must do great damage. The fact that the insect gets into the walls and causes them to thicken indicates great difficulty in treatment. The poultry experts advise raising young birds on fresh ground from which suspected adult birds are excluded.

Eleven Thousand Co-ops

There have been some conspicuous failures in farmers' cooperative organizations, but these cases should lead no one to believe that the movement is on the down grade.

That agriculture is finding great benefit from such associations is shown by the rapid growth in their number. At the close of 1925 there were 10,803 farmers' business organizations of all kinds listed with the United States Department of Agriculture. If there had been 45 more on the list the total number would have been just twice as many as were listed in 1915. The total of all the active farm business organizations is thought to be about 12,000, most of them having reported to the Department. They include all types except cooperative banks, credit associations, and insurance companies.

Weed Seeds Flavor Meat

Montana tests have shown that mill screenings containing large amounts of such weed seeds as fanweed, mustard, false flax, wild buckwheat and others will give a bad flavor and odor to the lamb produced on such feed. A lamb dinner was given by the experiment station, each guest being served a piece of lamb produced by feeding screenings high in these weed seeds and a piece produced by wheat feeding. Every person preferred the wheat-fed lamb, and the weed flavor was pronounced undesirable. The investigators are now searching for a way to feed the screenings without leaving the off flavor in the meat.

Fertilizer Leaching

It seems almost paradoxical to say that there is more loss from leaching of the less soluble forms of nitrogen fertilizers than of the more soluble forms, but that conclusion is reported from New Jersey. The reason given is that when a plant has the more soluble fertilizer, such as nitrate of soda, sulfate of ammonia, urea, and ammonium phosphate, it starts quickly and uses up the food in the soil to better advantage. The conclusion is that organic nitrogen really costs more than the more soluble forms. But it is good when a "conditioner" for the soil is needed.

More Clean Hogs

Throughout the corn belt hog raisers are taking to the idea that the hog thrives better under clean surroundings, and as a result they are making more money. In Nebraska those who followed the sanitation plan last year made enough more than the general run of pig producers to pay for a lot of new equipment, including a new set of A-type houses for their sows, fencing material for all the new lots they needed under this plan, and had in addition a dollar a day extra to pay them for the bother of attending the sows and pigs out in the lots. These men raised one and one-half more pigs to the sow than the average farmer and all their pigs averaged 40 pounds heavier at six months than the pigs that did not have the sanitary advantages.

This spring 1,000 Illinois farmers in 78 counties will demonstrate to others in their communities the value of this system, which was originated a few years ago by the late Dr. B. H. Ransom of the United States Department of Agriculture. It was demonstrated last year on 608 Illinois farms in 61 counties, and all these counties will be carrying on the work this year. It looks as if the roundworm finally will be eliminated as a serious factor in pork production.

Hear! Hear!

The latest report by the U. S. Department of Agriculture has it that there are now nearly 1,000,000 receiving sets on farms. In some States from 25 to 40 per cent of the farms have them.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

THE year 1925 was not an especially prosperous one for Hawaiian producers of farm crops. Prices were low for the products they sold and generally high for those which they bought. Many farmers are becoming discouraged and the movement from farm to city continues.

The vital problem confronting farmers is to lower their cost of production. The most logical way to attain this end is by increased production per acre, in connection with cooperation in buying their supplies.

The proper understanding of the problems of fertilization is the basis of all really successful farming ventures. In order to more fully get this understanding, all farming communities should organize and cooperate with their agricultural extension men. An individual farmer is not able to make the necessary soil examinations and to conduct the necessary field experiments which will tell him the plant food requirements of his soil. But, by working together this information may be easily obtained.

Unless one has had the experience, he does not realize the improvements that may be made by a proper understanding of his problems. It is very important that these problems be studied on the spot. It will not do to apply the successful methods of one district to another district where conditions will be different, without preliminary trials. This often leads to disappointment. A proper study of fertilizer problems always gives large returns.

One often sees in the literature, references to the wonderful natural fertility of the Hawaiian soils. This makes those of us who know the soils here, rather impatient. Without heavy fertilization and green manuring, all the sugar and pineapple plantations would soon be out of business. With proper fertilization and irrigation, some fields have given yields of 140 tons of cane equal to 18 tons of sugar per acre. These same lands, without fertilizer, would produce 15 to 20 tons of cane or about 2 tons of sugar per acre.

The area planted to sugar cane in the Hawaiian Islands has not materially changed in the last 15 years or so and amounts to about 220,000 acres.

In 1914, 44,000 tons of fertilizer was used on the area. In 1924, this had increased to 95,000 tons. The average yield of sugar for the years 1905-14, was 4.87 tons of sugar per acre. The yield for 1925, was over 6.50 tons of sugar. It is not claimed that all this increase was due to better fertilization, but a large part of it was. Better cane varieties and a general improvement in cultural methods all helped in the improvement.

All the sugar and pineapple planters are organized for the purpose of studying the various agricultural problems which confront them. Both maintain large experiment stations for this purpose, costing hundreds of thousands of dollars each year. These stations receive no government funds of any kind. The costs of these stations are prorated among the plantations on a yield basis. That the investment pays is indicated by the fact that the scopes of these institutions are being enlarged from year to year. Of course, one of the main activities of these stations is the study of soil problems.

Although the islands are very small, a tremendous variation has been found in the soils of the different districts. With sugar cane, for instance, some districts need nothing but nitrogen, being well supplied with both phosphoric acid and with potash. Other soils, mainly the upland soils, need phosphoric acid in addition to nitrogen, while other soils, nearby perhaps, but, generally in the very rainy districts, require potash in addition to nitrogen but do not respond to phosphoric acid. In other places, both phosphoric acid and potash are needed as well as nitrogen.

Very large quantities of fertilizer are used, often as much as 60 or 70 dollars worth per acre. When one is spending that much money, it is important for him to know what he is doing. If his soil does not need phosphoric acid, for instance, it is waste for him to put some on. The fertilizer dealer is just as interested as the farmer in seeing that he does not use unnecessary ingredients for, unless the farmer feels that he is getting a return for his money, he will not continue to buy fertilizer.

In order to meet these varying needs, mixed fertilizers of 20 different formulas are used on the comparatively small area involved. In addition to this, special dressings of nitrate of soda, nitrate of lime, or other nitrogen salts, of superphosphates and of potash are also used.

To obtain the information necessary for the proper coordination of this detailed system of fertili-

Sugar cane 5 months old—nitrogen and phosphoric acid were used here but no potash zation, many thousands of soils were analyzed and field experiments conducted. These soil analyses and field tests were carefully studied and from information obtained, it is now possible, with a very good degree of accuracy, to tell the plant food needs of a soil by its chemical analysis.

In order to obtain accuracy in field tests, it is much better to depend on replications rather than on weird mathematical acrobatics. Also one should not attempt to answer all of the questions at once, but should take them up one at a time. If he is interested in potash, for instance, he should not try to find out in one test whether he needs potash, what is the best form to use, and how much.

First of all, he should find out if potash is needed. To do this, a uniform part of the field is selected and laid out in about 12 plots. Potash is applied to every other plot and enough nitrogen and phosphoric acid is applied uniformly to all plots. The plots are made of such size and shape as to interfere the least with the regular farm routine. In this way, tests may be put in at very little cost and many farmers will be willing to make them.

The plots are made of such size that the yield will be of some convenient unit. In experimenting with sugar cane where the cane is harvested in wagons, the size of the plot is made so that the yield will be about a wagon load or multiples of one load.

After the basic question as to the need of potash has been determined, steps may be taken to determine the other questions.

But this does not mean that until all these points are decided that one must not use fertilizers. Here in Hawaii, we have found the returns from fertilizer so great that we do not hesitate to recommend the use of a complete fertilizer to begin with. Then as we obtain the desired information we drop one element or another and adjust the amount to the most economic quantity.

It is the careful following of such methods as outlined above that has enabled Hawaii to lead the world in the acre production of sugar and pineapples.

Sugar cane 5 months old—400 pounds per acre of sulphate of potash was used in addition to nitrogen and phosphoric acid

Keller's Field Day

(*From page 5*)

to the field southwest of the house where the boys from the vocational class in agriculture of the St. Francis Community High School had previously shucked out one-fiftieth of an acre from each of the plots.

The corn was in piles at the ends of the rows and by each pile was a placard indicating the yield per acre and the name of the variety or the name of the man furnishing the seed. The group of interested farmers and their wives was led by Mr. Keller down the ends of these rows while he discussed the relative merits of the various plots of corn.

DURING the five years past in which Mr. Keller has been conducting corn tests similar to the one this year, the white corn has outyielded the yellow from four to 17 bushels per acre. This year the situation was reversed, the yellow outyielding the white by about six bushels—all of the white varieties yielding 13.9 bushels and the yellow varieties making 19.5.

However, the five-year average of tests are from this same farm and show the white making an average of 33.7 bushels and the yellow making an average of 27.7. Mr. Keller accounted for this by saying that the rains came at just the right time to help the yellow corn and that they came too late for the white corn, the white being a shorter season corn.

The varieties which have been doing the best for Mr. Keller during these five years are Freed's White Dent, Cassel White, Colby Bloody Butcher and Blue Squaw.

When the group reached the end of the field, B. F. Barnes, superintendent of the experiment station at Colby, presented some results of experimentation with corn at Colby. In general his results coincided with those of Mr. Keller.

In regard to the preparation of the soil, Mr. Barnes stated that spring plowing for corn had gotten better results than fall plowing. The only time that Mr. Barnes would advocate plowing for corn is in the spring when the ground is especially hard.

County Agent Brunson discussed the results of type tests of seed corn as conducted in this county and in Kansas and Nebraska. These tests in other parts of Kansas and in Nebraska have resulted strongly in favor of the smooth type of seed corn. Tests in this county so far at least have shown that there is no very decided difference in favor of either the rough or the smooth.

Figures as to the drying qualities of the corn resulting from the rough and smooth types of seed proved interesting. In 1923, 45 days after shucking, dry weights were made on these two classes of corn and these weights showed that the corn from the rough type of seed lost 29.8 per cent in weight while the corn from the smooth type lost only 28.3 per cent in weight, thus showing that in that year at least the rough loses more weight in drying than the smooth.

Out of all this Mr. Keller has concluded that Freed's White Dent corn is the best for Cheyenne county and has secured several bushels of certified seed of this variety. He has decided to give up conducting these variety tests and will give time to the production of certified seed corn.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Bowling Green, Virginia, is in the sun-cured tobacco district. In 1908 an experiment station was started there for carrying on fertilizer experiments with tobacco. In 1920 the work was reorganized; many of the old experiments were discontinued. The results of the 12-years work, up to 1920, have just been published in Bulletin 242 "Experiments with Sun-Cured Tobacco and Other Crops Grown in Rotation With It." W. W. Green is the author. Different sources of ammonia, for sun-cured tobacco, sources of phosphorus and potassium, the effect of rotation, varieties, residual effects and the use of lime are among the subjects discussed. It is a useful bulletin.

The Soils Section, Michigan State College, is to be commended on the series of circular bulletins recently gotten out on fertilizer recommendations for the soils of several counties. For each county a fertility map is given following which are detailed recommendations for the most economical use of fertilizers on nearly 20 crops of the soils shown in the map. Two major groups are made: originally well drained and poorly drained. We have before us such circulars for 11 counties. The authors are M. M. McCool and J. O. Veatch.

Most land has too little soluble nitrogen; that is nitrate nitrogen. But there are parts of Colorado that have too much nitrate. Such instances of excessive nitrates in Colorado soils appeared as "brown spots." A very careful study of these lands has been made by Wm. P. Headden and published as bulletin 299 "The Nitrate Question in Colorado; A Review for the Farmer." The bulletin is very practical and is written in a "very-easy-to-read" style. It should be in the hands of all farmers that have such brown spots on their farms.

Director Jacob G. Lipman, New Jersey Experiment Station, is a well-known authority on the use of fertilizers. He has recently written a very interesting article on "Fertilizer Prospects for 1926 —The Use of Concentrated Materials in Potato Fertilization," in the American Potato Journal, January 1926. Other interesting articles will be found in this number and also in the February issue on potato diseases, inspections, spraying and the potato situation in different parts of the world.

The results of fertilizer inspections and registrations recently published are as follows:

"Fertilizer Report, Seed Report," Bulletin of State Board of Agriculture, Dover, Delaware, Vol. 15, *No.* 5, *July-December,* 1925, *Miscellaneous January-December,* 1925.

"Commercial Fertilizer Law," The State of Florida Department of Agriculture, Inspection Division, J. Hinton Pledger, Supervising Inspector.

"Eighteenth Biennial Report of the Department of Agriculture of the State of Florida, Division of Pure Food and Drugs, Stock Feed, Fertilizer and Citrus Fruits," for the years 1923 *and* 1924. *Nathan Mayo, Commissioner of Agriculture, Tallahassee, Florida.*

"Commercial Fertilizers," Bulletin Georgia Department of Agriculture, Serial No. 100, *Season* 1925. *J. J. Brown, Commissioner of Agriculture, Atlanta, Georgia.*

"Commercial Fertilizers," State Fertilizer Department, University of Maryland, College Park, Maryland. Control Series, No. 116, *February,* 1926.

"Inspection of Commercial Fertilizers," Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 33, *December* 1925. *H. D. Haskins, L. S. Walker and George B. Dalrymple.*

"Commercial Fertilizers," Vermont Agricultural Experiment Station, Burlington, Vermont, Bulletin 248, *September,* 1925. *J. L. Hills, C. H. Jones and G. F. Anderson.*

"Analyses of Lime, Fertilizers and Field Seeds," Department of Agriculture and Immigration of Virginia, Bulletin No. 219, *February-March,* 1926.

"Reports of Fertilizer Tests for 1925,*" West Virginia Department of Agriculture Weekly Market Bulletin, Charleston, West Virginia, Volume* 9, *Number* 35, *February* 22, 1926.

"Official Fertilizer Inspection for Wisconsin," Wisconsin Department of Agriculture, Fertilizer Inspection Division, Analyses of Fertilizers for 1925, *Registrations of Fertilizers, Bacteria and Limestones for* 1926, *February* 20, 1926. *W. B. Griem.*

Soils

In Special Bulletin No. 136, "The Muck Soils of Michigan," Michigan Agricultural Experiment Station, Drs. M. M. McCool and Paul M. Harmer ably present the essential facts concerning reclamation of muck soils and production of general crops on such soils. So very concise is the treatise and so applicable is it to muck soils in other states, that farmers desiring to reclaim such soils should write for a copy of this bulletin.

The Department of Soils, Ohio State University, in their "Timely Soil Topics" pamphlet No. 90, presents in a very interesting manner the geological origin of the soils of Northwestern Ohio.

"Timely Soil Topics" No. 93 (Radio Lecture No. 2), charts the land resources of Ohio. It shows very clearly how the soil survey work has made it possible for a farmer to recognize soil differences. The relation of climate and rainfall to soil characteristics is described in detail.

Crops

Quality production seems to be the keynote of most of the bulletins on crops which are coming out this spring. With the farm surplus a vital agricultural question, and one which is going to require time and serious work on the part of our best economists, it is well for the farmers to turn their attention to quality rather than quantity production.

Important and of interest to extension workers and farmers all over the South will be South Carolina's bulletin 225, issued in January at Clemson College—"Cotton Experiments at Florence." E. E. Hall and George M. Armstrong present their findings with text and pictures that instruct.

Other bulletins that merit inspection include:

"The Sugar Beet in California," Agricultural Experiment Station, Berkeley, California, Circular 302, *January,* 1926, *R. L. Adams.*

"Crossed Corn," Connecticut Agricultural Experiment Station, New Haven, Connecticut, Bulletin 273, *January* 1926, *D. F. Jones and P. C. Mangelsdorf.*

"An Experiment in Selecting Corn for Yield by the Method of the Ear-Row Breeding Plot," Agricultural Experiment Station, Urbana, Illinois, Bulletin No. 271, *November* 1925, *Louis H. Smith and Arthur M. Brunson.*

"Results 1925 *Cotton Production Contest," Extension Department of the Mississippi A. & M. College and the United States Department of Agriculture Cooperating, Extension Circular No.* 46, *January* 1926, *R. S. Wilson.*

"Variations in Varieties of Canning Peas," New York State Agricultural Experiment Station, Geneva, New York, Bulletin No. 532, *November* 1925, *F. H. Hall.*

"New or Noteworthy Fruits," New York State Agricultural Experiment Station, Geneva, New York, Bulletin No. 531, *October,* 1925, *U. P. Hedrick.*

"Growing Early Cabbage," Agricultural Experiment Station, State College, New Mexico, Bulletin No. 151, *January* 1926, *A. B. Fite.*

"Getting a Stand of Alfalfa," Crop Talk, Department of Farm Crops, The Ohio State University, Columbus, Ohio, No. 31, *February* 1926, *E. P. Reed.*

"Type Classification of American-Grown Tobacco," United States Department of Agriculture, Bureau of Agricultural Economics, Washington, D. C., Miscellaneous Circular No. 55, *January* 1926.

"Hubbard Squash in Storage, Climate of Storage Rooms and Changes in Composition," Vermont Agricultural Experiment Station, Burlington, Vermont, Bulletin 251, *November* 1925, *M. B. Cummings and E. W. Jenkins.*

"Agricultural Seed Inspection," Vermont Agricultural Experiment Station, Burlington, Vermont, Bulletin 253, *December* 1925, *Anna S. Lutman.*

"Sow Northern-Grown Domestic Red Clover Seed," College of Agriculture, Madison, Wisconsin, Circular 199, *March* 1926, *E. J. Delwiche.*

"Planning and Planting Home Grounds," College of Agriculture, Madison, Wisconsin, Circular 190, *December* 1925, *Franz A. Aust.*

"Inoculated Seed Increases Yield and Quality of Legumes," College of Agriculture, Madison, Wisconsin, Circular 194, *February* 1926, *A. L. Whiting and E. B. Fred.*

Economics

"Spanning the gap" means getting farm products from the farm into the hands of the consumers. A shorter word is marketing. Selling is only one of the nine services involved in marketing; the last. Cooperation is possible in some of these services in marketing; rarely in all. What cooperation can do and what it cannot do for Washington farmers is carefully and clearly explained by E. F. Dummeier in Bulletin 194, "Cooperation in Marketing Washington Farm Products." The bulletin is a long one, 107 pages. It gives detailed information regarding 166 cooperative organizations in Washington which did an annual business of $45,000,000. Two interesting pages give interesting reasons as to why some of these organizations failed.

Going from Washington south, we notice that George O. Gatlin has made an interesting study of "Cooperative Marketing of Cotton." The results are given in Bulletin 1392, U. S. D. A. The work discusses the methods of 280,000 cotton growers who marketed 10 per cent of the cotton crop through cooperative agencies.

In Alabama as in other States, the price of farm crops has varied widely during the last few years. Is the major trend of cotton prices downward? J. D. Pope, Specialist in Farm Management and Agricultural Economics, believes that it may be; that caution is the wisest attitude. A very constructive program is given for guarding against any future lowering of cotton prices. The work is a thorough statistical study of cotton prices for over 100 years. (Prices of Farm Products in Alabama by J. D. Pope, The Alabama Polytechnic Institute, Extension Service, Auburn, Alabama, Circular 91, January 1926.)

Other very useful information will be found in:

"The Utilization of Surplus Plums," Agricultural Experiment Station, Berkeley, California, Bulletin 400, *February* 1926, *W. V. Cruess.*

"A Permanent Program of Agriculture for Alabama," by F. W. Gist. Farm Economics, Vol. 1, *No.* 5, *Auburn, Alabama.*

Diseases

"A Promising Remedy for Black Measles of the Vine," University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California, Circular 303, *February* 1926, *L. O. Bonnet.*

"Irish Potato Disease Investigations, 1924-25, *University of Florida, Agricultural Experiment Station, Gainesville, Florida, Bulletin* 176, *November* 1925. *L. O. Gratz.*

"Diseases of Cucumbers," University of Florida, Agricultural Experiment Station, Gainesville, Florida, Bulletin 177, *December* 1925, *G. F. Weber.*

"Diseases of Brambles in Illinois and Their Control," University of Illinois, Agricultural College and Experiment Station, Urbana, Illinois, Circular No. 305, *February* 1926, *A. S. Colby and H. W. Anderson.*

"Control of Smuts on Cereal Crops," Agricultural Experiment Station, North Dakota Agricultural College, Fargo, North Dakota, Circular 28, *February* 1926, *H. L. Bolley.*

"Loose Smut of Wheat," Agricultural Experiment Station, North Dakota Agricultural College, Fargo, North Dakota, Circular 29, *February* 1926. *W. E. Brentzel.*

"Control of Smuts of Wheat and Oats with Special Reference to Dust Treatments," Ohio Agricultural Experiment Station, Wooster, Ohio, Bulletin 390, *R. C. Thomas.*

"Senescence and Rejuvenescence in the Cells of the Potato Plant," Vermont Agricultural Experiment Station, Burlington, Vermont, Bulletin 252, *December* 1925, *B. F. Lutman.*

Insects

The production of cucumbers is an important industry in many sections of the country. In recent years many important producing areas have abandoned cucumbers because of the presence of the striped cucumber beetle and cucumber wilt. The wilt disease is spread by the beetle. The Ohio Agricultural Experiment Station in Bulletin 388, by J. S. Houser and W. V. Balduf, gives results of several years of experimental work on control of the beetle and wilt.

So important has become the control of plant lice of vegetable crops, that the New Jersey Experiment Station has published in Circular 178 a complete treatise on the subject. Ninety-four species of plant lice have been identified in New Jersey, of which 12 species are enemies of vegetable crops. After much experimental study, nicotine dust or spray is recommended as the best agent for effective control.

"Spray Schedule for Peaches," Agricultural Experiment Station, Gainesville, Florida, Press Bulletin No. 373, January, 1926, Carl B. James, J. R. Watson.

"Push Out the Spring Growth to Avoid Aphis Injury," Agricultural Experiment Station, Gainesville, Florida, Press Bulletin No. 374, January 1926, J. R. Watson, R. W. Ruprecht.

"Stamp Out the Citrus Aphis During the Winter," Agricultural Experiment Station, Gainesville, Florida, Press Bulletin No. 375, January 1926, J. R. Watson.

"Fumigation of Citrus Trees," Agricultural Experiment Station, Gainesville, Florida, Press Bulletin No. 376, January 1926, J. R. Watson.

"Disinfecting Truck Crop Seed with Corrosive Sublimate," Agricultural Experiment Station, Gainesville, Florida, Press Bulletin No. 377, February 18, 1926, G. F. Weber.

"Spray Calendar for Apples and Quinces." New Jersey Agricultural Experiment Station, New Brunswick, New Jersey, Circular 180, 1926.

"Spray Calendar for Peaches," New Jersey Agricultural Experiment Station, New Brunswick, New Jersey, Circular 181, 1926.

"Spray Calendars for Plums and Cherries," New Jersey Agricultural Experiment Station, New Brunswick, New Jersey, Circular 182, 1926.

"Spray Calendar for Grapes," New Jersey Agricutural Experiment Stations, New Brunswick, New Jersey, Circular 183, 1926.

"The Adherence to Foliage of Sulfur in Fungicidal Dusts and Sprays," New York State Agricultural Experiment Station, Geneva, New York, Technical Bulletin No. 116, November 1925, R. W. Thatcher and Leon R. Streeter.

* * *

Kentucky Blue Grass

(*From page* 18)

computed Acre Value, (5) Digestible Nutrients—Pasture vs. Grain Rotation and Labor Economy of Pasture Feeding, (6) Pasture Fertilization, (7) Soil Building—Blue Grass Sod vs. Crop Rotation.

In this, the introductory article, the writer has attempted for a purpose to paint a word picture depicting two rather extreme agricultural conditions in two almost adjoining states. The one especially favored by nature (in a limited area), the other apparently forgot. One the open prairie, the other the rugged mountains. Strange, however, as it may seem the home of the Holstein, the two northern counties of Pennsylvania, ranks as one of the greatest dairy sections in the Union. The writer does not claim to have solved the eastern pasture problem, but he has demonstrated beyond question that Kentucky blue grass pastures may be developed to equal if not excel the natural pastures of Kentucky.

Editor's Note:—Watch the next issue of BETTER CROPS *for Professor White's article on "The Nature of Pennsylvania Pasture Experiments.*

Living off the Farm

(From page 8)

The figures used by Hawthorne are the average of the value of the family living from the farm given for each individual place. For the whole country he has averaged the living records of nearly 8,000 families. The average of the records for a certain section give the figures used for the cotton belt, the corn belt or some other belt.

For the entire United States six items furnish 92 per cent of the value of the family living from the farm. They are house rent, fuel, dairy products, poultry and eggs, pork and lard, and fruit and vegetables. House rent made up 36 per cent of the value of this part of the family living. Fuel made up three per cent and food, 61 per cent. Seventy-four per cent of the food used was animal products and only 26 per cent came from crops. The cow, the hog and the hen ranked in that order in supplying the family with food and the hog ranked first in supplying meat.

Hawthorne finds in the data no marked indications that families living in the better agricultural localities obtain more of the family living from the farm than do those in the poorer localities. The house rent was valued at a little more which indicates greater values in houses in the better farming regions. He does find, however, that the value of the family living from the farm varied with individual families from nothing to more than a thousand dollars per year and wide differences were found in every community.

The value of the products used was based on the prices they would have brought at the farm. Their value at city retail prices in one section of Ohio where the comparison was made, amounted to more than twice the farm value. Practically everywhere the living from the farm had an average value of \$200 to \$800 for each family per year. In a few localities some families got nothing from the farm directly as they did not live on the place and used no products from

(Turn to page 50)

The value of the farmer's house rent is \$184 per year it. This was noticeable in Polk county, Florida, where about 40 per cent of the citrus grove owners were non-resident, usually living in nearby towns and cities.

In general this study showed that the value of the family living from the farm was more for the large farms in a given section than for the smaller ones. Also in most cases the larger families used more dollars worth of family living from the farm than did small families. It was a little less for tenants than for owner families. The value of food furnished was practically the same, but that of the house rent was less. As the tenant had to share the farm receipts with the landlord, the value of the family living from the farm was larger in proportion to the tenants' receipts than would be the case for an owner.

FOR all of the farm business survey records included in this study, the value of the family living from the farm was practically one-ninth as much as the farm receipts, with variations from less than one-twentieth in a few localities with large farms and large capitalization or with highly specialized types of farming, to more than one-fifth in some localities with small farms and small capitalization. Prominent among the former localities are Polk county, Florida, Sherman county, Oregon, and the Palouse country of Idaho and Washington. Among the latter are Sussex county, Delaware; Catawba county, North Carolina; Jones county, Mississippi; and Washington county, Ohio. Farm receipts mentioned here include the proceeds from the sale of crops produced during the farm year, the increase from livestock, and the receipts from outside labor, rent of buildings, etc.

With all the variations for different localities in the relation of the value of the family living from the farm to the farm receipts, there were even greater variations for the different farms of a locality. In fully one-third of the areas studied, there were a few farms with the value of the family living from the farm amounting to more than their farm receipts and in most of the localities there were some farms where it amounted to as much as 50 per cent or more of their farm receipts.

BEARING in mind that the operating expenses of the farm business must be paid from the receipts, Hawthorne emphasizes the fact that such farms had but little cash left from the farm business for the use of the family. It was not, he says, that the value of the family living was so much on these farms when compared with the others, but that the farm receipts were so low.

THE value of the family living from the farm in 1918 for the places studied in Frederick county, Virginia, averaged $556. The same year it was $690 for white farmers in Sumter county, Georgia, and $471 for the colored farmers in that county. Washington county, Ohio, farmers got $511 in living from their farms, compared with $654 for Tama county, Iowa. For 1921, Washington county showed a value for the living from the farm of $399; and Tama county, $642. The highest average value of the living from the farm for any community studied was $690 for white farmers in Sumter county, Georgia, in 1918; and the lowest was $230 for Polk county, Florida, in 1919. The average value of the family living from the farm for all farms studied for all the years was $518.

Profit—$269 per Acre

(From page 11)

the seed was dropped. A fairly good seed bed was made to start with.

The potatoes were plowed four times. The seed were treated, and the vines sprayed four times. In spite of an unusually dry season, Mr. Wood dug 190 bushels of potatoes from the acre.

The average yield for Rappahannock county is right around 80 bushels in good years, and below that this year. Potatoes from Mr. Wood's acre were divided as follows; 60 bushels of certified seed, 115 bushels of table stock and 15 bushels of culls that were good for stock feed only.

The market price was $2.50 for certified stock, or $150.00 for the total and $2.00 for the table stock, making $230.00 for that lot, or a total of $380.00 for the acre. The cost of production was as follows: seed $32.00, fertilizer $36.00, spray $18.00 and labor $25.00, making the total cost of production $111.00 and leaving a clear profit of $269.00 for the acre.

The Farmers Union Store manager told the county agent not long ago that 5-8-5 fertilizer has been in such strong demand for the past few years that it is hard to keep a stock on hand. This the writer can verify, for he was unable to get, not only the 5-8-5 but any other high analysis fertilizer last spring for his garden, and incidently, his potato crop was cut 50 per cent in quantity and about 80 in size and quality.

This article is not intended to convey the idea that 190 bushels of potatoes is a high yield for the potato section, of Virginia, for it is not, but it is a good production for the Piedmont section.

The writer wishes to emphasize that potatoes may be produced profitably in the uplands of Virginia, where the yields are considered to be too low to make a profit, provided the proper plant food is supplied in sufficient quantities.

Further, it has been found by experiments that the potatoes produced in Piedmont Virginia, make just as good seed for the eastern shore producers as do the Maine grown potatoes—another incentive to the Piedmont spud producer.

State Inspector L. C. Beamer and Mr. Wood, grading potatoes

Efficiency—and Then What?

(*From page 14*)

such special profits tempt the recipients to increase their production. They also induce other farmers to adopt the efficiency methods that have made them possible. Increased production then wipes them out. In other words, increased efficiency, when confined to a few farmers, nets these few substantial individual gains that dwindle to nothing when, as a result of a general advance in efficiency, they have to be shared among the whole body of farmers.

THAT is what general improvements in farming practice accomplish. They divide up the cash returns from efficiency until the individual portion is negligible. Suppose, for example, our most efficient farmers begin planting a new and better variety of wheat or corn. For a time the practice brings them a return above the average received by wheat or corn growers. But as more farmers plant the improved variety, the supply of it increases and the premium for it declines. Eventually, when its use becomes general, there is no more profit in its production than there was in the production of the poorer varieties previously grown. The only difference is that there is now a penalty on growing the poorer kind, instead of a premium on growing the improved kind.

But is there no net gain for agriculture when its average efficiency is increased, you may demand? Not when the increased efficiency leads to increased production *regardless of market needs.* In that case the middleman or the consumer is the beneficiary, and not the producer. It is usually that way. Farmers, like other competitive producers, are habitually tempted to exhaust every possible chance to make a dollar. When a crop is showing a profit, they produce it and produce it until the profit disappears.

That is why efficiency in production does not suffice to make agriculture prosperous. In addition it is necessary to have an adjustment of production to the needs of the market, and such an adjustment requires collective as well as individual action. In our ceaseless striving for individual efficiency, we are apt to forget that individual effort, unless modified by considerations of the general welfare, is apt to degenerate into mere destructive competition. There are two things the farmers can do to retain for themselves the benefits coming from increased efficiency on the farm. Both call for group as distinguished from individual action.

YOU will guess that one of them is just ordinary cooperation in marketing. Let me give you an illustration of the way group action gets profits for farmers that individual efficiency cannot obtain. Tillamook county in northwest Oregon is settled by a high class of dairy farmers. Scientific dairying was started in the county as long ago as 1890. By 1919 it had more than 500 purebred cows and nearly 1,000 purebred calves and yearlings. Moreover, the region is ideal for dairying. Pastures are rich, stock can be grazed the year round, and labor and feed costs are therefore low.

With such advantages you might suppose dairying in Tillamook county could not be unprofitable. It was, however, until the dairymen got together for the cooperative production and marketing of cheese. As a matter of fact, it was not until 1909, when the Tillamook County Creamery Association was organized to federate a number of cooperative cheese factories, that really good financial results were shown. There had been some cooperation in the county before then, but not enough. Before the cheese factories were federated, they sold their output competitively. That played into the hands of dealers and reduced their profits almost to where they were in the old days of cheese production on the farm.

IN 1900 the Tillamook County Creamery Association began operations, with a membership of nine factories. Within six years its membership doubled. In 1923 there were 25 factories in the association. These factories made 7,113,176 pounds of cheese during the year and sold it for $1,884,689. Sale of whey, cream, and butter brought the year's receipts up to $1,927,290. Compare these figures with the returns for 1909, when the total amount of cheese sold by the association was only 2,506,612 pounds and the value of the product $386,135.

When their main reliance was individual efficiency, the Tillamook dairymen sold their milk on a guess system as to its value for cheese making. For lack of storage facilities, cheese made in the county was shipped on consignment to jobbers and commission houses in the season of heavy cheese production which is likewise the season of low cheese consumption. Naturally, it brought low prices. Small scale production of cheese on the farm was costly. It was but little less costly in the small cheese factories that preceded those now used. Cooperation had remedied these troubles, and cured the Tillamook dairymen of any hankering to return to the old system of unrestricted competition and devil take the hindmost.

THE other means farmers have at their disposal for preventing the results of general efficiency from slipping away from them lies in effort to raise their standard of living. This is something that must be widespread to be useful. Many farmers are content with a low standard of living because they want to turn profits into working capital, for the purpose of expanding their operations. An individual who scrimps to plant more corn or raise more hogs is likely to be applauded for prudence and foresight. But when too many do it, the result is heightened competition, lower prices, and diminished net profits for agriculture as a whole.

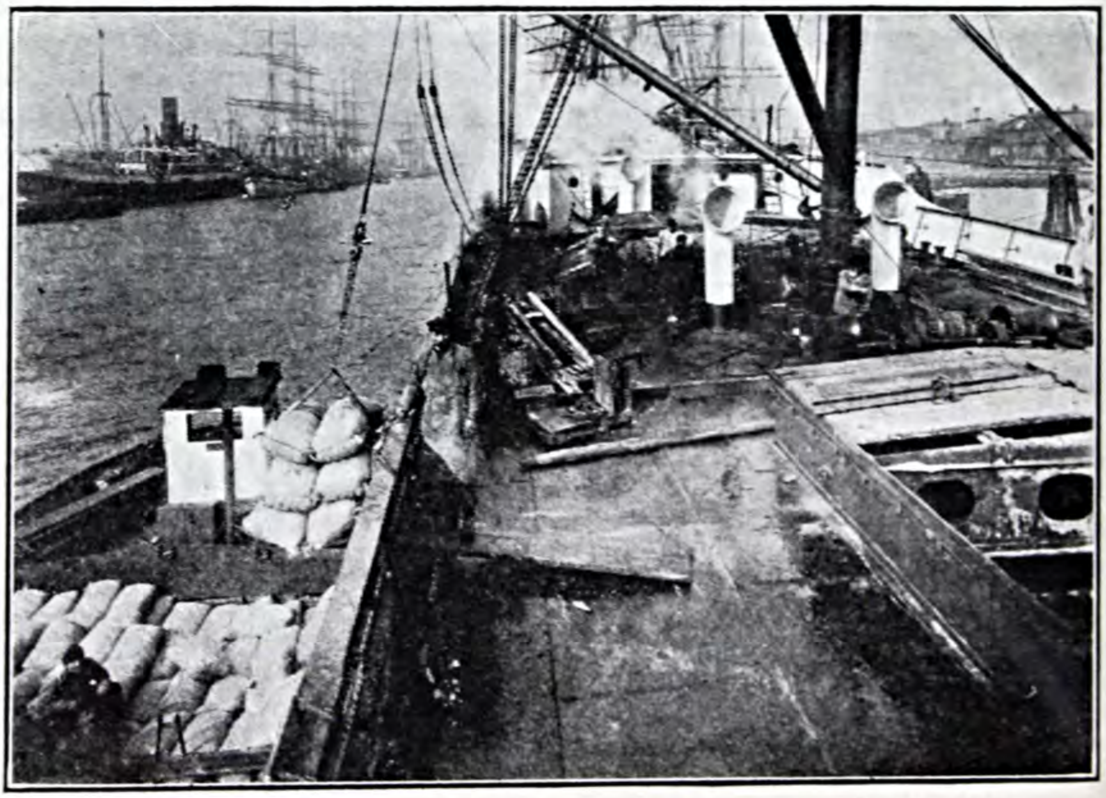
After all, you know, our farmers as a group do not maintain high standards of living. A study of 3,000 scattered farm families made by the United States Department of Agriculture indicated that the average total value of the goods and services used by them in one year was only $1,504. And of this value, $643 was furnished by the farm in food, fuel, and housing. Not many city artisans would be content with a standard of living representing so small an expenditure. Of course the city man has to buy many things that are not necessary on the farm. Nevertheless, many farmers go without things that most city men have, and that really contribute to life and happiness.

It may seem useless to urge individual farmers to increase their expenditures as a contribution to a general rise in farm standards of living, unless you can give them some assurance that other farmers will do the same thing. This is a case where individual and group interests don't always coincide. But if farmers put all their profits into expanding their production, they soon have the mortification of seeing their profits vanish. On the other hand, when they maintain good living standards out of their current income they tend to set up a collective demand for a reasonable income that soon becomes a force to be reckoned with. Trade unionists know how to make living standards a means of increasing their income. There is no reason why farmers should not do the same.

Essentially, it is a question of reconciling the interest of the individual farmer with the interest of the group. Farmers are a group, but they don't act as a group. They act as individuals. Showing them that collectively it is bad to increase means of production at the expense of reasonable living standards is of little use, unless collectively they can do something about it. Men get ahead individually by thrift and by building up their working capital. They will not modify that policy materially, without the prospect of a compensating advantage.

No sensible farmer is going to renounce what looks like a clear individual advantage simply to gain some remote and perhaps doubtful social advantage. But if it can be shown that the group gain will more than offset the individual sacrifice, the question looks different. A case along that line can be made out for higher living standards on the farm, whereas it is hard indeed to justify the opposite policy of continually expanding the means of farm production.

* * *



Loading German potash from barge to ocean-going freighter

Brains and "Bone Dust"

(From page 23)

County Agent R. N. Thomas of Jefferson county, who was in close touch with this work in his county, said, "The five acres of fertilized corn started growing much better, was of a deeper darker green, and grew more rapidly than the five unfertilized acres. It eared quicker, the ears were larger and more solid and ripened from 8 to 10 days before the unfertilized corn."

"THE ground was plowed 8 inches deep early in April," said Mr. Barnes, "and as soon as it was dry enough I went over it with the cultipacker following the practice of rolling down every evening all that I had been plowing during the day. I then let it lay a few days until the small weeds began to come up, when I harrowed it crosswise to kill all these young weeds that had germinated.

"I let it lay another week and then harrowed it again, this time going lengthwise of the field to kill the second growth of young weeds. This being especially foul land, it is necessary each year to kill all the weed seeds that have been washed in by the high water and the more of these that can be eradicated before planting the corn the easier it is to keep the corn clean.

"We can do much more effective work in the same time with a harrow before the corn comes up and do it much easier than with a cultivator or hoe after the corn is up. We harrow it twice and run the cultipacker over the field again in order to pulverize the clods and make a fine mulch to hold moisture.

"I then let it lay a few days and just before planting I went over the field with a disc harrow lapping half in order to clean out again all the young weeds and grass and to loosen the ground on top before planting. I followed this with a spike toothed harrow and then applied the fertilizer with a wheat drill.

"The corn was planted on the 24th day of May, running the planter about two inches deep, the rows three feet apart and drilling the corn 13 inches apart in the row. Immediately following the planter I went over the field again with the cultipacker. About the time the corn was two inches high I took the two-horse cultivator and plowed it, driving slow and being very careful to clear out the weeds and grass and not cover up any of the corn. I followed with this same implement once each week for the next four weeks.

"ON the fifth week I took a one-horse cultivator with five shovels and an 18-inch sweep in the back in order to keep the plow from running too deep and disturbing the corn roots and also in order to cut out any morning glory or other vines that the plow did not get. After the first plowing I thinned this corn, cutting out with a hoe any extra stalks, where there were two together in the row. When the corn began to shoot and tassel I went over the field again and cut out all barren stalks in order that the good stalks might have a better chance."

It is interesting to note that the seed which Mr. Barnes used to produce this, the highest yield in the state, and to which he attributes much of his success, was secured from L. M. Vogler of Hope, Indiana. It was some of Vogler's very best seed and had tested 100 per cent. It is the same strain of corn with which Mr. Vogler won Grand Champion honors of the 1925 International Grain and Hay Show held in Chicago. This would indicate that the best show type of corn may also be the utility or high producing type.

"When I first went to the farm," said Mr. Barnes, "I grew little except tobacco, which was my principal money crop. Beginning a few years ago I became interested in corn through the local members of the Indiana 5-acre Corn Club. My first efforts to produce a high yield were not so successful because I did not recognize the importance of good seed from a high yielding strain.

"I first tried out a mixed corn that I purchased from one of my neighbors, but later experience has proved to me that this was a mistake. While this mixed seed would produce a good yield running well up toward 100 bushels per acre I am thoroughly convinced that I would never have been able to produce the highest yield in the state had I not discarded this mixed seed and purchased the high producing kind.

"Good seed, fertile soil, good management, frequent cultivations and the application of 'bone dust' turned the trick," said Mr. Barnes.

* * *

Dewberries

(*From page* 16)

inches high, cottonseed meal tankage, or stable manure is used to encourage a vigorous growth the first season. Some growers use about 500 pounds of cottonseed meal, or some organic form, while others use 10 to 15 tons of stable manure per acre. After the first season, two applications of fertilizer are given each year, the first one being made as soon as the canes have been tied up in the spring. At this time a complete fertilizer is usually applied, composed of 2 or 3 per cent of nitrogen, 10 per cent of phosphoric acid and 8 per cent of potash. The quantity applied varies with the soil and with the different growers, but 500 pounds per acre of a fertilizer analyzing 2-10-8 is commonly used.

The second application of fertilizer is made immediately after the fruit has been picked and all the canes, both old and new, are cut off, the object being to induce a rapid growth of vigorous new canes for the next year's crop. A fertilizer containing a large amount of nitrogen is used at this time. An application of 500 to 600 pounds of cottonseed meal, tankage, or some organic form is considered sufficient, although there are growers using as much as 1,000 pounds. Growers using stable manure consider an application of 10 to 20 tons per acre sufficient. In addition to supplying nitrogen, stable manure adds large amounts of humus to the soil and is preferred when it can be readily secured.

Just as soon as possible after the fruit is picked, all the canes, old and new, are cut off as close down as practicable to the crown. All the litter including the canes is piled and burned and cultivation and fertilizing is begun, to be kept up until the new canes interfere.

DEWBERRIES ripened in Chesterfield late in May. Picking is done daily or every other day, depending on weather conditions as they accelerate or retard the ripening process. Women and children do practically all the picking, the rate of payment being at present one and one-half cents per quart. A picker carries a tray in which are set four or six standard quart strawberry baskets. These as filled are placed in standard 32 quart shipping crates. Dewberries are easily bruised and rehandling is impracticable, as are long and rough hauls to market or shipping point.

Yields vary widely, but in the dewberry region of the Sand Hills in North Carolina crops of 100 crates the acre have been obtained year after year and exceptional growers have consistently done still better. One 12-year-old field has produced more than 100 crates per acre ever since it came into bearing.

Original plantings are usually made with roots obtainable from any nurseryman or from neighboring fields. About 2,000 plants per acre are needed and plants cost about $10.00 per thousand. Once the grower has a patch of his own he provides his own transplanting material, by covering the tips of young canes with a few inches of earth late in the summer. These tips will take root almost at once and will be ready for setting out early in the fall. The rooted tips are cut off with 4 to 6 inches of vine showing. North Carolina plantations 19 years old are still producing.

* * *

Top-Dressing Alfalfa

(*From page* 10)

through as good a stand as did the plots treated with potash alone or phosphate and potash, there would have been no need to plow up the field in fall, 1925.

Application may be made with the fertilizer drill. Since tillage of growing alfalfa may be injurious, this should be done when the alfalfa is dormant, either very early in spring or after cuttings. Broadcast applications may be made in some convenient manner at similar times, but the application will naturally have much slower effect.

Having applied the treatment, we'll look for results. Do we see them? When do they appear? The first year there will almost certainly be no difference apparent to the eye, and there might be little for a scale to show. To the eye they might not appear the second year.

The writer and many others who saw the plots mentioned were unable to see any differences in them until 1925 when there was a difference of ½ ton between the untreated and some of the treated plots. A few hundred pounds per cutting for four cuttings will pay a handsome profit on the fertilizer investment and the writer has not found the man who can tell such differences by inspection.

This story is not complete without mention of the total effect and the subsequent course of such fertilizer applications to alfalfa fields. They liberate for use elsewhere upon the farm, manure which would otherwise have necessarily been applied to the alfalfa. The life of the alfalfa stand can be prolonged,—for how long it is impossible to say. It avoids much of the rubbish which is bound to be raked up after top-dressing the alfalfa with strawy manure. It enables the alfalfa plant to gather nitrogen more extensively and thus makes the farm richer in that element if the crop be fed on the farm. The farm will also be better supplied with phosphates and potash, because of the recovery of a certain proportion in the manure, an important consideration with sandy soils which are low in these elements.

* * *

Lee Critchlow, Hustler

(*From page 27*)

Their first farm was way out nine miles from "some place." On this account they got it on a low cash payment. Of course this $300 capital didn't go far, but Lee's father kindly helped them out by going on a note for all they could not get on credit and the mortgage. This put them $3300 in debt.

Lee always was a good farmer as far as plowing, harrowing, cultivating and building up the soil on a farm was concerned, but when it came to marketing the hay and grain crops of his farm through livestock, Lee was hardly more than in the kindergarten class when he started farming.

On this first farm in addition to fertilizers and the manure he applied 135 tons of lump lime that he had burned on the farm. However, due to lack of knowledge in feeding and breeding of livestock his income those first few years was so meager that several times he and his wife thought they would go under. He was afraid even to tell his father their plight.

Finally someone told him if he would feed his chickens a mash with a variety of feeds in it and with lots of protein, his hens would do better. "I tried it," he said, "even put in some cottonseed meal." Results showed almost immediately in an increased egg production. "I wonder why this same thing wouldn't work on cows," thought Lee. So he tried more variety on the cows in addition to the old stock ration of corn meal, and bran, with eye-opening results on them. This was the beginning of Lee's agricultural education.

He began to read and study farm papers and bulletins from the State College. Then he got in touch with the county agent and got more help from him. When need of it came the county agent brought specialists from the college to help him. Especially was this true in poultry. Now Lee is such a booster of the county agent's work, that in 1925 he was awarded a gold medal for doing the most work of any man in the county to promote the agricultural interests of his community.

As their knowledge grew, the Critchlows began to realize that nine miles from market was too far when good farms could be had closer. So when an opportunity to sell for what they had put into it came, they were not slow in letting the farm go. Thus their first five years were about an even break financially but in experience they were far ahead.

They bought their second farm near a market and a state road. Immediately Lee began to lime, repair the buildings and erect a home-made silo. He also built a new poultry house along State College plans. In two years he had made such a transformation in the farm that one day a friend of his came along and asked him what he would sell it for. Lee studied awhile and after consulting his wife he put a price on it $2,000 above its original cost plus the cost of the improvements (not figuring the labor which Lee did himself). He did not want to sell but the friend took him up and the Critchlows had to look for another farm.

This time they bought on a cement road that runs between Pittsburgh and Franklin and only a mile from a town of several hundred people. On this farm he has added to his house, put up a $435 silo, cemented the cow barn and put in stanchions, built a 20 by 60 foot chicken house of one of the latest types, has running water in the house, barn and chicken house. He also has an acetylene lighting plant in the house and poultry house. A radio outfit keps him in close touch with the outside world. On the farm he has laid 3000 feet of tile drain and has applied 48 tons of lump lime (part of this on the pasture). The beauty of all these improvements to the Critchlows is that they are free of debt.

Lee has five fields on this farm that he cultivates. He has these divided into two rotations. Three of these fields have a total of 24 acres that he runs in a rotation of corn, oats and clover. The other two fields have 8 acres that he runs in a two-year rotation of wheat and clover. On the wheat and corn he applies 200 pounds per acre of a complete fertilizer and on the oats 200 pounds of acid phosphate per acre.

For livestock he has nine cows (six pure-breds), two heifers, and a purebred Jersey bull. The bull is out of a three-year old cow that produced 14,292 lbs. milk and 639 lbs. of butterfat. The bull belongs to a bull association of which Lee is a member. So for several years he is assured of a good bull. One of his foundation cows is a two-year-old that has milked as high as 40 pounds daily in the cow testing association of which Lee is a member.

His poultry flock of 400 hens are purebred White Leghorns. Last year under state supervision they averaged 174 eggs per hen. They get the State College mash and grain mixture along with sour milk and plenty of green feed.

He has his work so well systematized that his labor bill for outside help does not run $100 a year. Practically all the building and improvements are made by himself.

The hen house and Silo that Lee Critchlow built

Potash *and* Cotton *on* Missouri Glades

(*From page 26*)

potash plot alone only about 40 per cent of the cotton was open whereas on the combination treatment area nearly 60 per cent was picked.

The final picking figured on a basis of seed cotton per acre showed a gain of 153 per cent for the potash, 150 per cent for the combination, and a loss of 14 per cent for the phosphate plot.

SOME very valuable information had been discovered by these 1924 trials but in farming we all know that one year's results can not be taken for conclusive evidence.

Harrison and Renner determined to try the proposition out again before saying too much about the first year's results. So much interest had been aroused from the sight of the field throughout the year that these gentlemen had to produce the goods. So in 1925 a similar trial was laid out on the same field.

This year six plots were laid out. The first had no fertilizer, the second contained 75 pounds of muriate of potash, plot number three carried 200 pounds of acid phosphate, plot 5 was treated with a complete fertilizer of 100 pounds of nitrate of soda, 200 pounds acid phosphate, 75 pounds muriate of potash, and plot number 6 was left as a check with no treatment.

The ground was broken thoroughly early in the season. It was bedded up the latter part of April, dragged and planted in the second week in May. The seed bed was in excellent shape.

As in 1924, this region was visited with a severe sandstorm but the cotton on this field stood the test satisfactorily owing to the excellent root growth caused by the fertilizers. Judge Harrison stated at that time he was pleased with the results in getting a stand.

Owing to a very wet and early fall, the cotton was picked as bolly cotton, that is, the cotton did not open sufficiently to be picked. This was true in a large measure throughout the entire cotton district.

Plot	Yield Pounds per acre
Checks	189
Straight acid phosphate	254
Phosphate and potash	896
Muriate of potash	914
Complete fertilizer	1106

Scott county farmers are convinced that a return of 485 per cent per acre as the complete fertilizer in this case gave is worth while. They are also convinced that the return of 383 per cent that was secured from the use of potash on the muck type of soil found in that county justifies a wider use of this kind of fertilizer. The story of the results has spread to adjoining counties with the result that a car of potash has been ordered through the Scott county office.

The field used for this demonstration of good farm practice with cotton is to continue in the service of better agriculture by being limed and sown in sweet clover in the spring of 1926.

* * *

City Cousin—What has that cow got the bell strapped around her neck for?

Country Cousin—That's to call the calf when dinner's ready.—*Pennsylvania Farmer.*

What Is Land Worth

(From page 22)

pounds of nitrate of soda, and 25 pounds of dried blood costing $6.40 increased the yield of wheat to 29.58 bushels, an increase of 16.49 bushels per acre. Wheat under Ohio conditions has a farm value of $1.00 per bushel, the increased yield, therefore, was worth $16.49 or a net increase of ($16.49-$6.40) $10.09, which is five per cent interest on $201.80. Such simple use of a complete fertilizer on these thin, cold soils of Ohio increased the land valuation over $200.00 per acre as determined by the increased interest return and made them approximately equal to the best lands of the state.

TEN wheat fields in southern Illinois on the poorer types of thin soils gave an average yield of 8.9 bushels of wheat on untreated soils as an average of seven years. When crop residues ordinarily produced in the rotation such as corn stalks, straw, clover chaff, and cover crops such as sweet clover seeded in the wheat and plowed under before planting corn, are used and the soil treated with lime and phosphorus, the yield of wheat has increased to 24.7 bushels per acre!

The increase due to the treatment is 15.8 bushels which at $1.00 per bushel is $15.80. The cost of the fertilizer treatment is $7.75. The increase produced by the treated land is $8.05, which is five per cent interest on a valuation of $161.00.

Such data as this indicates quite clearly that the farmer as a successful business man must pay more attention to the problem of increasing the producing power of his land. He can no longer afford to farm marginal land but must either abandon such land to a state of nature or convert it into high producing land by a judicious system of fertilization.

The day of land exploitation in America is rapidly passing. Too often cheap land has been held primarily for a rise in price and farmed only incidentally. The successful business farmer of the future is going to use land intelligently as one of the four economic factors in the efficient production of farm commodities and its proper use by the farmer will determine in a large measure his success as a business man.

* * *

Drugs for Bugs

(From page 19)

shown that, although the gas was generated to three or four times the amount necessary for disinfecting purposes, it killed only a few grain moths and apparently did not injure bean weevils at all.

Save the formaldehyde for the "germs" and use something with a kick in it for the bugs. One very efficient chemical is carbon bisulphide which is also a liquid, a gas being liberated when exposed to the air. It is excellent for killing insects in grain as the gas is heavier than air and, if applied to the top of the bin, will soon pass down between the kernels killing both young and adult.

It has one serious fault in that it is highly explosive and so cannot be used where any exposed flame will ignite it. If care is exercised in its use it will prove to be very efficient in the control of most insects, where fumigation is practicable.

Cheers and Jeers

(*From page* 4)

Robert Benchley, eminent critic, in a recent article says, "The vocabulary of critical terms applied by actors to audiences is less elaborate than that used in the dramatic departments of the daily press, but it is none the less searching!"

"GIVEN a play which has been proven effective by the vociferous approbation of seven audiences during the week, what is there about the eighth audience that renders it dull and heavy and incapable of a similar approbation of exactly the same scene?" he asks.

Benchley cannot explain this mystery, but says, "whatever it may spring from, the fact remains that it exists and that it is simply a part of the mysterious co-relation of mind and spirit which exists between audience and actor and makes of a performance an exhibition of team-work in which the entertained are of equal importance with the entertainers."

And I might say that the same co-relation of spirit exists between employer and employee, between man and wife, between partner and partner.

If an employee fails in his duties it is as much the fault of the employer as the employee.

What the *viva* is to the bull fighter, the *attaboy* is to the ball-player; and what the *fan letter* is to the movie star or radio entertainer, the *slap on the back* is to the man who is trying!

What would this world be without encouragement? How cold, dank and dismal a place without the occasional word of compliment from one who has been silently watching from the side-lines.

"We should not be too niggardly in our praise, said Colton, "for men will do more to *support* a character than to *raise* one!" In other words, give a dog a good name and he will do his best to live up to it; but give him a bad name and he will figure he might as well have the game as the name—and will lose all desire to improve himself.

We must, of course, be extremely careful how and whom we praise for as Feltham tells us in his unique essay, "Praise has different effects, according to the mind it meets with; it makes a wise man modest, a fool more arrogant, turning his weak brain giddy."

Friedrich Froebel, originator of the kindergarten idea, has quite definitely proven the power of praise rightly used.

Froebel, working with backward children, found that to constantly remind them of their inferiority only served to cause them to become even more shy, awkward and embarrassed; while to administer praise in well-chosen words and at exactly the right moment lent them courage, brightened their spirits and stimulated them to greater endeavors.

It is said, and I think that Froebel would agree, that artists are but children.

CREATIVE minds, I have discovered, must be lead, not *pushed*. It is the very retention of the child-spirit that gives these folks their vivid imagination. Kill it with a jeer and you have lost the most valuable asset in their souls.

As a matter of fact all men who create something where nothing was before are artists and should be treated as such.

THE man who takes a blank sheet of paper and makes upon it a beautiful painting is no more a creative spirit than the farmer who sees in his mind's eye while plowing, the crops that will some day spring from the soil—who sketches upon nature's brown breast with a plow and paints a green field of corn.

The salesman who creates business—who gets a name on a dotted line where no name flourished before—is an artist in his way and has many of the temperamental attributes which are at once the curse and the blessing of the creative mind.

The organizer who takes a lot of rough folks and welds them into a smooth-running machine is an artist; how is he different from the architect who rapidly sketches from a mental picture a beautiful cathedral with all its parts in harmony?

ALL are souls in tune—thrown into this world with the itch to *do,* to *create,* to *make* something.

To say that these merely toil and work for the sake of preserving their bodies, or to get themselves bread, houses, clothing, and money is not only a sordid thought, but a libel upon the whole race of men from which they spring.

For men work as heartily to secure the admiration and commendation of their tellows as they do for money.

They strive as mightily out of love for a common mother or for a loved cause as for food. They fight as hard for the glory of winning a game as for the prize—harder, in fact.

Witness the ball player, not the professional, but the college athlete. See him willingly forego the cigarette and the other tempting delights. Watch him arise early and race to the diamond. Observe how fully his mind and heart and hand are coordinated—to *win.* To win money? *Never.* You could not *buy* that kind of devotion. You must *deserve* it.

Most of the valuable things in life cannot be gained with money. One cannot buy love, loyalty, devotion.

PRAISE and enthusiasm go hand in hand. And the first is natural sire to the other.

The manager who has learned to harness these two giant forces has at his command a team that can outpull money, the fear-thought or the lash of necessity. For as Henry Chester has pointed out, "Enthusiasm tramples over prejudice and opposition, spurns inaction, storms the citadel of its object and like an avalanche overwhelms and engulfs all obstacles. It is nothing more or less than *faith*—in action. Faith and initiative rightly combined remove mountainous barriers and achieve unheard of miracles."

An ounce of enthusiasm beats a dollar; and it is formed in the test tube of the cosmos more easily by adding a grain of praise to a mass of flesh than in any other way.

As the Prince breathed life into the Sleeping Beauty, the well placed praise draws into the empty shell of a man his heart and soul, and lo, *cheers,* not *jeers,* maketh the full man—the man of the three "h's": *Heart, head and hand!*

SIGHT UNSEEN

"Hullo zat you, Lize?"

"Yassah."

"Is you made up yo' mind you's gwine to marry me?"

"Co'se Ah is. Who zis talkin', anyway?"—*Wisconsin Agriculturist.*

* * *

RAISING CHICKENS

She wrote to a poultry journal that poultry raising was much to her liking and wondered how long the hen should remain on the eggs. The editor wrote:

"Three weeks for chickens and four weeks for ducks."

Later she wrote to the poultry journal as follows:

"Many thanks for your advice about the setting hen. She remained on the nest three weeks, and at the end of that time there were no chickens hatched. As I did not care for ducks, I took her off the nest and sold the eggs."—*Everybody's Magazine.*

* * *

Ole Oleson, in pre-Volstead days, came into a Minnesota village one day, and inquired of the restaurant proprietor: "Got any squirrel whiskey?"

"No," said the restaurant man, "but I can slip you a little Old Crow."

"Aye don't vant to fly," said the Swede, "Aye yust vant to yump around a little."—*Team Work.*

HONEST LOVER

She—"Now what are you stopping for?"

He (as car comes to a halt)—"I've lost my bearings."

She—"Well, at least you are original. Most fellows run out of gas!"

* * *

Farmer: "When's the next train north?"

Station Agent: "In an hour."

Farmer: "When's next train south?"

Station Agent: "Fifty minutes."

Farmer: "All right, Mirandy, we can get across the tracks."

* * *

A HELPING HAND

Irate Parent—"I'll teach you to make love to my daughter, sir."

Young Man—"I wish you would, old boy, I'm not making much headway."—*The Humorist* (London).

* * *

An Englishman and an American were standing before the Victoria Falls, when the Englishman said:

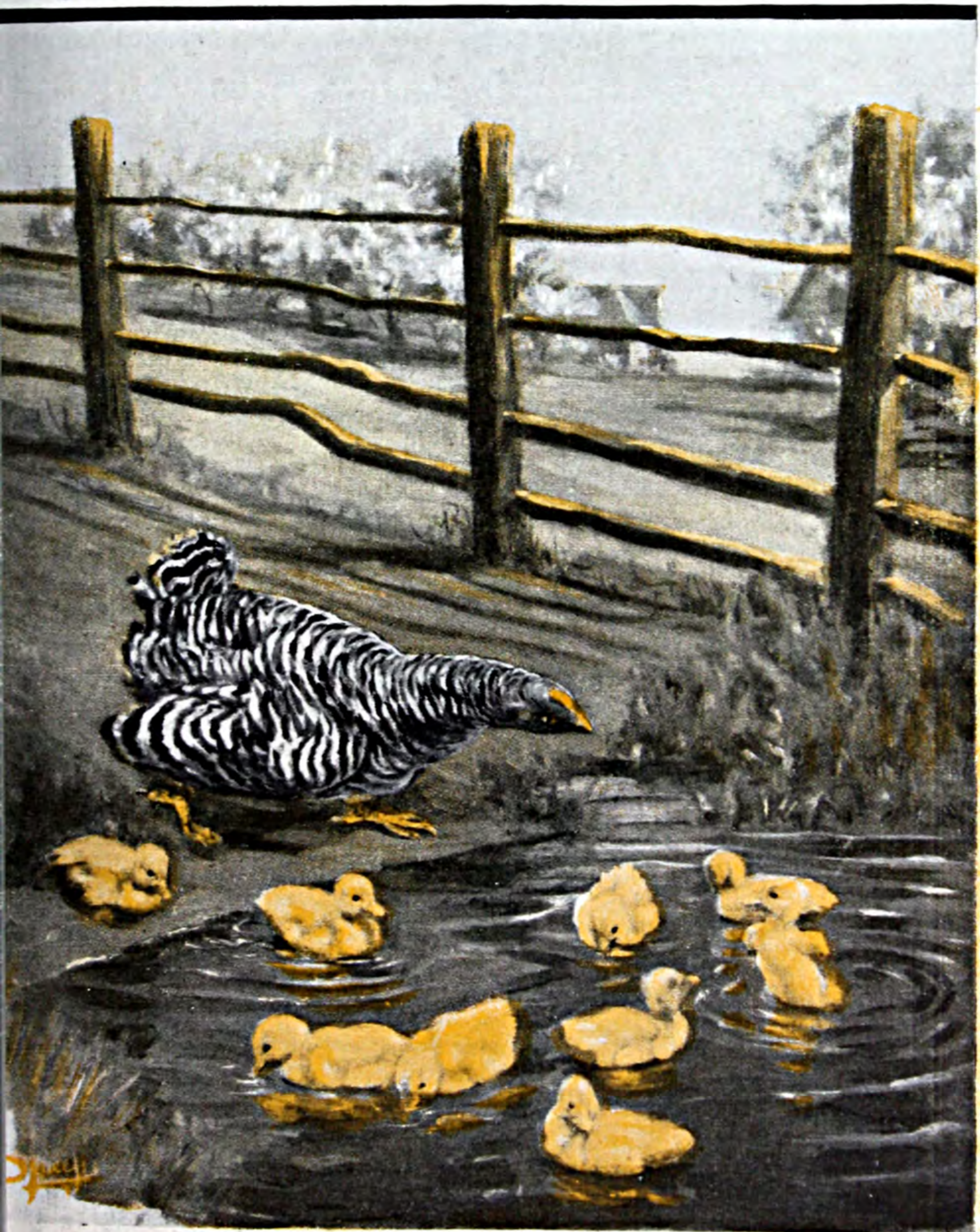
"Surely you must concede that these falls are far grander than your Niagara Falls."

"What!" replied the American. "Compare these to our Niagara Falls? Why, man alive, they are a mere perspiration."—*Tit-Bits.*

Better Crops

he Pocket Book of Agriculture.

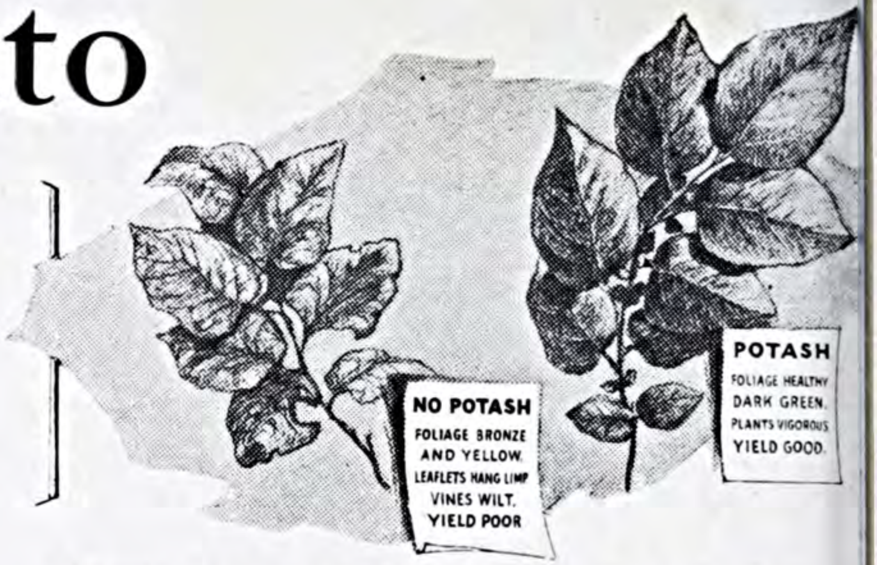
May 1926 — 10 Cents



his time: Competition — Ask the Soil — Potash and
uality — Unbending Backs in Farming — Minnesota

Potato

plants tell
of their
hunger
with these
symptoms—



YOU may eat three hearty meals a day but if your food is unbalanced you know what happens.

A potato plant suffers in a similar way. Its food must be properly balanced . . . it must have nitrogen, phosphoric acid, and potash in correct proportions.

If nitrogen is lacking the leaves turn yellow and the vines lack vigor. Insufficient phosphoric acid delays maturity.

You first notice signs of potash hunger in the foliage. The leaves develop a bronzed and yellow color; later the leaflets hang limp . . . the vines wilt.

Field demonstrations have shown that complete fertilizers containing 100 to 150 lbs. of actual potash per acre bring good returns.

On this basis at least 1,000 lbs. per acre of a high analysis complete fertilizer containing 10% potash, or 2,000 lbs. per acre if the potash content is 5%, are required for profitable returns. Many successful growers prefer sulfate of potash in their mixtures!

FREE. Potato growers interested in larger yields per acre will find useful information in the newly revised booklet "Better Potatoes." If you would like to receive a copy just send your name and address to the office below.

POTASH IMPORTING CORPORATION
OF AMERICA

10 Bridge Street, Dept. BC, New York

ATLANTA SAN JOSE, CALIF. BALTIMORE

Sales Agents—H. J. Baker & Bro., 81 Fulton St., New York
West of Rockies—Meyer, Wilson & Company, San Francisco, Ca

91 extra bushels per acre!

The Rhode Island Experiment Station has reported an interesting experiment made with fertilizers on potatoes.

When a complete fertilizer containing 50 lbs. of actual potash was used, the yield was 143 bushels per acre. But note the following:

When a complete fertilizer containing 150 lbs. of actual potash was used, the yield increased to 234 bushels per acre. An increase of 91 bushels per acre for an extra 100 lbs. of actual potash. Potash Pays!

Genuine German
POTASH

PICA BRAND POTASH PAYS

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

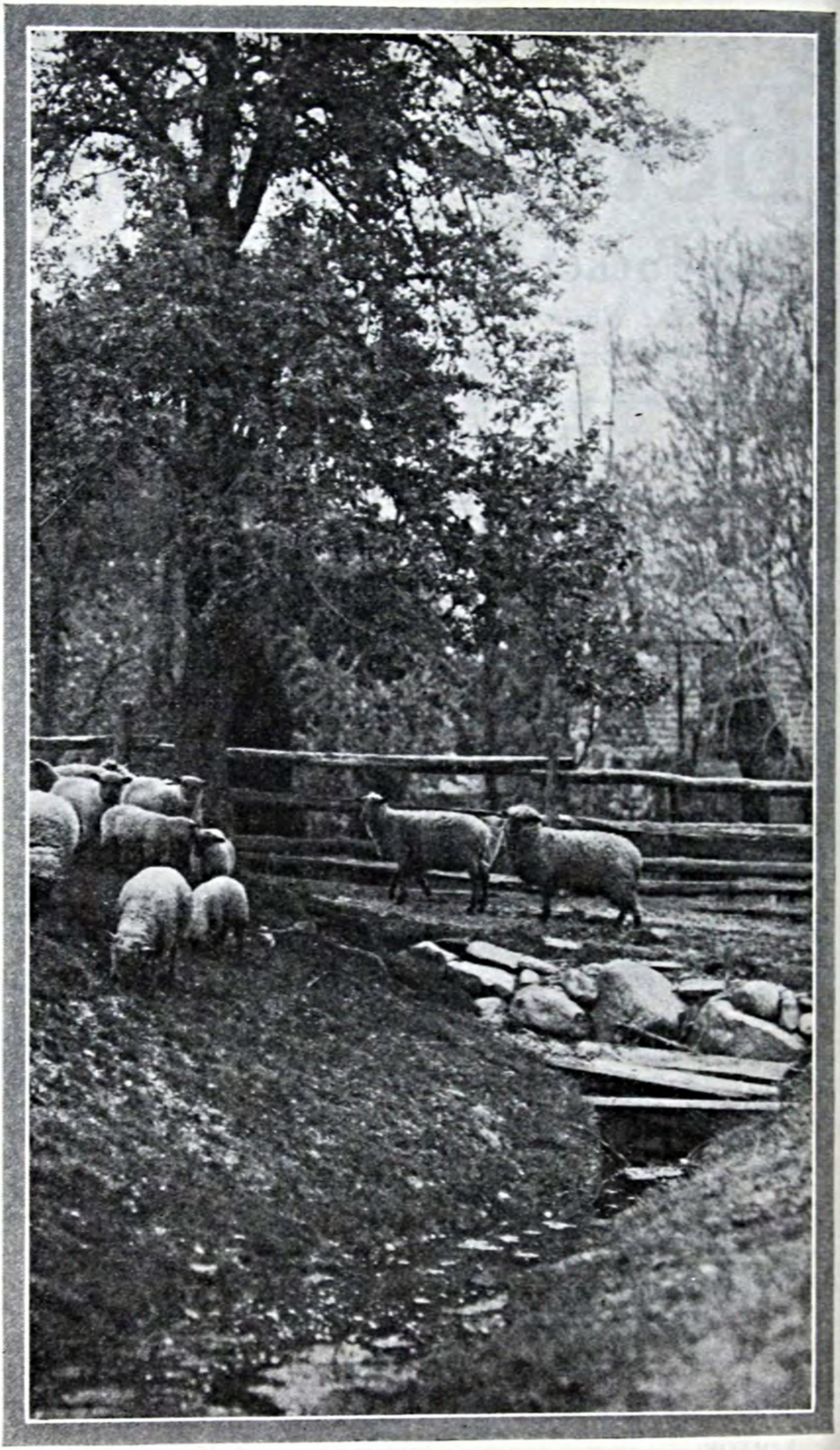
VOLUME VI NUMBER THREE

Table of Contents for May, 1926

Who's Who of BETTER CROPS

EDITOR.....R. H. STINCHFIELD
CONTRIBUTING EDITOR.....JEFF McDERMID
MANAGING EDITOR.....G. J. CALLISTER
PRESIDENT.....E. K. HOWE
VICE-PRESIDENT AND TREASURER.....H. A. FORBES

EDITORIAL *Office:* 10 *Bridge Street, New York*



As it fell upon a day
In the merry month of May

—Richard Barnfield

Better Crops

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, A SUBSIDIARY OF THE POTASH IMPORTING CORPORATION OF AMERICA, 10 BRIDGE STREET, NEW YORK. SUBSCRIPTION, $1.00 PER YEAR; 10c PER COPY.

VOL. VI NEW YORK, MAY, 1926 No. 3

An article of intense interest on the always new subject of

COMPETITION
Direct *and* Indirect

By Jeff McDermid

W. DUDLEY HAMMERSMITH, small-town jeweler, is a changed man.

The whole course of his life has swung into a strange channel; for W. Dudley has a New Idea.

That I gave him the thought is beside the point, and I submit that when two men each have one idea and exchange them they then have two apiece. W. Dudley, in return for my idea, gave me the incentive for this story. And multiplication by this method is fair, brotherly, honest and altogether good.

IN W. Dudley's town is but a single jewelry store. W. Dudley—he is it. Outside the occasional postal jaunt to the mail order house, all the money spent for jewelry in that community must go through his hands.

So, this jeweler-monopolist has always looked upon himself as a keen, cagey, sagacious business man, who had the acumen and foresight to find a town where there was no competition.

"No competition" was the foundation of what mediocre success he was enjoying when I discovered him. The only fly in his ointment was the apprehenson that some other Jeweler might discover his sinecure and open a competing store.

He eyed the signs on vacant stores furtively, always fearing to see an announcement of competition. He often awoke at night with a start, his brow beaded with cold sweat, from a nightmare in which he found his store in a row of jewelry shops, with himself pacing back and forth in his doorway, wringing his hands and pleading with the passing populace to please come in and purchase.

"NO competition"!

And then, fortunately or unfortunately, I hove into his cosmic consciousness with An Idea.

As we stood idly talking, leaning on his counter of silverware, he told me of his moderate profits, due to his vision in selecting a seat of operations free from the opposition of competing jewelers.

"O, a few send to the mail order houses, and one or two families shop in Cedar Rapids, but", with becoming modesty and yet a mild mental slapping of himself on the back, "I get ninety-nine per cent of the jewelry business in this town; they *have* to come to me!"

As he said this, thoughts began to race through my head—on competition and such things.

"They *have* to come to me!" he proclaimed.

Across the street was the Arcadia—"Gem of Film Playhouses." In front were parked two dozen or more empty perambulators. Nosed to the curb were flivvers packed side by side—like pencils in a box.

Suddenly, The Idea shot through my brain, full-fledged. "How much business does the Arcadia over there do in a day?" I asked.

"Oh," deprecatingly, "Sam Felton tells me—he's the owner—that he averages about a hundred dollars a day "take-in"; he has lots of competition, you see; three other houses in town, two of them bigger and better than his Arcadia with more central locations. Sam does well—considering his competition!" he ended, magnanimously.

"Do *you* do a hundred dollars a day?" I shot back.

He looked at me quizzically a long moment.

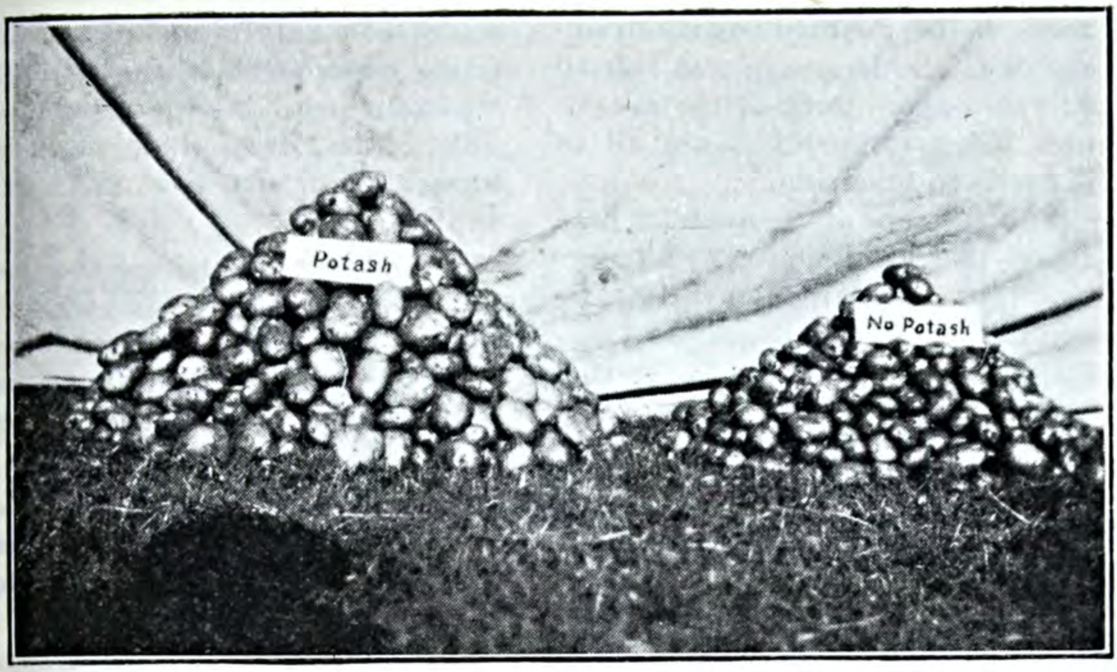
"No, I do not—I don't *average* that. Some days, of course", he started lamely—"but, naturally folks don't spend the money on jewelry they do on the movies" he followed, brightly.

"W. Dudley Hammersmith!" I bellowed; "you're a chump! You think you're free from competition; you're not. No one is. I've just got An Idea. I must cherish it. It's an orphan. Right over there at the Arcadia today a hundred dollars is being slid under the wicket. Half of that money could be yours—if you could convince the people of this town that, instead of *spending* money to enjoy a show, they should *invest* it in jewelry that could be used and enjoyed during their lifetime—and then passed down as a heritage to their grandchildren."

"Wait", I persisted, as he started to stammer a rebuttal, "Wait! *Here's some more!* You think you have no competition. And you make no efforts to build your business. You get nearly all the jewelry trade in this town. Yes. But what do you get? You've got *stiff* competition! Every merchant in town is your competitor. Ford is your competitor—every dollar spent for a new car *might* be spent over your counter".

"Not only that"—the words flooding from me—"You have been

(*Turn to page 62*)



$4.50 worth of potash produced 109 bu. more No. 1's per A

ASK *the* SOIL

By

G. J. Gallister

An interview with a live county agent and one of his enthusiastic farmers

"IT would be difficult to measure that man's influence in the growing of better crops in his community. Farmers come from miles around to ask him questions and they believe him because he has asked the soil."

"That" man is James Isherwood, a dirt farmer whose address is Plover, Wisconsin, and the speaker was H. R. Noble, agricultural agent of Portage county in which Mr. Isherwood lives.

I had heard that several farmers in this Badger county had been co-operating very successfully in solving some of their crop and fertilizer problems and wanted to know more about it. Consequently I called upon Mr. Noble a few weeks ago in his office at Stevens Point. He told me of farmers who had successfully seeded alfalfa on sandy and marsh soils and of one farmer who had kept careful records of fertilizer tests.

Why not pay them a visit?

Snow may stop traffic but it cannot stop a county agricultural agent when he wants to get anywhere. The spring thaw had set in—the going was very bad, but we got there, which is all in the day's work of a good county agent.

The soil in the drainage district south of Plover, Wisconsin, is mostly sandy loam, muck and peat. The muck soil is part of 50,000 acres in the Portage county drainage district. Drainage was started 22 years ago. Part of the area is now being farmed but not all of it has been taken up.

The farmers of the district have found that alfalfa grows and pays good profits. Although there were a few acres of alfalfa in the territory, the crop was really started in the district about three years ago when samples of alfalfa were sent out through the schools by County Agent Noble. Some of the boys grew alfalfa on small plots. It was a success. Then their fathers tried, and now many farmers have good alfalfa fields started on the sandy and muck soils. They are convinced that it has great possibilities on both soil types.

It is very important, however, that alfalfa be fed properly if it is to grow. Therefore, many farmers are buying lime, wood ashes, muriate of potash, and mixed fertilizers—analysis 0-12-12. Much of the lime is bought locally as residue from a paper mill. The lime was ready to spread in a number of fields, and heaps of wood ashes were noted in a number of barns.

James Isherwood, a leader in this crop improvement work, has made some careful and very inte esting experiments with fertilizer especially with their use on mu soils. These tests show what fe tilizers paid and how much w applied.

"I had lots of visitors last ye looking over my crops where used potash," Mr. Isherwood to us. "Lots of my neighbors sa the results I had and they are g ing to use some this year."

During the visit, Mr. Isherwo presented some photographs a records of his tests. He said th when Mr. Noble suggested that plant alfalfa, he thought that had no room on his farm for He needed all of his fields for cor potatoes, and other crops. B he has since changed his mind. H acreage of corn and potatoes h been cut down and he is very gl that he did it, because he now fin he makes just about as much pro on the potatoes as he did befo and he still has 24 acres of alfal in addition on the sandy upla and three acres on the marsh. I uses his barnyard manure on t sandy soil together with comme cial fertilizers and commercial fe tilizers alone on the peat soils.

Whole field had manure — Center rows had no potash

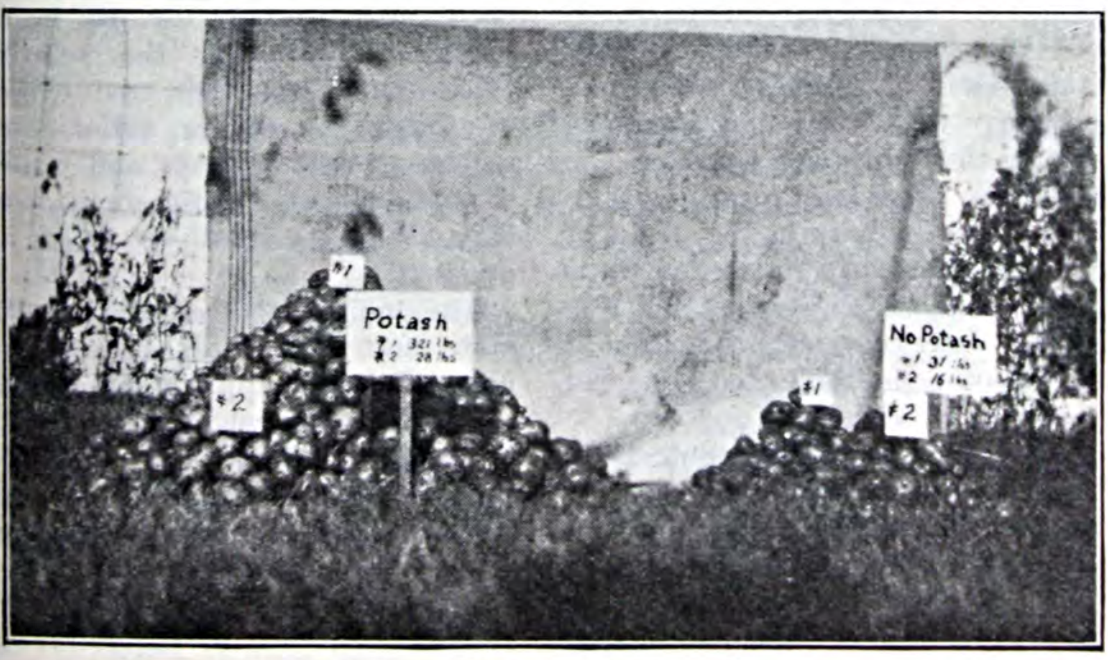
Corn receiving no potash could not be harvested

The first picture which Mr. Isherwood showed us was of a crop of corn with two quite small rows in the center. The corn on either side had received 100 pounds of muriate of potash. It grew 8 to 12 feet in height while the corn on the two center rows receiving no potash was too small to cut. The potash cost $2.40 per acre.

Next he tried fertilizers on potatoes on the peat soil. Eight tons of stable manure were broadcast across the rows. Two hundred pounds of muriate of potash per acre were then applied in the row except to the center row. The center row received only manure. It produced 21 bushels of potatoes per acre while the fertilized part produced 155 bushels per acre of excellent quality potatoes. The potato crop was pictured in the second and third photographs which Mr. Isherwood gave us.

The next picture showed the results of another test that was made on "Rurals". Two hundred pounds of muriate of potash per

(*Turn to page* 53)



Potatoes—Left: 200 lbs. potash — Right: 8 T. manure, no potash

Read about this new activity which has become a live subject in California

Orchard Judging

By W. P. Duruz

Pomologist, University of California

THERE are three classes of factors which determine success in fruit growing: (1) those involved in the orchard environment, (2) those which have to do with the inherent character of the trees themselves and (3) those determined by the grower in the cultural practices used.

For best results, the maintenance of an optimum combination of *all* these classes is necessary. That is to say, the production of profitable fruit crops is the result of the proper combination of many factors. Each of these factors may be likened to a link in a chain; thus we may consider soil moisture, spraying, pruning, thinning, etc., as links in the chain of fruit production. No chain is any stronger than its weakest link; so in the chain of fruit production if one factor is neglected the net profits are reduced.

The various orchard contests in California have brought out the importance of the right combination of these classes of factors. The winning orchards in these contests are those which have produced the largest yield and the best quality of fruit per unit, and which have the trees and orchard in the best condition at the end of the growing season. These orchards show the importance of a well balanced program of operations, each carried out in its proper relation to the orchard environment and to the trees themselves.

As a means of visualizing the relations of the three classes of factors mentioned a method of analysis is herein suggested. It has been found that its use will be of value in indicating the relative efficiency of orchards, the causes of failure to secure satisfactory yields, as well as ways and means of arriving at a fair method of estimating the real value of an orchard.

The individual tree is the ultimate unit of the orchard, a fact not sufficiently appreciated by the average grower, who usually thinks in terms of acres. The change in attitude from the acre to the tree as the unit is essential before analysis can be used to advantage.

The individual tree may be judged by means of the following score card:

Judging students examining a prize winning prune orchard

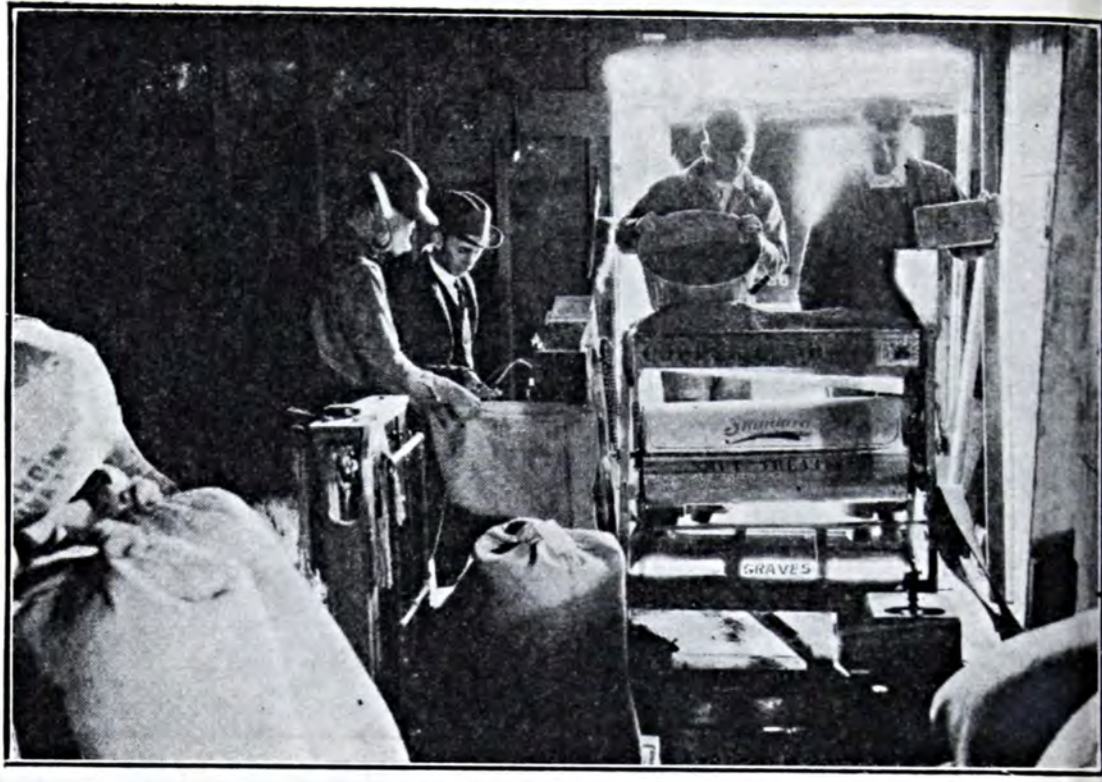
Factors	*Counts*
1. Size (For age and variety)	16
2. Training (Framework and symmetry)	8
3. Pruning (Science and practice)	12
4. Vigor (Length growth, color of foliage, etc.)	20
5. Fruitfulness (Past yields, prospects of crop, fruit buds, etc)	20
6. Health (Disease, insect and mechanical injury, frost, sunburn, etc.)	24
Total	100

After one has learned by practice how to judge individual trees it becomes fairly easy to apply this knowledge to *groups* of trees, or orchards. One quickly learns to note the uniformity or lack of uniformity as measured by an ideal tree as the unit.

The following score card has been used to advantage in this work:

Factors		*Counts*
1. Location, site and soil		40
A. Location	10	
1. Climate (temperature, frosts, fog, wind, etc.)		
2. Transportation (roads, rail, water, distance)		
B. Site	15	
1. Water supply (reliability)		
2. Slope of land (air drainage)		
3. Exposure		
4. Windbreaks		
C. Soil	15	
1. Character, fertility, depth		
2. Ease of working		
II. Condition of trees		40
1. Size	5	
2. Fruitfulness	10	
3. Vigor	10	
4. Health	15	
III. Condition of orchard		20
A. Soil care	10	
1. Cultural practice		
2. Planting distance		
3. Irrigation practice		
B. Tree care	10	
1. Pruning		
2. Bracing		
3. Repairing		
4. Spraying		
5. Sanitation		
Total		100

(*Turn to page 58*)



Mr. Biedermann supervising treatment of a carload of approved Marquis wheat

Better Wheat

By
H. W. Biedermann

County Agent, Chadron, Nebraska

DAWES county, Nebraska, is staging a rigid campaign against smut in small grains especially wheat. According to reports from the Omaha, Nebraska, market, over 42 per cent of the wheat received on that market during 1925 was affected with stinking smut. In addition to the wheat being affected with smut, it is estimated that approximately 10 per cent of the wheat received on this market was mixed wheat.

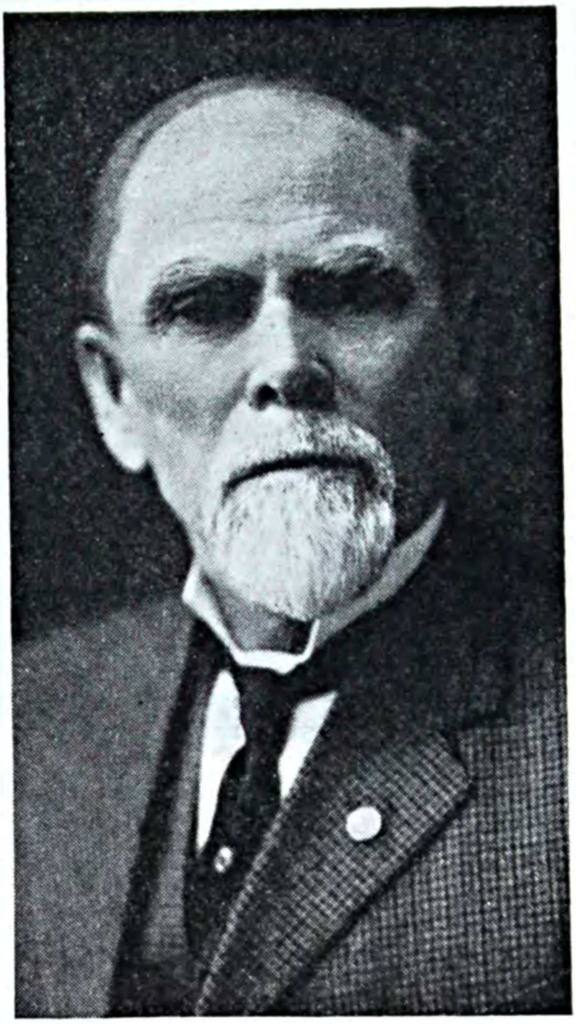
Realizing that the farmers of Dawes county were losing a considerable amount of income annually due to the reduced price received for smutty and mixed wheat, a campaign to rid the wheat of smut and mixtures was launched at the annual mid-winter Farm Congress in January. At this meeting H. M. Bainer, Director of the Nebraska Wheat Improvement Association, P. H. Stewart, Extension Agronomist, College of Agriculture, Lincoln, and F. P. Manchester, Secretary of the Omaha Grain Exchange, gave excellent talks relative to the situation and on methods of improvement. Mr. Stewart also gave a practical demonstration on treating wheat with copper carbonate.

As a result of these meetings, the Chadron Flour Mills in cooperation with the Dawes County

(*Turn to page 58*)

KANSAS' Most Useful CITIZEN

By
Ted Butlar



Foster Dwight Coburn

THROUGH its state board of agriculture, Kansas recently paid honor to whom honor was due. This great southwestern commonwealth paid deserved tribute to a man who devoted much of his life to the service of the state. The recipient of this testimonial of appreciation was Foster Dwight Coburn,—for twenty-two years secretary of the Kansas State Board of Agriculture.

Feeling that he could be of greater service to Kansas farming and farm folks by serving as the secretary of their agricultural board, he declined the appointment, extended him by the governor of his state, to become United States Senator. It is little wonder, then, that on his memorial tablet should appear these words: "In Tribute of Foster Dwight Coburn, Kansas' most useful citizen, whose genius was the wisdom of common sense."

Born upon a Wisconsin farm and going to Kansas at the age of twenty-one, Coburn first worked as a farm hand, later acquired a farm, then became editor of an agricultural paper from which he was advanced to the position, which for more than two decades, he held and in which he served his adopted state.

Complete fertilizer pays on tobacco

POTASH and

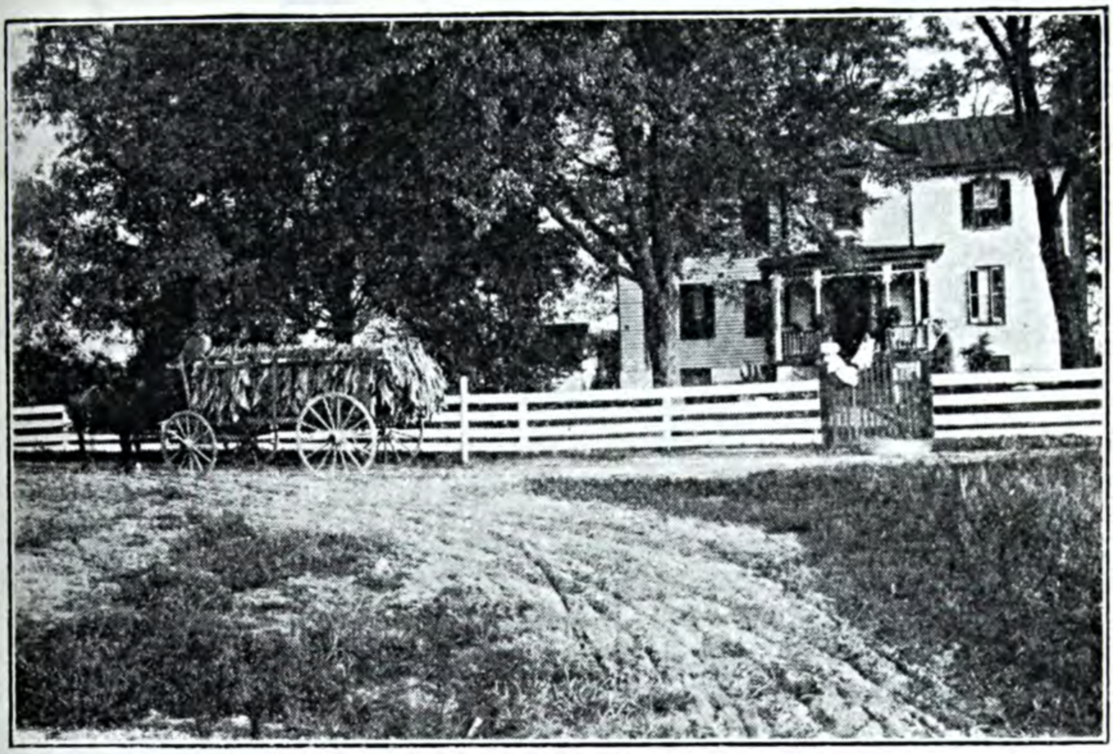
By T. K. Wolfe

Agronomist,
Virginia Agricultural Experiment Station

POTASH pays—not only pays but lends a handsome profit to the tobacco crop. It gives a polished and luxuriant appearance to tobacco which is the pride of every tobacco farmer. The ability to produce a good field of tobacco and to properly fit the product for market is born of long years of experience.

Science has aided the art of tobacco growing in a number of ways. Conspicuous among them, it has shown the dependence of the tobacco crop upon potash. The experiment stations in the tobacco districts have conducted a number of experiments to study the effects of fertilizers on tobacco and many valuable and worth while results have been obtained. In the furtherance of the knowledge on the subject the Virginia Experiment Station has issued Bulletin 242 on Experiments with Sun-cured Tobacco and Other Crops Grown in Rotation With It.

These fertilizer results show that for the most profitable production of sun-cured tobacco ammonia, phosphoric acid, and potash are all necessary. An application of 1,000 pounds per acre of an 8-3-3 fertilizer on heavy sun-cured tobacco soils and on light soils where stable manure has been applied pays handsomely. However,



A view on a prosperous tobacco farm

QUALITY

A winning team in success with tobacco

on the light or sandy soils an application of 1,000 to 2,000 pounds of an 8-3-4 or an 8-4-5 fertilizer to the acre will give more profitable results.

The idea prevalent in some localities that heavy applications of fertilizers will cause tobacco to fire or burn on the hill, is not borne out by experimental results when a well-balanced fertilizer such as those previously named are used in as large amounts as one ton to the acre. "However, where certain incomplete fertilizers are not properly balanced, burning is often observed in adverse seasons."

The Virginia results show that phosphoric acid was the limiting element in profitable production of sun-cured tobacco followed in importance by ammonia. Although potash did not show as good results with yield as phosphoric acid and ammonia, it was very necessary for the production of good quality.

In tobacco quality is of equal importance with quantity. The value of potash in improving the quality of sun-cured tobacco is evident from the Virginia experiments. The results show that from the use of potash "the quality was so much improved that the tobacco produced on the complete fertilizer plat sold more than a cent a pound higher than that produced

(*Turn to page 54*)

Unbending Backs

By
V. T. Bartle
University of Wisconsin

THE modern farmer is facing out upon a new day. For several decades, the scientist, the inventor, and the manufacturer have been helping him transfer some of his heavier physical burdens. Steadily, he is becoming a director of greater power and a better business manager of a unit of the world's greatest food factory—the farm.

In the opinion of rural-minded leaders, the farm owner, for too long a time, has been thought of largely, as a tiller and toiler of the soil. For centuries his duties have been classed by the artist and the author as physical—guiding the plow with his steady, calloused hand; seeding the fields with a wide sweep of his brawny arm, and accomplishing each task with the strength of his own strong back.

Fathers and grandfathers still live to tell, as deeds of heroism, their tales of primitive farming methods before the advent of much of the modern labor-saving machinery. Many of the old-time methods were picturesque and so served as a source of inspiration to the poet and painter. But the vision of a greater agricultural future cannot be caught by these heroic or artistic conceptions; it demands, not the willing yielding to things as they have been, rather the unbending of backs like those in "The Man With the Hoe," and the lifting of burdens, similar to those pictured by Markham in the words:

"Bowed by the weight of centuries he leans
Upon his hoe and gazes on the ground,
The emptiness of ages in his face,
And on his back the burden of the world."

All will readily admit that "The Gleaners," "The Angelus," and "Potato Planting," by Millet, as well as many other paintings of rural life, have both beauty and meaning; but the modern version of farming, and living in the coun-

in FARMING

This starts a remarkable series of stories on some of the things which science has done toward taking the aches and pains out of the world's oldest profession

try, must necessarily be quite different.

One has but to travel through the vast wheat fields of Montana, Nebraska or one of the Dakotas, during planting or harvesting time, to appreciate that there is an altogether different picture awaiting the pen of the poet and the brush of the artist. There, like great mechanical minds, the modern inventions of man break the sod, sow the seed, and harvest the myriad bundles of golden grain.

Everywhere a minimum expenditure of time and effort seem to be the aim. One marvels at the ease with which each task is accomplished! More and more the farmer sits at the wheel of agriculture, releasing and pressing brakes, shifting the levers, and, in it all, operating and guiding. He furnishes the direction; horses, or the motor, furnish the power.

But directing mechanical powers is only one phase of the busy life of the future farmer. He has been watching his neighbors, in the business world, succeed with well established and orderly merchandising practices; and now, he, too, intends to venture into business—the business of farming. Hereafter a portion of his busy days and weeks will be spent in keeping farm accounts and meeting, alike, his problems of marketing and production.

Quality will be his first consideration—a uniform, high quality product. His aim is to make it one upon which his consumers can depend and for which they will be willing to pay a better price. Then, by economizing carefully on the time and labor required in the production of each article, he expects to be able to market it in an efficient and orderly manner.

This is a better vision of the newer agriculture. By reducing his physical labor "The Man With the Hoe" will find time to straighten his back, to carry on his farming on a more businesslike basis, and to enjoy life more fully and richly.

Invention and Agriculture

WHAT is Agriculture? The European for hundreds of years regarded it as a mode of living. Americans have made it a science. Our farmers appreciate that it is a business. Nice technique employed by some specialists on modern farms make it appear an art.

But however it is considered, Thomas Edison's remark concerning the sufficiency of inventions is interesting indeed when applied to agriculture. For Americans, mechanical inventions have altered entirely the traditional concept of agriculture as a way of life. Mechanical inventions also have made agriculture a science. They have assisted more than most factors in making it a business. They are employed universally by those who regard agriculture as an art.

Yet it may be true that agriculture is, as Edison infers we all are, suffering from a surplus of inventions. The thousands of little, abandoned farms in New England are in part evidence of what big scale farming by the aid of machinery has done. Mechanical inventions have made possible the opening up of agricultural lands faster than they have been needed, so arable lands, once under cultivation, are obtainable cheaply anywhere. They have served to defeat the efforts of the woods dwellers, who, after spending years of time, which is money, clearing wooded acres have found land prices receding so their hoped for compensation vanished.

It is plain that our inventiveness has outrun our need for inventions in some respects. Yet it would be silly to infer that mechanical inventions have not been of immense net advantage to those engaged in agriculture, and that further perfections in devices will not bring more improvement in the status of agriculture as a whole. Even though the farmer suffers from his easily produced surplus and suffers because the vast areas of land subjected easily to the plow depress the market to his holdings, he would not care to go back to the land sowing and cradle stage of production, nor to the peasant stage of life.—Farmers' Dispatch.

Kentucky Blue Grass

No. 2 of this series by Pennsylvania's authority

By J. W. White

Soil Research Chemist, Pennsylvania State College

THROUGHOUT Pennsylvania with the possible exception of the limestone valley section, may be found thousands of acres of idle farm land, a condition no doubt true in most of our eastern states. The great majority of this land, abandoned in some cases for many years, is found to be in a depleted condition. Continuous cropping without the return of mineral plant food is largely responsible for this economic waste.

In 1915 several members of the experiment station staff, including the author, visited many of these waste areas with the idea of locating permanent field experiments as a means of studying in an experimental way the most economic means of reclaiming these areas of abandoned farms.

Three locations were selected for our study, representative of the most extensive soil types of the State. On each soil type several different fertilizer and lime experiments were later started including permanent pasture and crop rotations.

Farmers at Bradford County Farmers' Day being urged to "Use the Land and Not Abuse It"

The first experiments of the series were started on DeKalb soil in 1916 on a field that had been abandoned for almost half a century. This field is known as the Snow Shoe Experiments located near the soft coal region of northern Centre county. The DeKalb soil includes 43 per cent of the total soil area of the State, embracing for the most part the rough mountain land section of central Pennsylvania.

The experiment field is typical of the poorer phase of the DeKalb mountain land derived mainly from hard sandstones and thin bedded platy shale. An idea of this extreme poverty-stricken soil may be gained from the yields on the untreated plots. During the first grain rotation plot 1 of field A gave per acre 2.3 bushels of corn, 5.0 bushels of oats, and .1 bushels of wheat. When clover was planted 680 pounds per acre of weeds were harvested.

IT is no wonder that the farmer left this field in disgust for he did not believe in fertilizers. He no doubt was the type of farmer that Baron von Liebig had in mind when in 1859 he wrote as follows: "The American farmer despoils his farm without the least attempt at methods in the process. When it ceases to yield him sufficiently abundant crops, he simply quits, and with his seed and plants, partakes himself to a fresh farm."

The story of the regeneration of this soil is a fitting tribute to scientific agriculture and recalls to the writer's mind another statement of von Liebig: "Science is conservative in her nature, not destructive. She does not reject the truths discovered by practice, but receives them; they are never disputed by her, but are examined and receive from her their proper import and further application."

In 1918 two additional field experiments were started, one on Volusia soil in Bradford county, and the other on Westmoreland soil in Washington county.

Volusia soil represents 19.4 per cent of the state soil area and has recently been subdivided into Canfield, Wooster, and Volusia soil types. This soil covers the northeastern and northwestern part of the state and includes the glaciated soil area. Just how long this soil remained in cold storage is a matter of conjecture, but we do know that the great ice caps played an important part in the destiny of this farming area. These soils are derived from a mixture of glacial till and decomposed materials from the underlying shale and sandstone.

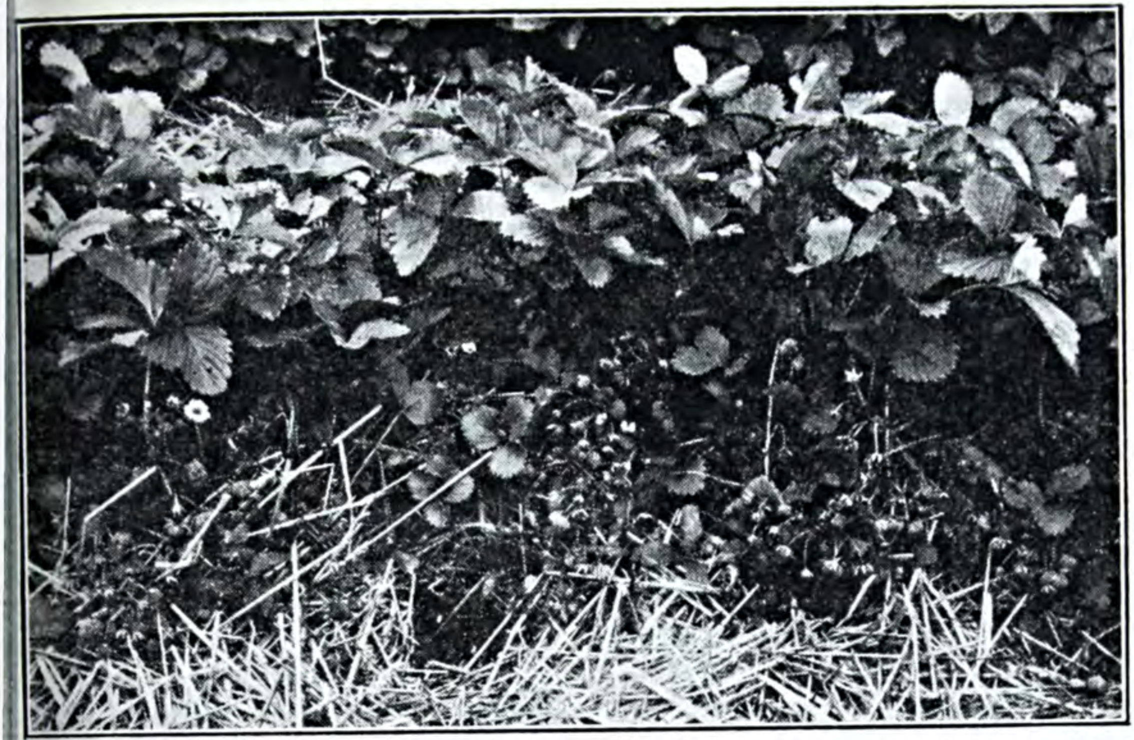
The soils in this section are poorly drained and very acid, occupying a hilly region of a somewhat subdued topography including smooth contoured hills and narrow, steep-ridged valleys.

The experiment fields are located on an abandoned farm and unlike the DeKalb soils the land is potentially fertile. Excessive acidity has largely controlled the nature of vegetation.

Here a great dairy industry is found in spite of the poor condition of the pasture land. The possibilities for the improvement of the small areas of level grazing land and the creation and maintenance of highly productive Kentucky blue grass pastures on land now utilized to poor advantage for cultivated crops are shown from the results of the experiments discussed in a later paper.

The Westmoreland soils are found in the southwestern part of the State and include 8.5 per cent of the State soil area. This soil re-

(*Turn to page 55*)



Strawberry Culture

By T. J. Talbert

Horticulturist, University of Missouri

THE strawberry is more widely grown than any other kind of fruit. Wherever diversified agriculture is practiced, strawberries may be grown profitably. For more than six months each year strawberries may be found upon the principal markets of the country. The strawberry is the most valuable of the small fruits grown.

Every community can use locally the product of from one to ten acres of strawberries. This fruit is not grown as generally in the home vegetable garden as it should be. In most communities, therefore, there is an opportunity for some good grower to supply berries for local demand at remunerative prices.

According to the United States Department of Agriculture, the average yield of strawberries for the whole country is about 1,800 quarts per acre, valued at $150 to $200. There is probably no crop that will produce more dollars per acre than the strawberry; however, no one should attempt to get rich quick by planting too large an acreage the first year. In such a case failure would be almost certain.

The strawberry is an especially good crop for the home garden. It is adapted to a wide variety of soils, and is comparatively free from injurious insect pests and plant diseases. The plants rarely require spraying. The crop is suited to the garden rotation, may be planted at a small initial cost, and will bring quick returns and large yields.

Soil and location will influence to some extent the time of harvest and the earliness of spring growth. In general, most varieties do better on light, sandy, gravelly or stony soils than on clay, heavy or wet soils. For best results, a well drained, fairly light, moisture holding, medium fertile soil is generally desired. A light, sandy or stony soil with a southern exposure will produce earlier fruit than a heavy, moist soil with a northern exposure. Also, low lands with poor air drainage are not as satisfactory as higher ground with good air drainage for strawberry production, because poor air drainage increases the liability of the plants to frost injury.

There are many varieties which are cosmopolitan and may be grown successfully over a wide area. Other varieties are restricted to certain sections or localities. Of the 1,800 or more varieties of strawberries, relatively few are adapted to any one combination of soil, climate, methods of growing or marketing conditions.

In the strawberry growing districts of the latitude of South Missouri, Northern Arkansas, Tennessee, and Kentucky, the leading commercial varieties in the order of their ripening are as follows: Klondike, Aroma and Gandy; while in North Missouri and similar regions the main varieties are: Dunlap, Warfield and some of the earlier sorts. The two leading commercial varieties are Aroma and Dunlap. Such sorts as Premier, Clyde, Bubach, and Gandy are favorites for table use. The Progressive and Superb are the leading everbearing varieties.

When the strawberry is desired from spring until fall, the grower may plant an extra early variety, a mid-season sort and an everbearing variety. The very early varieties will supply a moderate crop, the mid-season sorts the main crop, and the everbearing varieties fresh fruit for table use during late summer and early fall. For best results, the grower should limit his planting to a few varieties.

Some varieties are called pistillate or imperfect because of the plant's failure to produce the pollen necessary for fertilization, and they produce little or no fruit when planted alone. This difficulty may be overcome by planting every third or fourth row to a staminate or perfect variety such as Dunlap. All the varieties mentioned above, however, are staminate or perfect sorts and it is generally best to use such as one risk in production is eliminated.

EARLY spring planting is generally preferable to late summer or fall planting. Spring-set plants, except everbearing varieties, do not bear fruit until the following year. Plants set in the fall and grown under favorable conditions will bear a fair crop the following spring. For spring setting, the planting should be done as soon as the soil can be worked; while the latter part of August or September is usually best for fall planting.

The commercial and home growers generally prefer the matted row system of training. It is the simplest and easiest to establish and maintain. The runners are allowed to set at random in a row 18 to 20 inches wide. Some growers train the runners and space the plants while hoeing, but this is not required. The plow breaks off the runners and drags them lengthwise, which will prevent the middles between the rows from filling with plants. If the runners are weighted lightly with soil, they will root more quickly.

Perhaps there is no more important factor in strawberry production than thorough and frequent stirring of the soil to make available plant food and to assist in the conservation of moisture. This applies to both the new and old fields.

Where the soil will grow good crops of corn or wheat, usually a profitable crop of strawberries can be produced without fertilization. Experimental work at the Agricultural Experiment Station at Columbia, Missouri and in the Ozark region indicates that on these soils acid phosphate at the rate of about 250 pounds per acre, is more often needed as a fertilizer than potash or nitrogen. It may be spread broadcast along the rows about ten days or two weeks after the plants are set, and worked in with hoe and cultivator; or it may be spread in the rows at planting time.

Under most conditions mulching is a profitable practice. Nevertheless, many of the Ozark strawberry producers procure profitable yields from their fields without mulching. This is particularly true where the surface of the soil is covered with stones, chert or flint rock, and there is only a small amount of soil near the surface. The stones appear to have an effect upon the soil similar to that of a straw mulch.

The mulch should generally be spread in the fall or early winter after the first hard freeze. A mulch from two to four inches in depth will conserve moisture, tend to prevent heaving of the soil and keep the ripe fruit clean at harvest time. The best material for this purpose is wheat straw. Rye straw, hay and leaves are frequently used, but these are generally not as satisfactory.

In many parts of the country strawberries may be grown successfully without a great deal of trouble from the attack of insect pests and fungous diseases. This will be particularly true where the strawberry field is rotated with field crops and where strong, healthy, vigorous plants are used for the setting of the field.

Picking strawberries using handy 6 and 8 quart carriers

16 T. manure, 400 lbs. acid phosphate, 160 nitrate of soda, and 50 of muriate of potash on right compared with no treatment on left

New Diets for

A review of Ohio Bulletin 377,
"Manures and Fertilizers for Truck Crops"

THE expansion of our cities and obvious encroachment upon the surrounding districts where market gardening has been developed brings to the grower of vegetables a real problem. Truck farming with the heavy annual application of manures and commercial fertilizers has produced highly productive soil areas, but many such areas must now be given up to city expansion. This means that less productive soil types must be brought under cultivation by the truck grower.

When our cities were small and before the advent of automobiles the truck farmer had no difficulty in buying adequate amounts of stable manure. This, however, is now out of the question. Automobiles make lots of noise and smoke but no manure.

A very practical problem is—Can satisfactory crops be grown on the newer, less fertile soil without the use of stable manure? Or in other words, can the soil fertility be maintained by the use of green manures, crop rotations and the proper use of commercial fertilizers?

As a result of nine years of intensive experimental work these important problems are answered in a forceful and practical manner by Professors J. H. Gourley and Roy Magruder, of the Ohio Agricultural Experiment Station, Wooster, Ohio, in Bulletin No

The deleterious effect of a fresh straw mulch on early cabbage, left, as compared with no treatment on right. The straw was plowed under each year

Truck Crops

Here is Ohio's answer to a growing problem.

377—"Manures and Fertilizers for Truck Crops."

The results are extremely practical, very interesting and well worth studying.

The experiments were conducted at the Washington county experiment farm in the Marietta trucking district. The crops used were four—tomatoes, cucumbers, cabbage and sweet corn. Two series of plots—16 in each series—were used in this work. Each plot was 1/40 of an acre in size. Series A was designated as a soil fertility experiment and series B a soil improvement experiment.

On the 16 plots of series A, two tons per acre of finely ground raw limestone was spread over all the plots, fertilized and unfertilized alike. But on series B lime was applied to only certain individual plots. Some of the plots in each series received stable manure, chemical fertilizers and stable manure supplemented with chemicals. Where complete fertilizers were used on series A, the analysis was 4-10-4 and the amount applied per acre 1220 pounds. On series B the same analysis was used the highest application being 610 pounds. Cover crops were planted on series A after each truck crop was taken off, cowpeas after sweet corn, cabbage and tomatoes, rye after cucumbers and

(*Turn to page* 59)

Feeding Cotton

By E. B. Ferris

South Mississippi Experiment Station, Poplarville, Miss.

Cotton prefers some foods. Read what they are.

WE have mentioned in several previous letters certain work started here in 1925 to more fully determine the fertilizer requirements of South Mississippi soils both as to the amounts of nitrogen, phosphorus and potash necessary as well as the sources from which at least the nitrogen and potash should be derived. In our last letter we discussed six different sources of nitrogen that were tested here and in this letter shall discuss briefly an experiment with five sources of potash.

We regret to say that we got no increases in yields of cotton by use of this potash and therefore the results are negative. However, the results actually obtained are largely in line with previous work done in the past here and at McNeill. On permanent plats set aside at Poplarville in 1919 for fertilizer work with cotton, we obtained no increases in yields due to the presence or absence of potash for two years or more, but after this time the plats receiving potash began to show marked increases as a result thereof.

On plats without potash from 1922 to 1924 the cotton rusted badly, while on plats with potash cotton leaves remained green throughout the season and we obtained material increases in the yields of cotton. So, in 1924 the most outstanding results of our work here with fertilizers under cotton was the way the potash plats outyielded those without it. This was true whether the source of potash was kainit, sulphate of potash or double sulphate of potash and magnesia, these three being the only carriers used.

EVEN in 1924 when the use of potash was showing so favorably on these permanent plats, cotton on newly cleared land without potash made just as well as it did on many of the older plats that had received potash. In 1925 we continued to plant a portion of the ground to cotton that had been planted in 1923 and 1924. This made the sixth year that these plats had been fertilized the same way, they having grown sweet potatoes for two years, corn for one year and cotton for three years. On these plats of old land we obtained material increases due to the addition of potash to nitrogen and phosphorus.

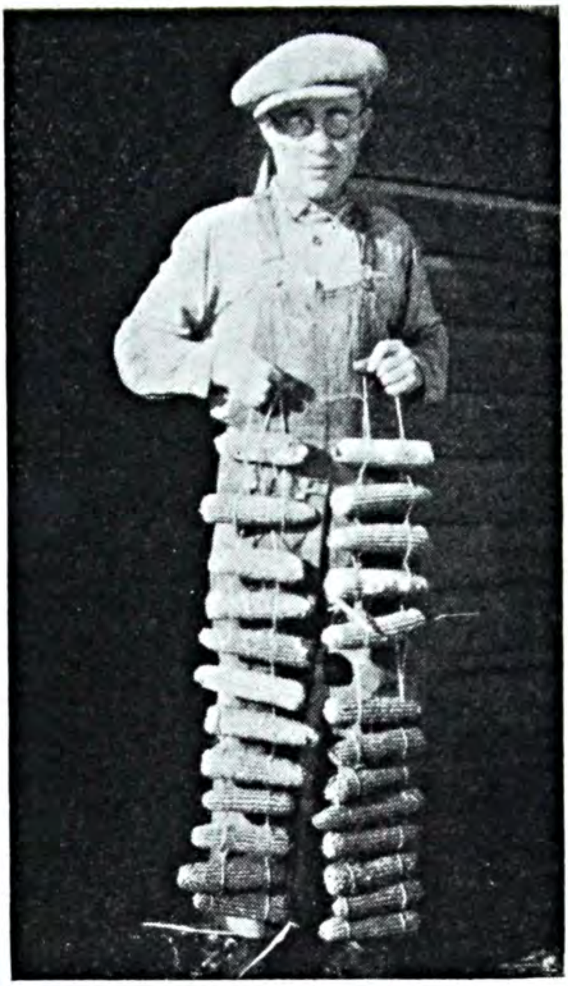
For instance, nitrogen and phosphorus alone in an 8-4-0 fertilizer increased the yield over the check

(*Turn to page* 60)

CORN or Quack?

By C. D. Byrne

South Dakota State College



Robert Bullis

THIS is the story of a South Dakota club boy, Robert Bullis of Brookings county, who was given a field of six acres, badly infested with quack grass, yet he grew 50 bushels of corn to the acre in one of the driest years the state has known in a decade. His net profit was $164.61. Here is the way he told his experience in a report to Paul J. Scarbro, boys' and girls' club leader at South Dakota State College.

"MY project was six acres of corn. The land was plowed in the fall and part of it was plowed again in the spring to check a thick growth of quack grass which covered about two acres.

"After plowing it in the spring, I went over the whole field once and over the quack grass patch several times with a spring tooth harrow. The harrow brought a great many of the roots to the surface. These I gathered and burned.

"When I had burned the quack, I spread manure on the field at the rate of three tons per acre. Then I double-disked it to cut up the trash and lumps and to make the soil firm so the weed seeds would not germinate. When this operation was completed I left it until a few days before planting when I went over it with a spike tooth harrow to kill the young weeds.

"In a judging contest at the Brookings County Corn show last winter I won a half-bushel of

(*Turn to page 52*)

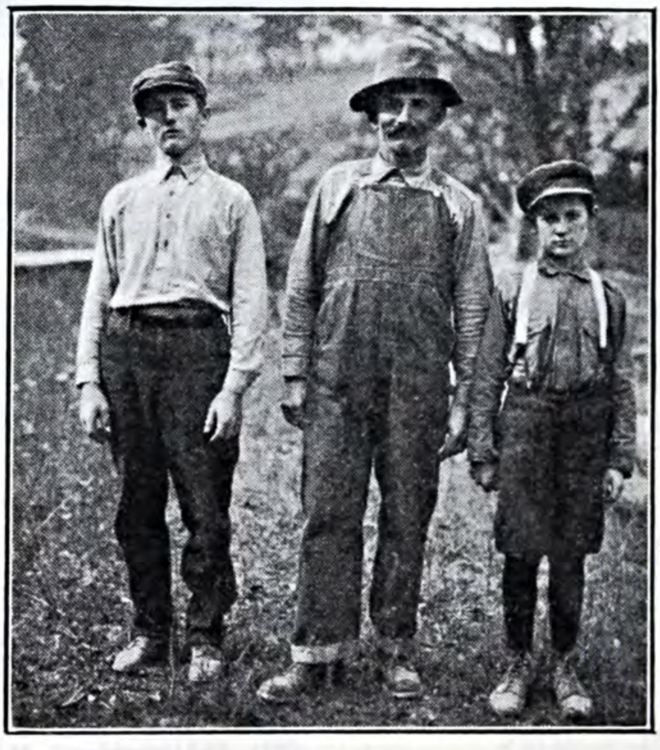
Getting Together for Profit

By

F. C. Gaylord

Horticulturist, Purdue University

FIFTEEN hundred extra tons of red ripe tomatoes for the canning company and $4,000 more hard earned silver dollars for the growers, higher yields per acre, less acres, more profits as well as satisfied contractors are only parts of the story of a Hoosier Canning Company that had foresight enough to go a little further than the law demands.



Ira V. Combs and his two sons—expert tomato growers

In 1911 the Tomato Products Company of Southern Indiana began operations. For the first few years contractors were plenty but yields were low, averaging around three tons per acre. Such yields tended toward poor quality and color and were unsatisfactory to both farmer and canning company. In 1918 the company, after three years of experimenting in cooperation with the Purdue Experiment Station, determined that well grown plants fertilized with a minimum of 500 pounds of a complete fertilizer, analyzing 2 per cent nitrogen, 12 per cent phosphoric acid and 6 per cent potash, would give average increases of from 5 to 7 tons an acre over unfertilized, poorly grown plants.

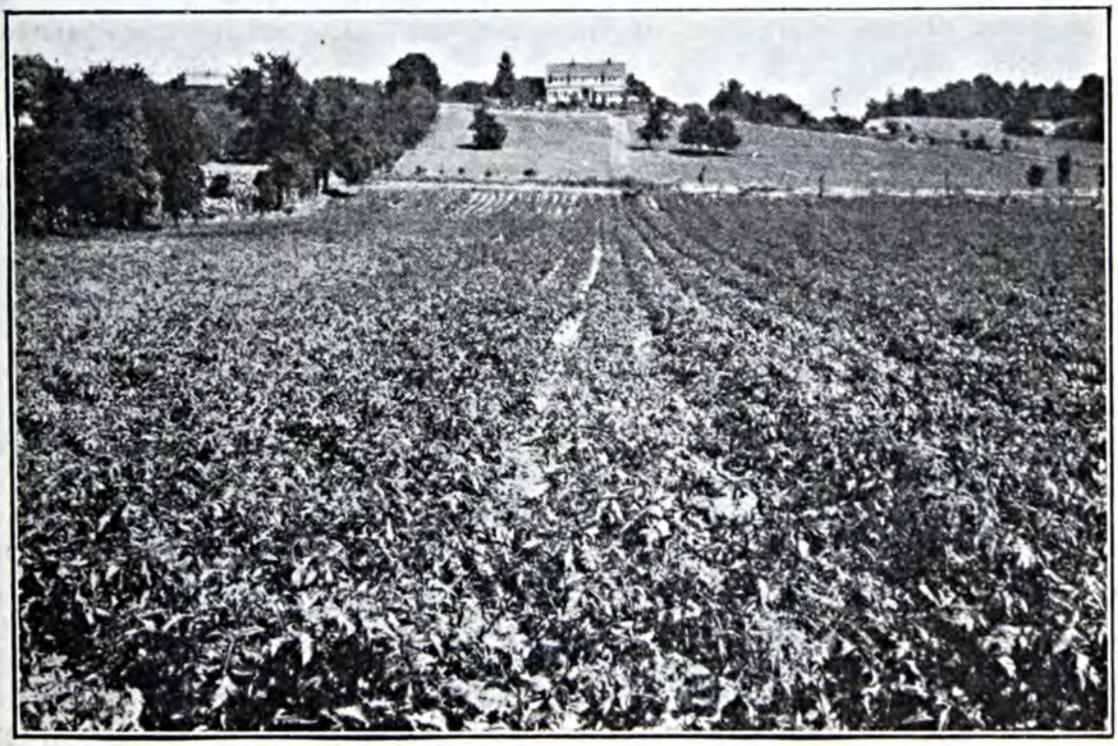
All these facts were presented to the growers but even though they saw the fields, few used the improved methods.

So in 1923 this company offered its growers a bonus of a dollar a ton in addition to regular contract prices for all who would agree to use 500 pounds to the acre of 2-12-6. About 85 per cent of the growers used the fertilizer and as a result produced an average yield of 4.37 tons while those not using the 500 pounds produced an average yield of only 2.5 tons. Again in 1924 the company repeated the fertilizer bonus proposition. Two hundred and thirty-three growers used 500 pounds of 2-12-6 growing 665.5 acres with an average yield of 5.7 tons to the acre while 109 growers not using the 500 pounds grew 243.5 acres with an average yield of 3.5 tons to the acre. Thus the 233 growers using 500 pounds of 2-12-6 secured an average increase of 2.2 tons per acre over those not applying the fertilizer. This 2.2 tons gave them $26.40 more per acre, and besides they secured an average bonus of $5.70 each.

As far as the company is concerned results of the fertilizer bonus plan are highly satisfactory. Mr. Grosvenor said, "We have doubled the yields and improved the quality and color. During the past two years we have had the highest average yield ever recorded and the best color and quality. Many of our growers secured around 10 tons or more per acre in spite of what was considered an unfavorable season." The superintendent of one of the factories remarked, "I can always tell whether or not a grower has used fertilizer. If he has heavy and frequent deliveries you can just bet he's used the 500 pounds of 2-12-6."

NOT satisfied with the company officials' attitude toward the fertilizer bonus contract and tomato growing as a money crop, I decided to see just what the growers really thought of the whole arrangement. I traveled up and down over the hills, seeking out the truth from the growers. Typical of the answers were those from George Williard, who averaged 11.6 tons to the acre on a two-acre plot. "I grew more tomatoes since I used that 500 pounds of

(*Turn to page* 56)



This tomato seed field at Purdue University averaged more than 11 *T. of red ripe tomatoes per A.*

Minnesota
Pioneer of Progress

By W. P. Kirkwood

Editor, Minnesota College of Agriculture

EDITOR'S NOTE: *We are going to give our readers a visit to the state agricultural experiment stations. We want you to know what they are doing to better crops, want you to meet some of their leading agronomists, to see some of their campus and experimental farms. The editors are pleased to introduce this series with a trip to the "Gopher" state—widely known as a source of new varieties of crops for the Northwest.*

WITH all of the talk of the agricultural depression of the last five years, the fact that agriculture in the United States has made mighty strides should not be lost sight of. Evidence of the progress made is seen in figures for Minnesota as a typical midwestern state. According to the United States census, the agricultural industry in Minnesota in 1890 represented, in lands, buildings, implements and other equipment, and livestock, a total investment of $414,701,626. Today Minnesota's total investment in agriculture is more than $4,000,000,000.

All through the years of the state's astonishing agricultural progress its experiment station has pioneered the way. The station began its efforts with demonstrations in sound practices. Then it turned more and more to creative work, to the development of field and of fruit crops specially adapted to climate and soils, and to the solution of problems relating to crop rotations, soil needs, weed control, plant disease prevention, drainage, land-clearing, livestock and livestock products, animal health, insect pests, farm marketing and all the rest.

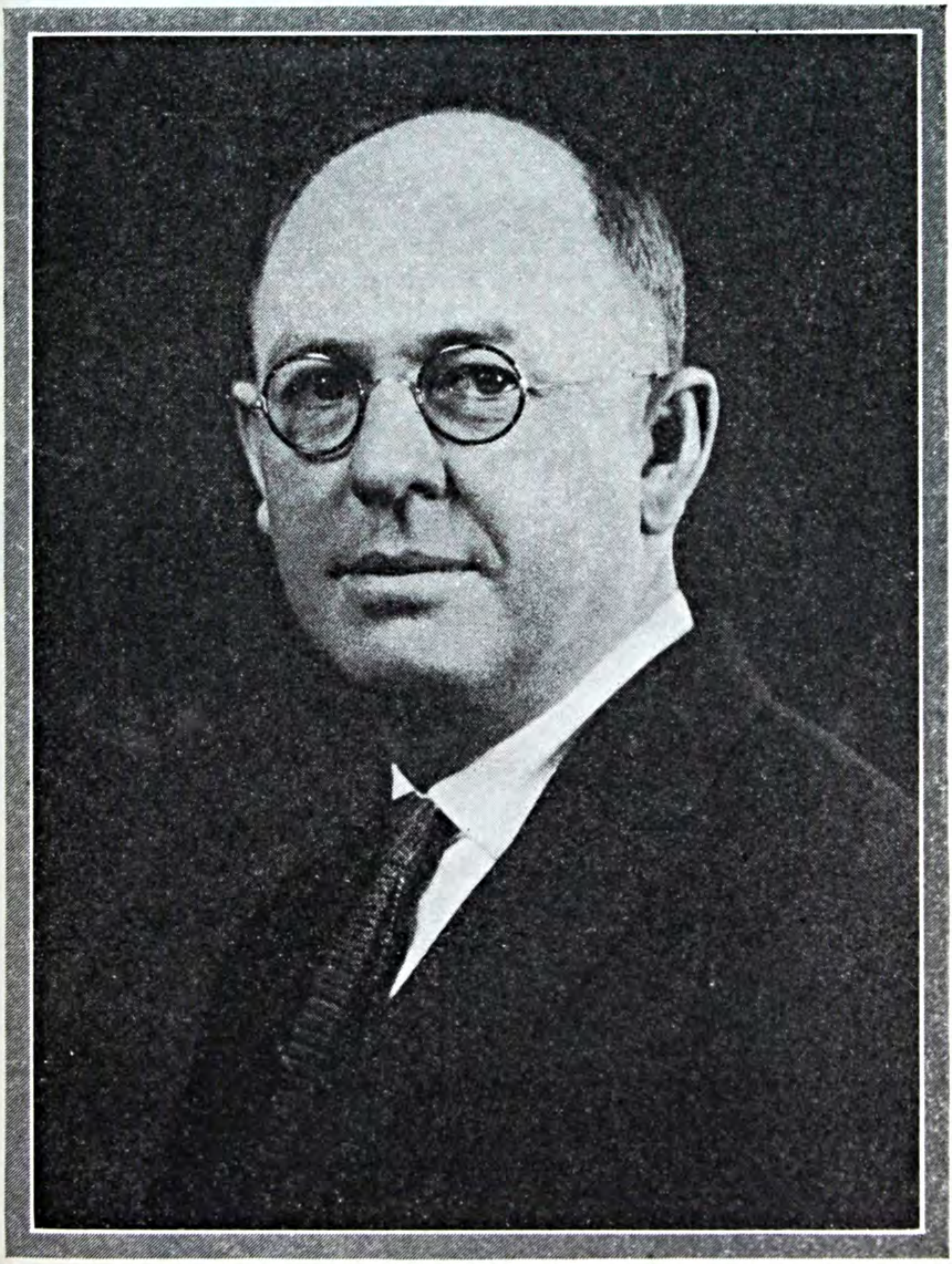
In all of its various lines of endeavor, it has made rich contributions to the prosperity of the state.

> It matters little how well a variety promises to yield unless all the product can be harvested.

One of the Minnesota station's early contributors to the welfare of the state was Minnesota No. 169 wheat. This yielded, on the average, three bushels more to the acre than the varieties commonly grown by Minnesota farmers. At the time this wheat came into favor, the wheat acreage of Minnesota was about 5,000,000. Assuming that the new wheat was grown on one-fourth of that acreage, or 1,250,000 acres, the added annual

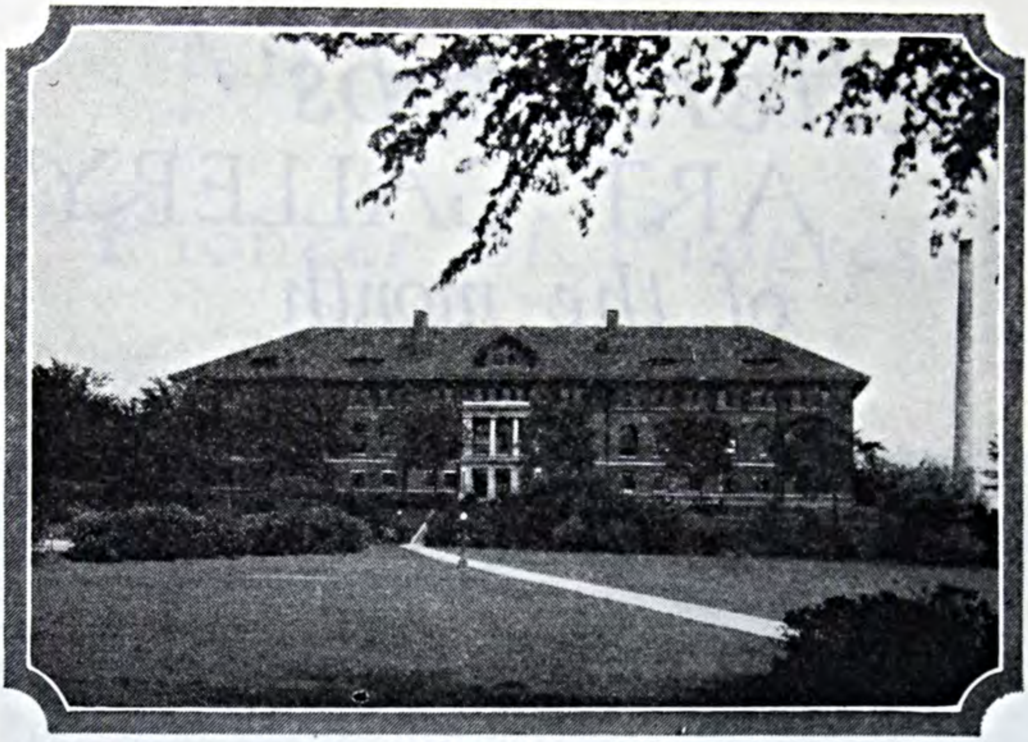
(*Turn to page* 48)

Better Crops' ART GALLERY *of the month*



W. C. COFFEY

Director of the Minnesota Experiment Station and Dean of the Department of Agriculture of the University of Minnesota, which includes the College of Agriculture, Forestry, and Home Economics and four Schools of Agriculture giving technical training in practical farming and in home-making



ADMINISTRATION BUILDING
The Minnesota Agricultural Experiment Station University Farm, **St. Paul.**

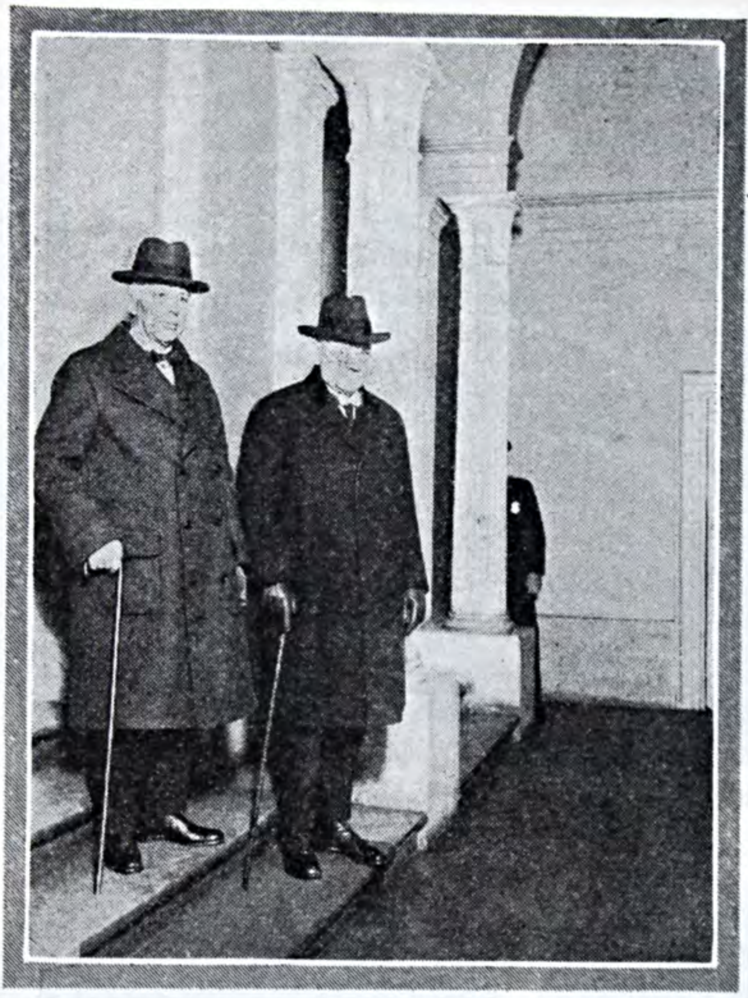
F. J. ALWAY
Head of Soils Division, Minnesota Experiment Station. His discoveries of the soil needs of the state have added enormously to the potential wealth of Minnesota, and, indeed, to the state's actual wealth.

ANDREW BOSS
Vice-Director, Minnesota Experiment Station and head of its Division of Agronomy and Farm Management. Under his supervision the Minnesota station has given largely to varieties of field crops adapted to northwestern conditions.

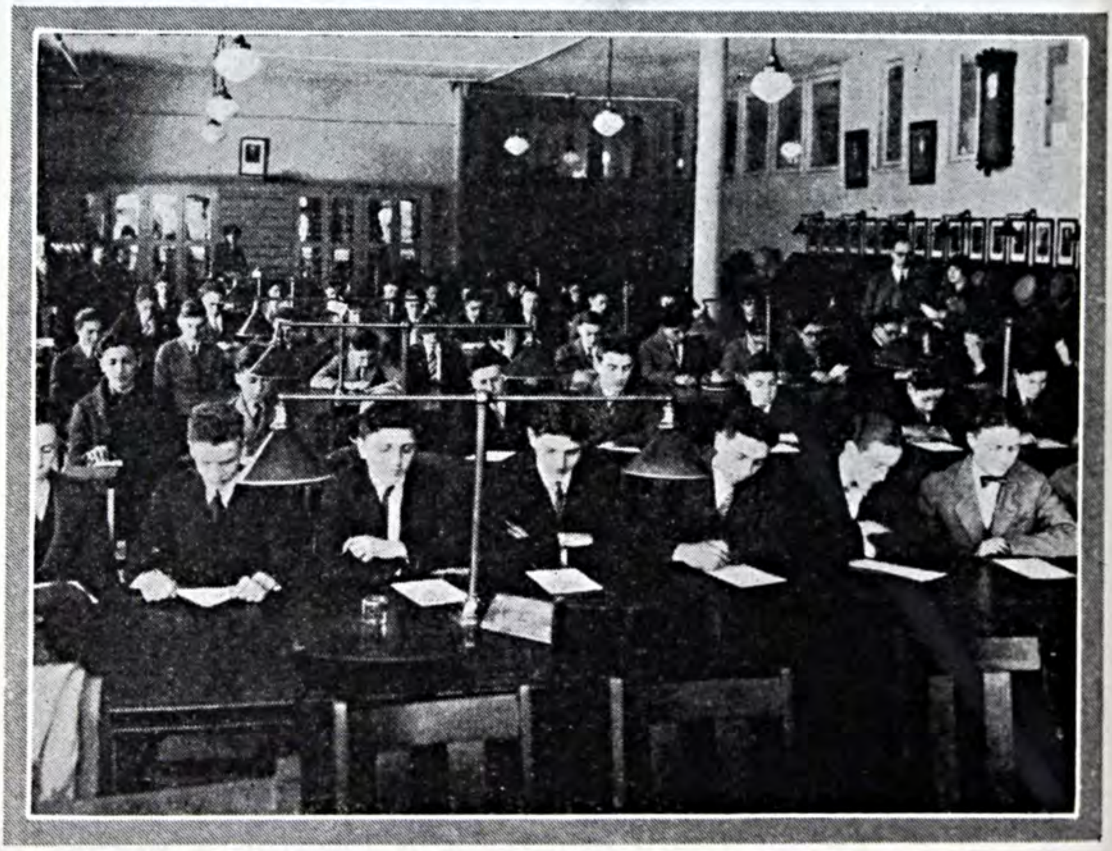
Secretary of Agriculture Jardine receives the champion garden growers of New York.

The first and oldest apple tree ever planted in the Northwest. This tree, which is 100 years old, is the most historic tree in the state of Washington.
(Photo from Ewing Galloway, N. Y.)

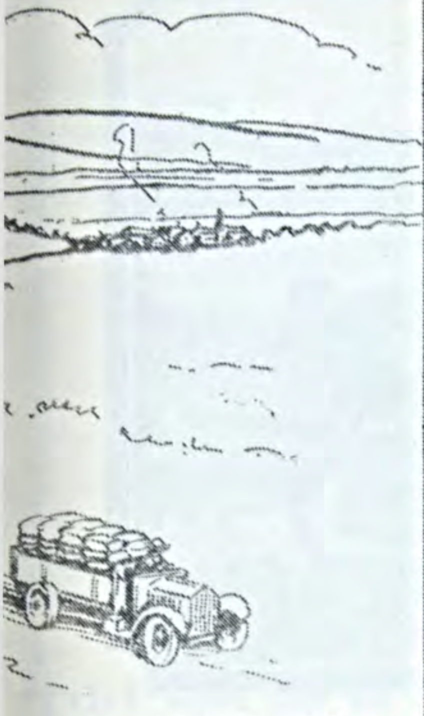
An art figure being hung on the agriculture building in Philadelphia in preparation for the Sesqui-Centennial celebration, part of which will be devoted to art.

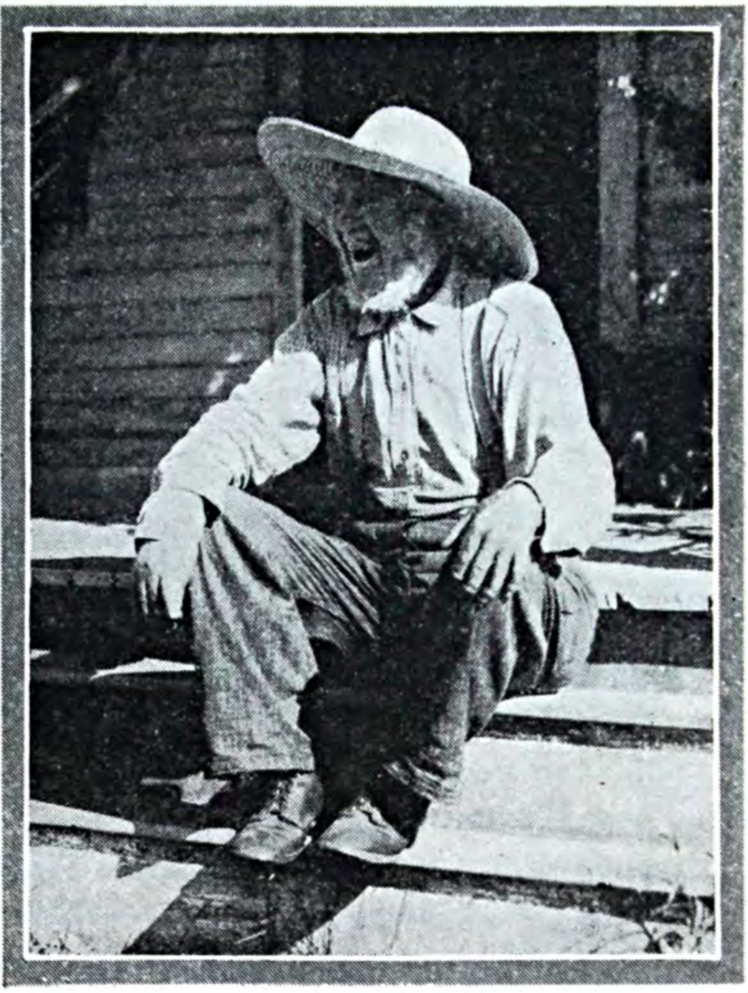


Justices Willis Van Deventer and Pierce Butler at the cornstalk entrance to the United States Supreme Court, Washington, D. C.



New York City boys taking examinations for scholarships for a three-year course in scientific agriculture at the National Farm School, Doylestown, Pa. The money for the scholarship is raised by prominent New York business and professional men.

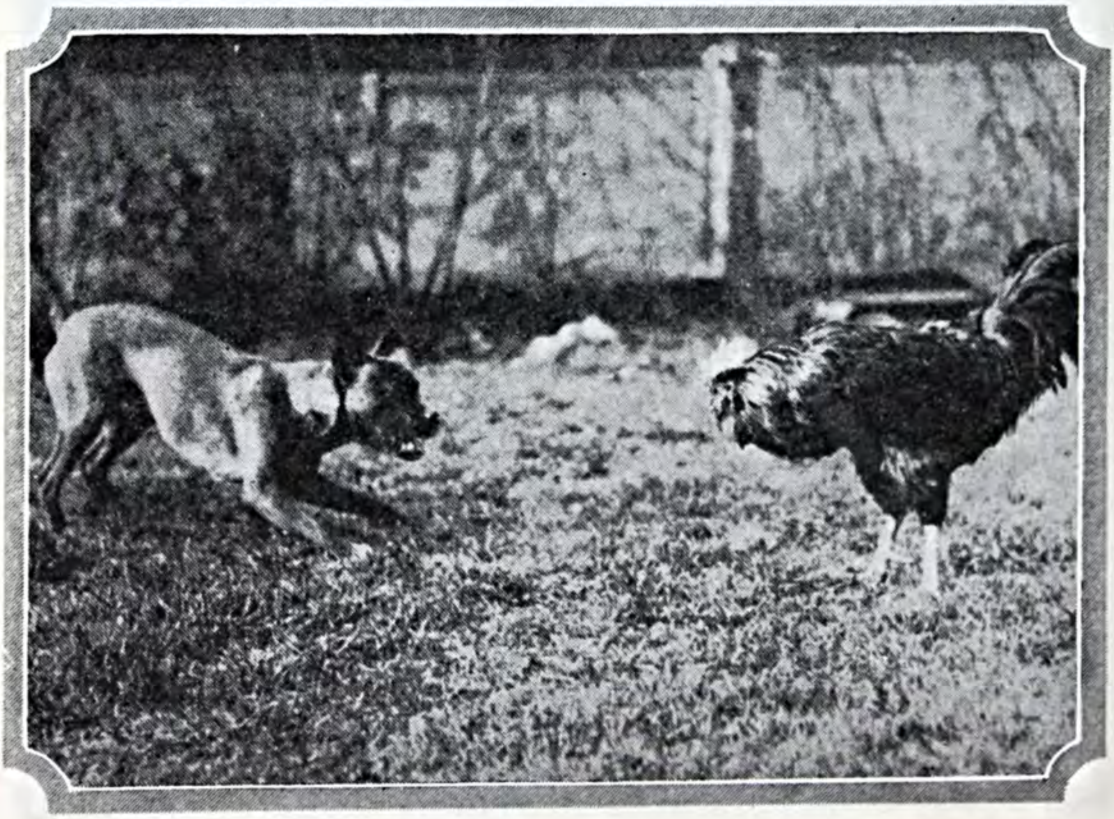




Crops look pretty good—the world pretty rosy to this old farmer enjoying the sunshine under the first straw hat of spring.

A shipment of $35,000 worth of tractors and farm implements recently delivered to farmers of McLean county, Illinois, in one day in exchange for corn at the rate of $1 per bushel. Each tractor is being driven by its new owner.

In the southwest cattle country. These steak-making Herefords are a long call from the Texas longhorns which grazed these lands in the early 70's.



This Seattle, Washington pup and rooster are sworn enemies. Nearly every day finds them in an encounter which usually ends in a draw.

The Editors Talk

The task of an investigator requires for its success the toughness of a soldier, the temper of a saint and the training of a scholar.—Humphrey Davy.

THE other day we visited a large farm in the west, unique in its way because the owners employed an agricultural adviser whose work it was to cheapen the cost of production. It was this man's work to confer with the State agricultural authorities, conduct fertilizer experiments, study and improve the drainage system, organize the most effective means of crop protection, find the best varieties and strains of seeds and study any other factors calculated to run the farm on the most efficient basis.

FARM ADVISERS

This man is paid solely by the owners. He is saving the farm money. Other large farms in the Southwest devoted to breeding cotton also employ experts along the same lines. The number of such farms is increasing.

We are beginning to realize that managing land for crop production is a business. Involved in successful management is the right relationship of a number of units—one must fit the other. Every factor affecting production must operate at maximum efficiency. The difference between profit and loss is often the total of small differences—not big ones.

Operating in large units there is all the opportunity and all the work any one man wants to control these units and factors to produce efficiency and success. Forward-looking business farmers recognize this and employ experts on single farms.

But when such men are employed by the state or county, we expect one man to look after the interests of a whole county.

Geographically he is expected to spread himself. Intellectually he is expected to spread himself. He must know every agricultural subject involved as farm accounts, crop production, stock raising, soil management, in fact be in touch with everything that can happen on a large number of farms.

In many cases it is doubtless true that by the geographical-intellectual spread the adviser almost eliminates himself or is in grave danger of so doing. If accomplishment is achieved, it is often at the cost of the county adviser's own free time.

In judging the work of such men is it fair to do so seriously until they are given a fairer chance to accomplish something? Until their duties and territory are narrowed down?

In Europe, one of the most important developments of recent years is the plan by which one adviser is employed by a small number of farms, say 20 or 30. Such an adviser can more thoroughly devote his time to the solution of farm problems and produce effective results.

We average about one county agricultural agent to 1200 farms.

The county agents and extension forces are among the hardest working group of men in our national agriculture. They are accomplishing much. They are putting into productive practice much of our laboratory and experimental findings.

But they are working under the handicap of covering too much territory and too many fields. It is not always the cheapest plan that produces the most profitable results. From an agricultural business viewpoint, the whole organization needs careful and thorough study.

"Thou mak'st my teeming hen to lay her egg each day"—Robert Herrick.

AT the time our Puritan forefathers landed at Plymouth, a poet was living in the English county of Devonshire. His name was Robert Herrick.

"THE TEEMING HEN"

Herrick was a Royalist, a true Cavalier. He loved his king and the life at court. He did not get along well with the Puritans, and so he kept closely to his small house, tended to the poor, wrote poetry, and lived to a ripe old age.

One of his poems is a thanksgiving for his house.

"A little house, whose humble roof is weather-proof;
Under the spars of which I lie
Both soft and dry."

He gave thanks for all the small house contained,

"Low is my porch, as is my fate, both void of state,"

for his little buttery and little bin, for the sticks of thorn or briar, for the purslane, and mess of watercress. And for his land that the bushel sown gave twice ten for one, and for the teeming hen—that laid her egg each day.

From two Puritans of the period we have inherited far nobler, greater poems. But for these simple things of home and land, Robert Herrick gave thanks. They were written in the Seventeenth century. Their spirit is still an example for the Twentieth.

The most important agricultural tool is a pencil for making calculations.

COMMERCIAL fertilizer in the amount of 7,272,665 tons was used in the United States in 1924.

FERTILIZER PROGRESS

This tonnage represents progress. This manufacture of commercial fertilizer materials in soluble forms is a modern development, one of the most essential to the prosperity of our National Agriculture and present standard of living.

The first fertilizer factories were built to supply a most urgent need, the most urgent that can exist, the necessity for larger crop yields. That was in 1842. The average yield of wheat in England at that time was 23 bushels per acre. It was insufficient. Cities were growing, land values rising, the population increasing. It was vitally necessary to increase the yields of wheat, turnips and other crops, in order to make the higher priced land pay and to maintain cheap food supplies.

Bones had been used for this purpose. They were partially effective. So Europe was searched for bones. Liebig in his laboratory at Giessen was very outspoken about this trade in bones. He protested "England is robbing all other countries of their fertility. Already in her eagerness for bones she has turned up the battlefields of Leipzig, and Waterloo, and of the Crimea."

Thus bones and also guano, fish, lime and marl were found insufficient to maintain yields. To fill the urgent demand, Lawes at Rothamsted discovered how to make acid phosphate by treating insoluble mineral phosphates with sulphuric acid. He took out a patent, built a factory and started the manufacture of acid phosphate, only 84 years ago.

Liebig suggested the same process. Later, similar methods were used by Pratt in South Carolina.

Such was the beginning of the manufacture of fertilizers. Acid phosphate and later potash supplemented the use of guano, then in use in the southern states. Consumption has grown. In 1924 there were 3,250,498 tons of acid phosphate used in the United States.

In 1860 Liebig discovered the value of potash as an essential plant nutrient. In 1924, 1,227,067 tons of potash salts were used in the world's agriculture. A growth of 62 years.

Basic slag was introduced 46 years ago.

The manufacture of soluble nitrogenous fertilizers from the air is of recent origin. Scientific research in all branches of manufacture and uses is in progress. The end is not in sight, in fact only a beginning has been made.

Thus the industry was founded in response to urgent needs. It is modern. It has grown rapidly; the problems are many, chiefly the result of rapid growth which is confusion—increased in this country because of the great diversity of soils, climatic conditions, crops and farming systems, under which fertilizers are used.

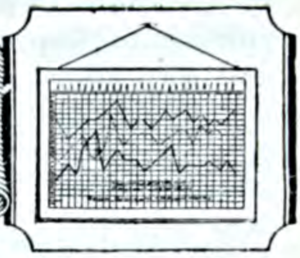
The problems rest on the basic fact that farmers must make a profit on their investments in fertilizers if consumption is to increase. If the farmer loses, the industry loses. If he profits, the industry profits.

Does each farmer make a profit on his fertilizer expenditures? This requirement means that there is a vast amount of work to be done. But progress is being made. Looking back on what has been accomplished, shall we not accomplish more in the future?

The factors that impelled the foundation of the manufacturing industry are more potent today than 60 or 80 years ago. Our needs are greater, our resources greater. Over a long time period the consumption of fertilizers must increase.

The greatest needs at present are, an impartial survey and analysis of all data affecting the use of fertilizers. This would provide a fundamental basis of correlated facts and result in less confusion. Other needs are a simplification of analyses recommended, more field and other experiments supplemented by shorter tests to determine local soil and crop needs, less pressure on research workers for quick results, closer cooperation between sales and experimental forces and the cultivation of a long time viewpoint.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

South African Farmers Coming

Ignoring the fact that the U. S. is never free from the shouts of those who think that American agriculture is in a bad way, a group of 50 farmers of South Africa are planning on coming here in 1927 to learn something of the producing and marketing methods of our farmers and those of the Canadians. The Minister of Agriculture and the Chief of the Division of Marketing and Economics of the Union of South Africa will accompany them. It is said that most of their interest will be in marketing. The U. S. Department of Agriculture and the Department of Commerce are cooperating in making plans for the visit.

Potash Controls Cotton Rust

Certain soils in North Carolina lacking in potash and organic matter are liable to produce cotton damaged by what is known as rust, and the damage is frequently great. Disease organisms and insects have nothing to do with the trouble which, according to G. W. Fant of the Experiment Station, may be prevented by using fertilizer containing 200 pounds of kainit or 50 pounds of muriate of potash to the acre. It is also recommended that a crop rotation be practiced to add organic matter to the soil. Cotton rust may be distinguished from wilt, which occurs in the eastern part of the State, by cutting into the stem of the plant. Those with wilt have a blackened streak within the stem. The only way to fight wilt is with resistant varieties. The "rusted" plants have mottled leaves that later turn reddish brown and drop, leaving only the skeleton. Sometimes there is a 50 per cent loss from rust.

Plants Have Their Troubles

If plants could give voice to their woes the air would be filled with sighs and lamentations even when the winds were stilled. For plants are greatly afflicted. The diseases alone, without considering insect pests and injuries the result of accident, according to the plant pathologist of the Department of Agriculture, figure up an appalling total. Thirty-nine separate and distinct diseases afflict the rose, and its thorns and beauty are no defense. The apple may have one or more of 66 pathological disturbances, more than 40 are known to attack the tomato, wheat is heir to 31, the oak tree to 52, and we grow big crops of corn in the face of 28 diseases that may attack the plant.

36 Years—38 Bushels

Since 1890 the potato yield in Pennsylvania has increased from 70 bushels to the acre to 108 bushels, a gain of 38 bushels, or more than 50 per cent. Last year nearly 40 farmers in the State made the grade in the 400-bushel potato club which has been running for several years. Credit for the increase in the State is given by the State Department of Agriculture to improved seed strains and varieties, control of diseases and insects by the use of disease-free seed and better spraying methods and equipment, better care and management, and more fertilization.

German Government Loans to Farmers

The German Reichstag has passed a bill providing for a loan of thirty million marks ($7,150,000) to a grain trading company made up of farmers, fertilizer syndicates and others, according to a report from the American Agricultural Commissioner at Berlin. The company will study ways and means to make agriculture more profitable, one of the principal means in mind being the stabilization of grain prices through buying, storing and selling German grain.

Sesqui in June

The Sesquicentennial Exposition, which will open in Philadelphia the first of June, will contain many exhibits of interest to the farmer. The U. S. Department of Agriculture is preparing exhibits showing the work of most of its bureaus and offices. It will show results of its laboratory and field work of interest not only to the farmer and the scientist, but also to the manufacturer and the general public.

New Apples

Six new varieties of apples have been developed at the New York State Agricultural Experiment Station and are being offered to fruit growers in the State for trial. Each of them is said to have some points of superiority over those of the same season now grown. Their names are Lodi, Medina, Orleans, Milton, Sweet Delicious, and Sweet McIntosh. The famous Delicious apple does not attain sufficient size in New York State and attempts have been made to get some of its qualities, along with size, in new varieties. Medina and Orleans are the results of crosses between Deacon Jones and Delicious. Sweet Delicious is another obtained the same way.

Jean! Jean! Make a Machine!

At a demonstration of fertilizer-distributing machines held at Clemson College, S. C., recently, J. T. McAlister, associate professor of agricultural engineering, said "one of the crying needs of the farmer is machinery that will perform four or five operations in one. We need machines that will open the furrow, distribute fertilizer, plant seed, and cover the seed in one trip over the ground." He said there is also a need for implements of similar efficiency for cultivating and harvesting crops. In the course of his talk he stressed need for great accuracy in fertilizer distributers, and for a capacious hopper on machines with the center of gravity low.

Would Concentrate Garbage

Garbage from city homes has long been known as good hog feed and an excellent supplement to grain. The principal difficulties in using it have been its bulk and poor keeping qualities. At the Oklahoma A. & M. College they are trying to develop a practical method for handling this valuable waste which, if successful, will be a boon to cities as well as to the farmers. The best quality garbage is collected, dried, and ground. Chemical and nutritional tests are to be made.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

How the Britisher Raises Spuds

By H. R. Cox

Agronomist, New Jersey State Agricultural College

THOSE who have a leaning for farm statistics will tell you that the average yield of potatoes in Great Britain over a period of years has been about 180 bushels per acre. In the same period the average yield in the United States has been about 98 bushels. The reasons for this great difference in yield are interesting to observe and may be suggestive of certain desirable changes in the future on the part of our American growers.

The British farmer follows a well balanced system of farming. Besides potatoes he usually has one or more cash crops. It is also quite general to have a considerable amount of livestock on the farm, beef cattle especially. Wheat is an important cash crop, and less frequently such crops as fruit, sugar beets, and seed crops of turnips, mangels and mustard. The British potato grower does not have all his eggs in one basket. He is vitally interested in the potato crop and strives for better results with it, but this does not prevent him from growing large yields of wheat, oats and roots, or from turning off a sleek bunch of steers or fat hogs.

The most intensive potato section of Great Britain is the fen country of Lincolnshire. Originally a large part of the fen district was marsh land with islands here and there upon which towns sprang up. The city of Ely where the great cathedral is located was originally built on an island in the swamp. The first important drainage operations were started by Dutch engineers some 500 years ago along the approved Dutch lines of ditching and dyking. Today this section is known as the Garden of England. The land is worth from $300 to $700 an acre. Much of it is owned in large holdings. Farms of 500 acres are common and some of them consist of 2,000 acres or more. This is a region of bonanza farming. I met a number of men who had started with nothing and had accumulated 1,000 to 2,000 acres. A tract of 2,000 acres worth $500 an acre makes the owner thereof a millionaire, if he has it clear. Some of these large land holders had a rather difficult time of it for years; then came the war with its high prices for potatoes, wheat and everything else the farmer had to sell. During the war and for several years after these land owners entrenched themselves so strongly that the sheriff will not catch many of them.

I visited one man in the fen

country who operates 1,400 acres, 800 of which he owns and the rest he rents. He had in 1925 a total of 300 acres in potatoes, 262 in wheat, 48 in barley, 79 in oats, 125 in peas, 40 in beans 135 in turnip and mangel seed, 7 in caraway seed, 76 in sugar beets, 120 in hay and 1½ in alfalfa. He also had 110 head of beef cattle, 206 hogs and 60 horses. I am giving a fairly complete picture of this farm as it is typical of most of the farms in the fen country.

This man stated that over a period of years his average yield of potatoes has been 335 bushels per acre. He has raised as high as 550 bushels per acre as the average of an entire field. As to his other crops, on most of his land with a favorable season he gets 60 bushels of wheat per acre, barley 64, oats 76, beans 52 and sugar beets 16 tons. So you see why it is possible for a man to raise small grain on land worth 500 dollars an acre.

Again, I visited a farmer in Scotland, fairly typical of his district, who has 510 acres. Of these, potatoes occupy 90, wheat 90, oats 120, barley 40, turnips 40 and hay 120. There are about 230 beef cattle fattened on this farm every year. This man stated that he had averaged 315 bushels of potatoes an acre for a number of years past.

The British potato grower is much interested in the seed question. The best seed is raised in Scotland where there are many growers specializing in seed potatoes. It is quite common for the English grower to get a certain amount of Scotch seed every year, the product of which is used to plant his entire acreage the following year. There is a careful system of seed certification in Scotland and about 60,000 acres are inspected every year. In the past, the principal concern has been to check up to trueness to variety, largely for the reason that some varieties are immune to wart disease and some are not. In addition to this, however, the inspection now takes into account the degeneration diseases, and no lot of potatoes having these diseases in any appreciable amount can be certified as seed.

The names of the potato varieties raised in Great Britain sound as strange to the American as our own varieties do to the Briton. Our standard varieties, such as Green Mountain, Irish Cobbler, Raleigh, Carmen and Rural are unknown to the potato growers of Great Britain. Their varieties include King Edward, Sharp's Express, Kerr's Pink, Iron Victory, Field Marshal, Great Scot and Epicure. The latter is an early variety. The rest are second early and late varieties. Most of these are immune to wart and have attained their popularity partly on account of this immunity.

It is almost universal in Great

A chitting house

The Owner's home

Wheat—60 bu. per A.

Britain to use whole potatoes for seed, although not tubers of the larger size. Also, it is customary to plant in rows 27 to 28 inches apart. Because of these two facts the amount of seed used is much larger than in our country, from 25 to 35 bushels per acre being the usual amount. With early potatoes it is customary to use larger seed pieces and more seed per acre than with the late kinds. This is for the purpose of pushing the early potatoes for rapid growth so the crop will bring high prices on the early market. In the early potato section of Scotland it is common to use 50 bushels of seed per acre and some growers use as high as 75 bushels per acre.

It is a fair question to ask whether some of our American potato growers cannot use larger quantities of seed to more advantage than they do. The rate of planting in this country generally is from 12 to 15 bushels per acre. Some tests recently conducted at the New Jersey Experiment Station would seem to indicate that heavier planting would be a profitable practice. This heavier planting might take the form of larger seed pieces or closer spacing. Although the New Jersey experiments indicated that pieces a little larger than average might well be used, a still greater increase in yield was made by placing the pieces closer together in the row. It might not be profitable for every grower in this country to increase his rate of planting; but for the grower who is following good practices in all other respects, heavier planting is a practice that he might well consider.

Fertilizers are known as artificial manures or "artificials" in Britain. The potato growers use fertilizers plentifully. The county agent in the fen district is recommending the use of about 1,700 pounds per acre of a mixture analyzing 7.5 per cent ammonia, 12 per cent phosphoric acid and 10 per cent potash, and many of the most progressive farmers are using about that quantity and that formula. This is for land that is rotated in small grains, grass and other crops and to which no stable manure is applied to the potato crop. Many fields are liberally manured for potatoes and in such cases the amount of fertilizer used is only about 700 to 900 pounds to the acre.

During the winter seed potatoes are taken from the pits and put in shallow trays about 3 feet long and holding about 40 pounds of tubers. The filled trays are put into unheated glass houses to force the sprouts. At planting time the seed tubers have sprouts on them which are hard and green and about a half inch or an inch long. The glass building is called the "chitting house" and the seed with the sprouts is known as "chitted seed." In planting two workmen

Digging with spinner

Picking

Screening and sacking

carry a tray, one on each side of the tray, and drop the seed tubers in the open and fertilized furrows. Not all seed potatoes are chitted, but the practice is growing and all progressive farmers do as much of it as time and their facilities will permit. The advantages of chitting are that it hastens the "come up" and largely eliminates the planting of weak seed.

Early potatoes are not sprayed as a rule, but spraying is common with the late crop. The principal disease is late blight and bordeaux mixture is the material used. The growers in the fen country generally dust instead of spray, using a copper lime dust. Spraying or dusting begins about July 1 when the plants are about a foot and a half high and two or three applications are made. It does not seem to be necessary to put an insecticide in the spray material. Fortunately for the British growers the Colorado beetle and the flea beetle are unknown to them.

THERE are various methods used in the Kingdom of Britain for harvesting potatoes. I observed one interesting method in the fen country. It consisted of the use of a spinner, which is a horse drawn implement. This tool has a revolving frame in the rear with six sets of teeth approximately a foot long which dig into the soil, pushing the potato plants, tubers, tops and all, to the right. Pickers then come along and pick up the tubers into baskets. The baskets are dumped into sieves to shake out the dirt and small potatoes. The tubers are then emptied from the sieve into the sack.

Fortunately for the British farmer his markets will take all the potatoes he can grow and then reach out to Ireland and the Continent for more potatoes. Great Britain is an industrial nation and, consequently, a food importing nation. Its markets, therefore, are always hungry for home grown products. This gives a certain advantage to the British farmer whose foreign competitors must pay heavier freight charges than he does. This advantage is largely offset, however, by the fact that he has to compete with industry for labor so that his producing costs are higher than his foreign competitors. A topic very much in the minds of the farmers of Britain is that they should have protection by the placing of a tariff on agricultural products coming in from abroad. As a majority of the people of Britain are consumers rather than producers, it is not likely that the farmers will get their wish.

For several years during the late war and immediately after the potato was a very profitable crop to British farmers. Many of them paid off their mortgages in that period. The year 1922 was a disastrous one for the potato growers, but since that year the crop has paid its way. One grower told me that in 1924 the average price he received for his late potatoes was $1.23 per bushel. In the bad year of 1922 his average price was 22 cents a bushel.

There is in Great Britain, as in the United States, an apparent tendency toward a diminishing consumption of potatoes per capita, but not from the same causes as in the United States. In Great Britain an important cause of this is the increasing cost of coal. The housewife will boil potatoes if she is going to build a fire to cook meat or other foods, but she is not so likely as formerly to make a fire for the sole purpose of boiling potatoes. This was the opinion expressed by one of the keenest observers I met in Scotland, and there is probably much truth in it.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

The work of the Experiment Stations is the basis on which much of our agricultural progress is founded. It is, therefore, both interesting and valuable to have the work of the Experiment Stations for the year 1924 embodied in one well arranged bulletin of 114 pages. The work is comprehensive, including such subjects as the trends of Station work, projects undertaken, the results, publications and statistics of the Stations. The bulletin can be obtained from the United States Department of Agriculture. The title is "Work and Expenditures of the Agricultural Experiment Stations, 1924."

Fertilizers

More fertilizer is used on cotton than on any other crop. Fertilizer experiments on cotton are, therefore, very necessary and of vital importance. The Mississippi Agricultural Experiment Station has recently published in Circular No. 63 the results of such experiments at the South Mississippi Branch Experiment Station. The author is E. B. Ferris.

Also in Bulletin No. 230, the results of similar experiments at the Central Station are given. This bulletin also gives the results of studies on different varieties of cotton.

Michigan Agricultural Experiment Station in February, 1925, Circular No. 53, gives the analysis of standard fertilizers suitable for Michigan soils and crop conditions. These analyses are set forth in a very complete and detailed table. It includes both mineral and muck soils.

The Michigan Station has also published in the Quarterly Bulletin for February, 1926, a very practical discussion on the effect of fertilization on the quality of muck crops, by Professors Harmer and Weidemann. We are particularly glad to note that such subjects as the marketability of potatoes and the size and number per hill have been studied. Also the effect of phosphoric acid and potash on the quality of beets, carrots, onions, parsnips and sugar beets. This is a step in the right direction. Such work is badly needed. The results show that with nearly every crop studied, the application of phosphoric acid alone on muck soils has produced little or no increase in yield or in sugar content. The following significant remark is added: "In other words, the results indicate that for the production of a crop of high sugar content, a fertilizer mixture high in potash content should be used." The Quarterly Bulletin also contains many interesting articles on subjects other than fertilizers.

Nitrate nitrogen is undoubtedly a limiting factor on many soils. The results of experiments on the effect of cultivation on the nitrate content of the field soil are given in Bulletin No. 205, published by the College of Agriculture, Arkansas. Dan T. Gray is the author.

"Fertilizer and Fertilizer Material," Alabama Department of Agriculture and Industries, Montgomery, Alabama, Department Bulletin No. 7, Fiscal Year

1924-25. *J. M. Moore, Commissioner.*

"Commercial Fertilizers, Agricultural Minerals," Department of Agriculture, State of California, Special Publication No. 61 1925. *Firman Thompson, assisted by Geo. E. Colby, W. G. Marshall, John W. Elmore, Roy P. Tucker, contribution from Division of Chemistry, Geo. P. Gray, Chief.*

"Annual Report of the State Chemist of Florida" for the year ending December 31, 1925, *Department of Agriculture, Tallahassee Florida, Volume* 35, *Number* 1. *Nathan Mayo, Commissioner of Agriculture, R. E. Rose, State Chemist.*

"Soils and Fertilizers," Florida Quarterly Bulletin of the Department of Agriculture, Tallahassee, Florida, Volume 36, *Number* 3, *January,* 1926. *Nathan Mayo, Commission of Agriculture.*

"Analyses of Commercial Fertilizers and Ground Bone; Analyses of Agricultural Lime 1925," *New Jersey Agricultural Experiment Stations, Department of Chemistry, New Brunswick, New Jersey, Bulletin* 426, *December,* 1925.

Soils

A very valuable and interesting bulletin of 68 pages has recently been published by the United States Department of Agriculture, entitled "A Study of the Value of Crop Rotation in Relation to Soil Productivity," by W. W. Weir. The bulletin reviews the results of the classic experiments at Rothamsted and many of the long-continued experiments in the United States, among which are studies of experimental plots in Missouri, Wooster and Germantown, Ohio. It is shown that crop rotation is a vital factor in increasing crop yields.

"Drainage on the Farm," University of California, College of Agriculture, Agricultural Experiment Station, Berkeley California, Circular 304, *March,* 1926. *Walter W. Weir.*

Crops

The March issue of the American Potato Journal, published by the Potato Association of America, is called the Seed Potato Number. Excellent articles by authorities deal with "The Value of Good Seed Potatoes," "Pennsylvania's 400 Bushel Potato Club," "The Potato Situation," and matters of certification, seed treatment, surveys and laws on certified seed production.

Other interesting crop bulletins received during the month include:

"Composition of Arizona Forages, with Comparative Data," University of Arizona, College of Agriculture, Agricultural Experiment Station, Tucson, Arizona, Bulletin No. 113, *December* 1, 1925. *C. N. Catlin.*

"The Pecan in Arizona" University of Arizona, College of Agriculture, Agricultural Experiment Station, Tucson, Arizona, No. 154, *December* 15, 1925. *A. F. Kinnison.*

"Making Money from Potatoes," Connecticut Agricultural College Extension Service, Storrs Conn., Bulletin No. 95, *March,* 1926. *Albert E. Wilkinson, Vegetable Specialist.*

"Growing Early Plants," Connecticut Agricultural College Extension Service, Storrs, Conn. Bulletin No. 91, *November,* 1925. *Albert E. Wilkinson, Vegetable Specialist.*

"Yellow Pickle in Greenhouse Cucumbers" Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 225, *December,* 1925. *Victor A. Tiedjens.*

"Research Service to the Massachusetts Apple Industry," Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 226 *January,* 1926.

"The Connecticut Valley Onion Industry," Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 227, *February,* 1926.

"Value of Certified Irish Seed Potato Seed in Mississippi" Mississippi Agricultural Experiment Station, A. & M. College, Mississippi, Circular 60, *December,* 1925. *H. H. Wedgworth, Inspector State Plant Board, C. B. Anders, Assistant Director, Raymond Branch Station.*

"Preliminary Agricultural Program for Western North Carolina" North Carolina State College of Agriculture and Engineering, State College Station, Raleigh, North Carolina. Extension Circular No. 157, *March,* 1926.

"Fruit Varieties in Ohio. 1," *Ohio Agricultural Experiment Station, Wooster, Ohio, Bulletin* 391, *February* 1926. *J. H. Gourley, C. W. Ellenwood.*

"The Bimonthly Bulletin," Ohio Agricultural Experiment Station, Wooster, Ohio, Vol. XI, No. 2, *March-April* 1926, *Whole No.* 119.

"Rotation and Hogging Off Experiments with Field Peas," State College of Washington, Agricultural Experiment Station, Pullman, Washington, Bulletin No. 198, *February,* 1926. *E. G. Schafer, R. T. Smith.*

"Growing Sweet Corn," Extension Service of the College of Agriculture, The University of Wisconsin, Madison, Wisconsin. Circular 196, *March,* 1926. *E. D. Holden.*

"Sugar Beets in Wisconsin," Extension Service of the College of Agriculture The University of Wisconsin, Madison, Wisconsin, Circular 1925, *March,* 1926. *A. H. Wright.*

Economics

The source and amount of farm income are important subjects to the farmer. These matters have been carefully studied by the survey method in Tama county, Iowa, by Clifford C. Taylor and Edward B. Hurd. The results are published in Research Bulletin No. 88 of the Agricultural Experiment Station of Iowa. The bulletin is divided into main parts, the type of farming and financial analysis. The work is a further interest to economics as a study in the multiple correlation method of analyzing data. An interesting discussion is given regarding the efficacy of this method. The results show that the farms of Tama county "are fairly prosperous under ordinary economic conditions."

Another very interesting Research Bulletin is No. 89 published in November, 1925, at Ames, Iowa, entitled "A Partial Correlation Analysis of Farm Organization and Management Data from Warren county, Iowa." In this study the net effect of 14 factors were measured as affecting the profits of 231 farms in Warren county in 1921. The author is C. W. Crickman.

Diseases

"Seed Treatment for the Control of Irish Potato Scab," Mississippi Agricultural Experiment Station, A. & M. College, Mississippi, Circular 61, *December,* 1925. *H. H. Wedgworth, Inspector State Plant Board, C. B. Anders, Assistant Director Raymond Branch Station.*

Insects

"Early Summer Dispersion of Boll Weevil with Special Reference to Dusting," University of Arkansas, College of Agriculture, Agricultural Experiment Station, Fayetteville, Arkansas, Bulletin No. 204, *February* 1926. *Dan T. Gray, Director, Dwight Isely, Associate Entomologist.*

"Poisoned Bait for the Control of Cutworms," Mississippi Agricultural Experiment Station, A. & M. College, Mississippi, Circular 62, *December,* 1925. *H. H. Wedgworth, Inspector State Plant Board, C. B. Anders, Assistant Director Raymond Branch Station.*

"Spraying Program for the Orchard and Fruit Garden," Ohio Agricultural Experiment Station, Wooster, Ohio, Bulletin 393, *March,* 1926. *H. C. Young, J. S. Houser, F. H. Ballou.*

"The Control of the Striped Cucumber Beetle," University of Tennessee, Agricultural Experiment Station, Knoxville, Tennessee, Circular No. 1, *February,* 1926. *S. Marcovitch.*

"The Corn Ear Worm on Tomato," University of Tennessee, Agricultural Experiment Station, Knoxville, Tennessee, Bulletin No. 133 *December,* 1925. *S. Marcovitch, S. A. Robert.*

"Supplementary Investigations of the Fluosilicates as Insecticides, with Observations on the Effect of Heat and Drouth on the Mexican Bean Beetle," University of Tennessee, Agricultural Experiment Station, Knoxville, Tennessee, Bulletin No. 134, *January,* 1926. *S. Marcovitch.*

"Investigations on Oil Sprays," State College of Washington, Agricultural Experiment Station, Pullman, Washington, Divisions of Entomology and Chemistry, Bulletin No. 197, *February,* 1926. *A. L. Melander, A. Spuler, E. L. Green.*

"Poisoned Baits for Strawberry Root Weevil," State College of Washington Agricultural Experiment Station, Pullman, Washington, Division of Entomology and Soology, Bulletin No. 199, *February,* 1926. *A. L. Melander, A. Spuler.*

* * *

Missouri Legumes

The place that legumes play in making good corn crops was forcibly demonstrated at the Carroll County Missouri corn show and sale, when eight of the ten highest yields reported in the five-acre contest were found to have been grown on legume sod. The other two were grown on timothy and blue grass sod. Sweet clover sod was turned under on five of these fields, while red clover sod was plowed under on the other three.

The highest yield reported for the county was 117.3 bushels to the acre grown by Herman Engelking. The average of the ten highest yields was 95 bushels.

* * *

Four animals went to a circus—a duck, a pig, a frog and a skunk. All of them got in except one. The duck had a bill, the pig had four quarters, and the frog had a greenback, but the skunk only had a scent, and that was a bad one.

Minnesota

From page 28)

return to Minnesota farmers was close to $3,000,000, and this continued for several years, until No. 169 was displaced by Marquis which originated in Canada.

The Minnesota station was also instrumental in pushing the cornbelt northward from the Iowa border until two-thirds of Minnesota was included. This was the fruit of studies and trials which developed two new varieties of corn—Minnesota No. 13 and Minnesota No. 23. The former matured earlier than the varieties grown in Iowa and enabled farmers in southern Minnesota to grow corn with comparative certainty that it would mature before killing fall frosts. Minnesota No. 23 matured still earlier and could be grown with safety even up in the Red River valley.

COINCIDENT with work in improving field crops was that in building up the state's dairy industry. This took two forms: The encouragement of cooperative creamery enterprises and the working out of standard rations for dairy cattle on the basis of milk and butterfat production. As a result, Minnesota today has among its 800 creameries, some 650 which are cooperative, and an annual total sale of dairy products amounting to about $150,000,000. Besides, Minnesota's feeding standards have been adopted far and wide.

Successful dairy farming involved the growing of legumes—alfalfa, sweet clover, soybeans. Consequently, the Minnesota station staff turned its attention to such crops. Members of the staff were instrumental in promoting a wide interest in Grimm alfalfa, a winter hardy variety brought over from Germany by Wendelin Grimm, an immigrant farmer of Carver county. Because of their success with this variety, Minnesota farmers are rapidly extending their alfalfa acreage. Sweet clover and soybeans are also rapidly gaining in favor.

More recent contributions by the field crops specialists of the Minnesota station include Gopher oats, a stiff-strawed, high-yielding variety which is rapidly displacing other varieties throughout the state; Minsturdi and Velvet barley, the latter a smooth-awned variety which promises to take high rank, contributing much to dairy farming in northern Minnesota where barley is a substitute for corn in the dairy ration; Winona and Chippewa flax, wilt-resistant varieties, and Minturki winter wheat, a winter-hardy variety likely to encourage winter wheat-growing for its larger yields and more even distribution of the year's farm labor.

Progress has been reported, also, in efforts to breed varieties of wheat resistant to black stem rust, which in recent years has taken terrible toll of northwestern wheat crops.

THAT Minnesota has become one of the leading potato states of the country, particularly in the production of certified seed stock which is being bought at a premium through the South and even in the East, has also been the outcome of the work of the Minnesota central station and its substations.

The work of the station's crop specialists early disclosed the need of widespread soil studies. Soil needs have now been pretty well mapped. Perhaps the most striking achievement has been in the discovery that on sandy lands, extending northward from St. Paul

> The biggest problem which the plant breeders of the Northwest have to meet is to develop a spring wheat resistant to black stem rust.

and Minneapolis to Bemidji and eastward, alfalfa can be grown with success if the soil is first treated with lime. This makes a large region a potential dairy country, and dairy farming is developing rapidly.

ANOTHER achievement almost as striking has come from careful study of Minnesota's large peat areas. The state has some 7,000,000 acres of peat soils. The soils division of the experiment station has delved into these and experimented here and there, until now it is able to give a very clear idea of the peat soil needs in any part of the state. The information already available, it is believed, will go far toward the reclamation of the state's peat land resources. Already large dairy and cropping enterprises have become established on peat lands.

Fruits are becoming increasingly profitable crops in Minnesota as a result of extensive fruit-breeding experiments. The Latham raspberry, bred by the Minnesota station specialists, is a winter hardy variety, the fruit being large and firm and of delicious flavor. Raspberry growing in Minnesota, before the invention of the Latham, was a difficult job. Most varieties, or practically all, had to be covered up in winter to prevent winterkilling. The Latham needs no such attention. It is said that the returns from this one output has more than paid for the Minnesota station's fruit-breeding farm and its maintenance.

In addition, the fruit-breeders of the station have given to the state a whole list of wonderful plums, crosses between native fruits and the large plums of California, the trees resistant to Minnesota's severe winters and the fruits of delicious quality and flavor, large in size and rich in color. Apples and strawberries are other contributions in the line of fruits.

Experiments in beef-cattle raising, swine production, poultry keeping, and beekeeping have given an impetus to intensive activity in all four fields. The growth of the immense packing industries of South St. Paul testify to the increasing interest among Minnesota farmers in beef cattle and hogs. The Minnesota station's cattle feeding and swine feeding days are always largely attended.

THE Minnesota station has at present about 160 projects under way. The growth in the demands upon the station and the varied conditions in the different parts of the state have necessitated the expansion of the station and the organization of numerous branches.

The first step toward the creation of a Minnesota Experiment

> The fundamental problem for the corn farmer is that of securing for each community the variety or varieties which will yield the greatest number of bushels per acre, and yet mature corn before frost.

station was taken by the legislature in 1868, only six years after the history-making Indian massacre in southern Minnesota, when Minnesota was still regarded as on the far frontier. That year the legislature authorized the board of regents of the University of Minnesota to spend $8,500 for the purchase of land and for experimental work. A tract adjoining the University campus on the outskirts of Minneapolis was obtained and made ready for experimental work, under the direction of Charles Y. Lacy. Professor Lacy continued in charge until 1880, when he withdrew, and on January 1, 1881, Edward D. Porter was placed in control. Professor Porter did not find the site which had been chosen suitable, and on his recommendation a new site, that now known as University Farm, about three miles from the other, was purchased.

PROFESSOR Porter served as director until 1889, when N. W. McLain succeeded him. Professor McLain resigned in 1891, and was followed by Clinton D. Smith of Cornell University, who remained in charge until 1893, when he became director of the Michigan station. W. M. Liggett succeeded Professor Smith.

Director Liggett resigned on account of ill health in 1907, and was succeeded by E. W. Randall, who served until December, 1908, and was succeeded by J. W. Olsen, at the time state superintendent of public instruction. In 1910, Mr. Olsen was followed by Dr. A. F. Woods of the United States Department of Agriculture. He resigned July, 1917, to become president of Maryland State University, and was followed in turn by R. W. Thatcher, at that time head of the division of biochemistry of the station. In July, 1921, Director Thatcher resigned to become director of the New York station at Geneva, and W. C. Coffey of the University of Illinois was appointed his successor.

THE Minnesota Experiment Station system now includes the central station, University Farm, St. Paul, with 456 acres, on which are 27 major and 31 minor buildings used for experiment station, agricultural college, and agricultural school purposes; the Northwest branch station at Crookston, where there is also a school of agriculture, with 550 acres and 11 major and 14 minor buildings; the North Central branch station at Grand Rapids, where another school is soon to be opened, with 445 acres and 6 major and 10 minor buildings; the Northeast branch station at Duluth, with 5 major and 9 minor structures; the West Central branch station at Morris, where there is still another school of agriculture, with 355 acres and 10 major and 10 minor buildings; the southeastern Minnesota branch station at Waseca, with 246 acres and 5 major and 10 minor buildings; the fruit-breeding farm, near Lake Minnetonka, with 112 acres, and a forest experiment station at Cloquet, with 2,662 acres.

IN addition, under the direction of the station are numerous experimental and demonstration fields scattered over the state to work out special regional problems, particularly in relation to soil needs.

The various branch stations and the experimental fields and demonstration plots throughout the state are all supervised from the central station. The system offers admirable opportunity for the solution of the various regional problems and for the study of the adaptation of such solutions to other parts of the state.

THE College of Agriculture, Forestry and Home Economics at the central station, along with a central school of agriculture for the technical training of boys and girls for farm and farm home lives, and the two other schools at Crookston and Morris, give opportunity to spread the information derived through experiment and investigation. But other means are used. At the college is a completely organized extension division, with a large staff of specialists who carry information directly from the station to every part of the state, working with a corps of county and home demonstration agents whose work is also directed from the college.

Moreover, the college also maintains a director of short courses, under whose supervision is held every year some 15 or more short courses, to which farmers and others from all parts of the state come for periods of intensive study. A Farmers' and Home Makers' Week every January brings in from 1,500 to 2,000 men and women to study farm and home problems. A creamery operators' short course furnishes training for buttermakers who supply the demand for trained help in Minnesota's 800 or more creameries. Furthermore, the college and station make free use of bulletins and the press in disseminating the knowledge acquired through experiment and through study of the work done at other stations.

H. K. Hayes

Head of the Plant-Breeding Section of the Division of Agronomy and Farm Management, Minnesota Experiment Station. It was under his direction that Gopher oats, Velvet barley, and other contributions to western agriculture were bred and made available to farmers.

The worth of the Minnesota station's work has been recognized by the people of the state and the work has been generally supported by the state legislature. The new work in agricultural economics, home economics, and rural sociology under the Purnell Act, is likely to attract still wider attention. This work will be carried on in coordination with the work of other stations throughout the country.

Hardy roots are as necessary as hardy tops for successful growth in Minnesota.

Corn or Quack

(*From page 25*)

Murdock seed corn and later I bought another bushel, paying four dollars for it. I ear-tested it all and planted only the ears which tested 100 per cent strong. I adjusted the planter to drop four kernels in a hill. The planting was done on May 15 and four days later the field was dragged to kill the weeds and give the corn a head start. At the time of planting the moisture was about two inches below the surface of the ground so I planted the corn three inches deep to make sure there would be enough moisture for the seed to germinate.

"WHEN I started cultivating June 4, the corn was about two inches high except in the thickest parts of the quack patches. The quack grass in these spots was so thick that I broke two singletrees and a neck-yoke going through.

"I used the surface cultivator and found that it did much better work than a shovel cultivator. A shovel cultivator digs deep, turning up the soil to dry out and also cutting the corn roots while a surface cultivator merely turns over the surface soil and cuts off the weeds without bothering the corn roots.

"The fact that the surface cultivator does not turn the soil up to dry out was especially valuable this year as there was very little rainfall. The first rain which did any good came on June 1. Up to July 6 there were five other heavy rains. After July 6 until the end of the growing season there was less than a quarter of an inch of rain. This came in small showers so did not do much good.

"It was a difficult task to adjust the cultivator properly but when this was adjusted the quality of the work done more than made up for the time spent in adjusting it. Another boy and I demonstrated the adjustment of the surface cultivator at the state fair this fall and took second prize.

"I cultivated the corn four times, twice each way. The quack grass is now nearly killed out.

"Murdock is a late maturing corn but mine matured as soon as most early varieties. I picked 15 bushels of seed, using the early field selection method, and strung it up with double strings. To save time in gathering, I put a large box on a stoneboat and hitched a horse to it, driving between the rows and picking two rows at a time.

"On September 22 I began to pick the bulk of the crop. I had the crop all picked before there was a hard frost. The yield was 50 bushels per acre; out of this I saved 35 bushels for seed. This gave me 50 bushels of seed and 250 bushels of market corn. My net gain on the six acres was $164.61.

"MY corn work taught me many things. Some of them are the value of good seed, the value of the surface cultivator and that the best way to kill weeds is to keep down the top growth. I intend to raise corn as a part of my project next year. I believe that I can do a great deal better because I know more about it. I am going to plant it on the same piece of ground in order to finish the quack grass. I have it pretty well under control now. Next year I can produce my corn with less labor."

Ask the Soil

(From page 7)

acre were used. The result was a gain over the unfertilized rows of 109 bushels of potatoes per acre at a cost of $4.50 for potash. This test was made on a newer piece of land.

Fertilizers were tried on oats—125 pounds of muriate of potash per acre. Alfalfa was seeded in the oats. A yield of 53 bushels per acre was obtained where the fertilizer was used and the alfalfa seeded very nicely.

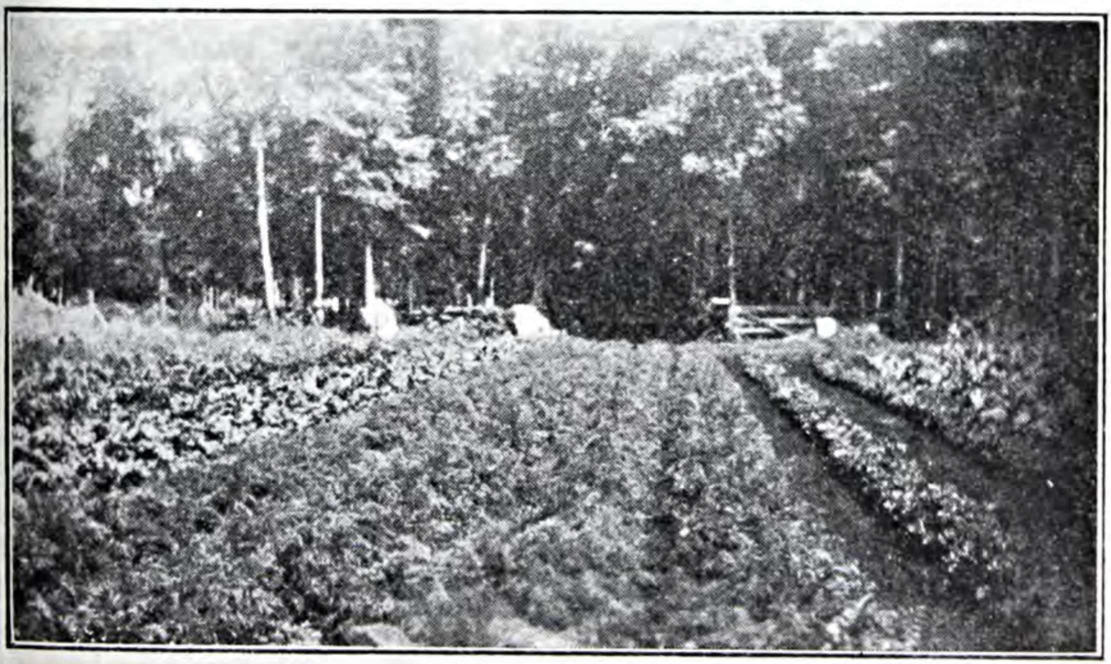
The last picture was of a garden on muck soil.

To sum up—on the muck soils for alfalfa and potatoes, 200 pounds muriate of potash gave a very good profit. On oats and corn 100 to 125 pounds muriate of potash were used. Mr. Isherwood uses potash alone on the peat soils, but after a few years intends to use phosphate with the potash to keep a better balanced fertilizer. For the present, however, he considers that potash is sufficient.

He finds the manure much more profitable on crops on the sandy upland. As Mr. Isherwood points out, when potash is applied to the oats on the muck soil it produces much more straw which is applied in the manure on the sandy upland. Thus potash on the muck soil helps to build up the sandy soil also.

On alfalfa grown on the upland about eight tons of manure per acre is used with 75 pounds of muriate of potash and 50 pounds of an 0-12-12. A number of farmers on the upland are applying 150 pounds of potash and from 75 to 100 pounds of the treble superphosphate per acre for alfalfa seeding. Some are also using the 0-12-12 mixture.

The farmers attribute their success to the help of County Agent Noble and to the branch experiment station at Coddington which for some years has been making experiments with fertilizers. Coddington is a branch experiment



Truck crops on peat fertilizer with potash farm of the Wisconsin Agricultural Experiment Station. Professor A. R. Albert is in charge.

The success in fertilizing and finding the most profitable crops and fertilizers for these soils is a very good example of team work between county agents, farmers, and the local experiment station.

EDITOR'S NOTE: *There is a great difference in muck soils. Local fertilizer and cultural tests should be made as much as possible, and where this is not done, the best experimental work in the state should be studied before starting cropping systems or fertilizer practices.*

* * *

Potash and Quality

(*From page* 13)

on the plat where no potash was used."

IN summarizing the fertilizer results, "It may be observed that for the production of good quality sun-cured tobacco a liberal application of nitrogen is necessary to promote a steady and vigorous growth and to fill the leaf in maturing; a liberal amount of phosphoric acid is necessary to hasten growth and maturity and to add bright color in ripening and curing; and a liberal amount of potash is not of less importance for on this depends largely the smooth, fine, silky and elastic qualities of the leaf.

"The healthy, clean appearance in the field is also greatly improved by potash. On our plats on which potash is eliminated the tobacco has a rough dull appearance both in the field and in the barn when compared with that of other plats where potash has been applied."

Surely these results indicate that the purchase price of potash, when the potash is properly used, on tobacco will return with manifold interest.

The question often arises which is the better source of potash for tobacco, muriate of potash or sulphate of potash? Burning tests show that the burning quality of tobacco produced from the use of sulphate is better than that produced from the use of muriate. However, the results from use of these two potash salts on the yield and selling price of tobacco are meager.

The Virginia Experiment Station has recently conducted tests to determine the latter point. Five years' results with dark tobacco showed that the average increase in yield in favor of the muriate was 58 pounds per acre and the increase in selling price was $12.1[illegible]. The tobacco produced from the use of each of these potash salts sold for an average price per pound of 22.3 cents. Two-years tests with bright tobacco gave results similar to those secured with dark tobacco.

THESE results indicate that muriate of potash is certainly as good as, if not superior to, sulphate of potash so far as yield per acre and selling price is concerned. However, since sulphate of potash tobacco burns better than muriate it would seem that a mixture of one-half muriate and one-half sulphate of potash would be best for tobacco.

Kentucky Blue Grass

(From page 18)

sembles the DeKalb though more fertile and formed in part from limestone fragments. The land is of a rolling to hilly topography with some relatively level uplands.

Kentucky blue grass at one time grew well on these hillsides and still limited areas of good blue grass may be found. Here also the spoliation system has been the practice resulting in the depletion of the pasture land until today the blue grass is largely replaced by weeds and grass of less economic value.

The experiment fields are located near the town of Washington on abandoned land typical of the soil type.

In each area described erosion is severe, made possible by deforestation and later depletion of the grass-covered hillsides.

THE pasture experiments include plots one-tenth acre in size treated with various combinations of commercial fertilizers, lime and manure. Space will not permit a detailed description of the various treatments and the final results secured. We will therefore confine our discussions to three important plots; namely, those treated with acid phosphate; acid phosphate and muriate of potash; and acid phosphate, muriate of potash, and nitrate of soda. In each case the soils were treated with pulverized limestone in sufficient amounts to insure a liberal supply and thus prevent lime from becoming a limiting factor.

The fertilizers are applied biennially at the following rate in pounds per acre: Phosphoric acid, 65; potash (K_2O) 50; nitrogen 48.

THE pastures were mowed in the early summer when the blue grass was in late bloom. The field cured hay was then raked and weighed. The second growth of blue grass was not harvested each year. It was difficult to secure accurate yields of the subsequent growth, due to the difficulty of cutting and raking the relatively short grass. However, during the progress of the studies, the later growth was harvested several times by use of the mowing machine, also by clipping representative areas with lawn shears. The data thus secured showed that the second growth was 54 per cent of that secured in the first cutting.

Data secured from somewhat similar studies at the Cornell Experiment Station (Bul. 424)

showed that the growth of Kentucky blue grass during the second half of the season was 44 per cent of that produced during the spring and early summer. The yields given include the first cutting plus 40 per cent added for the estimated second growth. The Cornell studies also show that blue grass under pasture conditions, that is, cut at five periods, gave 13 per cent greater yields than when cut as meadow hay.

Before and after harvest, the plots were carefully studied and the nature and proportion of vegetation present were estimated. The green weight of pasture grass is computed on the basis of 76.2 per cent water. In computing the green weight, the air-dry hay was assumed to contain 20 per cent water. (Field wt. x .80 ÷ 23.8 x 100).

EDITOR'S NOTE: *Next month Professor White discusses the adaptability and nutritive value of Kentucky blue grass.*

* * *

Getting Together for Profit

(*From page 27*)

2-12-6 and fertilized your way. When I started out I decided I'd try just as hard as I could to make the company pay for that fertilizer. Yes sir, and I did it, too! Since I tried out this fertilizer I have done better, I have given them better care.

"I CAN'T raise more than 35 bushels of corn to an acre, I'll tell you 35 bushels is a right smart yield, most of our tomato ground won't raise 20 bushels of corn to the acre. I picked the good spots—the best on the farm—I broke ground in March, worked it early, and planted the first part of June. I gave them good care throughout the season—weeds and tomatoes, I find, can't give best results on the same ground the same year. The piece of soil that averaged that 11½ tons was worn out soil 10 years ago. It had grown up in sassafras, was cleared and pastured and planted to corn twice then I planted to tomatoes."

Ernest Adams, another grower, averaged 10 tons in 1923 and 11 tons in 1924 on three acres. "I never raised a crop until last year and this year. I know that fertilizer doubled my yields,—it sure does the business. I wouldn't grow tomatoes any more without that 500 pounds of 2-12-6. My neighbor, David Bledscoe, just kept hauling and hauling. I don't know where they came from but he averaged 10 tons to the acre.

"I have found that tomatoes are the best paying crop on the farm, and I certainly am going to keep on growing tomatoes. I've found that it pays to keep the ground covered in winter with rye, follow crop with soybeans and cowpeas. I rotate, use clover, rye, soybeans and manure. I follow tomatoes with wheat or rye, that always pays."

Going on down the road I met Charlie Beaty who averaged 12.75 on top of another hill. On four acres he grew 50 tons of tomatoes and secured $665. "Better than anything else," said Beaty. "I would just as leave work with tomatoes as anything. They certainly do pay."

JAMES JONES, another farmer, averaged 15 tons on 2¼ acres. "Yes sir! that 500 pounds of 2-12-6 paid me. I can't get anything that will do what tomatoes will on this soil. I like the crop, too. I raise my own plants with the exception of a few I bought. I use rich soil, plant seed thin and cover beds with canvas. My plants come up thin and grow robust. I used a cut clover sod, turned this under in the spring, and plowed the field seven inches deep early. I think I want to plow deep for tomatoes. I drilled in 500 pounds of 2-12-6 and set plants the first of June. I like to set last of May. I found that good plants, good soil, liberal fertilizer and clean frequent shallow cultivation hits the spot. I shallow cultivated twice a week. I set all my plants by hand. I just waited until a damp spell, then we went right to it. I certainly am strong for tomatoes."

AT every farm I asked, "Do you know anyone that didn't use fertilizer?" But, so well have Grosvenor and Braxton driven home the gospel of "500 pounds of 2-12-6 farmer tried" that no one knew where the unfertilized tomato farmers lived. Everyone seemed well pleased with the crop and wished to keep on growing it.

I finally came to Ira Combs, who with his two boys Charlie and Elza, grew 39 tons on three acres of land that looked like the top of Lookout Mountain. I found the soil at the top of the ridge clay soil which had timothy and

(*Turn to page* 58)

Jeffisms

Love may not make the world go round, but it certainly can make your head spin.

* * *

There are no short cuts to experience.

* * *

Some reformers aren't content with making us walk the straight and narrow path; they want us to walk a tight-rope.

* * *

Things never look so black after a good substantial meal.

* * *

A good politician is a man who can say less than his opponent in more words.

* * *

A man is never so whipped as when he's lonesome.

* * *

Money and deviltry will make a smart set anywhere.

* * *

We can seldom have what we want because what we want is generally what we don't have.

Jeff

Getting Together for Profit

(*From page 57*)

clover turned under about eight inches deep, then thoroughly prepared and drilled with the proverbial "500 pounds of 2-12-6." I found that they too had grown their own plants on a heavily fertilized plot, had protected them by canvas, had planted seeds thin, and had planted real plants which had been given the best of care.

Many Indiana canners tried out the fertilizer bonus system last year with equal success. Typical of results secured was that of Greenfield Packing Company where $2,000 in extra cash was distributed for the use of 500 pounds of 2-12-6 per acre. Growers using the fertilizer averaged 6.59 tons per acre, while those using no fertilizer averaged only 3.65 tons.

Thus it has been demonstrated that high grade seed, good plants, liberal fertilizer, and good culture throughout the growing season will make 10 tons of tomatoes an acre possible in every section. May the day be near at hand when closer cooperation between canner and farmer will bring about these desirable results.

* * *

Orchard Judging

(*From page 9*)

By the use of this method of analysis together with tree and orchard records a grower can furnish himself with helpful information as to the relative efficiency of his orchard and ways and means for increasing his yields.

Before making a purchase, the prospective buyer of an orchard will be well repaid by looking over several of the districts that are producing the kinds of fruit he desires. He can then assure himself, within reasonable limits, that in general characteristics the district is suitable for his purpose. The best test of the fruit growing possibilities of any district is the success that has already been attained there. It is often on this account that land in proven fruit districts sells at a much higher price than in districts not so long established. With the above factors in mind the prospective buyer may balance the qualities of an orchard against the price asked and then decide as to whether it is a wise investment.

* * *

Better Wheat

(*From page 10*)

Farm Bureau and County Agent Biedermann shipped in a carload of approved Marquis wheat (spring) from Glasgow, Valley county, Montana. This wheat was secured through the county agent at that place.

Upon arrival this wheat was treated for smut with copper carbonate with the machine shown in the accompanying illustration. It was sacked direct from the machine and distributed in 5, 10, and 15, and 20 bushel lots, to approximately 60 Dawes county farmers who sowed it upon clean land and will keep it pure for seed the following year. It is expected that enough seed will be raised to sow practically the entire wheat acreage in Dawes county, in 1927.

In addition to this work several wheat and corn variety tests are also being conducted in the county to determine the varieties best adapted to the county.

New Diets for Truck Crop

(From page 23)

also after the cowpeas following frost. Series B also received a treatment of cover crops.

DID the chemical fertilizers and cover crops profitably replace the use of stable manure? The answer is—Yes.

One of the most striking results of the work shows that production can be maintained by the use of chemical fertilizers, ground limestone and cover crops without manure. Further than that, the net returns from the use of chemicals were nearly double that from the use of manure. This does not, of course, indicate that organic matter should be dispensed with. Its maintenance is always of vital importance.

The fertilizer treatment that gave the highest profit in series A was 1220 pounds per acre of a 4-10-4. This was more profitable than 16 tons of stable manure. The organic matter was supplied by a cover crop planted after each truck crop was off.

Series B confirmed these results. Six hundred and ten pounds of a 4-10-4 was more profitable than 16 tons of manure on all crops except tomatoes. The stable manure was most valuable on cucumbers and tomatoes.

WAS the use of the raw, ground limestone necessary and profitable? The answer is again—Yes. The limestone was profitable on all crops. On cabbage it returned a profit of 1200 per cent. Used with 16 tons of manure it was profitable on all crops except sweet corn, and especially high on cucumbers.

This answers two of the most important objects of the experimental work, but there is a great deal of detailed information on other points, especially the result of supplementing manure with chemicals. Generally speaking, manure gave larger yields on some crops than the chemicals, but the higher costs reduced the profits below the treatment with chemical fertilizers. Manure was also slower in maturing some crops.

Other results showed that on tomatoes, 1220 pounds of a 4-10-4 was more profitable than 610 pounds of the same analysis. Fresh straw mulch was unprofitable in this experiment. Manure was worth about $2 per ton, spread on the field. Four hundred pounds of acid phosphate added to 16 tons of stable manure increased both the yield and profit on each crop except sweet corn.

Among the most important results of the experimental work the relatively high production and low cost of increase from the proper applications of chemical fertilizers was the outstanding result.

The general plan of this experiment is very practical and the results are so comprehensive that we feel every truck grower interested in greater profits should read this bulletin. Write for Bulletin 377, Ohio Experiment Station, Wooster, Ohio.

* * *

"Liza, you remind me fo' all the world of brown sugar." "How come, Sam?" "You am so sweet and so unrefined.—*Exchange.*

Feeding Cotton

(*From page 24*)

468 pounds per acre, while nitrogen, phosphorus and potash in the proportions required to make an 8-4-4 fertilizer gave an increase of 684 pounds over the check. We make these statements before giving our 1925 result because we really believe that, taken alone, these 1925 results may prove misleading, especially with reference to potash as they were conducted on land which, while uniform in composition, had not grown cotton in several years and whose history as to previous fertilization we have no means of determining.

THIS work with potash was done on eight plats in three series, making a total of 24 plats. The first, fifth and eighth plat in each series were checks, that is, they received no potash. All plats had received 300 pounds acid phosphate and 150 pounds of nitrate of soda per acre and the plats mentioned received no potash. The other plats received at the rate of 25 pounds of actual potash per acre supplied from five different sources; sulphate of potash, muriate of potash, kainit, sulphate of potash and magnesia and kemfert.

The cotton from these 24 plats has been picked and weighed and the following figures, calculated in pounds of seed cotton per acre, give the averages in these several tests. It should be understood that the check, or no potash plat, represents the average production of nine different plats, while the production from the five forms of potash are the averages of three tests each. These results are as follows: no potash, 1,506 pounds; 50 pounds sulphate of potash, 1,450 pounds; 50 pounds muriate of potash, 1,550 pounds; 50 pounds kainit, 1,440 pounds; 100 pounds double sulphate and magnesia, 1,470 pounds; 40 pounds kemfert, 1,450 pounds.

These plats will be fertilized in the same way and cotton planted on them again in 1926. No rust, wilt, or disease of any kind appeared on any of this cotton, while on land in our main experiment field where cotton has frequently been grown for the past seven years, rust was present everywhere except on plats that had received potash, and wilt was present in several places where it had never been seen before. On two plats where from 1919 to 1924 we had conducted work with fertilizer under cotton, wilt had become so bad by 1924 as to practically destroy the stand.

On one-half of these two plats last named we used in 1925 acid phosphate and nitrate of soda alone and on the other one-half we used these two with kainit added. The cotton wilted badly over the entire area in 1925, but nothing like so badly where kainit had been used as where it had not been used. The yields on both tests were very low at best, but on the plats without potash they were at the rate of 468 pounds of seed cotton per acre, while on plats receiving potash they were at the rate of 828 pounds per acre. The addition of the potash affected the yield both in its control of rust and in its partial control of wilt. We do not believe that any form of potash will control wilt, but on land deficient in potash we feel sure its addition to a fertilizer will give healthier and stronger plants that will better withstand any disease that might attack them.

Better Crops Welcomes Newcomers

THE Fertilizer Review, a 16-page publication issued by the National Fertilizer Association at Washington, D. C., made its appearance in January, 1926. Devoted to the advancement of agriculture through an enlarged and wiser use of fertilizer, the editors state the purpose of the magazine: to be a means of disseminating timely information on the subject matter within its field to farmers; to private, county, state, and federal workers and investigators; to the farm press, and to the fertilizer industry.

The April number has just come to our desk. Like the preceding three, it contains a deal of material of value and interest to the manufacturers and consumers of fertilizers. It covers a broad field of statistics relating to production, reviews of bulletins on fertilizers, editorials on current subjects, and articles on the use of fertilizers and many other subjects. A particularly interesting illustrated article on Muscle Shoals gives detailed information on what is being done there.

As is well known, Charles J. Brand is the executive secretary of the National Fertilizer Association, and is also editor of the Fertilizer Review. Associated with him on the publication are the members of the Soil Improvement Committee: R. H. Smalley, director of the northern division, and J. C. Pridmore, director of the southern division. H. W. Warner is the editorial agronomist.

The magazine is well worth reading and keeping, among other good reasons for the figures it contains on the consumption and manufacture of fertlizer materials.

AN attractive magazine called Plant Food is being published every two months by the Bureau of Agricultural Information of the French Potash Society, 905 Hurt Building, Atlanta, Georgia. This little magazine is well edited, brightly written, and illustrated. It just fits the pocket, is brief and to the point.

The April number contains a very good article on "The Development of the Fertilizer Idea" by Henry T. Maddux. A few pages are devoted to the subject of more cotton on fewer acres. The results of experimental work at some of the southern experimental stations are cited which show particularly the value of potash in producing the maximum yield of cotton free from rust.

The general director of the Bureau, J. N. Harper, is well known as an agronomist. Sid Noble is the editor and is assisted in the publication of the magazine by H. E. Lefevre, director for Northern United States and Canada, and H. T. Maddux, agronomist.

Competition

(*From page 4*)

smirkingly claiming that people have *got* to come to you for jewelry because you are the only one who handles it. Have you ever thought of *inviting* them to come in—as the Arcadia does over there? That movie theatre across the street is a competitor for *your* dollar, and they invite folks in with bright lights, advertising, signs—"

"Stop—I see it!" he ejaculated.

He gazed across the sun-drenched street, for the first time seeing the Arcadia in a new light. "A competitor! Huh"! His eyes narrowed. His fist came down. Silverware rattled!

"I'm going to start something in this town tomorrow! I'm going to fight for my share of every dollar spent in this community! *'Invest* in long-lasting jewelry—don't *spend* foolishly'—will be the slogan. I'll advertise. I'll be active. I'll show competition what I can do!"

And for the first time W. Dudley Hammersmith looked and talked like a man.

IN this complicated, inter-dependent world, where American girls bob their hair and Chinese hair-net makers five thousand miles away die of starvation, there is no such thing as a monopoly in anything, and nothing is permanent except change.

One article or service competes —not with similar articles and services—but with every other article or service in the universe.

The doctor's competitor is not another doctor but *the apple,* the tennis court—and Niel's Bar Bell Exerciser!

Men can possess but three things —money, time, and what money can buy and time lend occasion to use. The whole world is competing for its share of each man's time and money, with the result that he must daily make decisions as to *where* to invest and in what.

These decisions are sometimes "*What* car shall we buy?" but more often "Shall we buy a car or help send John to college? We cannot do both"—*proving that a college education can be a competitor of a Chrysler!*

Every man who has a service or an object in which he is interested is subject to two kinds of competition: direct, from those who offer something similar; indirect, from every quarter of the globe.

The County Agent, who hangs over the fence waiting for the farmer to finish the furrow, finds his indirect competition in the farmer's unwillingness to lose time and listen. The rector's direct competitors are the priest, the pastor and the Science reader; his indirect competition is the Sunday morning golf game.

The strong man looks upon direct opposition merely as an indication that he has something for which the competitor is willing to fight. It is proof of the value of what he has to offer. Men don't bother to kick dead horses. It is always the silk hat that lures the snowball.

And he should look upon indirect competition as part of the game, devoting care and thought to plans to overcome it and secure his fair share or more of the rewards.

As we become more and more civilized, and more and more cluttered up with things to do and to buy, the real indirect competitor of the man with something to sell, a plan to put over, or a service to render is *time*—inexorable time.

I think I shall not be contralicted if I assert that all men—rich or poor, wise or ignorant—have but twenty-four hours a day.

The buyer who works six hours and must see twenty-four salesmen can allot but fifteen minutes to each. And the fellow who can't pack into his quarter of an hour the selling punch necessary finds his real competitor the minute hand, not the other salesmen.

The salesman who sold John Wanamaker a battery of change-making cash registers convinced Wanamaker, it is alleged, that his real competitor was not the group of uptown stores but the *clock;* and proved his assertion by showing that many shoppers who came prepared to buy five articles could buy only three, because of the time wasted in waiting for change to come through the old-fashioned pneumatic tubes.

FORD is advocating the five-day week for working people, as he believes that they do not have time to enjoy the purchase of a car and other things they have the money to buy.

Lacking time to use them, they sigh and put the money in the savings bank.

The competition of the clock is *real* competition.

The realization of this is putting men on their mettle; and in laboratory, office and field they are beginning to devise ways to beat "the old man with the scythe."

Folks cannot think of their needs while they are working to earn money. It is in their leisure time that they think up ways to spend just as Ford points out.

So, perhaps our modern Frankenstein monster of a machine civilization will eat itself up because of a lack of time to consume more palatable and digestible things.

DIRECT competition is merely the hurdle in the race of life. The higher the hurdle the more muscles are brought into play and the keener the zest in soaring over it.

Real men do not flinch at opposition—they relish it, as the football player enjoys plowing through the ranks of those whose business it is to down him if they can.

"The greater the obstacle the more glory there is in overcoming it", said Moliere; and the greatest error Suzanne Lenglen, Mistake-Maker Extraordinary, ever was guilty of she made when after winning from Helen Wills she foolishly minimized the skill of her competitor.

Her egotism outbalanced her wisdom. Had she stated with a "Whew!" that Helen was the greatest tennis player she ever met—the world would naturally have accorded to Lenglen the wreath that belongs to one who has vanquished his greatest opponent.

HOW a man views his direct competition is an unfailing measure of his own work.

If he is inspired by it and incited to even greater efforts, then competition is the life of trade, and he is strong; if it irritates and depresses him, it is a rampant raid upon his vitality, and he weakens and sickens.

Yet, after all, a man's real competition is not from the outside, but from within. He must constantly fight the opposition of his own inertia, leap the hurdles his own mistakes set in his path, conquer his inbred laziness and down that virile internal opponent—"I can't."

Competition is merely the salt on the real he-man's oyster!

HIS LAST ROUND

The mayor of Edmonton delights in telling the story of a friend who was out with him in the buffalo preserve when a big bull buffalo took after them. The mayor rolled under the fence, but his friend was not far enough ahead of the buffalo to take a chance. He circled around several times, but each time he approached the fence the buffalo was so close behind that he dared not slow up long enough to crawl under. Finally as he approached the fence he called out to the mayor—

"Tell my wife my insurance policy is in the top drawer of the dresser. This is my last time around."

* * *

Mrs. Murphy — Good morning, Mrs. Flannigan, an' what hev ye named the baby?

Mrs. Flannigan—We've named her Hazel.

Mrs. Murphy—With all the saints there are in heaven, then to name her after a nut!

* * *

"How long did it take your wife to learn how to drive an automobile?"

"It will be ten years in September."

* * *

Grandpa in a motor car
Pushed the lever back too far.
Twinkle, twinkle, little star,
(Music by the G. A. R.)

GONNA RAISE HER OWN

A bride walked briskly into a grocery store, and asked for a couple of good egg plants. As the grocer was wrapping them up, she asked, "How deep should these be planted to get the best results?"

"Planted," said the astonished grocer. "You're not going to plant them, are you?"

"Yes," replied the bride. "My husband won't eat any but strictly fresh eggs and the stores are so unreliable, I have decided to raise my own."—*Progressive Grocer.*

* * *

Ford made the worst mistake of his life when he made the new car four inches wider, the Iola (Kan.) *Register* believes, "Just think," argues the *Register,* "how many times in the past you have missed one by less than that. You'll hit them all now."

* * *

Visitor—"If your mother gave you a large apple and a small one, and told you to divide with your brother, which apple would you give him?"

Johnny—"D'ye mean my big brother or my little one?"—*De Laval Monthly.*

* * *

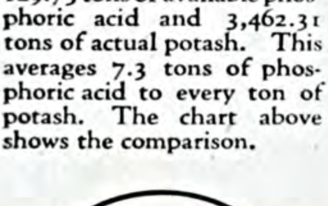
THE DIFFERENCE

"Modernists say 'there ain't no hell.' Fundamentalists say 'the hell there ain't."—The Rev. James Shera Montgomery, Chaplain of the House of Representatives.

Look back . . . then ahead

In 1920

Indiana farmers used 25,129.73 tons of available phosphoric acid and 3,462.31 tons of actual potash. This averages 7.3 tons of phosphoric acid to every ton of potash. The chart above shows the comparison.



In 1924

Farmers in the same State used 29,379.70 tons of available phosphoric acid and 8,788.90 tons of actual potash. Note how potash increased—one ton to every 3.3 tons of phosphoric acid—the use of potash was more than doubled.

LOOK back a few years at a typical corn state . . Indiana.

In 1920 her farmers used less than 3½ thousand tons of potash . . but in 1924 they used more than 8½ thousand tons of actual potash in their fertilizers.

Indiana is progressive. Her increasing use of potash is due to progressive farming methods . . more intensive cropping . . proper maintenance of soil fertility.

Look ahead . . are you maintaining the fertility of your soil? Are you keeping in line with other progressive farms?

Do your small grains lodge . . do you fail to get a catch of clover . . is your corn chaffy? If so, the percentage of potash in your fertilizer could be profitably increased.

Give more attention to the productivity of your soil . . a slight increase in your use of potash may mean a big increase in your profit.

Please send me a free copy of the useful booklet "Hints For Profitable Corn Growing" which you have prepared for corn growers.

Name..

Address or RFD..

County...............State...........

M-4

POTASH IMPORTING CORPORATION OF AMERICA

10 Bridge Street Dept. B.C. New York

ATLANTA SAN JOSE BALTIMORE

Sales Agents: H. J. Baker & Bro., 81 Fulton St., New York
West of Rockies: Meyer, Wilson & Co., San Francisco, Cal.

Genuine German POTASH

Better Crops

The Pocket Book of Agriculture

June 1926 10 Cents

de: Slaves — Tattooed Hogs — Her Majesty, Alfalfa —
t Price Disparity — Winning on Principles — Virginia

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

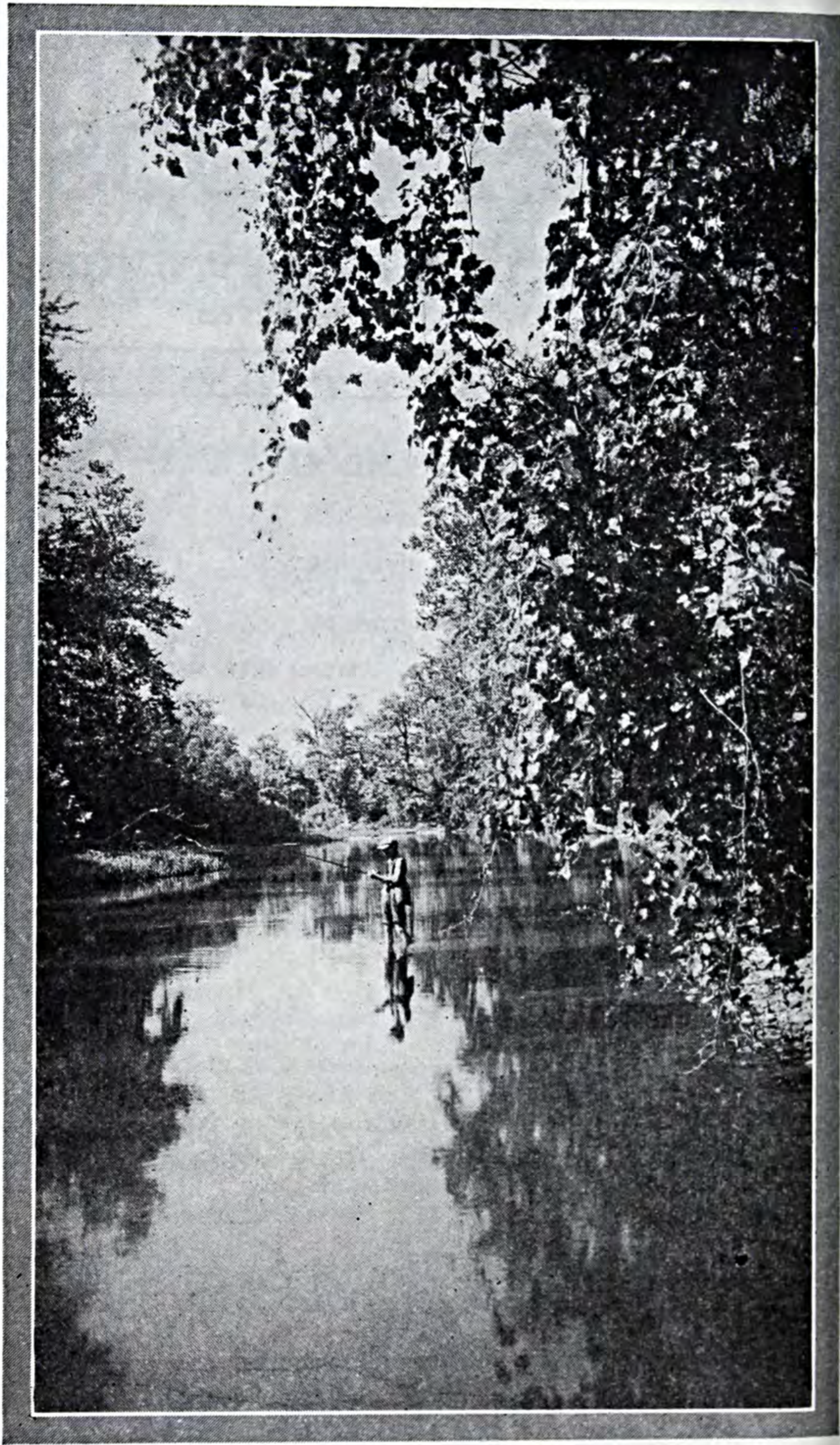
VOLUME VI NUMBER FOUR

Table of Contents for June, 1926

Who's Who of BETTER CROPS

EDITOR.....R. H. STINCHFIELD
CONTRIBUTING EDITOR.....JEFF McDERMID
MANAGING EDITOR.....G. J. CALLISTER
PRESIDENT.....E. K. HOWE
VICE-PRESIDENT AND TREASURER.....H. A. FORBES

EDITORIAL *Office:* 10 *Bridge Street, New York*



But should you lure
From his dark haunt, beneath the tangled roots
Of pendent trees, the Monarch of the brook
Behooves you then to ply your finest art.
—Thomson

Better Crops

Published Monthly by the Better Crops Publishing Corporation, a Subsidiary of the Potash Importing Corporation of America, 10 Bridge Street, New York. Subscription, $1.00 Per Year; 10c per Copy.

Vol. VI NEW YORK, JUNE, 1926 No. 4

An essay that may make a fork in your thinking route.

SLAVES

By Jeff McDermid

THE man who went upstairs merely to change his collar, and found himself, ten minutes later, fully arrayed in his *robe de nuit* and about to slip into bed in full daylight, was absent-minded!

But in addition to being *non compus mentus* he was the victim of a habit; for while his brain was busy on some absorbing, abstract problem please note that his fingers were busy undressing him without his knowledge—given the accustomed starting point his trained muscles completed the chain of customary action without being told.

Nature, to free man from the necessity of learning over and over again, day after day, how to do the simple little things he must do, teaches his muscles and nerves habits until they become so proficient that his conscious brain need no longer supervise their activities.

Note tomorrow morning the intricate gyrations your nimble fingers perform to tie your shoes; watch, consciously, just how your hands tie your four-in-hand or bow tie. Or better yet, describe now to yourself just how you button your coat: which hand does this and which finger that!

Then button your coat—and get a surprise.

You will discover that although your hands have buttoned and unbuttoned thousands—yes, millions—of buttons, that you do not know how the simple feat is performed.

Nature is kind to her chosen, partially freeing him from the necessity of overseeing his body's work. She lets a man shave in peace and comfort every day, his mind on more important things, his nimble fingers going through the habitual manipulations like a troupe of bored and blase trained seals.

But, in being kind, she oversteps the mark and with chains of steel shackles man to his habits so securely that once in their grip he can seldom release himself without almost superhuman effort.

The Reverend Doctor Schaeffer was right. There are only two kinds of habits: good and bad.

"What is a medium good egg?" asked Mark Twain when someone reported that So-and-So's poetry was neither bad nor good, but just medium. Mark knew that in many lines there is no middle ground—a thing *is* or it *isn't*, so there.

A good habit is one to which one should be willing to be a slave—that frees the mind of conscious effort by reposing the necessary confidence in a set of trained muscles which, like good employees, do their work well when the boss is not looking; or that leads on to better, greater, finer, safer and broader things.

A bad habit is—well, I say, do I have to go into all that? Let's get on.

THERE is a theory which men who breed animals have, called telegony—"the suppressed influence which a previous sire has on the subsequent one from the same mother."

And there is, I believe, such a thing as mental telegony in man—errors and fool ideas dropped centuries ago into the cosmic whirl still persist. We "breed back" to these old mistakes with a sureness and a persistency that to the progressive mind is disheartening and disillusioning.

The longer folks have done a thing the more likely they are to continue.

To attempt to inject new ideas into the public consciousness smacks of the foolhardiness of the swaggering bull who planted all four feet between the tracks, lowered his head, and dared the Limited to put him off!

Men are slaves to ideas of the past, to habits of their grandfathers. The race of men seems to run on and on simply through a momentum gained in previous generations. Anything new has to struggle for bare existence; and then after it is gradually adopted, let someone *try* to take it away!

Men will fight nearly as hard to hang onto a new idea now become old as they did to ward it off when it first presented itself.

Doctors still write prescriptions in Latin. But fifty years from the day someone teaches them to substitute Esperanto they will defend Esperanto against all comers and refuse any other substitute.

With nearly the whole world using the easily calculated Metric System, Americans still adhere to the moss-covered foot and yard; the ancient pound, mile, bushel and rod—but after adoption they will viciously protect the Metric System against all vilifiers.

That we are a little more receptive to a new idea now than ever before, I think is proven by the

(*Turn to page* 62)

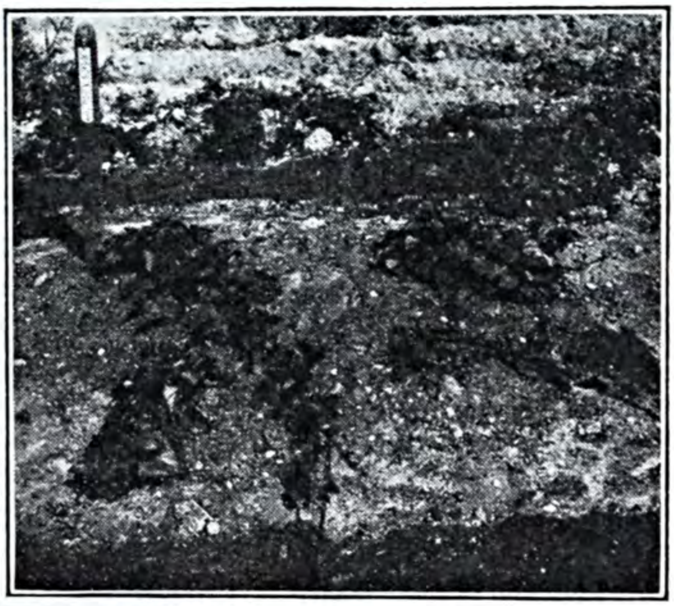
Fertilizer Injuries to Sweet Potatoes

By R. F. Poole

Assoc. Plant Pathologist, New Jersey Agr. Expt. Station

Editor's Note: *This article is of value as showing the effects of the different forms of potash and especially that sulphate is preferable to all other forms.*

BARNYARD manure, which is recognized widely as the best fertilizer for sweet potatoes, has become both so scarce and expensive that its use has been limited for some time. Commercial fertilizers have been sought for and used extensively for growing sweet potatoes in New Jersey.



The effect of fertilizer injury on sweet potato plants in sand plots. One plant to the right was almost completely defoliated. The fusaria that cause stem rot entered the injured roots and killed the plant

There is some but not a perfect agreement as to what is the best source of the necessary elements and what amounts should be used in a mixture as well as the quality of the mixture necessary to give the greatest returns in growing this crop. The use of nitrogen in mixtures varies from none to three per cent, the phosphoric acid from eight to ten per cent, and the potash from five to twelve per cent. The applications of the mixtures vary from 750 to 1500 pounds per acre.

It is sometimes a practice to use an additional application of 300 to 500 pounds of muriate or sulfate of potash and this results in severe damage unless applied in the fall or early spring. Kainit is sometimes used and applied broadcast at the rates of 500 to 2000 pounds per acre and this causes heavy damage unless applied in the fall and winter. It is sometimes doubtful if such large applications of potash are really necessary, but excellent results are more frequently obtained than are failures due to its use. In Europe it is the common practice to apply all fertilizers except soluble nitrogen well ahead of planting time—thus maximum amounts are safely used.

The use of commercial fertilizers, whether mixed at home or purchased already for use, have resulted in heavy losses on light sandy and other soils where the proper use of the mixtures were not familiar. The substances used for applying the nitrogen and phosphoric acid have not been injurious to the sweet potato, but the serious damage has been due to the toxicity of the substances from which the potash was derived.

The injury, which was most conspicuous and most severe in dry seasons, was first observed as a yellowing of the leaves and stems and finally the blackening and killing of all parts of the sprout. This took place from two to four weeks after the plants were set in the field. In some fields the loss of plants was more than 50 per cent of the planting. Affected plants which were not killed were at first stunted, but grew well later on in the season and sometimes produced a fair yield. The leaves on injured plants were very mosaic in appearance, and the tissue between the veins was frequently browned and spotted. Since parasitic fungi enter injured tissue much more readily than healthy tissue, the losses due to wilt or stem rot were increased on the infected soils when the plants were injured with fertilizer.

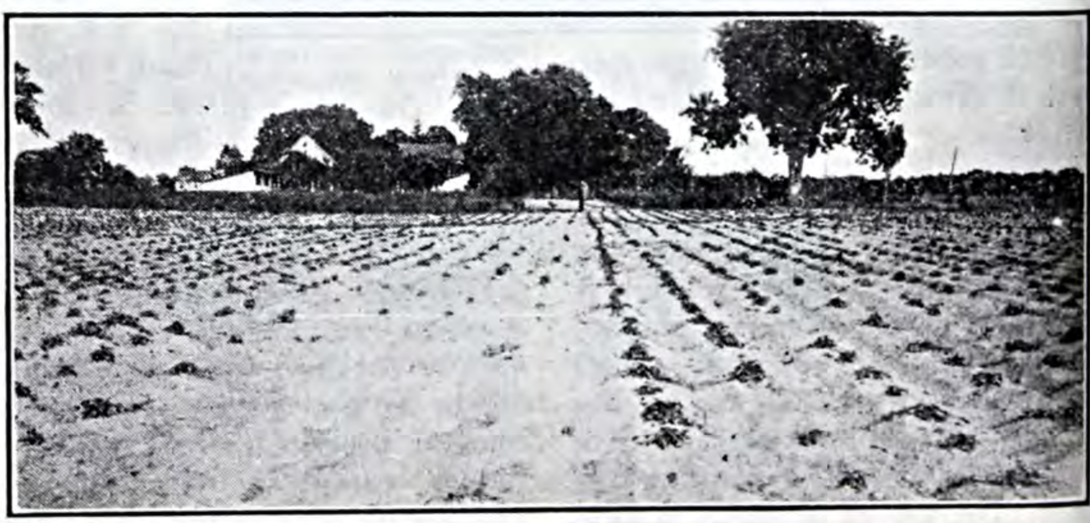
The use of potash is very necessary for growing the sweet potato and large amounts per acre are more apt to produce the desired quantity and qualities such as shape and color than are small amounts. The sulfate of potash is preferable to all other forms, since it can be used extensively without injuring the plants.

While muriate rarely causes injury, it sometimes does on the very light sands, especially when applied a few weeks previous to setting the plants. Where 300 to 500 pounds per acre is broadcast just before and after the land is first plowed in the spring no injury is apt to occur; however, the fall would be the proper time to make the heavy applications.

Kainit, the form lowest in potash, and most toxic to young plants, can be applied in the fall and winter at rates of 500 to 2,000 pounds per acre without any danger of injuring the plants.

The very best results and the least amount of injury would be obtained by applying separately part of the potash in the fall or early spring and from 500 to 750

(*Turn to page 47*)



Left of center—Three rows showing plants injured by a fertilizer containing kainit as the source of potash

Right of center—Rows that received the same amount of fertilizer but with muriate and sulfate of potash as the source of potash

Some interesting tax figures presented by a man who is in a position to draw conclusions.

Paying for Unnecessary Government

By A. M. Loomis

Washington Office of the National Grange

FARMERS have many local problems. They are not all ılike, nor all harmonious, even in the same neighborhood. They ıre less alike, and less harmonious in more widely scattered localties. The Illinois corn and wheat grower who sells these prodıcts and buys cotton cloth and cottonseed meal, has a very different view on some important matters than does the Alabama ɔr Georgia farmer who grows cotton, and buys flour and perhaps ılso buys either corn, or some of the meat animals to which it is ed.

BUT it is being increasingly emphasized by Dr. T. C. Atkeson, Vashington Representative of the National Grange, and by leaders n Grange activities both national nd local that there are some probems in which there is a common nterest among all the farmers of very section. It has been disussed at length in BETTER CROPS hat there is a common interest in better distribution of the costs f operating railroads between reight rates on farm products and n manufactured products. Farm roducts, it was shown by this tudy of Dr. Atkeson, and his brief efore the Interstate Commerce Commission, are carrying an unlue part of this load.

NOW Dr. Atkeson has come out with an equally important study showing how the increasing burden of taxation is veering down with fearful force on those dwelling on the farms and in the farming villages, of the country. This, he shows, is a common problem in which farmers from Maine to Florida to Seattle to San Diego have an absolutely common interest.

"The problem of the average farmer," says Dr. Atkeson, "is principally within his own line fences. In this sphere he labors to produce the crops and the live stock and their products, which enable him and his family to exist, to have the necessities, and in addition such pleasures, enjoyments, refinements, education, communication, and social, moral and religious refinements, as his abilities and his inclinations will permit.

"The American farmers today require far less of government than is being forced upon them. They are being made to pay for what they do not require. The average American farmers think, talk, or ask very little in the way of what the state or the nation can do for them. Peace, safety, daily mail, a good school and a passable road are about all they ask. Beyond these but based on them, the American farmer feels perfect confidence in his own ability to provide. He does ask, however, that this ability to provide should not be handicapped either by artificial benefits to other classes, or by unloading an excessive cost of government on his shoulders."

Upon this simple and sensible picture of farm life as it is for the majority of the twenty-five or thirty million men, women and children now living on and working the farms of the country, Dr. Atkeson, by the study of state and local taxation now completed, pours the flood of light as to the handicap which excessive taxation shackles to the farmer's ability to provide for his own.

"While federal taxes are being reduced the cost of state and local taxes are still going up," he says. Comparison between Census Bureau figures for 1922 and Grange tabulations for 1924 shows that as to state taxes alone there was an increase of more than $21,000,000 in the two years. This is also incomplete, as the Grange when this was published lacked figures from several states, and lacked many items from most all of the states. "I believe the increase in two years is closer to $40,000,000 than to $20,000,00," says Dr. Atkeson.

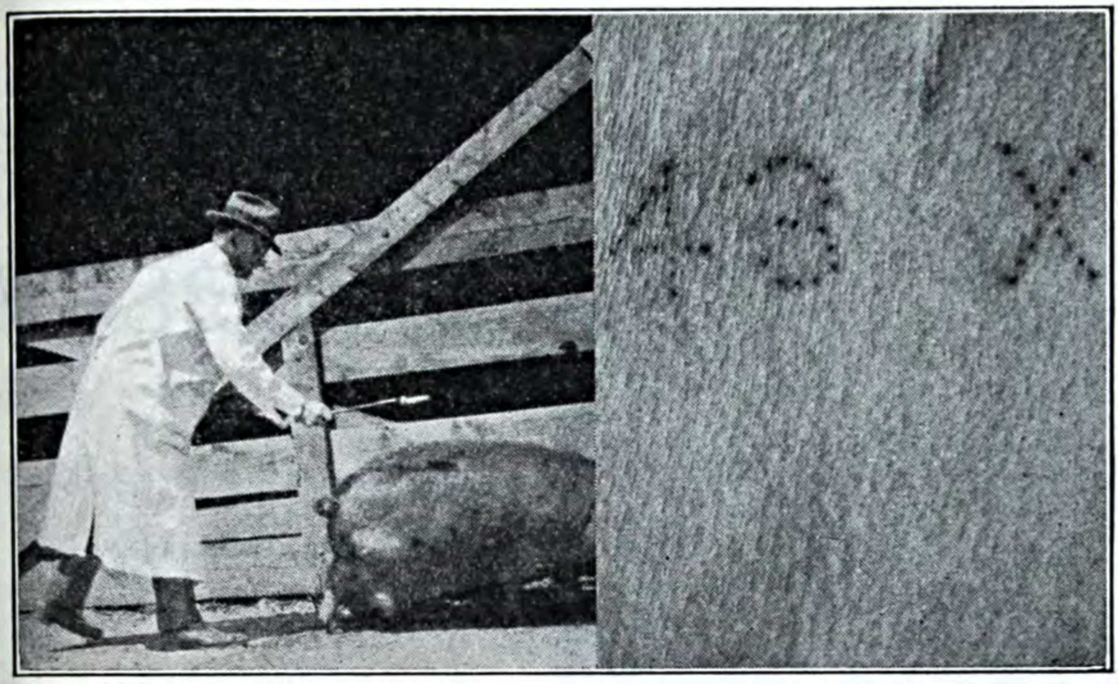
"The total federal government taxes for 1924 were $2,688,000,000. The total state and local taxes so far as tabulated, with several whole states missing, and dozens of items incomplete because of the faulty state systems which do not record local taxes at all in state tabulations, amounted to over $4,000,000,000, or more than 50 per cent more than the federal taxes.

"County taxes alone, where almost every dollar is a direct tax on farmers and farm property amount to as much as the state taxes. The county taxes are more than the state taxes in most of the states, all but those in which there are a number of very large cities like Illinois and New York.

"School taxes, raised also by direct taxes on real and personal property account for another item far in excess of the cost of state government, and an item which bears very hard on the farmer. Only nine states report school taxes less than the state direct tax. In three of these this is due to a system of state aid for schools. In some of the states the school taxes are three and even four times as much as the state taxes."

THE study of the records, state by state, as they can now be found in the Washington office of the Grange, shows a remarkable situation as to the various methods of levying the cost of this enormous governmental activity. In all of the states except a very few the bulk of the state taxes are direct levies on real and personal property. It would be interesting, if space permitted to detail the few exceptions and explain the special systems, like North Carolina, where no direct state taxes

(*Turn to page 54*)



Showing the method and the mark which is made

Tattooed Hogs

By L. S. Richardson

United States Department of Agriculture

THE circus "tattoo man" no longer has a monopoly on the age-old decorative art of tattooing. The American farmer is going to make use of the practice in marking his hogs so that they may be easily identified even after they have been hung on the hooks at the packing plant.

In the systematic handling and cooperative marketing of hogs many occasions arise when it is desirable to trace the origin of certain animals after slaughter. Some means of identification which is infallible has long been needed. There is nothing so lasting as the "tattoo" mark. Properly applied, a tattoo mark will resist all attempts to remove it and, after death, is as permanent as the skin itself.

The practice will have its most important use, perhaps, in connection with diseased animals condemned at the slaughtering places. In a cooperative shipment of hogs, those found diseased can readily be charged against the right owner. More than that, the tracing of the source of the infection to the farm may be a means of eradicating the source of further infection.

One example has been recorded where the tattooing of hogs led to the discovery of tuberculosis in a poultry flock on a farm supposedly free from the disease. The cattle on the farm had been tested and

(*Turn to page 55*)

Her Majesty

By G. E. Langdon

Wisconsin College of Agriculture

"King Timothy is dead!
Long live Queen Alfalfa!"

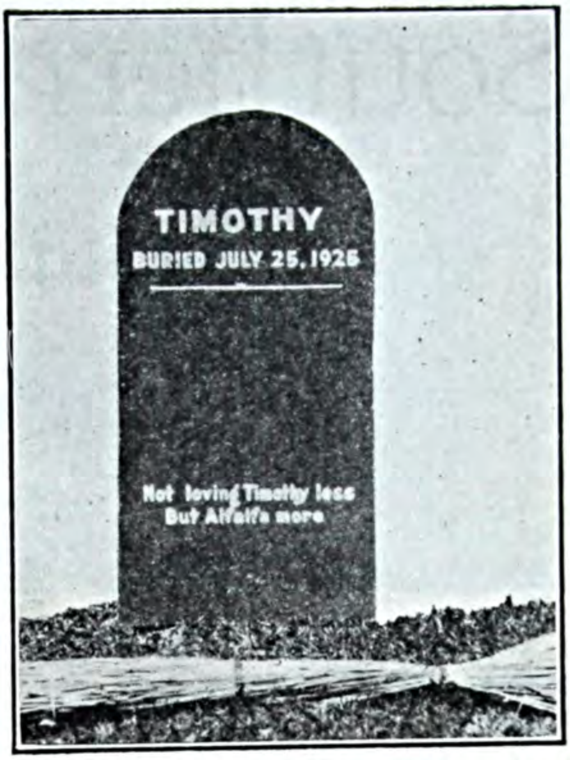
WITH this heartening cheer the young Queen Alfalfa is being crowned in many sections of Wisconsin, and the old monarch is given farewell honors.

The two pageants, "The Coronation of Queen Alfalfa" and "The Passing of Timothy" are proving very popular with Badger farmers. They have a simple dramatic value and are easy to stage and direct so that county agents and extension workers have found them very useful in teaching the value of the "Queen of Forage Crops."

The first alfalfa pageant was given on the shores of a beautiful lake in Burnett county, Wisconsin. It was planned by County Agent Edward Thompson, assisted by George Briggs and L. F. Graber, both of the Wisconsin College of Agriculture. The pageant has since been dramatized and enlarged by Mr. Graber; and the new version staged in many towns and

The coronation throne was simple and easy to make

ALFALFA



Timothy's wooden monument

A happy funeral is an unusual event. You will enjoy this one

villages in the state, as well as before more than 700 people in attendance at the Farmers' Course at Madison.

The pageants may be given either in a hall or out-of-doors on a temporary platform. Either 19 or 20 girls ranging in age from 8 to 16 years are needed. They should be dressed in white with some green trimmings or a green sash. The queen wears a gilded crown bearing the inscription "Queen Alfalfa" which may be decorated with alfalfa blossoms if they are available.

The Queen's attendants are: Lime, Fertility, Firm Soil, Hardy Seed, Two Cuttings, Marl, Inoculation, Mill Lime Waste, Early Removed Nurse Crop, Phosphate, and Ground Limestone. These girls should carry a banner or standard plainly labeled on two sides and held so that they can be seen by

(*Turn to page* 56)

The attendants who conduct the ceremony

Southern Ways *with* Peaches

By R. B. *Fairbanks*

Um'm—Georgia peaches! Read how they are grown

THE peach crop of the South has reached major proportions. Georgia ships more peaches to be used while fresh, than any other state in the Union. California produces more peaches than any other state, but these are largely used for canning purposes. North Carolina, Arkansas, East Texas, and Tennessee also produce peaches in comparatively large quantities.

Growers in the South long ago learned that to secure good prices, a quality produce must be offered. They have also learned that to produce a quality product, very thorough cultivation and fertilization are necessary. Pruning and spraying are equally important, but these without very thorough and efficient cultivation and fertilization will avail little.

Like the cultivating and fertilizing of any other crop, there are various methods of cultivation and kinds of fertilizer used by different growers of peaches. What we shall say in this article, therefore, should not be understood as "cut and dried" rules that are considered best by all growers. However, the methods which we shall describe are practiced by many of the most successful peach growers and are generally considered as the best for average conditions.

In commercial practice, it is generally the rule to plant some cultivated crop between the peach trees the first two or three years after they are planted. Certainly where the peaches are planted on medium poor ground, the time between planting and when the trees commence bearing, should be utilized for growing cover crops to be turned under and thus improve the fertility of the soil. However, if planted on reasonably fertile land these intercrops may be grown for two or three years without material harm to the peach trees, provided these intercrops are not planted too close to the trees and provided further that ample fertilizer is applied for both.

The trouble is, that many folks seem to think that when growing both trees and field crops on the same ground that the ordinary

A well tilled peach orchard in North Carolina

amount of fertilizer is enough for both, which, of course, is not the case. Ample quantities of both must be applied, as this method must be practiced if most desirable results are to be obtained.

Usually the peach trees are about 20 feet apart each way. When growing these intercrops in the peach orchard, a row space at least six and preferably eight feet wide should be left for the trees with none of the intercrop planted on this space. In other words, only 12 to 14 feet of the 20 feet of space should be devoted to these intercrops. When these intercrops are grown this space left for the tree row should be cultivated as carefully as the intercrops.

ONLY low growing crops and those that mature in a comparatively short time and do not consume abnormally large amounts of water, should be grown. The low growing truck crops such as beans, peppers, tomatoes, potatoes, etc., are suitable. Cotton is also all right. Any of these crops if grown in between the trees should mature early enough so that a fall cover crop may be put in.

Where the ground is reasonably poor when the trees are set, no attempt whatever should be made to grow these intercrops, but the entire time made use of to increase the fertility of the soil by the cover crôp route. In this case, the customary method is to cultivate from early spring until about June 1, at which time a crop of cow peas, bunch velvet beans, or soybeans are planted between the tree rows. These may be either sown broadcast or planted in rows, and are turned under in early fall in ample time for a winter cover crop to be put in.

The winter cover crop should consist of a mixture of some of the small grains and some of the winter legumes. For medium poor soil a mixture of hairy vetch and rye is best, because the rye will make a much better growth on poor land than will oats or wheat. Usually three pecks to a bushel of rye and 15 to 20 pounds of the hairy vetch seed are sown per acre. On soil that is reasonably fertile a mixture of a bushel and a half to two bushels of oats and 15 to 20 pounds of the hairy vetch is good. When this cover crop is sown on the ground for the first time, inoculation of hairy vetch seed is necessary.

Some orchardists plant only the

small grain as a winter cover crop. This is better than nothing, but very much inferior to the grain and hairy vetch mixture. These cover crops are turned under early in the spring. It is especially important to turn under before the small grain matures, because nothing is worse for peach trees than to have the moisture and plant food sapped out of the ground by a maturing crop of small grain.

Usually these winter cover crops are turned under just about blooming time or soon after. The ground is plowed shallow, because the peach is a shallow rooted tree and deep plowing is of course, injurious. The customary method is to turn under shallow with a turning plow, then scatter the fertilizer broadcast and follow with a disc harrow, which serves to chop the cover crop to pieces and more thoroughly incorporate it with the soil, as well as to mix the fertilizer with the soil.

There are different methods of applying the fertilizer. Some run a furrow on either side of the trees and put the fertilizer in this furrow and then cover it. The most generally practiced method, however, and one that seems best, is to scatter the fertilizer broadcast under the trees and out beyond the spread of the branches, usually twice as far as the spread of the branches. No fertilizer is put up close to the trunk of the tree. Usually it is not put closer than two and a half or three feet of the trunk of the tree.

VARIOUS fertilizer analyses are used. One grower likes one kind and another another kind. It is generally agreed, however, that a fertilizer analyzing approximately 8 to 10 per cent phosphoric acid, 4 to 6 per cent nitrogen, and 4 to 6 per cent potash is right for peach trees growing on sandy soil. About the same analysis has proved all right on clay soil. Some, however, on clay soil, find that an 8-4-4 is about the right analysis.

A goodly amount of nitrogen is needed in order to produce the proper amount of wood growth. The phosphoric acid, of course, is essential for the development of the fruit crop. The potash is needed to properly harden the wood and give the proper color, firmness and keeping qualities to the fruit and to increase the size

(*Turn to page* 60)

A good cover crop of cow peas between the trees

No. 3 of Professor White's series

Kentucky Blue Grass

By I. W. White

Soil Research Chemist, Pennsylvania State College

AT the time of my visit at the Kentucky Experiment Station I had an opportunity to study the various field experiments on the College Farm and was impressed with the remarkable growth of several crops. As a recent student of the late Cyril G. Hopkins, "I applied mine heart to know, and to search, and to seek out wisdom, and the reason of things."

THE picture of the Elmendorf herd grazing on the blue grass plain was still before me, and the cause of this wonderful natural growth of this matchless grass was uppermost in my mind. I asked my host the reason for these abundant crops and what fertilizer seemed to give the best result. His unexpected reply fully answered my question, for he answered, "We got no response from fertilizer treatment on the College Farm". Having lived in the East where the spoliation system of farming had so long been the practice his reply was even more surprising.

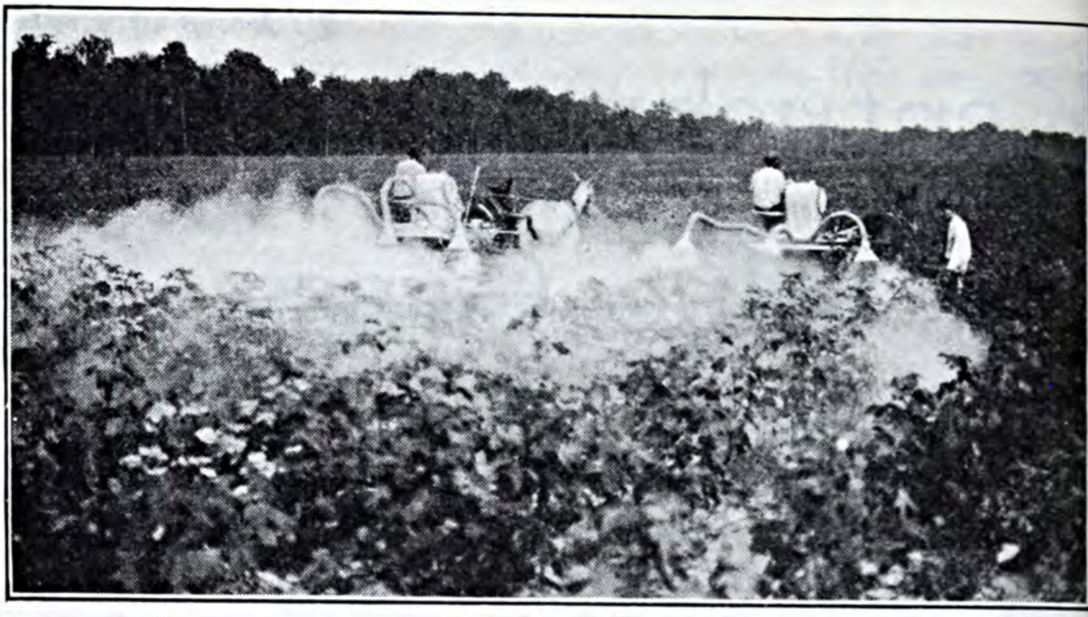
The failure of fertilizers to produce a crop response on this local soil suggested that the natural growth of blue grass was due to the unusual soil and not to more favorable climatic conditions.

A study of the composition of this Kentucky soil, with special reference to the phosphorus content should therefore furnish fairly conclusive evidence. Reference to the publications of the Kentucky Station showed that this blue grass soil to a depth of seven inches actually contains 625 times as much so-called available phosphorus as found on Dekalb soil at Snow Shoe. The following summary shows the phosphorus content of the Kentucky soil in comparison with the three Pennsylvania soils included in this story.

Reference to the above summary shows that the blue grass soil, formed from the weathering of phosphatic limestone, contains a supply of phosphorus almost unbelievable. Even more surprising is the fact that the blue grass soil at a depth of from 40 to 80 inches contains five per cent phosphorus equivalent to 100,000 pounds per acre, or equal to one-fourth its weight of tricalcium phosphate.

Beyond question the secret of the natural growth of blue grass in Kentucky is the phosphorus content of this abnormal soil. Here

(Turn to page 57)



Cotton growing can be a losing game, even when cotton prices are high, if it is attempted without up-to-date weevil control measures

That Price Disparity

By Arthur P. Chew

United States Department of Agriculture

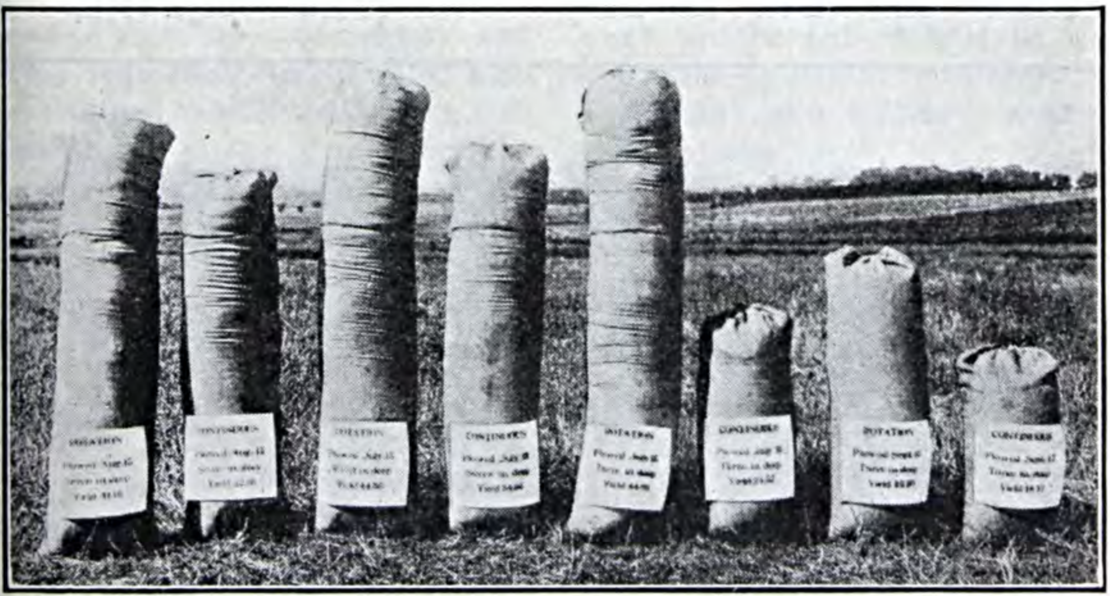
IT is a common weakness to dream of a Golden Age either in the past or in the future. Where you look for it may depend on whether you are an optimist or a pessimist, or perhaps on whether you are young or old. Pessimists and elderly persons usually have their Golden Age in the past. For them there are no days like the old days. The present is drab by comparison, and the future hopeless. Optimists and the young yearn toward a Golden Age in the future. Indeed, they often fail to make the most of the present by thinking about what the future may have in store.

JUST now, agriculture is in a pessimistic mood and consequently has its Golden Age in the past—to be exact, in that five-year period from 1910 to 1914. That stretch of years is supposed to have been pretty nearly ideal for the farmer. He measures things to-day by the way they compare with what existed then. Government agencies back him up in this habit by using a pre-war measuring rod for reckoning price movements and farm commodity purchasing power. It is widely held that we can tell just how sick agriculture is by comparing the buying-power of grain and livestock to-day with their buying power from 1910 to 1914. There is a belief that every step in the convalescence of the patient will be marked by an approach to the pre-war relative price situation.

That explains the interest of farmers in price index numbers. Statistics are usually dry, but not the statistics that show what kind of a deal the farmer is getting compared with that of other producers. All sorts of personal, economic, social, and political values center about statistics of that kind. They are the basis of the agitation for farm relief legislation. They prove to the farmer, and also to other people, that he has something to holler about. They get him a hearing in quarters that otherwise might be cold to his plea for help in struggling out of the slough of depression. The Department of Agriculture's index number showing the purchasing power of farm products today as compared with what it was before the war is the focal point of all this eager interest and profound concern. It is blazoned on every banner of agricultural revolt, and dominates every proposal for farm relief.

Well, it is proposed to do away with the present method of calculating farm commodity purchasing power by comparisons with a pre-war base period, and to adopt a post-war base period instead. You can imagine what sort of a rumpus that will kick up. A post-war base period for reckoning price movements of course would make the present position of agriculture look favorable rather than unfavorable as compared with the position of industry, because agricultural prices have risen more than industrial prices in the last few years. Instead of an index number indicating an agricultural position below par, we should have one showing it to be above par. That would be the result of exchanging a pre-war par, when farm commodity purchasing power was high, for a post-war par when it was very low.

Although the change is not yet decided on, it is probable that a large number of price-index numbers, including those of the Government, will be calculated on a post-war basis before long. Don't blame the Department of Agri-



A comparison of rotation with continuous cropping for winter wheat. Efficient methods can so vastly increase the margin between costs and prices that farmers see their best chance for profits in controlling costs, not prices culture for the change, if it is made. The initiative comes from business, which sees no point in hanging on to a 1910-1914 yardstick in view of the tremendous and perhaps permanent price-changes that have taken place since then. Business wants the Bureau of Labor Statistics to reckon wholesale and retail price movements on a post-war basis, and wants the Department of Commerce to report imports and exports in the same way. In calculating the purchasing power of farm commodities, the Department of Agriculture has to use industrial prices furnished to it by the other departments. If these other departments put their index numbers on a post-war basis, the department will be forced to do likewise, since it does not itself collect all the figures necessary for working out the problem.

How will this affect the farmer? Our answer will depend on what you think price comparisons are for. A pre-war base period indicating that the present state of agriculture is not good is useful in drawing attention to a national problem, and perhaps in winning legislative concessions. But many farmers think they wouldn't be able to make out a case for themselves without a pre-war basis for gauging their present position. They want pre-war price ratios constantly held up as a mark to aim at, in the belief that no price relationship less favorable to agriculture can possibly enable the farmer to prosper. This is a serious mistake. There is no proof that the pre-war position is either "normal" or necessary to farm prosperity. It is utterly wrong to waste time and money and energy in vain efforts to restore it by artificial means, in the belief that agriculture will go to the dogs unless it is restored.

Even as a means for making out a case for farm relief, the farmer is not wholly dependent on pre-war price comparisons. There are other, and perhaps better, ways of demonstrating that farm commodity prices are too low. Take for example the testimony of income statistics. Not since 1919 has the return from agriculture allowed both a commercial interest rate on its capital investment and reasonable pay for the farmer's labor, risk, and management. The crop

(*Turn to page* 44)

Improved Mammoth seed wheat on a Maryland farm whose owner worries less about price disparities than most farmers because he knows how to keep his costs of production down

Honored by Workers

By Ted Butlar

Dr. Andrew M. Soule

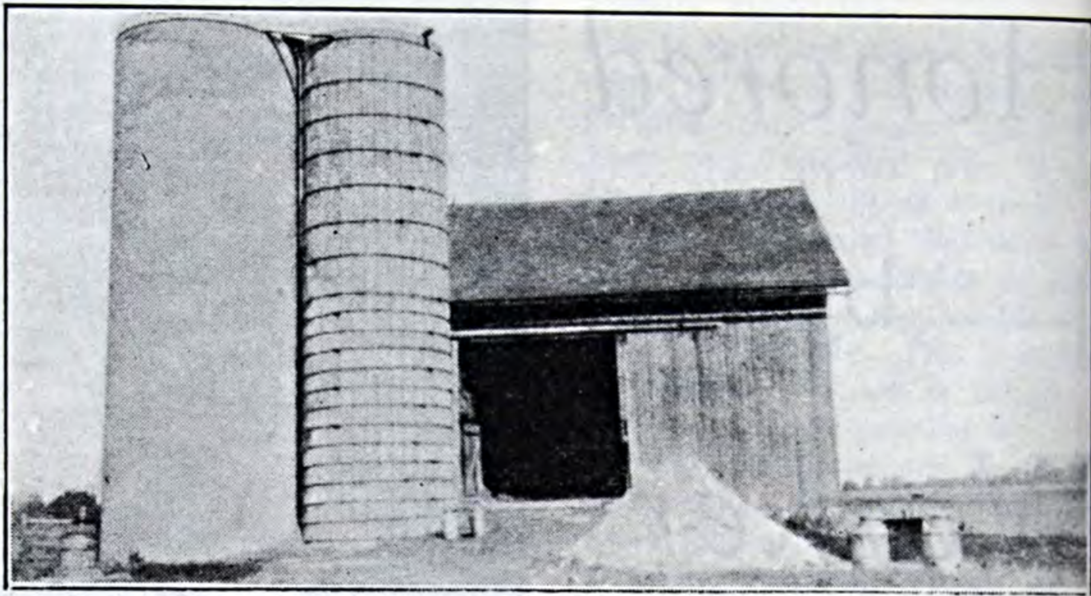
A brief sketch of a busy man

SOUTHERN Agricultural Workers met recently in Atlanta, Georgia, and elected a new head for their organization. In selecting the director of its policies, this association—made up of agricultural college and experiment station workers, agriculturists representing railroads, fertilizer companies, and other industries closely allied with agriculture—has chosen a man well and widely known throughout the South, Dr. Andrew M. Soule, president of the Georgia State College of Agriculture and the Mechanic Arts.

Oddly enough, Dr. Soule who has become such an ardent student and worker in all things pertaining to the betterment of agriculture in the South, was born near Hamilton, Ontario, Canada. All of his early school training was obtained in northern schools. He was prepared for college in the primary and secondary schools at Niagara Falls, Canada, received an associate diploma from the Ontario Agricultural College in 1892, and graduated from the University of Toronto in 1893 with the degree of B. S. A.

In 1894 he accepted a position with the Missouri Experiment Station as assistant director and in charge of the live stock and dairy work. In the fall of 1894 he was appointed assistant professor of agriculture and assistant agriculturist of the Texas College of Agriculture and the Texas Experiment Station. He served in this capacity until the fall of 1899 when he was called to the University of Tennessee as professor of agriculture and director of the Tennessee Experiment Station. In 1904 he was elected Dean of the College of Agriculture and Director of the Experiment Station at the Virginia Polytechnic Institute. In 1907 Dr. Soule became President of the Georgia State College of Agriculture and the Mechanic Arts, which position he still holds.

(*Turn to page* 61)



Silos and lime are a part of this farmer's creed

WINNING on

By H. E. McCartney

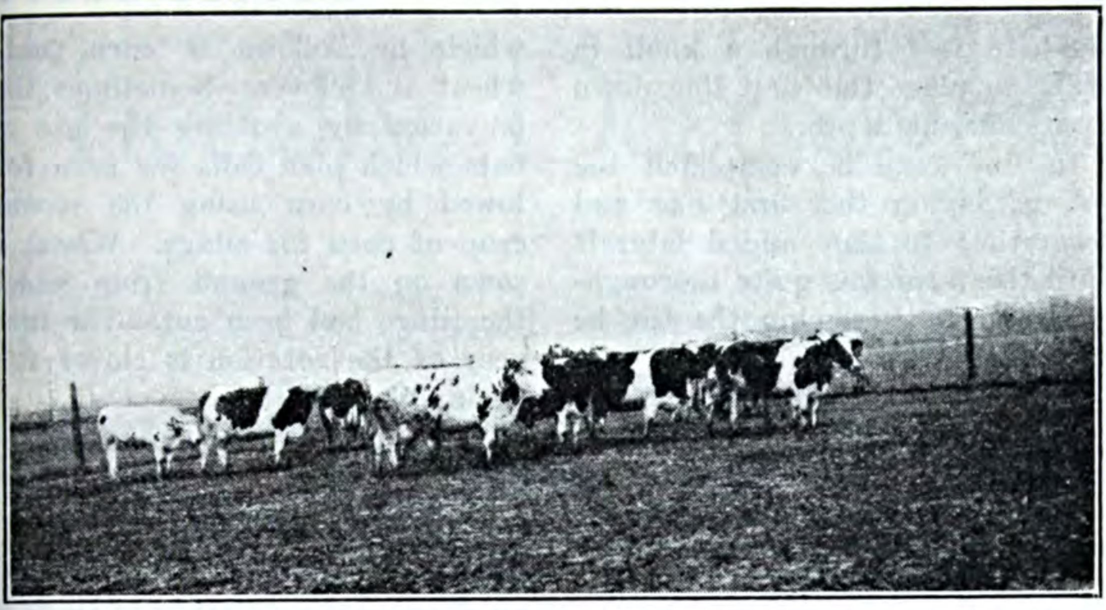
Fairmount, Indiana

THIRTY-THREE years ago Charles Zigler, a carpenter, Swanton, Ohio, bought a farm in the northern part of Ohio. The land was poor. It never had been in a high state of fertility. It had not been half farmed and the meager crops which had been grown had been sold off and nothing returned to the soil.

After the new owner had made a cash payment of about one-half of the purchase price he did not have much money left with which to provide working equipment and capital to support his farming operations. A cheap team, a second-hand wagon, a few of the simplest of farming implements, one cow and a few chickens made up about all he could boast of with which to start.

Men at the corner grocery laughed and said that Zigler was a fool to quit the carpenter trade and try to make a living on that old worn out 38 acres.

NO sooner had he gotten possession of the place than he began to practice the first of the ten principles that have won final success for him. Expressed in his own crisp words this was, "You must feed the soil if it is going to feed you." He began to haul manure from town and to spread it carefully over his fields. He contracted for all the manure from one of the two livery barns in a nearby village. Later he was able to get the entire output from the second one.



Mr. Zigler keeps a herd of well bred Holsteins

PRINCIPLES

Here are 10 which made a carpenter a successful farmer

Whenever possible he bought from people about town who kept a horse or a cow. In relating his early experiences he said, "Many a time during those first years I went to town with only 25 cents in my pocket and spent that for a load of manure."

The first crop he put in was 5 acres of fall wheat. This was made possible because he had gotten possession of the field as soon as the crop was removed after he had completed the purchase in the summer. One object in sowing wheat was to get straw. This he furnished to men who had livestock in town. In turn he got the manure, thus carrying back to the farm more fertility than the sale of a small crop of wheat had removed. With regard to this he said, "I was too poor to afford livestock, so had to resort to every means possible to secure manure."

BEFORE he had actually grown a crop or even before he had put in any crop except the wheat, he was practicing the second of his principles of success. This is as he put it, "Get the surplus water off." Part of the farm was wet and needed drainage.

His difficulty was to secure tile. The problem of labor did not worry him for he could do the work himself. Finally he bargained for enough to run one line from the wettest spot on the place to a point where he could secure a satisfactory outlet. It was necessary that he dig to a depth of seven and one-half feet through a knoll in order to place this first line down to a sufficient depth.

In due time he completed the job of laying this first line and from time to time added laterals until the farm was quite thoroughly drained. In laying the tile he says that his experience as a carpenter was very helpful to him in getting the necessary levels and in laying out a permanent plan of drainage that he might install as opportunity might afford. Likewise that same previous experience has been useful in laying out fields in a systematic manner and in planning and doing the thousand and one operations incident to running the farm.

"KEEP livestock," is Zigler's third principle. After his start with one cow he purchased others as rapidly as he had the cash or credit. The purchases he was able to make and the keeping of the female off-spring soon built up a herd that could take care of all the feed produced on the farm. Keeping livestock means more with him than merely using the feeds to produce fertility to return to the fields. Good livestock, he says, will make a profit above the market value of the feed. Being located in a section which is very favorable to dairying, he has naturally turned to that line and has kept a herd of milk cows continuously since he was first able to purchase cattle to place with the one cow he had when he started farming. Today he has a nice herd of Holsteins. The cream checks are sufficiently large to indicate that the keeping of livestock is profitable for him.

"ROTATION" is his next principle. The succession of crops which he follows is corn, oats, wheat and clover. Sometimes this is varied by avoiding the use of oats which plan calls for corn followed by corn using the second crop of corn for silage. Wheat is sown on the ground from which the silage had been cut. The final year of the rotation is clover following the wheat.

"YOU must replace the fertility in the soil if you are to produce good crops," says this philosopher of good farm practice. Accordingly he has used commercial fertilizer in rather liberal quantities. He has adopted a plan of using 500 pounds of mixed acid phosphate and potash on his wheat. For nitrogen he depends upon the clover crop and upon humus in the manure which he returns to the fields.

It is his desire to constantly improve the crop yields on his farm and the use of fertilizer is one of the things upon which he depends for this purpose. He has used lime, also.

At the time I visited him the farm help was completing the job of digging 6 acres of potatoes. This crop was part of a 12-acre field upon which a car of 46 tons of lime had been used the preceding year and upon which commercial fertilizer and manure had been applied during the rotation. The yield of potatoes was slightly under 300 bushels when a few miles away a yield of 200 bushels was boasted of as high compared with an ordinary run of 100 bushels per acre.

He makes use of green manure crops, also. Whenever he has any ground that would be left bare through the winter, he seeds it to rye. This he plows under the next spring. "It all helps," he says.

(*Turn to page* 58)

Friendly Destroyers

By Don B. Whelan

Entomologist, University of Nebraska

MANY farmers in the north central states have good cause to rejoice in the fact that there is present in many localities, an active enemy of the Colorado potato beetle or "potato-bug." It is a sucking insect belonging to the stinkbugs or pentatomids, which, for the most part, are beneficial. This insect is known by one of its two common names, "The Potato Beetle Destroyer" or "The Friendly Perillus."

For over half a decade this insect has become more and more numerous until now it is quite widely distributed. In Michigan it has been present for many years and some farmers state that it has almost completely kept the potato beetles under control, but in most cases the destroyers are not yet numerous enough to make the spraying of potatoes unnecessary.

These destroyers have been seen repeatedly on the potato plant, attacking the larva of the potato beetle, piercing their bodies with their spear-like mouth and sucking out the body juices. The adult bettles are also attacked as well as the larvae. With its long legs the destroyer is quite spry in its actions, easily overtaking the escaping potato beetles.

The potato beetle destroyer can be found during the warm periods of the late fall, early winter or early spring, in houses, sheds or other convenient shelters where they are hibernating. If found in the house they should not be killed as they are doing no harm but are spending the winter months there until spring when they return to the fields in search of their favorite prey.

ONE should not cease spraying for the potato beetles just because these beneficial insects are present. Inasmuch as the destroyers suck their food, the arsenical sprays that are used against the beetles have little direct effect upon them. However, in these days of intensive warfare on the part of the farmer against insects which attack his crops and consequent difficulty to realize that there are still some bugs ready to enlist on the side of man, steps should be taken to recognize these friends and protect them wherever possible. Educators are working toward that end.

Planting strawberry slips with the old-fashioned, back-breaking method

Unbending Backs

By
V. T. Bartle
University of Wisconsin

A MACHINE, which at first a doubting public ridiculed and rejected, has made possible the development, upon an economic and extensive scale, of commercial cabbage and tobacco growing. This implement—the tobacco or cabbage planter—has been used successfully in unbending the back of "The Man with the Dibber."

As long as man was required to bend his weary back to the tedious tasks of planting by hand strawberry, cabbage, and tobacco plants, truck gardening was destined to remain an unpopular occupation; but, with the invention of the planter and other types of time and strength-saving garden and truck field equipment, the possibilities of extending the industry began to materialize.

That "times have changed" is perhaps the most common observation of the pioneer truck or tobacco growers. They remember well the anxious periods of waiting for rain when the strawberry, cabbage, or tobacco plants had reached the proper stage for planting. And at last, when the much desired rains had fallen, they were among the crews of six to eight men who plodded forth into the freshly cultivated fields, each carrying a basket laden with young plants. The setting of each plant

The stick planters straightened the backs but still made a lot of hard work

in Farming

¶ More than 2,000,000 fertile acres in the U. S. are devoted to the growing of truck crops. Science has helped to unbend the backs that plant them. This is the second of this series

meant stooping over, and the task was such that each worker invariably returned home at twlilight with a tired, aching back.

Then following the invention of a spade type of planter which eliminated much of the bending but which still demanded the services of a large crew of men. The strawberry slips were carried in a box attached to the belt of the planter; and both hands of the worker were thus freed to operate the tong and shovel planting device. But even this improved method had its drawbacks, and the truck grower began to seek better ways to set his plants. It was then that he conceived the idea of adapting the tobacco transplanter for this use.

Forty years ago, Frank Bemis, a Wisconsin farmer, journeyed to Madison to demonstrate his original, crudely constructed planter. Little did he realize that he had invented a machine which would later unbend the back of thousands of truck growers from Canada to the sweet potato growing sections of the South and from California to New Jersey. Nor did he ever fully appreciate that he had designed a machine which would have a lasting effect even in foreign countries.

The work of Bemis did more than help straighten the back of "The Man with the Hoe" — it practically revolutionized the tobacco industry. It proved that three men could do the work that formerly required the services of six or eight. With the cost of labor for a given amount of production reduced, the truck grower was thus encouraged to enlarge his business from "truck garden" to "truck fields" and this is just what he did and has been doing ever since.

Not only is the modern truck grower able to produce with more economy of time, labor, and strength, but in many instances the quality of his product is decidedly improved. According to the old methods of hand transplanting the tender roots of the young plants were frequently doubled as the planter hurriedly thrust them down into the soil. Today, the planting machines are so adjusted that the dirt sifts in around the roots and consequently, the latter remain spread out as nature intended. Naturally, the roots are able to adapt themselves to new conditions in a shorter period of time, and growing processes are quickened.

(*Turn to page 52*)

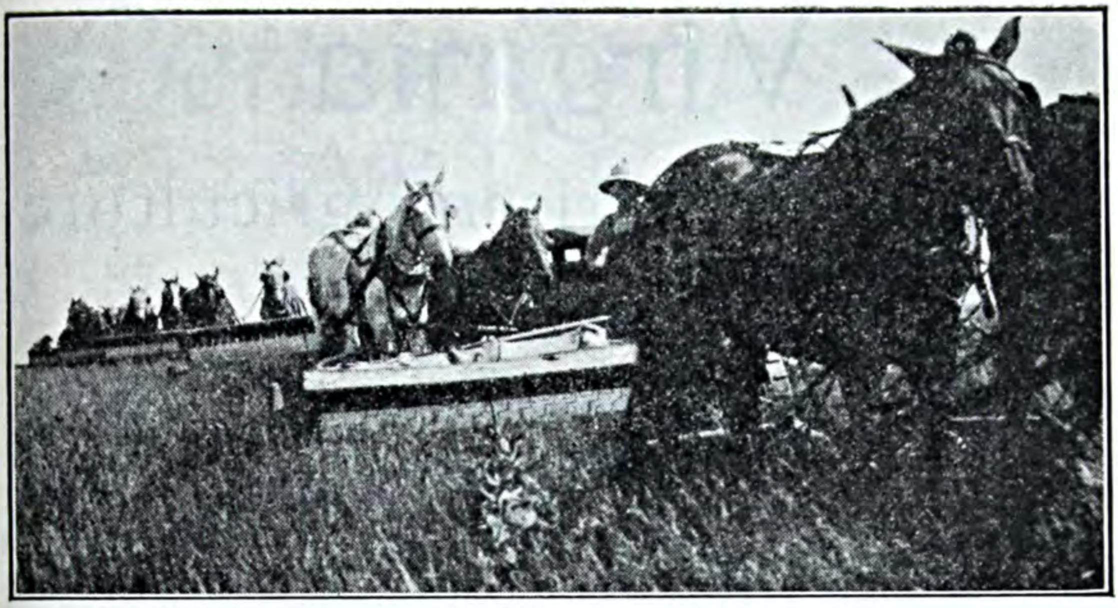
Considered Cabbage Planter a Joke

As a boy, Frank B. Swingle, now associate editor of the Wisconsin Agriculturist, saw at a middle-western county fair one of the first plant setting machines. It was exhibited by Daniel Clow, a Wisconsin inventor who had previously perfected the old Clow reaper.

Having helped set, by hand, many crops of tobacco, Swingle was much interested in the machine for which the inventor claimed so much. In common with other boys in the tobacco sections of the country, Swingle was able to recall vividly "planter's backache" which never failed to return each tobacco planting season. Planting by hand was both slow and tedious.

None of those who viewed Clow's exhibit had ever seen more than a small patch of cabbage and so could not appreciate the need of a planting machine to say nothing of the mechanical possibility. It may be, then, that the 30 and 40-acre cabbage fields now common in Wisconsin, have been largely the results of the invention of the mechanical planter. Of course, no one in that group at the old county fair had any notion of the future of the cabbage growing industry. What was then a joke has become a great boon to planters of large acreages.

Plant setting machines save labor and do a better job



Blue grass seed must be stripped quickly when ripe

The "Kentucky" *of* Missouri

By C. A. Helm

Associate Professor of Field Crops, University of Missouri

PREPARATIONS for the blue grass seed harvest of northwest Missouri are now under way. The center of this activity is to be found in Gentry county, where the returns from blue grass seed ranks as one of the primary assets of the county.

Blue grass seed stripping is not limited to Gentry county alone, however, but is an asset in some 20 counties in northwest Missouri.

The weather man is the most prominent figure during May and June. The weather conditions are the primary factor in determining whether it is to be a successful year or not. Plenty of sunshine is all that is needed. The harvesters will do the rest.

The industry ranges from the hand stripping by individuals to the operating of from 25 to 50 machines by contract companies and seed merchants. There are several types of strippers used in harvesting blue grass. In many cases, individuals buy the castings from local foundries and make their own machine which consists of a large drum with spike nails which revolves at high speed. The seed and chaff is thrown under and behind the drum. A tilting lever is used to raise or lower the drum to adjust to the height of the grass. At frequent intervals the strippings are removed and placed in large burlap bags ready to be taken to the curing beds.

As soon as the strippings are obtained from the fields, they are

(*Turn to page* 53)

Virginia

Cradle of American Agriculture

By T. K. Wolfe

Agronomist, Virginia Agricultural Experiment Station

Editor's Note: *No. 2 in our series of visits to agricultural experiment stations takes us to the "Old Dominion" state. These pictures and story present a few things to remember about the commonwealth where some of our first farming was done.*

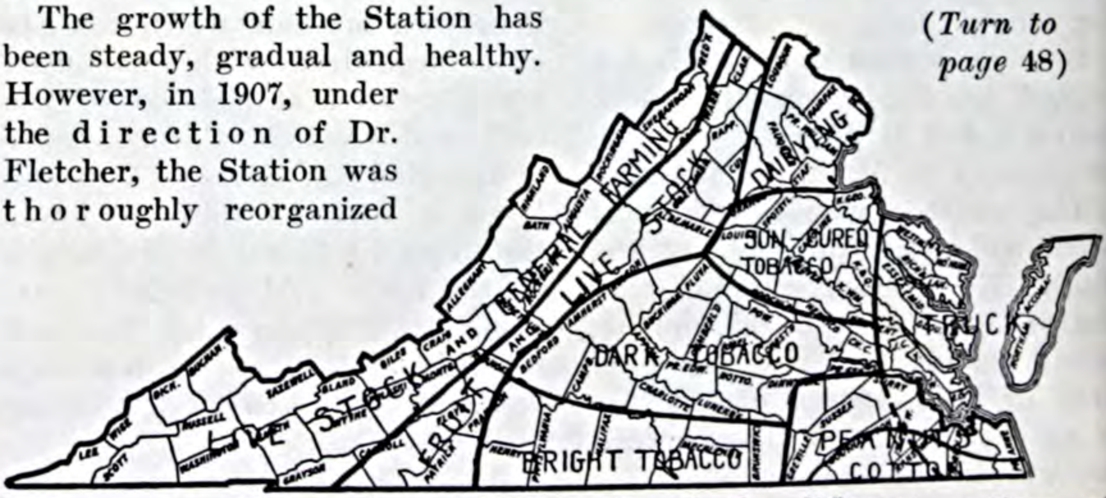
THE Virginia Agricultural Experiment Station, which was organized in 1888, is located at Blacksburg, Montgomery county, Virginia, on soil of the Hagerstown series at an elevation of 2,100 feet above sea level. It has a historical setting in that it is situated on the first stream found flowing westward by white men in America and in its boundaries occurred the famous Draper's Meadow Indian Massacre of July 8, 1755.

The growth of the Station has been steady, gradual and healthy. However, in 1907, under the direction of Dr. Fletcher, the Station was thoroughly reorganized and the research work of all departments was placed on a good foundation for sound and influential development. Previous to 1907 much creditable work was brought to completion but since 1907 the progress has been comparatively rapid and marked.

The Virginia Station has had seven directors during its existence. Their names and terms of service are as follows: Professor W. B. Preston (1888-1890), Professor W. D. Saunders (1890-1891), Dr. J. M McBryde (1891-1904), Dr A. M. Soule (1904-1907), Dr. S. W Fletcher (1907-1914), Professor W. J. Schoene (acting, 1314-1916), and Dr. A. W. Drinkard, Jr. (1916 to date).

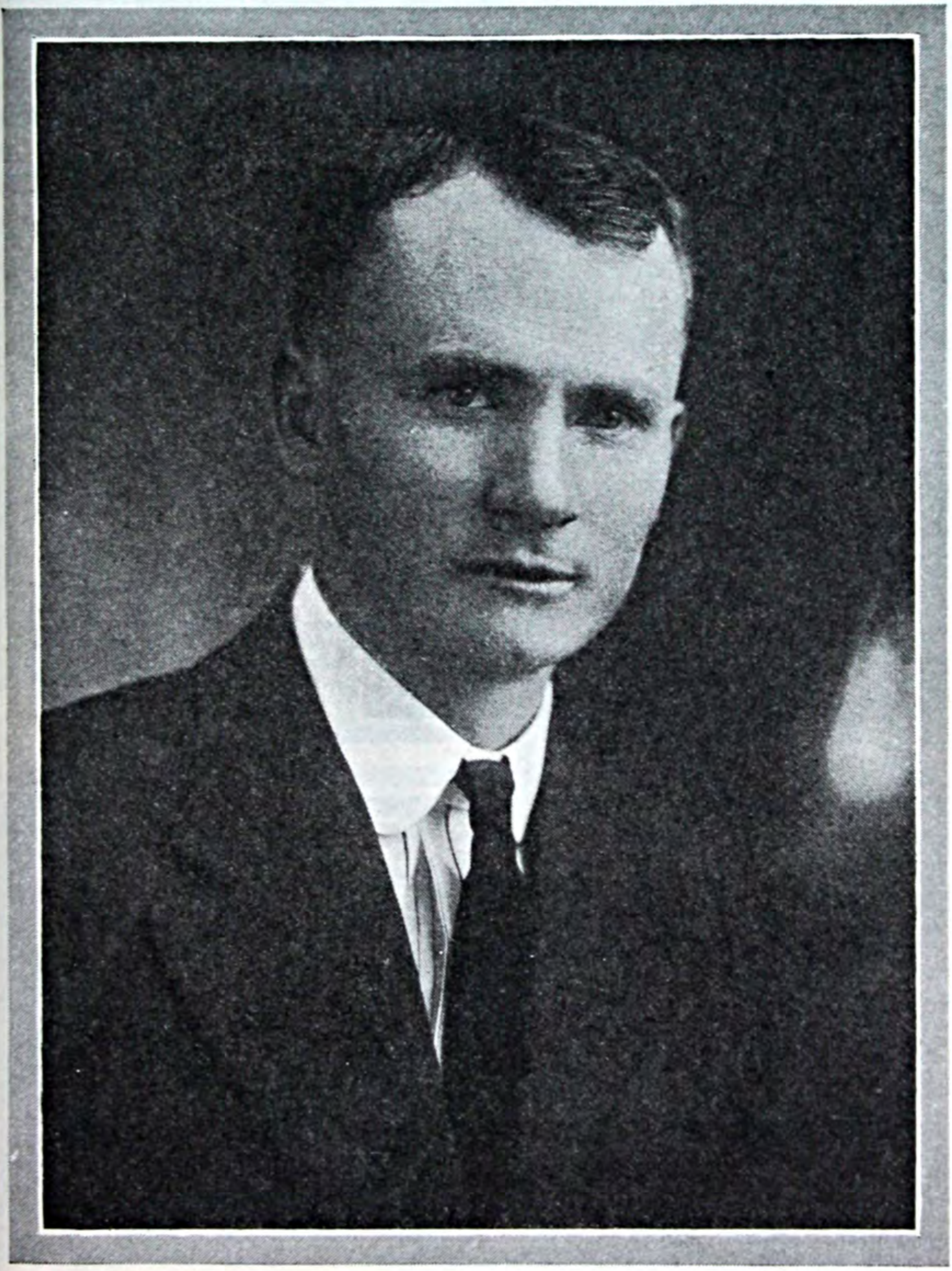
In 1907 the Station employed 15 whole or part-time research workers while in 1925 it employed 34. There has been a gradual increase in the number of depart-

(*Turn to page* 48)



Showing the chief agricultural pursuits of the different sections of Virginia

Better Crops' ART GALLERY of the month



Dr. A. W. Drinkard, Jr.
Director, Virginia Agricultural Experiment Station,
Blacksburg, Virginia

Where Virginia experiments for her farmers.

V. P. I. No. 1 oats, an improved strain of oats developed by the Virginia Agricultural Experiment Station has yielded exceptionally well on Virginia farms.

Orchard grass breeding plat where valuable new types are being isolated. This is a long-lived, deep rooted perennial bunch grass used for hay and pasture. It makes good early spring and late fall grazing.

Agricultural Hall—the main building of the Agricultural Experiment Station.

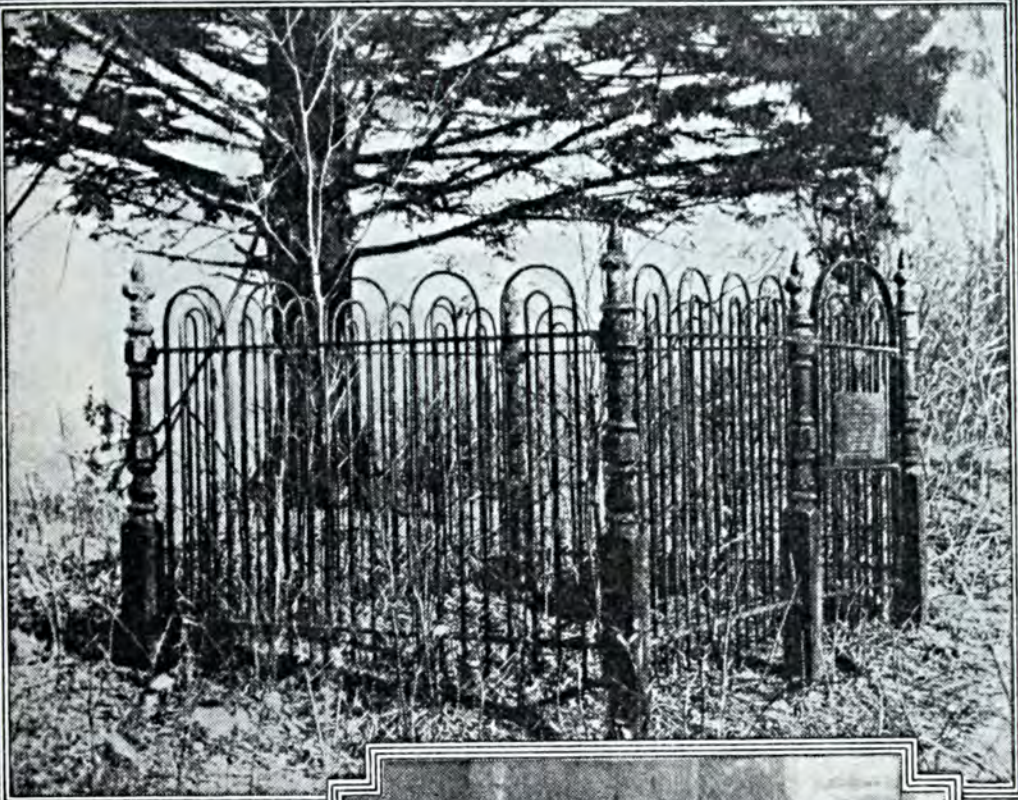
A rare combination—a trained and experienced scientist, a successful and practical farmer, and an inspiring teacher—Professor T. B. Hutcheson, Head of Virginia's Department of Agronomy.

Wheat on left following tobacco which received no fertilizer—on right following tobacco fertilized with. 400 lbs. nitrate of soda; 700 acid phosphate; 200 sulphate of potash. Wheat received no fertilizer. Both plats were limed.

Senator Stanfield (center) with Oregon Committee which called on President Coolidge to support a California-Oregon land relief bill.

Virginia:

The big apple recently used to celebrate the Apple Blossom Festival at Winchester, Va., which has become an annual event.



A memorial is being planned for Johnny Appleseed, strange nomad who scattered apple seeds through the Middle West in early '80's.

New York:

A new use for pigs—Chorus girls from a new musical show, "The Girl Friend" are using them for pets.

P. D. Sanders, Maryland entomologist, showing an interested farmer the asparagus beetle on a big Eastern Shore asparagus farm.

Twin Percheron colts, thought to be the only pair living, were recently born at the California Agricultural School, Davis, California. As twin colts are rarely born to draft mares, the little fellows are attracting nation-wide attention of horsemen.

The Editors Talk

For who would keep an ancient form
Thro' which the spirit breathes no more?—
Tennyson.

THE agriculture of New England today compared with that of the sixteenth century may be likened to an old automobile and the same automobile when new.

NEW ENGLAND'S STANDARD FARMS

While there are many successful farms in New England today, there are thousands of abandoned and dilapidated farms. Every evidence of a generally prosperous farm life at some time in the past exists. The remains of large, well constructed houses and barns, with miles of hand-laid stone fences are what greet the eye today. It is a sad picture, but one that can be retouched and made as beautiful as in past days.

Present conditions in New England are due largely to movement of the farm people to the broad acres of the Middle West, where vast areas of easily tilled, fertile soils were in past years to be had for the asking.

With the increase in our population and development of the agricultural areas in the Middle West, has come a condition of scarcity of desirable farm land in this section and consequent high land values.

People who are agriculturally inclined must now consider the once profitable abandoned farms in the East. Thousands of such farms await the tiller of the soil and fortunately can be bought at prices that are nominal.

With the vast development of the manufacturing industries in New England has developed simultaneously one of the best markets for farm products in the country. Millions of mouths in this region must have food daily, which at present largely comes from the west and south.

The poet "Whittier" describes New England as cold, bleak and barren—her mines those of ice and snow and her soil those of rock and yellow sand. But he further says:

While on her rocks and on her sands
And wintry hills, the schoolhouse stands
And what her scanty soil denies
The harvest of the mind supplies.

But Whittier was not a modern farmer—he was a poet.

In spite of the abandonment of New England's farms, in spite of the general belief that the soils here are extremely poor, let it be understood this is not so.

The harvest of the mind—education, scientific research—far-sightedness of big industries and railroad systems, through their various agencies and experts, have demonstrated that New England soils can be made unusually productive. With proper attention to the selection of crops for the many soil and climatic conditions here; with proper fertilization of the soils; with introduction of new types of farming, conditions here can be made highly satisfactory, and farming quite as profitable as in the agricultural regions farther west.

In short, New England's abandoned farms are mines of potential agricultural wealth. What they need is brains and brawn—men and women akin to the Puritan fathers, real pioneers in American agricultural development. Truly, New England should and in a large measure can be self-supporting.

"Nothing is to be expected thence but by labor."

SO wrote John Smith, leader of a little band of colonists who settled in Virginia. He explored the bay of Chesapeake and discovered the Potomac and the Susquehanna.

SECURED BY LABOR

John Smith brought to this region 105 colonists "48 were gentlemen and only 12 were tillers of the soil". It was the first successful and permanent settlement. After five years of struggle, the fortunes of Virginia were secured.

Success was due "to the conviction of the settlers that the secret of the new world's conquest lay simply in labor".

Nothing complicated or difficult to understand—simply "in labor". But the lesson was only learned by experience, after much wasted life and effort. It displaced a delusive dream of previous settlers—a poetic fancy, a dream of easy gold.

Hence, after these bitter experiences, John Smith wrote "nothing is to be expected thence but by labor".

That was written in 1606.

How often have we since cultivated the same dream of easy gold—government assistance—magic political help!

For three centuries since John Smith wrote—the fortunes, the happiness and prosperity of our country has been secured in one way only—by labor.

So it will continue. No one knows this better than our six million farmers."

> *"Knowledge of production alone may make a man a slave.*
> *Knowledge of distribution alone may make a man a plutocrat.*
> *Knowledge of consumption alone may make a man a parasite.*
> *Knowledge of all three makes a man an effective citizen of democracy."*
>
> GLENN FRANK,
> *President, University of Wisconsin*

SOIL CLINICS ENROUTE

AGRICULTURE is very old—railroad transportation is very new. The routes of transportation systems were laid out for a great variety of reasons. Chiefly, to get from one important point to another by the quickest route and the straightest grade.

The problem of developing much of the agricultural land over which the railways were laid now presents itself. The development of such land works beneficially in two directions. It brings better, more frequent and cheaper service to the inhabitants along the railroad and more freight to the railroad itself. In other words, it improves the link between the farm and the markets.

As one of our important railroads has pointed out, cooperation rather than individual action is the spirit of the day. The railroad—the farmer—and the agricultural colleges are neighbors. It is in this spirit that a soil fertility train has been operated by the New York Central lines in Michigan, where we had the pleasure of meeting the workers in charge of the train who were employed, both by the Agricultural Department of the New York Central Railroad and the Michigan State College of Agriculture, particularly from the Soils Department.

The train stopped at various points along the lines of southeast Michigan. Wherever stops were made the farmers and merchants turned out in large numbers to attend the meetings and bring soil samples for examination and for testing. Everyone seemed well pleased with the service that was rendered.

The purpose of the train in the fewest words is—to assist in the conservation of our greatest natural resource, which is soil fertility. Again as the railroad officials point out, this is a "gift bequeathed to us for safe keeping by the generations of men, animals and plants which have preceded us by millions of years." As pointed out by the "head soil surgeon"—"this greatest natural resource is fast slipping away. Farms which were producing 30 bushels of wheat and 80 bushels of oats are now doing well if they produce half as much. Farming cannot be made to pay on a 50 per cent yield per acre. It is our purpose to call attention to the seriousness of this soil fertility depletion and to present the best methods of combating it by proper rotations, proper applications of limestones and adapted fertilizers and other good farm practices. The laboratory car furnishes the farmer an opportunity to have their soil samples tested and to discuss their soil problems with us first hand."

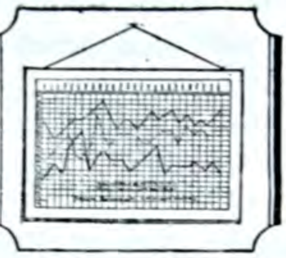
In discussing the lime and fertilizer problems of southeast Michigan, Professor O. B. Price, among many others, made the following pertinent statement: "It is estimated that approximately 35 to 50 per cent of the soils in southeast Michigan and the thumb district need lime." Lime was then discussed in detail. Professor Price also pointed out that there are very few soils in Michigan that do not respond to the application of fertilizers. The points to consider in the profitable use of fertilizers were then discussed.

The train was made up of three cars—the New York Central Agricultural Demonstration Car used as a laboratory car, a lecture car equipped with motion picture apparatus, and a business car for living quarters for the crew.

The crew was made up of Professors O. B. Price, Geo. Grantham, C. E. Millar, and Messrs. D. A. Matthews and J. A. Porter, all of the Soils Dept., Mr. Lawrence Bell of the Agr'l Engineering Dept. and E. J. Leenhouts of the New York Central Lines. Dr. M. M. McCool was on the train from time to time.

Again—the farmers—the railroads—the colleges are neighbors. This good work of the Agricultural Departments of our large transportation systems is to be highly commended. It should be continued and heartily supported.

AGRICULTURAL DEVELOPMENTS



By P. M. *Farmer*

The Rising Rabbit

The rabbit, well known as one of the greatest of multipliers, is now getting increasing attention from the Department of Agriculture. A survey has been made to locate rabbit breeders in all parts of the country and lists of these breeders have been compiled. Attention is being given to the study of rabbit production with a view to solving the problems of the industry and developing this source of meat and fur. One of the breeds which is receiving attention is the chinchilla, which has been receiving attention in the United States since 1918. It is essentially a utility rabbit which weighs about 6 pounds at maturity, but attempts are being made to increase the average weight to 9 or 10 pounds. The chinchilla has a particularly good pelt with soft, thick, silky fur about an inch long which resembles in color the fur of the South American chinchilla, a combination of slate, pearl gray, blue and white. In the past excessive claims have been made regarding the value of the fur and for that reason the industry has received a black eye in some regions. The pelts usually bring more than ordinary rabbit skins, say from $1.00 to $3.50 each on the raw fur market.

Earthworm Farming

Earthworms have long been said to be a benefit to the soil, although they are great pests in lawns and in golf greens. But it is not generally known that the ordinary earthworm is sometimes grown under control conditions as a source of bait for fishermen. Earthworms, says the Department of Agriculture, multiply by producing eggs laid in little capsules in the ground. The worms become full grown in four or five months. One method of growing is to sink a box not less than 18 inches deep into the soil in a shady spot. The top of the box is hinged or removable and placed two or three inches above this surface. The soil with which the box is nearly filled may be a rich dark loam kept quite moist but not too wet. The department suggests the easiest way to collect foundation stock is by the use of a flashlight or lantern on humid evenings, as at that time the worms may be found upon the surface of ground which has been devoted for some years to lawn or sod. Some raisers of *lumbricus,* which is its scientific name, feed him by spreading ordinary molasses on one side of a gunny sack which is then laid on the surface of the ground with the sticky side down. The back of the bag is sprinkled with water. Sometimes powdered bread crumbs and crumbled hard-boiled eggs are used.

Woodland Pasture Not So Good

Woodland pastures make the prettiest scenes for the livestock photographer but they do not make the most beautiful bank accounts. According to some tests made at the Experiment station at Wooster, Ohio, grass grown out in the sunlight produces much more per acre and the grass is much sweeter. It was found that a plot 64 feet square in the open produced 676 pounds of grass during the season while plots of the same size in woodlands cut only an average of 97.4 pounds. Weeds compete with the grass more aggressively in the shady pasture. In these plots the weeds made up 76 per cent of the yield, whereas in the sunlit plots weeds made up only 40 per cent. The woodland grass contained 38 per cent less sugar-forming carbohydrates than the grass grown in the open. This grass also contained 22 per cent less total nutrients, pound for pound.

Close Cotton Bears Earlier

The boll weevil has caused a lot of changes in the methods of growing cotton. One of the most important is the practice of growing a closer stand so that the plants will produce less vegetative growth and begin fruiting earlier. In South Carolina the experts have decided that it is best to have one or two plants every eight or twelve inches to induce them to hurry along and beat the weevil. At Clemson College plants eight inches apart bore 124,000 blossoms up to August 15, while at the same time plants spaced 16 inches had borne only 108,000 blooms and those 24 inches apart had only 93,000.

Co-ops Get Bigger

Along with an increase in number of farmers' cooperatives, the local cooperative associations have been increasing in size, says the Department of Agriculture. In 1915 the average numbers of members for each local association was 122. It is now 155, a gain of 33. Ten years ago reports were received from 4,683 associations whereas the last year the Department heard from 9,245 independent locals and units of federations. They had a total membership of 1,435,516. And these figures do not include the large scale centralized associations. Some of the details are interesting. Associations marketing dairy products increased in average membership from 83 to 124. Grain marketing associations increased from 102 to 130. Livestock shipping associations grew from 140 to 230. Fruit and vegetable associations membership decreased from 124 to 118 average.

To Study Disease in Tropics

Scientists who are doing the pioneering in the work of understanding and controlling diseases of humans and animals do not limit their field of discovery to the laboratory, but go out as the explorers of old on ships, on horses, and afoot. During May and June a party of scientists sponsored by Johns Hopkins University and the Rockefeller Foundation will go into Panama and Nicaragua to study control measures against the hookworm disease. One of the parties of the expedition will include Dr. Maurice C. Hall, Chief of the Zoological Division, Bureau of Animal Industry, U. S. Department of Agriculture, famous for his discovery of carbon tetrachloride as a cure for hookworm disease and one of the greatest helminthologists.

While on this expedition Dr. Hall, in cooperation with others, will make a survey of the disease of livestock, particularly parasitic diseases, in Nicaragua. He says the Bureau of Animal Industry wants to know what diseases of domestic animals are to the south of us as the Tropics is a reservoir from which certain diseases flow northward.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

An Afternoon on a Rittergut

By Dr. Guy A. Peterson

Madison, Wisconsin

FOR one who was unaccustomed to German agriculture under modern conditions, it was a great eye opener to spend an afternoon walking over Rittergut Nienhagen with Rittermeister A. St. Kuehne's inspector, or foreman as he would more generally be called in America.

I talked first with the head bookkeeper on the farm to get "the lay of the land." Of the 1,295 acres operated, 1,162 were under the plow, 120 in permanent pasture, while the remainder were in roads, buildings, and waste. The diversification of the crops is indicated by the acreage in each which was, 244 winter wheat, 187 sugar beets (before the war there were twice as many), 131 spring barley, 106 fall rye, 94 oats, 84 alfalfa, 81 fall barley, 75 potatoes, 63 Victoria peas, 31 green picking peas, 31 horse beans, 19 root crops for cattle and sheep, 16 onions.

This farm is just an average sized large farm, like many thousands of others in that country. In spite of the many improvements and new machines, it requires a host of workers to operate it, for besides the Rittermeister, who serves as the commanding officer of the whole organization, there are 121 men, women, and children who receive a yearly salary from the proceeds of the farm.

Directly under the Rittermeister, as the right hand man, is the inspector, or general manager. This is the man with whom I spent the afternoon. He usually rides from one part of the farm to another, directing the overseers and managers, but he does no manual work whatever. He told me that it is not customary for an inspector to help with any work as the laborers would lose their respect for him if he did.

As assistant to the inspector, is the "Verwalter" or second officer. He, too, does no manual labor, but goes out to superintend the various activities as directed by the Inspector. Under him is the "Hof Verwalter" who superintends all the work around the barns. This superintendent gives the various feeders and stockmen orders, but he does not assist with the fork or shovel, except to illustrate the proper use of these tools. Five overseers make up the remainder of the group of men who give orders. These overseers wear working men's clothes and can help with manual labor at rare occasions without injuring their reputations, but the men over them are dressed in the finest cut and fashion.

Two bookkeepers, with two boy assistants, keep account of all time and money spent on any project. When I was there they were reducing the inflation time records to the gold mark standard so they would be comparable.

In charge of the stock are two cowfeeders, one of whom is the "Schweizer," one swine herder, as the hogs are run in pastures during the summer in the same way as sheep are herded, and two shepherds. These men, of course, have their appropriate number of helpers.

One miller is kept busy grinding feed and flour, storing purchased feeds, and attending to this end of the farm work. One woodworker or "Stellmacher" repairs wooden wheels or anything wooden that needs attention. He has a very well equipped tool house to work in, for he has much of the steel and iron work, too.

Most of the real work is done by common laborers. On this farm, in addition to the 14 overseers and skilled workmen, there were 45 men, 45 women and girls, and 17 "Burschen" or boys, 14 to 15 years old. Many transient laborers from Poland or from the city are hired in the summer as well.

Accommodations for the workers are very good in comparison to those on many farms in Germany. The married families each have a little brick house and a little yard where they can keep some poultry and livestock. The unmarried girls and men have army style barracks where they sleep and have their meals. The girls sleep three or four in a room, and though they have no accessories like dressers or looking glasses, they do have electric lights, a comfortable place to stay, and a shower bath where they can get clean if they care to do so.

When the mother, son, or daughter worked they were paid a cash wage at the end of each week. The amount varied with the sex and age of the laborer, ranging from about 50 cents a day for a single man over 18 years of age, to only a few cents a day for young girls. The pay line on Saturday night when the wages are given out is a most interesting thing to see.

Germany looks upon tenancy as a thing greatly to be feared because of its consequences on the land. They point at the growing percentage of tenancy in the United States as a dangerous state of affairs. There can be no question but what a permanent class of tenants, with no ambition to become owners of a farm in later life, is an undesirable thing, but one cannot help but think that it is better to have a class of good tenants, who are looking forward and expecting to buy farms of their own, than to have this line of laborers.

The inspector dropped into the bookkeeper's office to interrupt our musings on the labor situation, with the remark that he was ready to make a tour of inspection over the farm. When he asked me whether I would rather walk or ride, I told him that we would walk, as we could see more in that way.

We first went across a willow plantation. Willow culture is an important part of the farm business in many sections of Germany. The trees are grown in damp places, the fagots being hauled home for fuel and the good branches being sold to basket and furniture makers. Willow rods are also used by bakers to push the bread into the long ovens. Some plantations are cut every year while others are allowed to grow longer, depending on what the branches are to be used for. In some sections, for example around Hamburg, the willow stumps are about eight feet high, and the new growth is cut off every year or two. When smaller brush growth is desired, the willow twigs are laid in low wet land in rows a few feet apart with ditches dug between the row to let the water drain out.

We left the willows to see an alfalfa field. Three boys, driving oxen, were cultivating it with heavy iron toothed drags. One would think that this would dig up the plants, for the teeth were set straight up and down, and the field was being dragged both lengthways and cross-ways. The inspector told me that a few days spent in dragging not only killed many weeds, thereby resulting in a better quality of hay, but the mulch thus formed serve as a valuable aid in retaining moisture, so the yields were very noticeably increased as well.

As we crossed this field to the next we saw about 50 women on an adjoining farm who were digging quack grass roots with forks. A single man was directing the entire squad. Unfortunately no sun was shining so I was unable to get a picture. I couldn't understand how a farmer could afford to go to so much effort to kill off quack grass, but the inspector said that after this weed gets a good start it can be eradicated in no other way. Then, too, the neighbor had no other work for his women to do just at that time but he had to keep them at work in order to have help a little later in the season for sugar beet culture and harvesting.

I was due for a surprise as we got to the wheat fields, for they were cultivating them, or rather hoeing them as they called it. Three men followed four oxen pulling the cultivator which is supplied with a sort of garden hoe attachment. Each trip takes as many rows as the drill took at seeding time. One man drives the oxen, one walks along in front of the cultivator, holding a guide pole or steering device, and a third follows the machine to set it into the ground and pull it out again as they get to the ends. It looked like a pretty slow process, but my companion said it was a great improvement over the hand hoeing method, and that the yields are enough higher to more than pay for the work.

The spring wheat was just coming through the ground but it was being worked just the same.

Partial view of the stone buildings around the square

Lighter drags were being pulled back and forth across the spring seeding. Small sized rollers, oxen pulled, followed the drags to pack the plants in again. It looked to me as though the wheat was too small to be handled in such a vigorous manner, but it evidently pays or they wouldn't do it, and it wouldn't be a universal practice among the better farmers. In case pounding rains pack the surface, the ground is often dragged two or three times after the wheat comes up.

Two eight-foot drills with three men and four horses to a drill and one overseer for the two of them were sowing oats. As far as man power operation was concerned, the machine was being run in much the same way as the hoe.

(To be continued)

That Price Disparity

(From page 18)

year 1924-1925 was the best American agriculture has had since 1919-1920. Yet even in that year the average farmers, after allowing hired man's wages for the labor of himself and his family, had left only 0.3 per cent as interest on his investment. What better proof could anyone ask that there was something wrong with prices?

Then there is the showing of production costs. You can not prove from production costs alone that agricultural prices are too low. Production costs vary on every farm, and no satisfactory averages have been compiled. Moreover, some items that are costs to one man are profits to another, as when a landowner saves rent or interest that a tenant or a man running an encumbered farm would have to pay over to someone else.

Nevertheless, when important "cost goods" are relatively higher than farm commodity prices, it is a fair guess that there is not much margin left for the farmer after paying all expenses. Cost goods include labor, farm implements. lumber, building materials, etc.—all of which are relatively higher in price than farm products. If you want more evidence that agriculture is getting the thick end of the stick, you might mention recent farm bankruptcy statistics and banking troubles in agricultural states.

What we particularly need to know, in order to judge the significance of the proposal to drop the pre-war base method of calculating farm commodity purchasing power, is whether that method really tells you what the disparity is between agricultural and industrial prices. That is the vital point. We hear a lot about price disparities nowadays. The term is generally used to indicate how much more grain or meat you have to deliver today in return for a given amount of clothing or farm equipment or building materials than would have been necessary before the war. This assumes that the pre-war position was a natural and normal "par oı exchange," as the international financiers put it. But how are you going to know what exchange basis for commodities is "normal" between agriculture and industry, at a time when all values are in flux?

(Mr. Chew will conclude his discussion next month)

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

The proper use of lime and its effects on several crops is well illustrated with nine pages of pictures in Bulletin 430 written by A. W. Blair, entitled "More Lime Needed for New Jersey Farms." The crops illustrated include alfalfa, timothy hay, soybean hay, oats, vetch, rye, and sweet clover. The writer gives the results of experiments with various amounts of lime applied in a rotation conducted by the New Jersey Agricultural Experiment Station. The lime was applied once in five years. Legume and non-legume green manure crops were grown. Commercial fertilizers were used. The bulletin is very practical and in addition to the experimental results discusses which is the best form of lime to use and how to make calculations to use lime at the greatest profit. It is interesting to observe that samples of acid soils on which nothing would grow were studied. Acid phosphate was used without lime. The soil still remained acid but the barley grew as well as where lime was used. The writer believes that the toxic properties were due to the soluble aluminum compounds which were rendered insoluble by the acid phosphate. This confirms the work of Hartwell & Pember and others.

Based largely on cooperative experiments conducted with farmers, C. J. Chapman and A. R. Whitson have written "Fertilizers for Special Crops," a very practical and interesting bulletin discussing the use of fertilizers on potatoes, tobacco, canning peas, cabbage, onions, sugar beets and in the home garden. The bulletin is simply written and will be reviewed at greater length in the next issue.

Fertilizer data on the consumption of commercial fertilizers by areas or by plant food constituents will become more and more useful and necessary as the opportunities for statistical work develop. It is very encouraging therefore, to note that the Experiment Station of Missouri now records the use of fertilizers in each county of that state; also the tonnage used in the fall and in the spring. Missouri also reports that the larger proportion of the tonnage sold is made up of the standard brands. This information is contained in Bulletin 239 "Testing Fertilizers for Missouri Farmers, 1925."

Other bulletins are:

"A Preliminary Report on Experiments with Fertilizers for Peach Trees," University of Arkansas, College of Agriculture, Agricultural Experiment Station, Fayetteville, Arkansas. J. R. Cooper, C. B. Wiggans.

"Some Chemical Constituents of Fruit Spurs Associated with Blossom Bud Formation in the Baldwin Apple," New Hampshire Agricultural Experiment Station, Durham, New Hampshire, Technical Bulletin 29, December, 1925. H. R. Kraybill, G. F. Potter, S. W. Wentworth, P. T. Blood and J. T. Sullivan.

"Effect of Phosphorus upon the Yield and Time of Maturity of the Tomato," New Hampshire Agricultural Experiment Station, Durham, New Hampshire, Technical Bulletin 28, June, 1925. J. R. Hepler and H. R. Kraybill.

"Inspection of Commercial Fertilizers for 1925," The University of New Hampshire Agricultural Experiment Sta-

tion, Durham, New Hampshire, Bulletin 219, *November,* 1925. *T. G. Phillips, T. O. Smith, A. W. Petre.*

Soils

"A General Purpose Soil Auger and Its Use on the Farm," University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California, Circular 306, *May,* 1926. *Stanley W. Cosby.*

"Pecan Soils," University of Florida, Agricultural Experiment Station, Gainesville, Florida, Press Bulletin 380, *April,* 1926. *G. H. Blackmon.*

"Suggestions on Rotation," Timely Soil Topics, Radio Lecture No. 5, *Ohio State University, Cooperating with United States Department of Agriculture, Columbus, Ohio.*

"Soils of Eastland, El Paso, Lubbock, and San Saba counties," Texas Agricultural Experiment Station, College Station, Brazos county, Texas, Bulletin No. 337, *January,* 1926. *G. S. Fraps.*

Crops

The California Agricultural Extension Service has started the publication of a series of bulletins on California crops and prices. In explaining this series, B. H. Crocheron, Director of Extension, states that each bulletin will discuss the economics of a crop prominent in California agriculture. Heretofore, those who desired statistics for any particular crop had to search through long and varied lists of references. This publication will bring the material together in one publication and present it in graphic form. The first publication is on Peaches, and gives facts available for the assistance of farmers interested in growing the crop, both to those who have already planted peach orchards and to those who may wish to determine whether they should plant them. The bulletin is full of valuable data assembled by H. R. Wellman and presented in a well picturized and systematic manner.

Onions are one of the most important crops of Massachusetts, there being 3,820 acres within the boundaries of the state devoted to the growing of them in 1925. In the interest of these growers, the Massachusetts Agricultural Station has just issued progress reports of its experimental work in Bulletin No. 227 "The Connecticut Valley Onion Industry." The publication contains excellent articles on "The Present Status of the Connecticut Valley Onion Industry" by Lorian P. Jefferson; "Fertilizers for Connecticut Valley Onions" by A. B. Beaumont and O. E. Street; "Onion Blight or Downy Mildew" by A. Vincent Osmun; and "A Study of the Life History and Control of the Onion Thrips" by A. I. Bourne.

Others include:

"Revised Estimates of Crop Acreages, New York, 1862-1919," *United States Department of Agriculture, Washington, D. C., Department Circular* 373, *April,* 1926. *Donald Jackson, Joseph A. Becker.*

"Asparagus Plumosus" (Asparagus Fern), University of Florida, Agricultural Experiment Station, Gainesville, Florida, Press Bulletin 384, *April,* 1926. *Harold Mowry.*

"Research Service to the Massachusetts Apple Industry," Massachusetts Agricultural Experiment Station, Amherst, Mass., Bulletin No. 226, *January,* 1926.

"Eighty Winters in Michigan Orchards," Agricultural Experiment Station, East Lansing, Michigan. Special Bulletin No. 149, *February,* 1926. *F. C. Bradford, H. A. Cardinell.*

"Emergency Hay and Pasture Crops," Agricultural Experiment Station, East Lansing, Michigan, Special Bulletin No. 150, *February,* 1926. *C. R. Megee.*

"Effect of Nutrient Conditions on Colloidal Properties of Certain Vegetable Crops," Agricultural Experiment Station, East Lansing, Michigan, Technical Bulletin No. 74, *February,* 1926. *John W. Crist.*

"Peonies in the Garden" New Jersey Agricultural Experiment Stations New Brunswick, New Jersey Circular 184, *February,* 1926. *Charles H. Connors.*

"Pansies from Seed," New Jersey Agricultural Experiment Station, New Brunswick, New Jersey, Circular 185, *February,* 1926. *Charles H. Connors.*

"Results of Seed Tests for 1925," *New Hampshire Agricultural Experiment Station, Durham, New Hampshire, Bulletin* 220, *December,* 1925. *M. Gale Eastman.*

"Subterranean Clover-A New Sandy Land Grazing Crop for Southeastern Texas," Texas Agricultural Experiment Station, College Station, Brazos county, Texas, Circular No. 37, *August,* 1925. *A. H. Leidigh, Assistant Director.*

"Orchard Crowding Its Effects and Remedies," Agricultural Experiment Station, Pullman, Washington, Bulletin No. 200, *March,* 1926. *O. M. Morris, W. A. Luce.*

Economics

"An Economic Study of the Massachusetts Apple Industry," Massachu-

setts Agricultural Experiment Station, Amherst, Mass., Bulletin No. 228, March, 1926. Hubert W. Yount and Lorian P. Jefferson.

"Steps to Nebraska Farm Ownership," Bulletin 210, February, 1926. J. O. Rankin, Cooperating University of Nebraska, Agricultural Experiment Station, U. S. Department of Agriculture.

Diseases

The wheat crop is a victim of many diseases and annually losses of several million dollars are sustained. Among the outstanding diseases probably come Stinking Smut. Losses frequently run as high as 30 per cent. Such losses are preventable if the seed wheat is properly treated. For a number of years both the formaldehyde and copper sulfate treatments have been effectively used. Because of danger from injuring seed by the use of above treatment, experts have searched for a cheaper, more effective material. The Utah Agricultural Experiment Station has published in Circular 59, results of their investigation with various chemicals for smut control. Professors Richards and Bracken state that copper carbonate has given best results and is recommended for control of stinking smut in Utah. Stinking Smut being so widespread in this country, no doubt farm advisers and farmers will be interested in writing for a copy of this bulletin.

"Disease of Grapes in Florida," University of Florida, Agricultural Experiment Station, Gainesville, Florida, Bulletin 178, January, 1926. Arthur S. Rhoads.

"Pecan Scab Control," University of Florida, Agricultural Experiment Station, Gainesville, Florida, Press Bulletin 381, April, 1926. G. H. Blackmon.

"Yellow Pickle in Greenhouse Cucumbers," Massachusetts Agricultural Experiment Station, Amherst, Mass., Bulletin No. 225, December, 1925. Victor A. Tiedjens.

"Control of Cherry Fruit Fly," Michigan State College, Agricultural Experiment Station, Entomological Section, East Lansing, Michigan, Circular Bulletin, No. 86, March, 1926, R. H. Pettit.

"The Apple-Maggot," Michigan State College, Agricultural Experiment Station, Entomological Section, East Lansing, Michigan. Circular Bulletin No. 87, March, 1926. R. H. Pettit.

"Cultural Methods for Reducing Sweet Potato Losses Caused by Stem Rot," New Jersey Agricultural Experiment Stations, New Brunswick, New Jersey, Bulletin 433, April, 1926. R. F. *Poole.*

"Anthracnose of Dewberries and Its Control," Agricultural Experiment Station, State College Station, Raleigh, North Carolina, Bulletin No. 248, February, 1926. Frederick A. Wolf, B. O. Dodge.

"Seed-Potato Treatment," Utah Agricultural Experiment Station, Logan, Utah, Circular 60, March, 1926. B. L. Richards.

"Making Weather to Order for the Study of Grain Diseases," Agricultural Experiment Station, Cooperating with the Office of Cereal Investigations, Bureau of Plant Industry, State Department of Agriculture, Bulletin 379, January, 1926. James G. Dickson.

Insects

"The European Corn Borer," Iowa Agricultural Experiment Station, Ames, Circular No. 100, March, 1926, Carl J. Drake.

* * *

Fertilizer Injuries

(*From page* 6)

pounds of mixture containing none to three per cent of nitrogen, eight per cent of phosphoric acid, and five to seven per cent of potash per acre about one month before setting the crop, the mixture to be broadcast in the open rows and worked into the soil. When a fertilizer mixture such as that used above was increased in amounts from 500 to 3,000 pounds per acre the injury became worse as the amount was increased.

The response of the plant to growth is most difficult on account of the cold and windy conditions that exist during June, and when the growth is further retarded by toxic fertilizers, and especially heavy applications made just before planting, the plants are not only rendered more susceptible to disease infection, but the crop so severely injured in dry seasons that the production is frequently below normal.

Virginia

(*From page 28*)

ments conducting research work until at the present time there are 11; namely, agricultural chemistry, agricultural economics, agricultural engineering, agronomy, animal husbandry, animal pathology, bacteriology and plant pathology, dairy husbandry, entomology, home economics, horticulture and rural sociology.

In addition to the research work being conducted at the main station at Blacksburg, research work in agronomy is being conducted at eight other places in the State, in entomology at four locations, in plant pathology at two points, and in horticulture in several localities.

The Station received $5,000 from the State in 1907; its first appropriation from that source. However, there has been a consistently steady increase in State appropriations until at the present time $63,000 are annually received.

The Station has issued 246 popular bulletins, 29 technical bulletins, 8 circulars and numerous newspaper and magazine articles.

THE first organized research work in agronomy began in 1902. Previous to 1902 one man did all agricultural teaching and conducted the experimental work in agronomy but there were no permanent experimental grounds while in 1925 the agronomy department had 11 research workers and extensive experimental grounds. Since 1902 the activities of the agronomy department has steadily increased. In 1905 an experimental barn was erected and 66 acres of land laid out in experimental plats. From 1902 to 1908 preliminary fertilizer tests and a number of variety trials were conducted. In 1908 several long-time fertilizer experiments were started and the work of the department was reorganized and placed on a more scientific basis. In 1914 fifteen additional acres of land were added for experimental purposes. At the present time all of the 81 acres of land operated by the agronomy department at the main station is under experiments. The soil here is Hagerstown silt loam.

On account of the great variation in soil and climate in different parts of Virginia and of the great variety of crops grown, it has been necessary for the agronomy department to establish county agricultural experiment stations at various locations in the State. There are now eight county experiment stations located on important soil types and conducting fertilizer and crop tests with the important crops of the section.

The names of the county stations with the date of inauguration, soil type, and the chief crops grown are as follows: Appomattox (1904), Cecil loam, dark tobacco; Chatham (1904), Cecil sandy loam, bright tobacco; Bowling Green (1908), Norfolk sandy loam, sun-cured tobacco; Staunton (1911), Dekalb sandy loam, general farm crops; Charlotte (1912), Cecil sandy loam, dark tobacco; Martinsville (1912), Davidson loam, general farm crops; Williamsburg (1912), Norfolk sand, forage crops; and Holland (1914), Norfolk fine sandy loam, peanuts and cotton.

As far as feasible the agronomy department conducts the same tests at all the experiment stations. The location of the county stations makes it possible to determine the value of different fertilizers and varieties under the different climatic conditions and on the various kinds of soils.

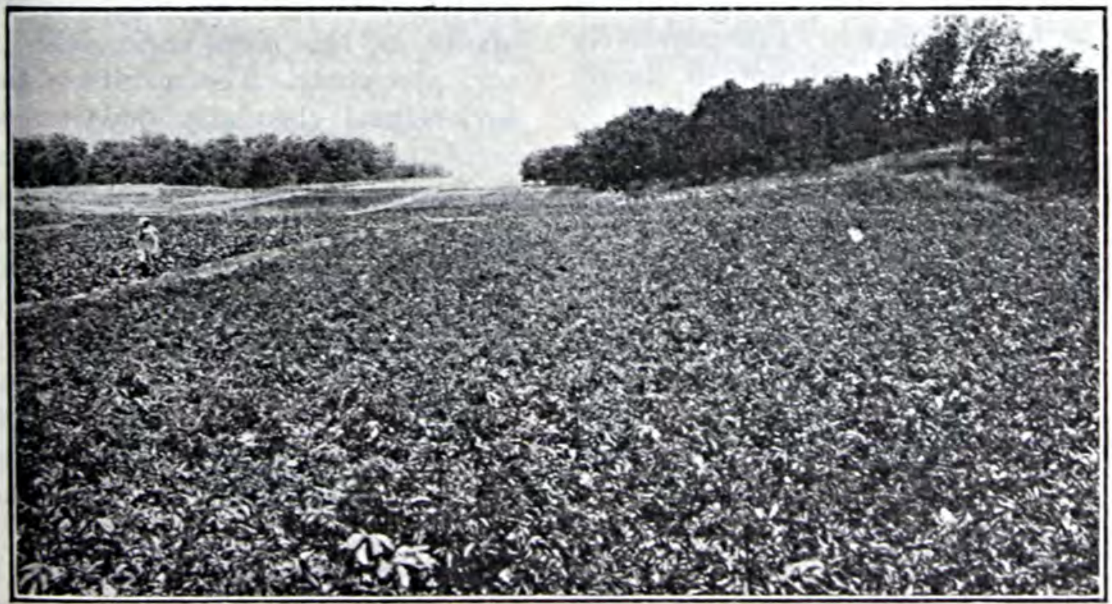
The field experiments with fertilizers have shown that available phosphorus such as is applied by acid phosphate is necessary for all crops and all soils of the State. In fact in most cases phosphates and organic matter seem to be the chief limiting factors in production as shown by the experimental results. The results show that one of the best ways to add organic matter is through the use of the proper kind of rotation. It was found on Hagerstown silt loam that the cost of producing a bushel of corn without fertilizer when the rotation was corn, wheat, grass and clover two years was 69 cents and 65 cents when 400 pounds of acid phosphate was used per acre. The cost when corn was grown continuously without a cover crop or fertilizer was $1.08.

The experiments of the agronomy department in the improvement of old pâstures have yielded excellent results. Phosphates and lime have paid handsomely in increasing the carrying capacity of blue-grass pastures.

The fertilizer experiments with tobacco have had a material influence in improving the quality and yields of this crop. These experiments show that all three types of tobacco, bright, dark and sun-cured, require a fertilizer analyzing 8 per cent phosphoric acid, 3 per cent ammonia, and 3 per cent potash for the ordinary tobacco soils. On the lighter tobacco soils the ammonia and potash should be increased 1 per cent. On very sandy soils the tests show that a fertilizer analyzing 8 per cent phosphoric acid, 4 per cent ammonia and 5 to 6 per cent potash is the most profitable.

The results indicate that the source of ammonia is an important factor in fertilizing tobacco. The dark and sun-cured types should receive two-thirds of their ammonia from organic sources such as dried blood and cottonseed meal and one-third from nitrate of soda or ammonium sulphate. On the other hand, bright tobacco should receive one-third of its ammonia from an organic source such as dried blood or cottonseed meal and two-thirds from an inorganic source such as nitrate of soda and ammonium sulphate in equal amounts.

The ordinary rate of application of tobacco fertilizer is 700 pounds per acre. The results secured by the agronomy department show that the amount can be profitably



V. P. I. Green Mountain potatoes developed by Virginia increased to 1,000 or 1,400 pounds per acre. The experimental results show that increasing the application of 8-3-3 fertilizer from 700 to 1,400 pounds per acre increased the returns from bright tobacco $95.00 an acre.

Experiments show that fertilizers play an important role in cotton production. It seems from the fertilizer tests with cotton that a fertilizer analyzing 12 per cent phosphoric acid, 4 per cent ammonia, and 4 per cent potash should be used. The season in Virginia is rather short for growing cotton and for this reason care should be used to apply the right kind of fertilizer. Too much ammonia should not be used as the maturity will be delayed too much. Phosphorus is very important as it hastens maturity and produces a high quality lint.

THE experimental results show that potash plays an important part in cotton production. This plant food seems to be especially valuable in that it aids greatly in preventing rust. Rust causes premature shedding of the leaves and ill-formed, hardened bolls which do not develop normally. Rust injury can be greatly reduced by the use of potash. Comparatively large quantities of potash should be used when the soil is light.

The results of the fertilizer tests with peanuts show that when peanuts are grown in rotation with other crops, which are properly fertilized, direct applications of fertilizers to the peanut crop is unprofitable. However, where such conditions do not exist an 8-2-4 fertilizer should be applied to the peanut crop.

The experiments with lime show that liming should be done in reference to the rotation as a whole rather than in respect to any one crop. All the crops in the rotation secure benefit from the lime. The results of experiments conducted with lime by the agronomy department in various sections of Virginia show that the use of one ton per acre once in a four-year rotation gave returns valued at $10 per acre per year or $40 per acre for the rotation. The experiments also showed that ground limestone, marl and burnt lime are of equal value as measured by crop yields provided they are applied on the basis of equivalent quantities of calcium per acre.

THE chemical work in reference to fertilizers and soils is done by the department of agricultural chemistry. This department has found that when phosphatic fertilizers are applied to soils and corn grown continuously, practically all of the phosphorus that is fixed in the soil is held in the top four inches and the amount fixed is about the same from various phosphatic fertilizers such as acid phosphate, raw rock phosphate, and basic slag.

Another interesting fact discovered is that recently precipitated iron and aluminum phosphates are just as available to plants as the phosphoric acid in acid phosphate. The results of the agricultural chemistry department refute a statement commonly heard to the effect that acid phosphate makes soils acid. The results show that soil to which 3,000 pounds of acid phosphate was applied over a five-year period was no more acid than soil to which an equal quantity of phosphorus from raw rock phosphate had been applied and no more acid than the soil on the check plat.

It was found that land which had grown corn continuously for 15 years and which had decreased narkedly in productivity even when ieavily fertilized and manured had ts productivity greatly increased y the application of one ton of ime per acre. The results indicate nat the cause of the decrease in roductivity was the reduction in alcium in relation to magnesia nd the increase was due to the ncrease of calcium in proportion o magnesia by the addition of the ime.

The department of agricultural hemistry has been carrying on ysimeter studies for three years with the object of studying the vailability of different liming materials as shown by the amount of alcium in the drainage water. There are two batteries of lysimeters, one containing 63 and the other 30 including two rain gauges. In the former set Hagerstown silt loam is being used and in the latter Norfolk sandy loam.

In some of the lysimeters red clover is planted and the entire crop is turned under while green. It is interesting to find that the green crop has not increased the acidity of the drainage water. This finding is in keeping with field results which show that if green manures create acidity in the soil when turned under, the acidity is very transitory. When the green clover is incorporated in the soil in the lysimeters nitrate production and losses were greatly increased. This same condition existed when dried clover hay was incorporated in the soil. The experiment has not been conducted long enough to secure conclusive results in reference to loss of calcium.

The analysis of the rainfall collected in the rain gauges has yielded some noteworthy results. It was found that the recovery of sulphur in the rain water amounted to 12 to 13 pounds per acre per year, potash 8 pounds, magnesium carbonate 30 pounds, calcium carbonate 35 to 37 pounds, and nitrate nitrogen about one pound. It is interesting to find that the bulk of the nitrate nitrogen was found in the rainfall after severe electrical storms.

THE agronomy department has conducted numerous experiments to determine the value of varieties of different crops. These tests have made possible the use of the proper varieties and have aided greatly in preventing the use of poor and unadapted varieties.

The production of improved strains has been an important accomplishment of the agronomy department. Two improved strains of wheat, one bearded, V. P. I. No. 131, and one smooth, V. P. I. No. 112, have been distributed to farmers and have done exceptionally well on Virginia farms A new oat, V. P. I. No. 1, has been originated and is widely grown with unusual returns on the farms of the State. A new potato, V. P. I. Green Mountain, has been developed by selection from the ordinary Green Mountain which yields, on the average, 19.5 bushels more per acre than its parent. This new strain has wonderful cooking quality and is in great demand.

That the work of the Virginia Agricultural Experiment Station is appreciated by Virginia farmers is evidenced by the ever-growing demands which they make of it and the ever-increasing support given by the state.

* * * * * * *

Said one mouse to another as they spied something peeking from the edge of a box—"Ain't that the cat's whiskers."

Unbending Backs in Farming

(*From page 26*)

No longer does the truck grower have to wait for rain to water his field before planting. Modern transplanting machines are equipped with water tanks which sprinkle the roots of each plant before pressing the soil about them. Since the moisture is applied from below, the surface soil is given less chance to "cake." On most of the machines, a fertilizer attachment may be employed to enrich the soil, automatically, during the process of transplanting.

Both horse and tractor power are now in use with the transplanter. R. A. Rasmussen, a strawberry grower at Oshkosh, Wisconsin, prefers to use a light farm tractor because of its uniformity of speed. To make it possible for the plant "droppers" to keep up with the speed of the planter, Mr. Rasmussen has all of the strawberry plants packed one way in the boxes before the work is begun. With the soil in readiness, the plants properly arranged, and plenty of water convenient for use, this truck grower has planted as many as five acres in a single day.

Cabbage growing is another industry which has been greatly encouraged by the invention of truck field machinery. The ground is cultivated; and as soon as the plants have reached the proper stage for transplanting, they are set out into the fields in a manner similar to the transplanting of tobacco.

Down the Mississippi River on an island just out of Muscatine, Iowa, we are told that there are other truck growing industries which have developed with the aid of farm machinery inventions. There W. A. Hoopes has transferred the back-breaking tasks of planting peas, beans, Irish potatoes, and the seeds of watermelon and cateloupe to the machine with unusual success. In North Carolina, Georgia, Kentucky, and other southern states they have transferred the tasks of transplanting sweet potatoes from muscle to machine; and in Michigan, truck growers are transplanting celery by machine. Even florists have enlisted the services of machinery to transplant bulbs and foliage.

But the transplanter is not the only miracle of invention now available to the truck farmer. There are the tobacco and wheel hoes, the weeders, the harvesters, and all of the other cultivating machines that are rapidly transferring labor from the shoulders of man to the machine. Among the harvesters is the beet harvester which can pull, top, and stack four acres of beets in a single day. With W. S. Drummond's discovery of the onion mower, the task of topping onions has lost much of its burden.

And so the story goes. Inventive minds are constantly at work devising new methods of unbending the back of "The Man With the Hoe."

* * * * * * *

THE MANICURIST

An Irishman who was signing articles on board a ship began to write his name with his right hand, then, changing the pen to the left hand, finished it.

"So you can write with either hand, Pat?" asked the officer.

"Yis sor," replied Pat. "When I was a boy, me father (rist him!) always said to me, 'Pat, learn to cut your finger nails wid your left hand, for some day ye might lose the right.'"—*Exchange.*

Seed is sometimes transported 10 to 15 miles to central curing beds

The "Kentucky" of Missouri

(*From page 27*)

spread to dry. Frequent stirring hastens the rapidity of the curing process. Rapid curing is essential to bright, high quality seed. Slow curing results in dark, discolored seed and in many cases low germination.

In rainy seasons the curing process becomes a real problem. Once the crop is partly cured, it is ricked when rain threatens. To prevent heating the ricks are "turned" frequently.

As soon as the strippings are cured sufficiently for storage, they are sacked and stored away ready for sale to the threshing and cleaning companies. In this condition it is known as "dry rough."

Experience has shown that the practice of stripping the fields each year does not in any way injure the stand or growth of the blue grass on permanent blue grass pastures.

Northwest Missouri is famous for the quality of blue grass seed produced.

The green strippings are scattered between the ricks and turned at intervals

Paying for Unnecessary Government

(*From page 8*)

are levied. But these are exceptions and not the general rule, which is that real and personal property bears the burden, even of the overhead or state tax.

Turning then to the tables of property valuations, it is found that the predominating item is land and buildings. The next item is of the various items of property found on the farms, live stock, utensils, etc. Money, merchandise, and credits are found in the lists of many states, but the total of all these items other than land and what is required to work land, falls very far short of what it is a matter of common knowledge is the value of what we generally term "intangibles".

This is not the time or place for a discussion of various tax or valuation methods. It is only an effort to set down the facts as shown by this survey by The Grange.

At least one-half the cost of state government falls directly on land and its appurtenances.

In the realm of county taxes it is shown that this burden, larger than state taxes is a direct burden on real and personal property.

Village and city taxes are chiefly raised by the same system.

School taxes, except in the few states in which the State makes a material state contribution to local school costs, are entirely matters of direct taxation on real and personal property.

In other words, assuming that the total tax burden is $4,500,000,000 (the survey with 9 states missing totals to $3,742,000,000) it is safe to assume that all except one-half of the state taxes or something less than $500,000,000 is raised by direct taxes on real and personal property. For conservatism we will take out this half billion, and will take out as nearly as can be estimated the total city tax burden of $800,000,000 more. This will leave $3,200,000,000 raised directly on rural and urban real and personal property. Of this nearly a billion dollars is direct school taxes all on rural, or farm and small village property. Fully one-half the remainder or $1,100,000,000 is direct tax on farm and rural property the other half on city property.

OF course all of these computations are theoretical and approximation, but they are safe and conservative from the figures in the Washington office of The Grange, and they show that the farm property of the nation is paying $2,100,000,000 direct taxes each year, $1,000,000,000 for schools, and $1,100,000,000 for its contribution to state, county, town and other direct taxes, or a total which is within a half billion of as much as the 1924 Federal tax receipts.

This means a burden, if evenly distributed of $262.50 on every one of the 8,000,000 farms in the United States—if there are that many. Two hundred and fifty dollars is more than the average profit of many hundreds of thousands of farmers, according to Department of Agriculture figures. This tax, the cost of unwanted government, is the handicap that the rapidly expanding cost of government creates—the millstone around the neck of farmers in their efforts to be, as of old, the independent, self-respecting, self-supporting, sturdy, self-perpetuating bulwark of Americanism.

In a further discusion Dr. Atkeson points out that schools and roads are the principal items which have caused this tremendous total of tax costs. It is apparent, however, that outside these two most essential items, there are hundreds of millions of tax money going elsewhere. Parallel to this, he points out that the cost of armament, and pensions, and interest and debt payments, costs due to past and prospective wars, are the principal items which cause the tremendous total of federal government costs. It is equally obvious that outside of these items there are hundreds of millions of federal taxes spent for other purposes.

Concluding the discussion of these facts Dr. Atkeson adds this comment:

"The trend of state and local government costs is still upward, although there are some notable exceptions in a few middle and western states. This is the most important problem before good American citizens. So long as the public insists on a continuation of the present road policy and on increasing and extending our system of education at public expense the field of tax reduction is limited to careful economy in the administration of government, to the limitation of government functions to those which are essential, and to the elimination of those alleged functions of government designed to spend tax raised money for purely sentimental purposes."

* * *

Tattooed Hogs

(*From page* 9)

pronounced free from tuberculosis, consequently the hogs could not have become infected through following the cattle. The inspectors then turned to the poultry for the cause and found the flock badly infected. The remainder of the hogs on the farm all reacted to the avian test. On the inspector's suggestion, the entire flock of poultry was disposed of and replaced with day-old chicks in the spring. Later a number of hogs from this farm were shipped to market and again identified by the tattoo mark. A report on the slaughtered animals showed that not one was infected.

Experimental work involving the study of dressed carcasses could also benefit by the use of the tattoo marks.

A simple and efficient tattoo instrument which any farmer can easily make anu learn to use readily has been invented by Dr. F. E. Murray, a veterinarian of the United States Department of Agriculture. He has diverted ordinary phonograph needles from their tuneful purpose and utilized them in making an instrument for playing a sort of a "tattoon" on the pig's skin.

The instrument consists of an 18-inch handle with a metal holder on the end, slotted to receive Babbitt-metal blocks, ¾ inch by 1 inch. Phonograph needles are imbedded in the metal blocks to a depth which leaves their points protruding about ¼ inch, arranged in the form of letters or figures. By changing the blocks any combination of letters or figures can be secured.

Ordinary black automobile paint is used for the inking fluid and is spread on the needle points with a small brush. The mark is applied to the hog merely by striking him smartly with the inked points, usually on the back.

Her Majesty, Alfalfa

(*From page* 11)

the audience both while in the procession and when on the stage.

Four little girls precede the queen and strew alfalfa blossoms and leaves in her path from baskets which they carry. Two other girls carry the train of the coronation robe, and another bears the crown on a cushion.

The county agent or whoever is in charge of the "coronation" gives a little preliminary talk about the value of alfalfa and the high esteem in which the community of farmers holds it. Then the royal procession appears heralded with march music by band or orchestra. After the crown has been placed on the head of Alfalfa, she makes a fitting inaugural address, in part somewhat like this:

"You have elevated me to the highest post of honor in the land—that of Queen of all Forage Crops. My gratitude can best be measured by the prosperity that will come to you during my reign. I shall claim many lands that are now sod-bound with inferior timothy—so inadequate in supplying the needs of dairying in the greatest dairy state in the Union. My conquests will extend in the sand country—now so exhausted under the shackles of rye, corn and potatoes. From north to south; from east to west; I shall extend my domain. All this is possible only by the loyalty and cooperation you, Wisconsin farmers, show my worthy warriors and servants whom you now see surrounding me."

After each one of the warriors have spoken of what part they will take in the successful reign of Alfalfa, the queen concludes:

"You have heard my warriors. Together we will fight high fee costs that levy such a heavy burde on farm profits. With them w will avoid the griefs that have com from the worn-out soils of the old er agricultural regions in America With them we have a constructiv program that will make better an better this fair land, Wisconsin."

The alfalfa song, by audienc and attendants of the queen, i sung immediately after the en trance march. The song is.

"How do you do, friends and neigh bors,
How do you do?
We have brought our Alfalf Queen to you.
If you will take her by the hand
She'll bring wealth unto the land
How do you do friends an neighbors,
How do you do?"

After the coronation anothe song by the audience and roya party makes a good conclusion.

The ceremony of "The Passin of Timothy" has also been success fully given in many places in Wis consin. A simple sheaf of timoth is respectfully laid on the restin place of the deposed monarc while his eulogy in the spirit o "not loving Timothy less, but Al falfa more" is spoken.

The poet Laureate of the Alfal fa Kingdom has composed in par these fitting lines on the passin of the old monarch.

"My heart burns deep with grav distress
That Timothy's fate has bee progress.
Timothy, who by the settler stoo
When most the land grew naugh but wood,
And failed him not in his hour o need,

His passing is most tragic, indeed.

Long before enlightening science of this day,
Had blazed the trail to alfalfa hay,
With lime, inoculation and phosphate,
Timothy reigned 'o'er all this state;
Though parting now may be sweet sorrow,
We must look forward unto the morrow."

* * *

Kentucky Blue Grass

(*From page* 15)

nature has laid the foundation for a permanent agriculture—lime and abundance of phosphorus — the basis for the growth of all field crops.

In the northeastern states, however, with the cooler climate, the shorter summer months, the conditions from this standpoint are more favorable to the best development of Kentucky blue grass. The growth of blue grass in Kentucky occur not by virtue of its climate but rather in spite of it.

Throughout the northeastern states Kentucky blue grass may be found well established in limited areas, along roadsides, in well kept lawns, and in the vicinity of barnyards. At the Pennsylvania Experiment Station the division strips between the old fertilizer plots have maintained a heavy growth of Kentucky blue grass for over half a century. There is, however, no extensive pasture land in the State which supports a blue grass turf comparable with that found in the blue grass region of Kentucky.

The wide range in nutritive value of green immature pasture grasses has not been fully realized by producers of livestock. As a result, their attention has been directed to the development of existing grasses rather than to an attempt to introduce into their pastures more desirable species.

A comparison of the nutritive value of immature Kentucky blue grass with other pasture grasses shows that it excels in nutritive value all other eastern pasture grasses. In fact, it contains a higher percentage of digestible protein than either red clover or alfalfa. Data presented later show that a well fertilized blue grass pasture is capable of furnishing three times the digestible crude protein supplied by a four-year rotation of corn, oats, wheat, and grass. It will also be seen that an equal area of blue grass pasture is capable of producing more total digestible nutrients than is produced by a grain rotation on the same soil. The known labor cost of producing a grain rotation as compared to pasture maintenance

	Pounds per Acre Seven Inches			
	Blue Grass Soil, Ky.	DeKalb Soil Pa.	Volusia Soil Pa.	Westmoreland Soil Pa.
Total Phosphorus	15,000	873	1834	1384
Available Phosphorus (Soluble in N/5 HNO_3)	5,000	8	35	17
Per cent Total P Soluble in N/5 HNO_3	33.3	0.91	1.8	1.2
Acid Phos. Equiv. to Soluble P	18,868	30	131	62
Acid Phos. Equiv. to Total P	56,604	3294	6921	5223

should leave no doubt in the mind of the reader concerning the economy of pasture feeding.

Kentucky blue grass differs from other pasture grasses found in Pennsylvania in that stock relish the self-cured grass left in the field during the winter months. The following table shows the nutritive value of Kentucky blue grass, in comparison with other pasture grasses and legumes:

Computed on the Basis of Green Roughage. Pounds Digestible Nutrients in 100 Pounds of Dry Matter.

	Crude Protein	Carbo-hydrates	Fat	Total Nutrient
Kentucky Blue Grass (before heading)	15.5	43.6	3.4	66.9
Kentucky Blue Grass (headed out)...	8.3	45.8	1.9	57.9
Kentucky Blue Grass (after bloom)..	4.3	50.2	1.6	58.2
Canada Blue Grass	3.9	51.8	1.2	58.4
Red Top	4.8	50.8	1.5	59.0
Orchard Grass	5.8	45.5	2.0	55.1
White Clover	14.2	44.0	2.2	63.3
Red Clover (in bloom)	9.0	50.1	2.5	65.8
Alfalfa (in bloom)	12.7	41.7	1.1	57.1
Average 44 Grasses	5.6	48.2	1.6	57.4
Average 25 Legumes	13.6	42.7	1.7	63.1

Computed from Henry's Feeds and Feeding, Table III., p. 738

* * *

Winning on Principles

(*From page 22*)

AS a sixth point he states very emphatically that it is necessary to do a thorough job of plowing. No matter how urgent the time or how late the season, the plows on this farm always do a good, thorough job. Following the plow, is the roller or disc or harrow. Always enough pulverizing is done to prepare an extra good seed bed.

As one would naturally expect, Zigler's next point is cultivation. He uses the ordinary implements. He uses them thoroughly and well and at the time that will do the most good. He keeps the weeds down and provides a nice loose mulch around his growing crops.

"Use good seed," he says. His potato yield was high because he had fertilized, because of good cultivation and because of the fact that he had used seed from a high yielding variety. In just the same way he secures a few extra bushels of wheat or corn by using the varieties best suited to his locality. The seeds he uses must possess germinating qualities. He takes no chance with seed corn that may not grow but tests it.

THE ninth principle which he emphasizes is marketing. In his busy life, this has been closely tied up with production. To produce quality crops of the kind that the market wants is his principle method of handling the market situation. A variety of crops helps, too, he says, for if a low price develops for one crop he is very likely to make on another.

His last point isn't exactly farming but it is important in the business of farming. It is the old ıdage, "Spend less than you nake." It was this that enabled ıim to make the small savings with vhich he started farming. It was his that enabled him to enlarge his ıerd, to improve his farm, to edu-ate his children and to buy more and. He applies this to his fields ınd endeavors to place more fer-ility upon them than his crops re-nove. Once he stated to his boys, 'If you sell hay or grain you are robbing our farm to build up that of a neighbor. If you buy feed you are building up our own."

THE original 38 acres grew to 140. This came from the efforts out forth on the 38. Never did ıe resort to the carpenter trade or ıny other work to provide assist-ınce. Furthermore a real home was built upon this farm.

Eight years ago the father turned he home farm over to his sons ınd moved to an 80-acre farm which he purchased at that time. The fertility of this land was in a ow state.

On this newly acquired farm he was able to put into practice more readily the principles that had proven so helpful on the other farm. He had capital yet did noth-ing elaborate. The 300-bushel yield of potatoes was grown on this farm.

He insists that one complete four-year rotation together with a heavy application of commercial fertilizer is all that he needs to re-store any farm to a productive state.

A STORY of a visit to Zigler and his farm would not be complete without reference to his depend-ability upon the state agricultural college. It was a state extension worker who first told me of Zig-ler and whose enthusiastic account of his success that persuaded me to change my routing so that I could visit him. Zigler is a splen-did cooperator in conducting dem-onstrations in soils and crops. He depends as a balance wheel and guide upon the specialists who bring him the best from the ex-periment station and college. He is well versed in technical informa-tion which has a bearing upon his business. His friendliness and his reliance upon the college men is not a separate principle but an in-tegral factor in the development of the ten points that, to him, con-stitute a rather complete outline of successful farming.

Ready to make use of better crops

Southern Ways with Peaches

(*From page 14*)

of the fruit. The potash is absolutely necessary to produce the highly colored fruit, which is so much desired. The highly colored fruit always sells the best. Firmness is necessary where the fruit is to be shipped and, therefore, a liberal amount of potash, as well as nitrogen and phosphoric acid is always included.

Some prefer to apply the fertilizer just before blooming. Still others apply ten days or two weeks before blooming time, but this is not generally practiced. It is known, of course, that apples should have the fertilizer ten days or three weeks before blooming in order for the fertilizer to have the proper effect on the production of the fruit buds. This is not the case with the peach and, therefore, it is generally considered that the proper time to fertilize the peach trees is just about the blooming time.

One of the leading peach growers of the South, whose orchard is in a sandy section, uses a 6-4-3 for the trees that have not reached the bearing age. For bearing trees he uses an 8-5-5, with three-fifths of the nitrogen coming from organic sources, such as meat scrap, tankage, and cottonseed meal, and the other two-fifths from nitrate of soda and sulphate of ammonia. For the nitrogen used on the unbearing trees, 75 per cent of it comes from organic sources and 25 per cent from the inorganic. He also advises that he wants all of his potash to come from sulphate of potash. This same grower recommends that where the soil is fairly rich that for the bearing trees the nitrogen may be reduced one per cent and the phosphoric acid increased one per cent, thus giving a 9-4-5.

The amount of fertilizer applied varies, but it is generally agreed that one or two pounds per tree is needed the first year; two to three pounds the second year; four to six pounds the third year; six to eight pounds the fourth year and by the time the trees are five years old 10 to 12 pounds should be used. Some apply more and others less, but where there are 100 trees to the acre and 10 pounds is applied to the tree it is seen that one is using 1,000 pounds per acre. This is liberal fertilizing, but not at all excessive. The peach, as is well known, is a quick grower and must have large amounts of immediately available plant food in order to produce the biggest, finest quality of fruit.

In order for the fertilizer to do its best work and for the peaches to produce maximum crops, the soil must be kept reasonably well filled with organic matter. That is the reason why cover crops are so important. Where the ground is not already fertile, the double cover crop system, or the growing of both summer and winter cover crops, is highly desirable. Even after growing both summer and winter cover crops, it is desirable to apply any available stable manure in between the peach trees during winter.

Considered from every angle, the peach crop is one of the important cash crops grown in several different sections of the South. It is a highly specialized business. There is some gamble in it, but it is almost invariably true that the grower, who practices the most improved methods and produces very high quality fruit, is the one that makes the most money and finds it the least trouble to sell his fruit.

Honored by Workers

(From page 19)

From 1917-1919 he was Federal Food Administrator for Georgia and chairman of Zone 5, consisting of the states of North Carolina, South Carolina, Georgia, Florida, and Alabama.

DR. SOULE had the degree of Sc.D. conferred on him by the University of Georgia in 1911 and the degree of LL.D. by the same institution in 1916. He was chosen a fellow of the Royal Society of Arts of London, England, in 1915. He has traveled extensively in the United States, South America, and Europe. He is ex-president of the American Association of Farmers' Institute Workers; ex-vice-president of the Association of American Agricultural Colleges and Experiment Stations; a member of the Association for the Advancement of Science; the American Genetic Association; the National Geographic Society; the American Economics Association; the Society for the Promotion of Agricultural Science. He was a member of the Jury of Awards of the Louisiana Purchase Exposition held in St. Louis. He served as a member of the Arkansas Education Survey in the spring of 1922. He was appointed official delegate from the United States to the Second American Congress of Economic Expansion and Commercial Instruction and the World Cotton Congress held in Rio de Janeiro, Brazil, in October, 1922. He is a member of the Phi Kappa Phi and Alpha Zeta fraternities. He is a Rotarian and an elder in the Presbyterian Church.

Dr. Soule is the author of a book on "Agriculture; Its Fundamental Principles," and of numerous papers, bulletins, and monographs on agricultural subjects, and has delivered many addresses and lectures before business, scientific, and educational organizations in all parts of the country. He has been intimately associated with teaching, research, and extension enterprises of great magnitude. He participated very actively in the agitation which led to the expansion of the work of the state colleges of agriculture and the mechanic arts through federal appropriations known as the 2nd Morrill Act; the Nelson Act; the Adams Act for the furtherance of research work; the Smith-Lever Act for the endowment of extension teaching through the placing of men and women agents in agriculture and home economics in every county in each state; and the Smith-Hughes Act for the promotion of instruction in vocational subjects as they pertain to agriculture, home economics, and the trades and industries. He has thus been identified with every great educational movement originating in the United States in the last quarter of a century.

The Georgia State College of Agriculture has organized and developed under his direction and now has a student body of 1,400 persons and a teaching, research, and extension staff of 300. The institution has the State of Georgia for a campus and intimately touches the lives of more than 100,000 citizens of the State through its service work. Dr. Soule has always actively participated in the formation and support of all organizations calculated to advance the public welfare and has achieved considerable distinction as a thinker and writer along economic lines.

Slaves

(*From page 4*)

rapid changes now taking place all about us.

Man is making strides. The trouble is, man cannot jump forward with both feet at once. His gait is so conceived by Nature that he must place one foot forward at a time, the one to preserve the equilibrium remaining firmly planted on known ground developed by his fathers, while the other foot explores cautiously forward.

In making advances man thus presents a preposterous and incongruous picture—a motley of past and present.

INDIVIDUALLY and as a race men are slaves to habits.

On January first, eighteen hundred and sixty-three, Lincoln, with a few strokes of his pen, freed the black man from the dominion of his white superiors.

But on January first *nineteen* hundred and sixty-three the descendants of the slaves he freed will be still in the chain gang with all other men—the chain gang of superstition, habit, bogies and precedent. Men will still look backward for their ideals, not forward.

"Habit," wrote Fielding, "hath so vast a prevalence over the human mind that there is scarce anything too strange or too strong to be asserted of it. The story of the miser who, from long accustoming to cheat others, came at last to cheat himself, and with great delight and triumph picked his own pocket of a guinea to convey to his hoard, is not impossible nor improbable."

And men in nineteen hundred and sixty-three will, unless I am wrong, still obey the dictates o[f] habit and pick their own pocket[s] of opportunities they do not recognize as theirs.

Slaves, unfortunately, are as unaware of their shackles, as the birds are that they swim in the air. Born to their environment or hardened to it through constant confinement, they resent lustily any attempt to remove them to better things.

The world seems to wax fat and cheerful in the toils of bondage—and the very men who most need to be freed from the chains of some certain superstition or habit who most need to be wafted away from ancient and ofttimes wasteful or even vicious custom are the ones who struggle most successfully against education.

Thus Lincoln, in preparing for the emancipation, found some of his strongest opposition amongst those very slaves who were the most cruelly oppressed.

The prisoner comes finally to love his cell. As Byron's gifted stylus limned it, "my very chains and I grew friends . . . and I regained my freedom with a sigh!"

BUT once ever so often appears a personage and a personage is a person who hews his own way in his own way.

Tumbling precedent, a personage frees men from one more of their hobbling habits.

It was only day before yesterday that we killed those who had the temerity to think for themselves—whenever we saw a head above the throng we hit it hard.

Those whose brains sprouted new ideas we first exhibited out of curiosity in the market place then, fearful that the profane sight might mark the unborn we hastily burned the of fender against uniformity at the stake.

Authority and habit tremble when confronted with a personage.

When a Voltaire, a Rousseau, a Burbank is born, conformity first seeks to kill, then finding the armor invulnerable, rushes to cover in the underbrush of protective habit.

Those strong, self-reliant ones who stamp fearlessly about the world, making the solid terrain of our realms of routine tremble and totter, are lucky if they live until the tender stalks of their ideas grow high enough up into the sun to assure the burst of their full flower.

But history will always be the collection of the biographies of personages—men who thought for themselves, trampled habits into the ground and broke over them new paths of truth down which the lesser, frightened souls may forever march to freedom.

NEITHER matter nor energy ever disappear. But both change form and position as life progresses.

So no tiniest act of man can be literally wiped out. "Every smallest stroke of virtue or vice leaves its never-so-little scar," said William James.

Out in Des Moines a friend of mine, a Class A doer of unusual things, a trampler of habit, invented a plan to inculcate into his seven-year-old the idea of forming good habits before it was too late.

The system was this: every time the young hopeful so far forgot the precepts as to knowingly or unwittingly do something bad he was to drive a nail into a post that stood at the back steps. Every good deed permitted him to pull one out.

For a while the post looked like an up-ended porcupine. But soon the youthful struggler saw the light and one day beamingly announced that again the post was free of nails—a good act had balanced every evil one.

"But," said his father, "go look at the post and you will see that *the holes are still there!*"

In Irving's play, Rip Van Winkle, endeavoring to break the liquor habit, says with every drink, "I won't count this time!" But Nature counts every time. Next time it is easier. Nature uses each act as a sort of divine cement more firmly to secure the act to its brother of the near future.

BUT there are some habits that make excellent taskmasters. The habit of rising early is just as easy to form as the habit of playing cards every evening. As we become drunkards by so many separate drinks, we can also become fully and proficiently educated in any subject by so many daily short periods of study.

Let no one worry about his future who will worry *now* about the habits he is forming.

The danger lies in the rulership that habits have the habit of establishing over us before we get the habit of considering them habits!

And some of us never recognize them, and are deeply offended if some outside observer, thinking to be helpful, points them out to us.

Be a slave only to good habits. Watch all habits, especially the little personal ones.

And do not fear to be a personage—a person who hews his own way in his own way who thinks thoughts of his own thinking and is a slave to no ritual or custom not of his own making.

FATHER'S FAIRLY SAFE

Nervous, frightened and worrying, the young man was striding up and down the hospital corridor. Somewhere behind the door his first child was being ushered into the world. Finally, the doctor appeared and told him to control himself or else go out and walk around the block.

"But I tell you, I'm scared to death," protested the new father.

"You needn't be," urged the doctor, "I've brought more than 2,000 babies into the world and I haven't lost a father yet."—From the Funny Side of Nellie Revell.

* * *

"What's the shape of the earth?" asked the teacher, calling suddenly upon Willie.

"Round."

"How do you know it's round?"

"All right," said Willie; "it's square then. I don't want to start any argument about it."—Stillson Zenith.

* * *

FISHING

One day about noon Mr. Jones called up a friend and said:

"I understand that Brown was at your house last night and not in A-1 condition."

"You heard right," admitted the friend. "He was here, and very much intoxicated."

"Terrible, terrible," ejaculated Jones. "By the way, was I there too?"—*Everybody's Magazine.*

PAST ALL HOPE

The neighbor of a man noted for his extreme thrift saw him going down the road on a week day dressed in his Sunday clothes.

"What's up, Cy?" he called out. "Why the glad rags?"

"Haven't you heard the news?"

"News! What news?"

"Triplets!"

"Oh, and you're celebratin—?"

"No, but what's the use tryin' to be economical now."

—*De Laval Monthly.*

* * *

Bootblack: "Light or dark, sir?"

Absent-minded professor: "I'm not particular, but please don't give me the neck."

* * *

First Englishman: "Charlie, did you hear that joke about the Egyptian guide who showed some tourists two skulls of Cleopatra—one as a girl and one as a woman?"

Second Englishman: "No; let's hear it."

* * *

Pansy to Sweet William: "Come in! Poppies not here."

* * *

DID SEEM SUSPICIOUS

"Your celebrated prisoner got away?"

"Yes," said the rural jailer. "When he borrowed my keys and told me somebody wanted to see me in the alley on important business, confound him, I knew he wuz up to somethin'."

Better Crops

he Pocket Book of Agriculture.

uly 1926 10 Cents

his issue: Thoroughbreds—Getting Educated on Quackgras
N. F. A. Annual Convention—Little on Cotton—Wisconsi

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

VOLUME VI NUMBER FIVE

Table of Contents for July, 1926

Who's Who of BETTER CROPS

EDITOR........................R. H. STINCHFIELD
CONTRIBUTING EDITOR........................JEFF MCDERMID
MANAGING EDITOR........................G. J. CALLISTER
PRESIDENT........................E. K. HOWE
VICE-PRESIDENT AND TREASURER........................H. A. FORBES

EDITORIAL *Office:* 10 *Bridge Street, New York*

Young America at his best

Better Crops

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, A SUBSIDIARY OF THE POTASH IMPORTING CORPORATION OF AMERICA, 10 BRIDGE STREET, NEW YORK. SUBSCRIPTION, $1.00 PER YEAR; 10c PER COPY.

VOL. VI NEW YORK, JULY, 1926 No 5

An essay that eulogizes and one that should interest scientific men

THOROUGHBREDS

By

Jeff McDermid

FIVE hundred million dollars is, I contend, a lot of money. Only two or three men in the history of the world have been able to amass such a large sum.

AND most men, to get their horny hands on a fortune of that magnitude, would almost sell their souls. Yet, I met a quiet, little man less than twenty-four hours ago who willingly and knowingly let such a Ford-fortune trickle purposely through his fingers.

This was the man who succeeded in isolating the secretions of the pancreas, the absence of which causes the dread disease DIABETES. Working assiduously and patiently in his laboratory, he finally discovered, in the Islands of Longerhans—a part of the pancreas—the secret of the body's ability to create the excess sugar which kills.

By the most conservative estimate, there are at least one hundred thousand diabetics to whom life would be cheap at $5,000. Upon his discovery, had Banting wished, he could have set up a laboratory in some large city and these sufferers would have raked and scraped together $5,000 each for an Insulin treatment. FIVE MILLION DOLLARS!

But NO.

Diabetic sufferers can secure relief in almost any town or city for a few dollars.

Why? Because there are some men in the world to whom fame and fortune mean little; men whose wish to serve outweighs any desire for greater recompense than a bare living—and of these Banting is King.

The man who finally isolates the cancer germ—if it be a germ—will proudly broadcast his discovery to an anxious, waiting world, free, gratis, for nothing. No thought will enter his mind of profit. For he will be of that group of thoroughbreds who do their duty without thought of reward.

"So to conduct one's life", said Ibsen, "as to realize oneself seems to me the highest attainment possible to a human being. It is the task of one and all of us, but most of us bungle it"; and Banting, the thoroughbred, having realized himself to the full in his unique work, seeks no more than a corner in which to contemplate new worlds to conquer.

SWING a fine dog by the tail; the creature is in a sweet ecstasy of pain, but no sound escapes him.

"You see", says the expert, "they never complain. It ain't in 'em. Same way when a stable burns. It ain't the fine horses that scream—it's the nags".

The thoroughbred never whines—never complains of unfair or unjust treatment. His eyes meet yours fairly, without fear, though you unnecessarily mistreat him.

To say a man or an animal is a thoroughbred is to enlist the services of the strongest, finest word in the vocabulary of commendatory terms.

The race horse which, in the extreme joy of feeling his sinews stretch to the thrill of a race to the finish, punishes his noble heart to the extreme—thinks only of WINNING.

He is a thoroughbred. No hope of recompense urges him faster than his own love of victory. No fear or scourge adds much to his speed. Others in the racing game look upon him as a money-making animal machine which must be well cared for—to be sold for a song as soon as its ability to win is over.

But the heart of the thoroughbred asks only decent food and shelter. Thank God, he does not even know what money is! He has no desires, except to win—and serve. He is the only thoroughbred in the racing game.

THE man who conceives the idea of putting a bump in a hairpin secures a patent through our government and the feminine gender pays for the privilege of using his patented device.

But the man who discovered that malaria and yellow fever were carried by the mosquito dies unsung, unheralded, unknown—no patents were issued in his name to make him rich.

Lawes, who discovered how to make acid phosphate; Liebig, who first pointed out to the world the value of potash as an essential plant nutrient; Burbank, who enlarged man's knowledge of plant growth—THEY did not die rich, as commercial wealth goes nowadays.

Yet Liebig's discovery, with Lawe's and Burbank's, has yielded great wealth to mankind.

"It happens to but few men to change the current of human progress, as it did to Watt, to Fulton, to Stephenson and to Morse", spoke Peter Cooper in a platform address, "but most men may be ready to welcome laborers to a new field of usefulness, and to clear the road for progress".

"I have endeavored to remember that the object of life is to do good; hence, I have been ready to engage in all new enterprises, and

(*Turn to page 62*)

Potash Experience

By G. W. Patteson, Jr.
Extension Agronomist, Virginia Agricultural and Mechanical College

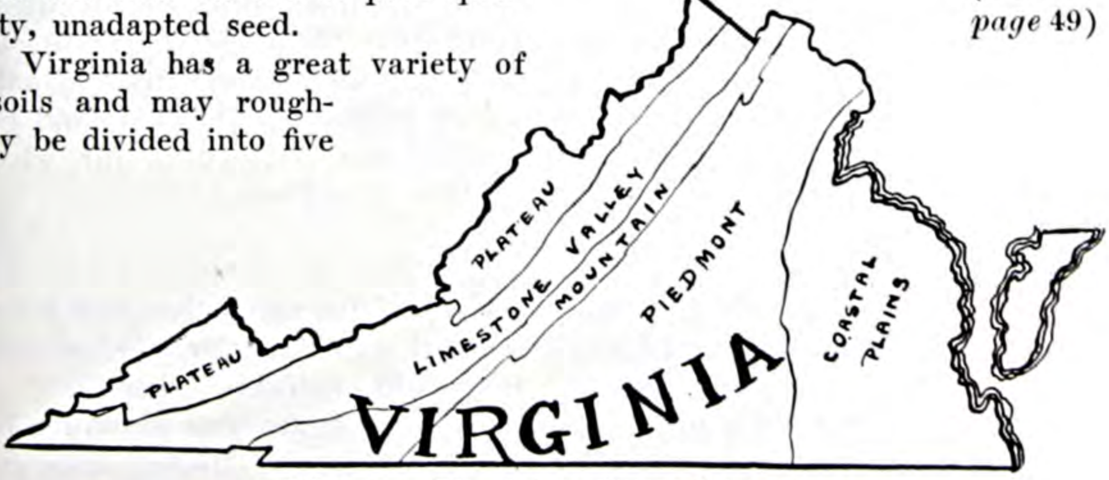
In which Mr. Coppedge draws some conclusions

RED clover is an important crop to Virginia agriculture. Following in its trail goes fertile soils and prosperity. Until comparatively recent times red clover crops grew luxuriously and were obtained without difficulty. Crops of red clover have continued to be increasingly hard to obtain over a long period of years. The stage has been reached now where the situation is really alarming, for no crop will take the place of red clover in supplying rich legume hay and at the same time maintain and improve the fertility of the soil.

THIS trouble has been due to the gradual depletion of the soil fertility through the lack of rotations, or proper rotations. Much of the land in Virginia has been under cultivation for a long period of years and the lack of care in handling it has greatly reduced the supply of organic matter, lime, and fertilizing elements (nitrogen, phosphorous, and potassium). Another factor that has added to the trouble has been the use of poor quality, unadapted seed.

Virginia has a great variety of soils and may roughly be divided into five distinct soil provinces, viz; Coastal Plains, Piedmont, Mountain, Limestone Valleys and Plateau. The soils of the Coastal Plains are, generally speaking, of a sandy nature in both top soil and subsoil. All of the fertilizing elements (nitrogen, phosphorous and potash) are deficient in these Coastal Plain soils. These soils are more deficient in potash than any others in the State.

(*Turn to page* 49)



Showing Virginia's five soil provinces

Twenty acres of "enemy"

Getting on "Quack

By M. A. Crosby

United States Department of Agriculture

"OLD BILL" CRUTCHER, as he was generally called, and his son Billy were sitting on the front porch reading by the twilight of an early July evening. Old Bill was scanning the market reports in the daily paper and wondering if it wasn't about time to dig and market his crop of early potatoes, while young Billy was studiously absorbing the contents of a Farmers' Bulletin that he had that day received from the Department of Agriculture. From the kitchen in the rear came the clatter of the supper dishes where Ma Crutcher and the girls were busily engaged in finishing up the day's housework.

THE bulletin in which young Billy was so deeply engrossed was one dealing with the question of controlling quackgrass, a pest that had become the bane of the majority of farmers in the Crutcher neighborhood. For a number of years quackgrass had been gradually encroaching on the fertile acres and rendering them practically useless for the production of cultivated crops. Old Bill, generally conceded to be the best farmer in the community, had fought the pest "tooth and nail" but despite his eternal vigilance some 20 acres of his most productive land had become thoroughly infested. The harder he tried to check the quackgrass by thorough cultivation the more it spread, so he finally adopted the passive policy of letting the infested land lie untilled and utilized it for what pasture it afforded.

AFTER reading the quackgrass bulletin through for the second time Billy suddenly asked:

"Say Dad, are you planning to do anything with that quackgrass land this year?"

Educated

Grass"

"Quack grass be d——d"

A true story that reads like fiction

"Why I reckon I'll just let it in pasture from now on," re-ied his father. "I haven't forgot-n how we just about wore our-lves out two years ago trying to ise a crop of corn on that land. don't have any particular han-ring to go through that exper-nce again, and reckon the best ay to check the darned stuff and ep it from spreading to the rest the farm is to leave the land in sture and graze it close."

"Well," said young Billy, "what ould it be worth to you to have at field cleaned up and put in falfa?"

"WHAT would it be worth? hy, if I had a good stand of al-lfa on that 20 acres it would be orth more to me than any 40 res on the whole farm. But shucks n, what are you dreaming about? would be a complete waste of ed and labor to try and get a stand of alfalfa on that land. That darned quackgrass grows so fast that it would choke the young al-falfa out before it could ever get a start."

"MAYBE you are right Dad, but from what I have just read in this bulletin I believe we can kill practically all of that quackgrass out, or at least enough of it so that we can get a stand of alfalfa on the land. Anyway, I would like to take a shot at it and see what I can do. We know that quackgrass spreads mostly by means of its underground stems, or rootstocks. This is why the more you try to kill it out with a cultivator the more it spreads.

"Now it says in this bulletin that in cultivated land these rootstocks go way down deep in the soil, but that in a meadow or old pasture they are usually massed in a thin layer just below the surface. Furthermore, the best time to kill out plants of this kind is when the rootstocks are at their point of lowest vitality. With quackgrass this occurs in midsummer, about the time it would naturally be ripening seed. If the land is plowed in hot, dry weather, just deep enough to turn up this shallow mass of rootstocks, and then harrowed thoroughly and frequently when it is hot and dry, most of these rootstocks can be killed out. This field of ours has been in pasture and grazed close for over two years so it ought to be in just the right condition for the treatment this bulletin recommends.

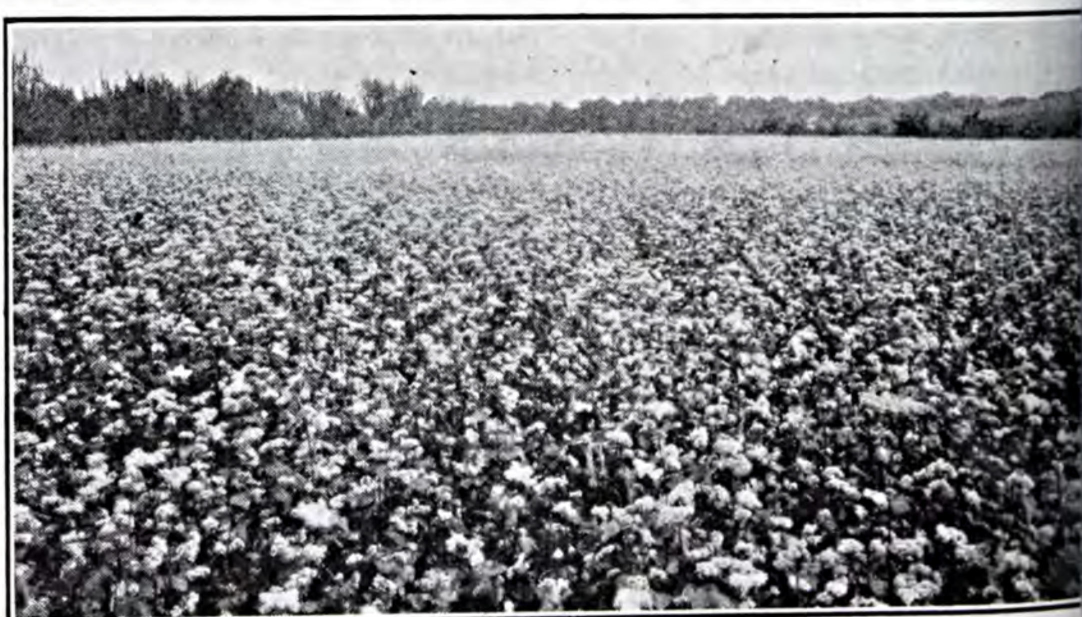
"Now my plan of action would be this: Plow that 20 acres shallow the last of July and harrow it every week or ten days through August and September, and even later if necessary. You know it is usually hot and dry all through August so conditions are apt to be just right. If we go after it hard enough I believe we can soon have Mr. Quackgrass on the run. Next spring I would keep the ground harrowed to kill out any plants that had lived through, and if the quackgrass is pretty well killed out by the last of June sow the land to buckwheat for a smother crop. This will hold in check any plants that have survived the fall an spring harrowing, and as buck wheat is now a good price a fai crop will more than pay the cos of the extra work put on the lan

"After the buckwheat is harvest ed I would apply about three ton of ground limestone to the acr fall plow the field, and sow it t alfalfa the following spring. Th Department of Agriculture recom mends a cultivated crop the fir year, and then a smother crop, bu if we put in a few extra licks an have luck in killing out the quack grass we can skip the cultivate crop and get the land seeded to a falfa a year earlier. What do yo think of my scheme?"

"Well, there may be somethin to it," replied Bill, "but it su sounds too good to be true. I' think it over and maybe we wi give it a try."

Followed three busy weeks o the Crutcher farm. The thre acres of early potatoes were du and marketed; then came whea harvest followed by thrashin Nothing further had been sai about Billy's quackgrass schem but in the meantime old Bill ha carefully read the quackgrass bu letin and weighed the whole matt

(*Turn to page 61*)



The buckwheat completely shaded the ground

N. F. A.

Annual Convention—*1926*

By G. J. *Callister*

A detailed report of a big get-together

THE essential nature of the fertilizer industry and the great diversity of subjects in which the industry is interested are strikingly shown by the wide range of subjects discussed and reports made at the recent Second Annual Convention of the National Fertilizer Association at White Sulphur Springs, West Virginia, June 7-10.

In addition to the able and instructive address of the president, Spencer L. Carter, addresses were given covering three outstanding groups of subjects, namely: agricultural research and educational work generally, a comprehensive group; fertilizer business problems; and production problems. Excellent addresses, well received, were given. The executives are to be congratulated on the program.

Everyone regretted that the Hon. William M. Jardine, Secretary of Agriculture, could not be present to give an address on "The Outlook for Agriculture". Fortunately, however, Mrs. Jardine was present throughout the Convention. A reception in her honor was held on Monday afternoon which gave everyone a delightful opportunity of becoming better acquainted with this charming guest.

The address of the president opened the first general session on Tuesday. The address was full of material of interest to all fertilizer manufacturers, distributors, and consumers. The president pointed out that although the South produced its second largest crop of cotton in history last year, and there were also large crops of tobacco and other staples, the low prices which the farmer received caused the fertilizer business for 1925-26 to be disappointing. Various factors contributed to this result—chief of which were the drop in the prices of farm products, a lack of available local credit and ready cash, and bad weather conditions which delayed farm operations. However, as was shown in the period following the war, the industry has inherent strength and great resisting powers.

It should also be borne in mind that while the general commodity index stands at about 155 the fertilizer materials index shows only about 113, as compared with prewar figures and also that the fertilizer materials index shows lower than any other commodity index with the exception of the non-ferrous materials. "Fertilizers were and still are the cheapest major elements in farming".

The president continuing reviewed the splendid educational activities of the Association carried on through the Soil Improvement Committee which maintains a large number of fellowships established to conduct a variety of research work. The Committee also does educational work through the county agents, vocational schools and other agencies, in addition to a variety of other work, all of value to the fertilizer industry and the consumer.

Touching on the problems of the industry, President Carter was emphatic in saying "that to my mind one of the most important things before the industry today is the question of simplified practice, such as the elimination of unnecessary grades; more uniformity in bag sizes, source tags, state fertilizer laws, etc., as well as the elimination of duplication wherever it exists". It should mean greater returns to the manufacturer, distributor, and consumer. It was pointed out, however, that it was not intended to advocate standardization that would destroy initiative or the value of brands or trade marks, but rather to advocate the elimination of waste and duplication.

The Association is strongly supporting the high analysis program "at the same time we are moving carefully and feel we should be sure we are on sound ground before taking each step". President Carter dealt fully with the practical side of concentrated fertilizers.

The Muscle Shoals project was discussed. The Association believes that Muscle Shoals is primarily a power proposition and should be dealt with as such.

In closing, President Carter recommended six major subjects for the consideration of the Association:

(1) Simplification of fertilizer practices.
(2) A proper system of cost accounting
(3) A careful study of the cooperative movement
(4) Intensive education through the Soil Improvement Committee
(5) Proper statistics and indices arranged in simple form
(6) Every member should tell the story of fertilizer at every opportunity, to the farmer and the world at large.

The keynote of the address was a constructive handling of the fertilizer problems in an intelligent, courageous and straight-forward manner.

"INDISCRIMINATE extension of more credit to farmers will not help them out of their difficulties", was an outstanding statement of George R. James of Memphis, Tennessee, a member of the Federal Reserve Board. Continuing, Mr. James pointed out that certain basic principles must necessarily be employed if farming as an industry is to be made successful. "The most important basis of national prosperity," he declared, "is the maintenance of soil fertility. We cannot have a rich and prosperous people on poor land". Mr. James spoke from 15 years of experience in farming.

The most vital question of crop surpluses was ably discussed by Sydney B. Haskell, Director of the Massachusetts Agricultural Experiment Station. Director Haskell told the Convention that the talk

(*Turn to page* 43)

Rollo Darby (left) and a prize hill of potatoes—height 44" spread 8'

California Spuds

By

B. E. Maynard

San Jose, California

CALIFORNIA potato men are watching with keen interest e work being done in potato club contests in the Golden State youthful growers. As the time for digging draws near, many e the speculations as to probable yields and references to the itstanding results of the contests last year, especially the yield one prize winner, Rollo E. Darby, age 7, whose record is going be hard to beat anywhere.

THIS youngster, who grew arly 830 bushels to the acre—is a member of the Pleasant Hill hool Potato Club in the Sebaspol district. The club was comsed of 25 members, the largest ub of its kind in the state, and 21 t of the 25 original members fined the contest. The club was der the volunteer leadership of r. and Mrs. J. B. Darby, direcr of the Farm Center and teach of the elementary school of Pleasant Hill respectively. Mr. Darby is quite an experimenter and is much interested in the use of fertilizers.

The seed for the contest was provided by the Farm Center. It was treated for diseases by P. H. Becklund, agricultural adviser of rural schools, and H. P. Everett of the extension service. The variety planted was Early Prize Takers and each club member received 20 potatoes.

Records of planting and of the care and cultivating of the various plots were on file at the school house for inspection and as each duty was performed, it was set down on the record.

The potatoes were dug about the middle of July by members of the Farm Center. The potatoes of each plot, were numbered and were passed over to the three judges who had been named previously by the Farm Center. The judges weighed and sorted the potatoes according to the United States' grade.

Rollo Darby received the prize for the greatest yield per acre, the yield being 49,728 pounds to the acre over the full area of 20 hills. However, three hills of this plot were missing. One hill was destroyed by gophers, one by wire worms and one by poor drainage. This left him but 17 hills. His record yield was for the entire plot of 20 hills and if it had been reckoned on 17 hills, this record would have defeated the English record

The fertilizer used on this plot was superphosphate and German sulphate of potash known as 0-21-21 at the rate of a ton per acre. As the potatoes were planted early in the season when the ground was wet and cold, the nitrate was provided for this plot by chicken manure, at the rate of two tons per acre. The yield of

Rosa Hagg, crowned queen by youthful potato growers

this could ha been great increased if had been ir gated. One h that receiv small portio of wate thrown from hand bas yielded good - siz marketal potatoes fr from all d ease. This pl has shown th by proper fe tilization a r sufficient mo ture all pot to diseases c be overcome

The club he a Potato D presided over by Rosa Hagg, years of age, a very enthustas grower of potatoes. This little gir welcoming address, worthy of speaker of more years' experien follows:

"Mr. Chairman and Friends:

"On behalf of the Pleasant H Agricultural Club I welcome y here today. You must be inte ested in the boys and girls cl work or you would not be he Let me tell you something abo our club.

"Our club consists of 25 me bers engaged in the potato conte organized by Mr. and Mrs. J. Darby and 38 members engaged the flower contest. Some of th are in both contests. You w notice all our members with t white and green caps and butto the caps were made by Mrs. L. French and the buttons were c nated by Mr. W. S. Borba.

"You will be pleased to bear t in mind when judging our wo Our meetings have been interesti

(*Turn to page 52*)

A Strawberry Festival

By W. F. Pate

Agronomist, National Fertilizer Association

COLUMBUS county, North Carolina, has been growing strawberries on a commercial scale for so many years that recently a celebration was held in honor of this luscious fruit.

CHADBOURN, which is a village in Columbus county, containing a few hundred people, succeeded handsomely in entertaining hundreds of visitors. With Boy Scouts acting as guides, a brass band to furnish the music and a large warehouse filled with luscious strawberries and the Governor of South Carolina as the main speaker, followed in the evening with a delightful dance, the occasion is one which will be remembered by all visitors for a long time. It seems very probable that the event will become an annual affair to be held during the height of the strawberry season.

The farmers of Columbus county know how to grow strawberries. The three main problems with the industry are insect troubles, fertilization, and marketing. Growers are succeeding in controlling the insects that bother the strawberries and this year the prices of the products have been encouraging. In regard to the fertilization of the strawberry, a great advance has taken place in the last few years. A few years back they were using from 500 to 1000 pounds of a fertilizer analyzing about 8-2-2 or 8-2-3 and now they are using from 2000 to 4000 pounds per acre of a fertilizer analyzing 10 per cent phosphoric acid, 4 per cent ammonia and 8 per cent potash. They have learned by experience that to

(*Turn to page 54*)

Little *on* Cotton

By Hubert N. Cooper

Abilene, Texas

EDITOR'S NOTE: *Last October* BETTER CROPS *carried a short story about this unusual farmer. Herein Mr. Little gives us more detail of his fine work.*

SEVERAL years of experimental cotton breeding and type testing on his farm in Texas have provided Felix Y. Little an opportunity to study cotton in all conditions and phases in a comprehensive manner. Mr. Little for the past two years has been experimenting with 24 varieties of cotton in a special experiment block. He has a total of 36 varieties of cotton on his farm.

He has given for BETTER CROPS the following interview as to what he has learned from his experiments:

"It was an accident that caused me to begin my experimental work with cotton," he said. "I placed my order with a cotton breeder for 40 bushels of pedigreed seed. In a few days I received a letter from him saying he did not have more seed for sale. Then I began to buy seed from several farmers. I planted the seed side by side and watched them to see how they would produce. I kept a record to see which was the best suited for my land. At the end of the year I could tell to a pound how much each variety produced and I gained some good experience from my year's work.

"Then I resolved to do some experimenting for myself. The second year I did some breeding work. In all of my work I kept a record of everything. I used both long and short staple varieties also large and small leaf varieties. I found the small leaf type better adapted for my land. Some farmers will try only one or two varieties on their land and grow them from year to year and never try another variety. In my tests I find some types better suited for black land than sand and some just the opposite. I believe in a one variety community. In a one variety community, the cotton will be a uniform staple and the seed can be kept purer.

"SOME farmers in buying seed, buy seed that will produce more lint regardless of the staple length. In my test plot, I have cotton that ranges in staple length from 9/16 to $1\frac{1}{2}$; also large and small bolls ranging from 36 to 94 per pound."

The all-important question of cottonseed is one which every

—*Photograph by Ewing Galloway, N. Y.*

A typical scene on a Southern cotton plantation

farmer has to deal with every day. The results of his experiments should prove of much value to every cotton farmer in the United States. Experiments with 24 varieties of cotton have taught Mr. Little many lessons.

"IN my experiments with cotton I find there are only two kinds of cotton seed that can be told from any other kind with any accuracy," he continued. "Half and half cotton seed are smaller than any other kind. And Rowden has a very distinct type of seed that can easily be told from any other variety. I have tried time after time to distingush one type of cotton seed from another. There is not any way by which they can be judged as far as I can find out. Sometimes I think I can tell the difference by the color of them but when I begin to examine them closely they appear so near alike that when they are mixed together it is difficult to pick out all of the seed of the same type.

"Deterioration, that great bugbear of cotton breeders, is constantly cropping up to undo the work of the cotton breeder. There is a natural law that cotton will deteriorate up to a certain period and then come to a natural state of rest, beyond which it will not go. Cotton is a plant that can adapt itself to meet the surrounding conditions. Cotton is being grown farther north than people 25 years ago thought it would grow. Cotton breeders saw the necessity for growing cotton farther north and began to work to that point. We can now see the results of their work.

"In my experiment I tested out one variety of cotton that produced half a bale of matured cotton 90 days from the date of planting. In 100 days I picked 320 pounds of seed cotton per acre. It was a long staple cotton with large bolls, medium stalk and a high lint per cent. Cotton breeders work along different lines and get different results. Some work for production and some lint per cent; some staple length.

"IT is well that they work along all these lines because some people want production regardless of the lint per cent and staple; some want one thing and some want another. So it is a very easy matter to find the kind of cotton to suit their wants.

"In my experimental work, I find some cotton produces an abundance of pollen and fertilizes the bloom perfectly, while in others there is a lack of pollen to fertilize the bloom perfectly. In one of my tests I took the pollen from one pollen and after cutting all of the rest off, placed it on the stigma or female part of the bloom to see what the results would be. When the boll appeared I found I had only fertilized one seed. All of the rest were motes. So when cotton produces a lot of motes or immature seed it shows that there was a lack of pollen from one cause or another.

"I was called to investigate one field of cotton to see if I could discover what was the matter with it. The farmer who owned the field complained about his cotton not turning out at the gin. I went to the field to see if I could discover what the cause was. The cotton seemed to be well matured; had large, thrifty stalks with lots of bolls. Just by looking at it, the field was all right, but when I began to examine the cotton, I found from three to four motes in every boll. I could not account for it for I grew the same variety in my test plot and it seemed to be a heavy pollenizer. So I asked the farmer what he had done to the cotton that was unusual. He said he had poisoned it in the day time. So I came home and tried it out on a small scale and I find if you disturb the pollen with any foreign substance you create more or less motes. I used flour instead of poison in this test.

"One of the greatest mistakes is for a farmer to plant cotton seed that has been planted three years and that has been gin run, for you can take pure seed and plant them and have them ginned and unless you take pains with them you receive only 74 per cent of your seed back. If you plant them next year and pick the inferior cotton that year and have them ginned the same way, at the end of the third year, you would not have any of the original seed at all. You would have every kind that was planted in the community. But still some farmers will tell you they are satisfied with their seed and that the seed are pure as they have had them only two years. They do not stop to think of the inferior type of cotton that will creep in when they least expect it.

"A FARMER will always make money by planting the best seed he can get and not plant them over two years. Every farmer can have good seed if he will only take time and select his planting seed. Some lands produce a better lint turnout than other land. The land that produces the best lint per cent usually produces the shortest staple. I have watched this very carefully for some time. Some people plant cotton for lint production regardless of the staple.

"In the next five years there is going to be a radical change in regard to the length and quality of the staple produced. The spinners demand good staple and are willing to pay for it. Every year sees us nearer to the time when staple will be the most vital point in the production of cotton instead of lint per cent. If you can find a cotton of good lint per cent, also staple length, you will usually make more money by planting

(*Turn to page 58*)

Wormy Winter Apples

By C. L. Burkholder

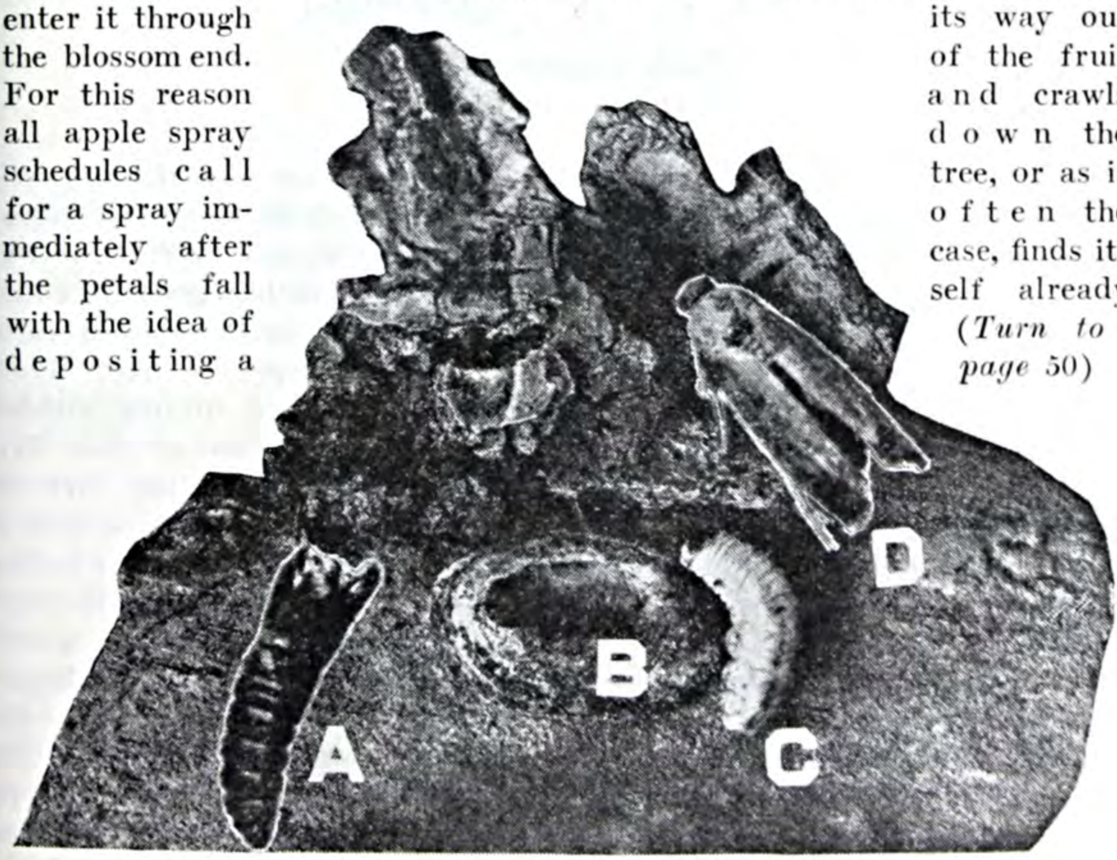
Purdue University, Lafayette, Indiana

They may be avoided according to this story

THE first brood of Codling Moth or apple worm is only indirectly responsible for the wormy winter apple.

The moths of the first brood emerge from their cocoons in the spring and lay eggs on the foliage of the trees soon after blossoming time. The small white worms that hatch from these eggs make their way to a nearby fruit and usually enter it through the blossom end. For this reason all apple spray schedules call for a spray immediately after the petals fall with the idea of depositing a film of poison in the calyx of the apple before it closes up.

This poison trap is then in readiness for the little worm whenever it enters the calyx of the apple and starts to chew its way into the fruit. If the worm finds its path unprotected it works on into the apple and in about 30 days grows to a length of three-quarters of an inch. It is then mature and bores its way out of the fruit and crawls down the tree, or as is often the case, finds itself already (*Turn to page 50*)



A—Codling Moth pupa case; B—Cocoon C—Codling Worm; D—Codling Moth

Clover seed proved one of the best crops

Deciding a County

By E. R. Jackman

Oregon Agricultural College

HOW does a county agent decide upon his program? There is one out in Oregon who managed it in a unique way. After he had been on the job for a year he began to see that he was using up most of his time upon things which weren't really fundamental. One man would want to know about corn, the next about clover, another would have a suddenly developed dairy complex, and so it went from day to day. He found that his job kept him busy as near to 24 hours a day as his health would stand, but when the year's work had been done, he had little to show for it except thousands of unrelated bits of work. A program was in the making, however, to be hurried by subsequent events.

Five years ago when L. R. Breithaupt started in as county agent in Malheur county, Oregon, it was quite largely a hay growing county. Out of 95,000 acres in farm crops 75,000 were in hay. Each acre of irrigated alfalfa yielded four to seven tons of fine hay. People were doing quite well in growing hay and either selling it on the farm to stockmen or baling it and shipping it to other districts. But suddenly the alfalfa weevil appeared on the scene and began to raise particular Cain with the alfalfa growers. First it ate the growing hay and reduced the crops down to about three tons and then its appearance was followed by a quarantine upon hay from this district so that the growers could not

Corn, wheat, clover was a profitable rotation in Malheur county

Agent's *Program*

A story of a county agent who planned ahead

ship out the hay they did grow. And to further complicate matters, came a great slump in livestock, the industry upon which the hay farmers depend for a market. Hay dropped to next to nothing in value, and some of it has not been sold to this day. The most cheerful thing about this appeared to be Mr. and Mrs. Weevil who apparently were masters of the situation.

Now Malheur county is blessed with a long growing season. Most anything will grow there except bananas and polar bears. This complicated the situation because plans for reorganizing the farming of the county ran riot. Some wanted to grow vegetables for canning; others, navy beans for shipping; others, potatoes; and some, corn for supplying the big deficit in the Pacific Northwest. Dairying, seed growing, wheat farming, all had their devotees and some pessimists were in favor of quitting altogether. Others, enamored of the comparatively simple problems of hay growing, decided to keep right on and wait for stock to come and eat what they produced, or grind the hay, weevils and all, into alfalfa meal. Some wanted to plow up all the hay and put the land in pasture.

All of this merely an introduction to show the somewhat chaotic condition of things and the general unsettled state of people's minds. It would have been easy for the county agent to go on about his myriad duties and let events take care of themselves. Or a man without a level head might have adopted some plausible cure-all and pushed it hard, only to reap disappointment. What Mr. Breithaupt really did is the important part of this story.

IT appeared to him that there was need for more diversified farming but information about the profit to be made from various crops was lacking. Without this knowledge he thought it would be futile to adopt a cut and dried program and urge it upon the people. He determined to get this information. Meetings were held in every part of the county and nearly every farmer in the county was interviewed at one or more of these meetings. As a result some rather accurate data were gathered about the cost per acre of growing everything which could be grown locally. These were carefully checked with results in other counties. The figures were then put upon huge charts and farmers were urged to try to pick flaws in them. By the time the acre costs had been all over the county and revised in detail they were finally able to pass inspection anywhere. Just as an example, here are the cost figures on an average farm for producing alfalfa hay:


L. R. Breithaupt

Man labor 37 hours at 30c.	$11.00
Horse labor 33 hours at 15c.	5.00
Machine expense	2.50
Seed	.50
Taxes	2.50
Water and drainage assessments	6.00
Repairs and insurance	1.00
Total (exclusive of interest)	$28.50

Space is lacking for including all of the crops but the totals (exclusive of interest) for some of the leaders appeared like this:

Alfalfa hay	28.50
Corn for ensilage	53.00
Corn for grain	40.50
Wheat	38.25
Clover seed	34.10
Beans	49.75
Potatoes	85.50

All of this took some time, but it was just a starter for a man like Breithaupt who didn't care how thoroughly he did things. He then painstakingly gathered accurate figures on the prices paid locally for all of these crops over the preceding 10-year period. He figured that this would be of no value in any one particular year but that such figures should give a fair idea of what prices might be normally expected on the average in the future. If the general price level were higher or lower it might affect individual items, but on the whole the relative values would be maintained, he thought. The

(*Turn to page 51*)

That Price Disparity

By *Arthur* P. *Chew*

United States Department of Agriculture

Finishing a good discussion started last month.

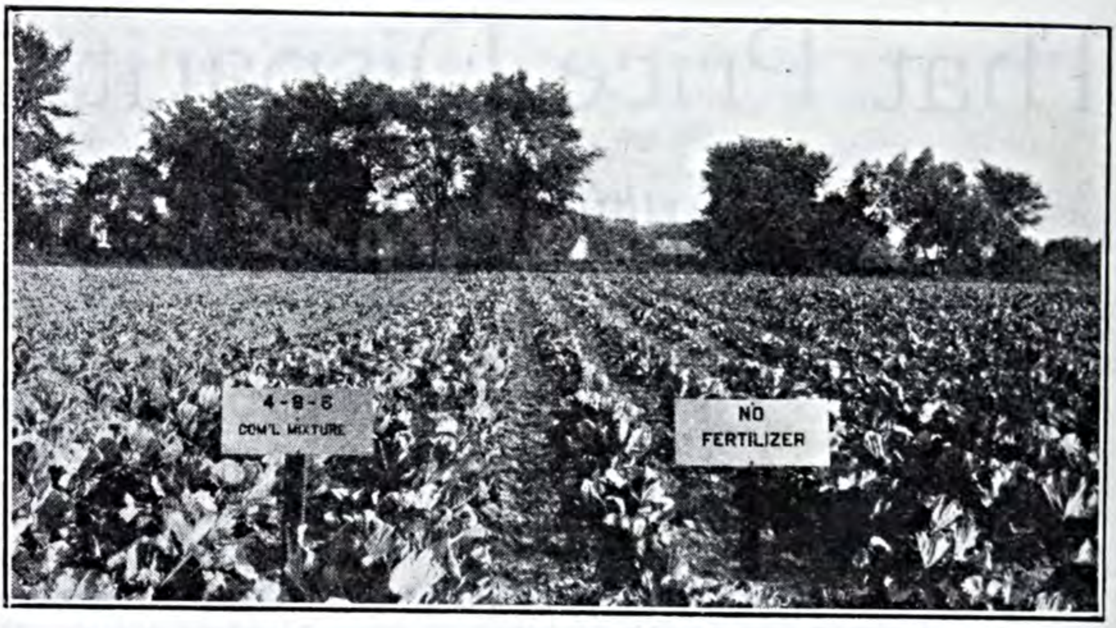
AGRICULTURAL and industrial prices are always rising or falling in relation to one another. From the Civil War down to 1896 the advantage was usually with industry. From 1896 to 1910 the advantage was with agriculture. In that period the prices of farm products rose considerably more than the prices of other goods. From 1910 to 1914 the situation didn't change. You may think that the steadiness of the situation in that period shows that a permanent balance had been reached. Few economists would bear you out there.

MANY students think the country was heading for a depression in 1914. In that event farm commodity prices would almost certainly have slumped more than industrial prices, just as they did in 1921-1922, because agriculture can not be readjusted to declining markets as rapidly as industry. On the other hand, food production in the United States for 15 years before the war did not keep pace with our constantly growing population. A similar tendency was noticed in other countries. You had forces working in opposite directions. The most anybody can do is to guess how they would have affected the relationship of agricultural to industrial prices.

It is therefore plain that we can not consider the pre-war situation as normal and necessary. It is impossible to predict the price relationships of the future from those of the past because new forces are constantly coming into play, many of which defy statistical measurement. Some authorities believe the pre-war price situation was so favorable for agriculture that in the nature of things it could not have been permanent. Others maintain farm commodity purchasing power has been too low for a hundred years. About all we can say with confidence is that it is not what it should be now. To say that it should be stabilized on the 1910-1914 basis, or on any other basis, is sheer guess work.

And now as to whether the pre-war position is essential to farm prosperity. That is a question the answer to which will depend largely on whether you think price relationships are self-adjusting or should be the subject of legislation. If, as I believe, they are self-adjusting, it is a consolation to reflect that, after all, they are only one factor in farm prosperity. Production costs and the volume of production are at least equally important. Henry Ford has demonstrated that profits don't absolutely depend on high prices, and our wheat growers are realizing

(*Turn to page* 59)



Cabbage makes excellent use of good commercial fertilizers

Fertilizers *for*

By The Editors

IN Wisconsin agriculture "the proper use of suitable fertilizers is one of the surest ways under present conditions to increase the farm income" say Professors C. J. Chapman and A. R. Whitson.

IT is pointed out that the cost of interest, tillage, taxes and seed must be met before a profit can be counted. Average yields may cover these items, higher yields must be secured to obtain any profits. A maximum yield on a small acreage is, therefore, more profitable than an average yield on a larger acreage.

While this is true of all crops, it is particularly true of cash crops. The many factors that must be considered in growing, using and applying fertilizers on several cash crops are given in a most practical and readable manner in Bulletin No. 383, "Fertilizers For Special Crops". The crops studied are potatoes, tobacco, canning peas, cabbage, onions, sugar beets and the home garden and lawns.

In growing special crops the authors point out that the crop should be grown on the soil adapted to it. The soil should not be too light because on light soils, with low water holding capacity, less fertilizer can be used at a profit. The drainage should be good. Manure and clover are the cheapest sources of nitrogen. Commercial fertilizers should be used to meet both the soil and crop requirements and not the requirements of the soil alone. Rank heavy growing crops need relatively large amounts of plant food, especially nitrogen and potash.

Methods of application are very

Quality and yield were improved by 800 lbs. per A. of 5-8-7 mixture

Special Crops

Reviewing a valuable bulletin

portant. The Bulletin contains ıny excellent illustrations show- g how to apply fertilizers, in fact, is one of the best recent discus- ›ns of the subject. It is point- out that these methods vary th the crop, and that care should taken not to cause injury from e use of fertilizers. Detailed in- rmation is given for each of the ›ps mentioned.

High grade fertilizers are most onomical when figured on the sis of unit cost. Regarding me mixing, it is observed that, ıe home mixing of fertilizers, ntaining nitrogen, involves cer- n difficulties and should not be tempted unless the farmer is in ssession of full knowledge of oblems involved".

Specific fertilizer recommenda- ›ns are given for the above men- ned six crops, and for the home rden and lawns.

Potatoes respond to fertilizers more than any other crop in Wisconsin. Where fertilizers are properly used increases of from 30 to 60 bushels per acre can be expected. The analysis of the fertilizer and the amounts per acre vary under different conditions, but particularly with the amount of manure used. Generally speaking, from 400 to 800 pounds per acre is the best amount. The analysis will vary. The authors point out that potatoes are heavy feeders of potash. Plenty of available potash is required for a maximum yield. Also, since phosphoric acid is the limiting element on most soils, this element is essential.

Where manure and clover sod are used on the lighter sod types, an 0-14-4, or 0-12-6, is recommended. Certain conditions warrant the addition of nitrogen. On the

(*Turn to page 53*)

COMING through

By I. J. Mathews

Winamac, Indiana

"SURELY any man who has been a more or less successful county agent can take hold of any worn piece of soil and make it bloom like the rose." That is what I thought three years ago but in the actual taking hold, there was a great clash between desire and possibility. Had I moved out here from town, where we had all the conveniences that modern town life affords, onto a run-down farm with a fat wallet on my hip, I would soon have been "sitting pretty" as the agents say and could have "put it over" in great style. Putting it over is great business so long as the process is largely mental but putting it over and sitting pretty on a depleted soil is a somewhat arduous task—a jo that for hardness has Pharaoh' heart skinned a city block.

Quite true, I had been count agent in this county for six year I knew a few of its problems an although some farmers thought was pretty well paid, we foun that although we lived frugall there was little opportunity t save very much after we had pai tribute to the milkman, icema fuel man, tax man, and sever others who stood along the gaunt let that one must traverse befor he can begin to save. No, I wa in the same class with most othe county agents who will be frank— I hadn't saved very much. Offici life with its white collar an

Showing that sweet clover likes lime

the ALFALFA

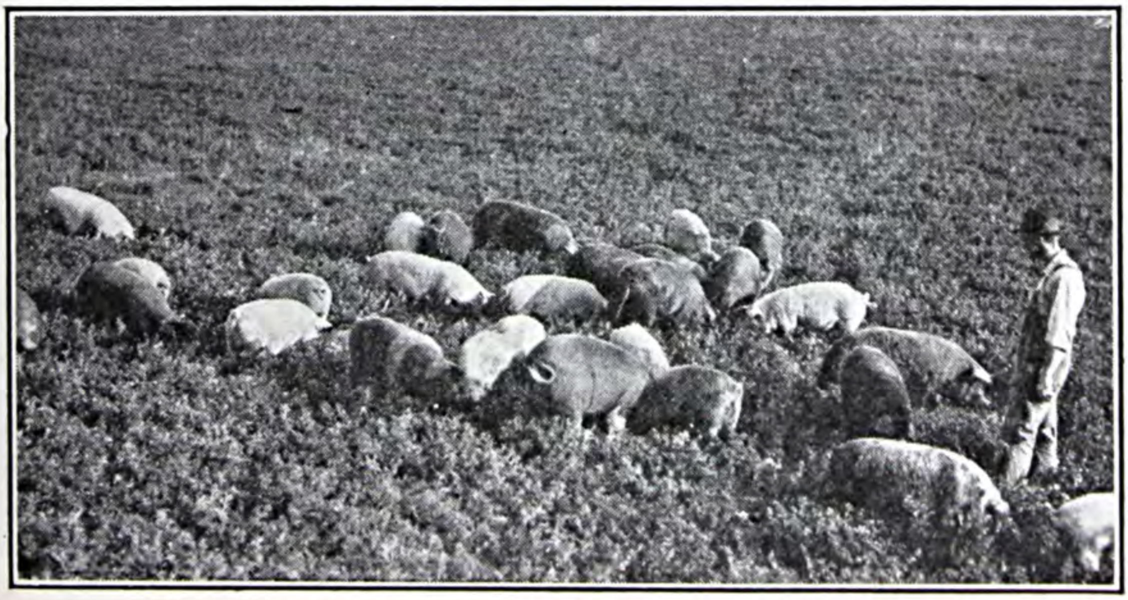
An ex-county agent turned loose on a worn-out farm

monthly stipend had almost made us salary hounds.

Although both the mistress and myself had been reared on farms and were constantly working with farm problems, we dreaded to make a stab at farming on so little money because we could not jump right into it the first thing and build for ourselves a home that would be at all comparable with what we had left behind.

A bird's eye picture of the farm! It bordered on the Tippecanoe River and had a wonderful scenic spot where a log cabin had been put up years before. That was its greatest recommendation. The land had been skinned for years, no clover grown since Heck was a pup although the old men with spinach, that survivor of a former style, could remember when the farm had grown clover. But the man who had owned it since then had simply squeezed the top soil until there wasn't anything left to get out of it. All of this I thought I knew at the time I bought it, but I didn't realize it half so well as I do now.

There was on the farm proper a farm house that had been built of good materials but had been allowed to gradually rot into the ground. Window panes and jambs were gone, roofs were leaky, walls were covered with uneven shades of what in the twilight might have been tapestry but in the daytime



Hogs in good alfalfa on sandy field

was simply grime, varnish had long since lost its identity and where paint had been smeared on the woodwork, even a blowtorch failed to get a smell out of it. Eaves troughs were gone, the kitchen floor sloped three inches to the north, the cellar-way steps and doors had long since vanished. And the grounds were littered with old pieces of wood, boards, and poles. Even the limbs that had been cut off the old apple trees hadn't been cut up for wood. The owner thought it cheaper to buy coal and more productive to play pool and I was to pay the bill. Outbuildings, there were practically none.

Into such conditions as these we found ourselves thrust mainly because of our desire to own the cabin which I have mentioned before. But here and now, allow me to dismiss said cabin with the emphatic statement that cabins, scenic though they may be, do not pay the bills for fixing up an old run-down farm.

MY banker and I had many arguments largely because we had two different viewpoints on farming. His farm is across the river from mine and he had bought it two years before. We often argued as to how one would best go at it to build up a run-down farm, one thing which we had in common. He looked at it from an investment standpoint. He felt sure that the proper stunt was to illuminate it with nice white concrete corner posts and good fences, patch up the buildings, give them a coat of the cheapest paint that could be bought and then look for some sucker who was in the market for a fine farm and couldn't see beneath the surface.

I looked at my land as a spot where I might rear my family, the only thing of any importance that I had accumulated, under conditions that would allow them the fullest development within our power. It was to be an investment that we could so manage that it would pay returns on the capital and give us money enough besides so we could put in such conveniences as furnace, electric lights, running water, and the like. But I soon discovered that in its present condition, the old farm would do nothing like that and already I had strained my credit to the breaking point. Nothing but high tensile strength kept it from slipping the halter.

But if I was to be consistent, I must do what I had been telling others to do, although it made the credit sway a little farther. I borrowed the money at eight per cent with which to lime 110 acres of that farm. In the first two springs I have owned the farm, the entire 110 acres have been limed. I knew that I must grow clover if I would succeed. The most successful way to resuscitate a lethargic soil is to fill it with footprints, mostly of animals that have four legs. But it is a long way between run-down soils and animals, and I have seen several men fail because they did not fully realize that a soil and crop improvement program must precede any attempt at livestock raising.

But almost as providential as the dropping of the ancient manna, my limestone produced results within three weeks from the time I limed the first acre. It was on a field that had been in corn the year before. This field we limed with an end-gate lime-sower, the team following every fifth row. On so many fields, I had seen what uneven spreading of the limestone

(*Turn to page 60*)

¶ *No. 4 of Professor White's series*

Kentucky Blue Grass

By J. W. White

Soil Research Chemist, Pennsylvania State College

AT the time the pasture lot experiments were started there as very little information availble concerning the fertilization of ue grass. The general impression emed to have been that the farm- could not afford to invest more an a few dollars per acre in the nprovement of his pasture. This nservative stand taken by our cperiment stations was entirely in eeping with experimental results that time. The meager data vailable was gained from attempts improve old pastures on land nfit for cultivated crops. In many ses the failure of grass was hastned by poor physical conditions f the soil in which case fertilizers nd lime were of little value.

THE Snow Shoe experiment on eKalb soil started in the spring f 1916. It was thought then to the crucial test, for nowhere ould we find land so poor in ferlity, so apparently hopelessly deoid of agricultural possibility. and that had lain practically arren for 40 years, abandoned by e class of farmers who, accordg to Hoard, have a lazy faith in e Lord and think or hope that e will somehow make up for hatever they fail to do.

In spite of a certain amount of "kidding" by an occasional passing farmer, the land grown up to "bracken", an occasional scrub pine and a scattered growth of poverty grass ("moonshine"), was put to the plow and prepared as is the custom for the preparation of wheat seed beds.

Three tons per acre of 20-mesh limestone were applied and thoroughly harrowed in followed by the top-dressing of mineral fertilizers and manure. After thoroughly mixing the fertilizers in the soil, 10 pounds of Kentucky blue grass, 2½ pounds white Dutch clover, and 10 pounds of sweet clover seed were raked into the seed bed.

The field was then dedicated to science and the writer hoped for the best. Was it not Lincoln who said that "Every blade of grass is a study; and to produce two where there was but one is both a profit and a pleasure"? Here the writer was content, perhaps, to grow one where none grew before.

In a comparatively short time the pasture plots seeded in May began to show green and by fall there was a thick growth of blue grass on all the fertilized plots. The unfertilized areas showed not a blade of blue grass. In July of

(*Turn to page 57*)

WISCONSIN

Finds Facts For Farm Folks

By A. W. Hopkins

Editor, Wisconsin College of Agriculture

EDITOR'S NOTE:—*"At Your Service" is the slogan of this College of Agriculture and Agricultural Experiment Station where we stop for the third of our series of visits.*

"A SMALL farm house, two ordinary barns, a little livestock, a few tools and an armful of books."

In this way, William Arnon Henry, the first dean and director, was accustomed to inventory the early "worldly goods" of the institution, which is today known as the Agricultural Experiment Station and College of Agriculture, of the University of Wisconsin.

We are told that although the seed of agricultural education had been planted in Wisconsin as early as 1866, it lay dormant until 1880, when young Henry was appointed professor of botany and agriculture. From that time on, howev the embryonic institution gr from a single chair into a depa ment, and then into a college a station, waxing steadily in stren and usefulness.

IN his message to the legislat in 1883, Governor Jeremiah Rusk, (a an early s retary the Uni States I partment Agricultu advocated generous a ricultu policy, which an a ricultural periment s tion was be esta lished on University farm. Acting on his a vice, the legislators authorized development of the experiment p ject.

Accordingly, in June 1883, regents of the university organi the new station, with Henry as head. Then, through the pass of the Hatch act in 1887, the f

(*Turn to page 55*)

Under Two Leaders

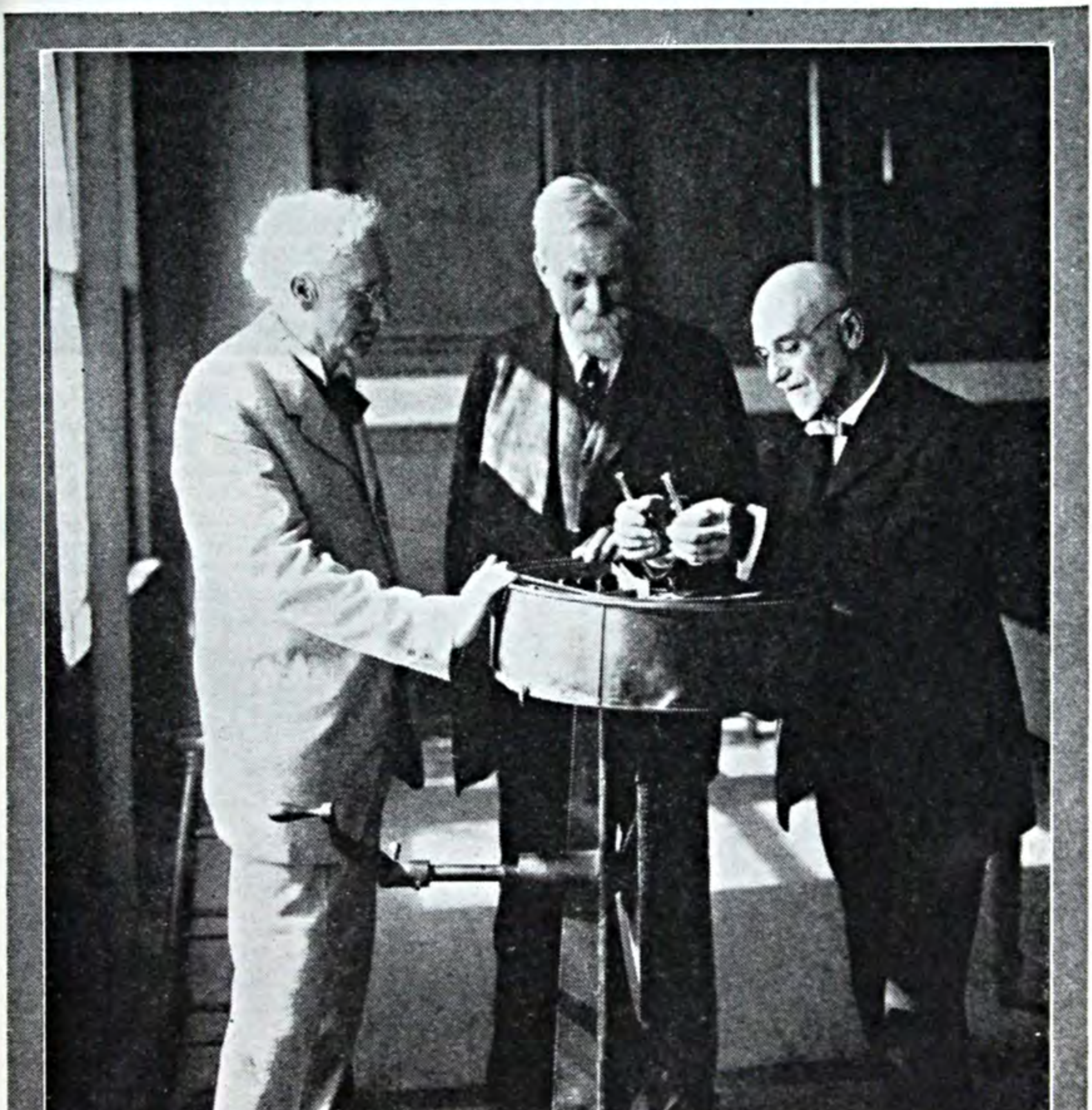
The Wisconsin Agricultural Experiment Station was established in 1883.

The first Short Course in Agriculture given in this country, was organized at the University of Wisconsin.

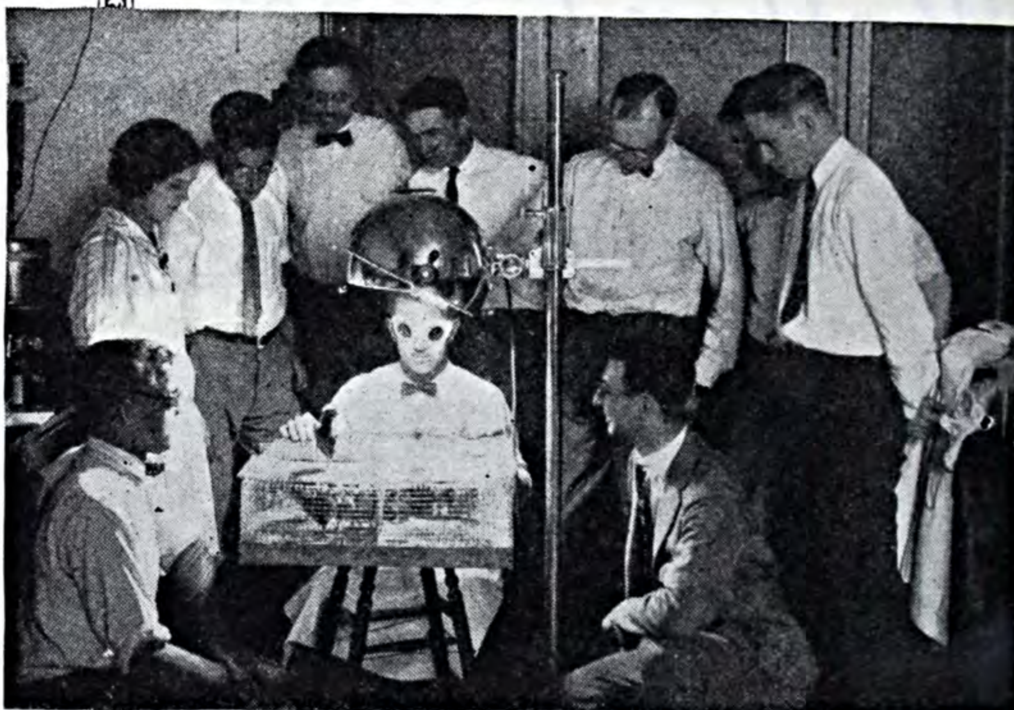
Under the leadership of Dr. S. M. Babcock, the first Dairy School in America was started at this same midwestern institution.

Forty-one years ago, Wisconsin started the farmers' institute movement, which has since had a mighty influence upon American agriculture.

Better Crops' ART GALLERY of the month



Standing beside the original butterfat tester Dr. S. M. Babcock is telling Dean W. A. Henry (left) and President T. C. Chamberlain (center) about the test which revolutionized the dairy industry.

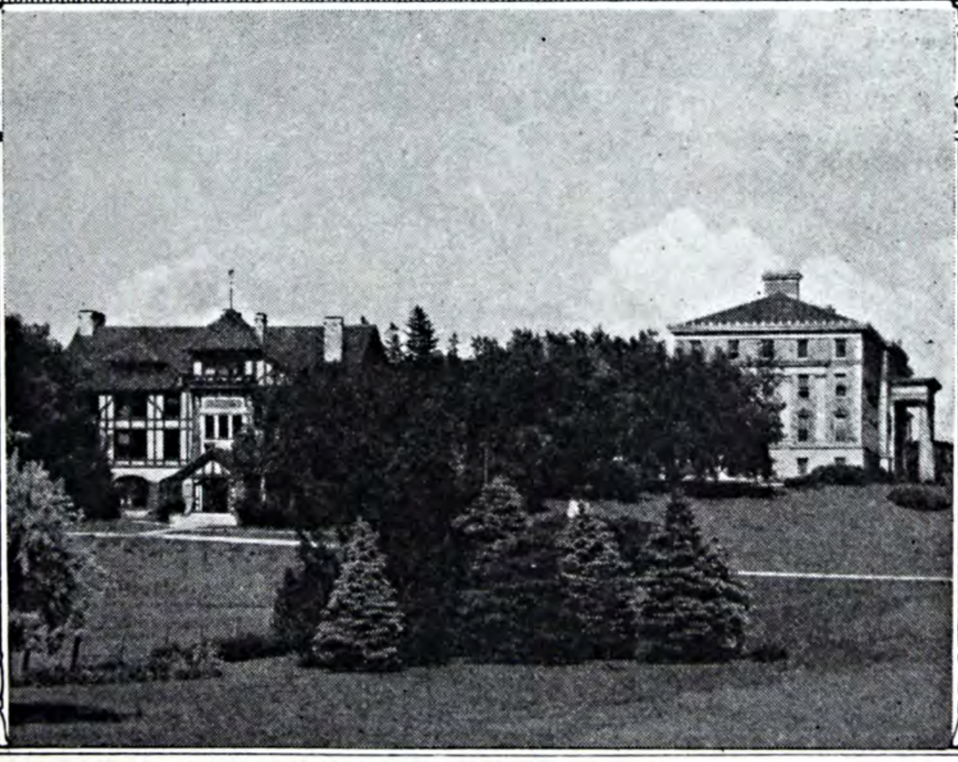


What wonders light has wrought! Here is seen a corner in one of the agricultural chemistry laboratories at the University of Wisconsin. Students are learning, first hand, of some of the latest findings upon the ultra violet light and its beneficence to growth in plant life and animal kind.

WHERE DAIRY HISTORY WAS MADE.

In this building on the campus of the University of Wisconsin there assembled in 1890-91, at the call of Dean W. A. Henry and Dr. Stephen M. Babcock, the first dairy school in America. Their pioneering has won the approval of the whole agricultural industry in the decades which have since followed.

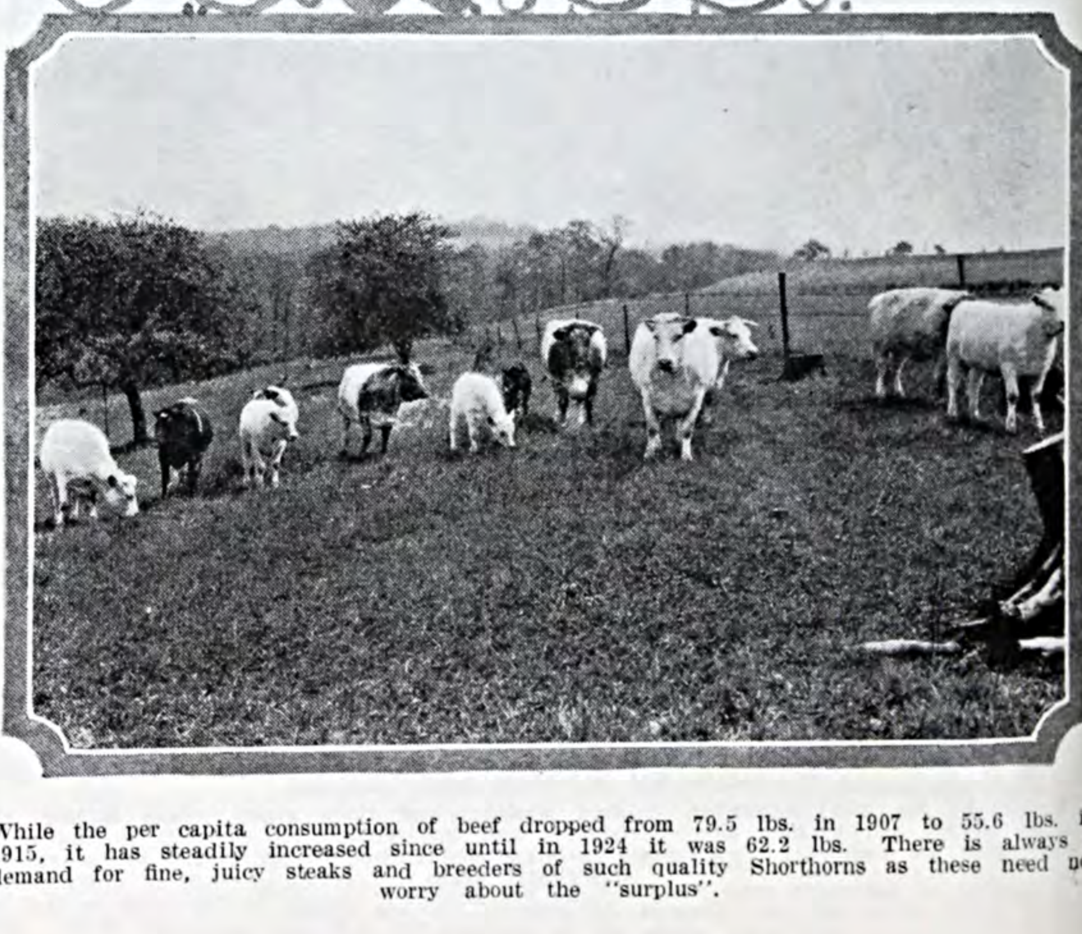
A stronger faculty than Dean W. A. Henry left to his successor in 1907 would be hard to assemble. Front row left to right. C. A. Ocock, F. W. Woll, W. A. Henry, S. M. Babcock, E. H. Farrington, and A. S. Alexander. Back row: H. L. Russell, G. C. Humphrey, E. B. Hart, A. R. Whitson, and D. H. Otis.



FASHIONED BY MAN AND NATURE.

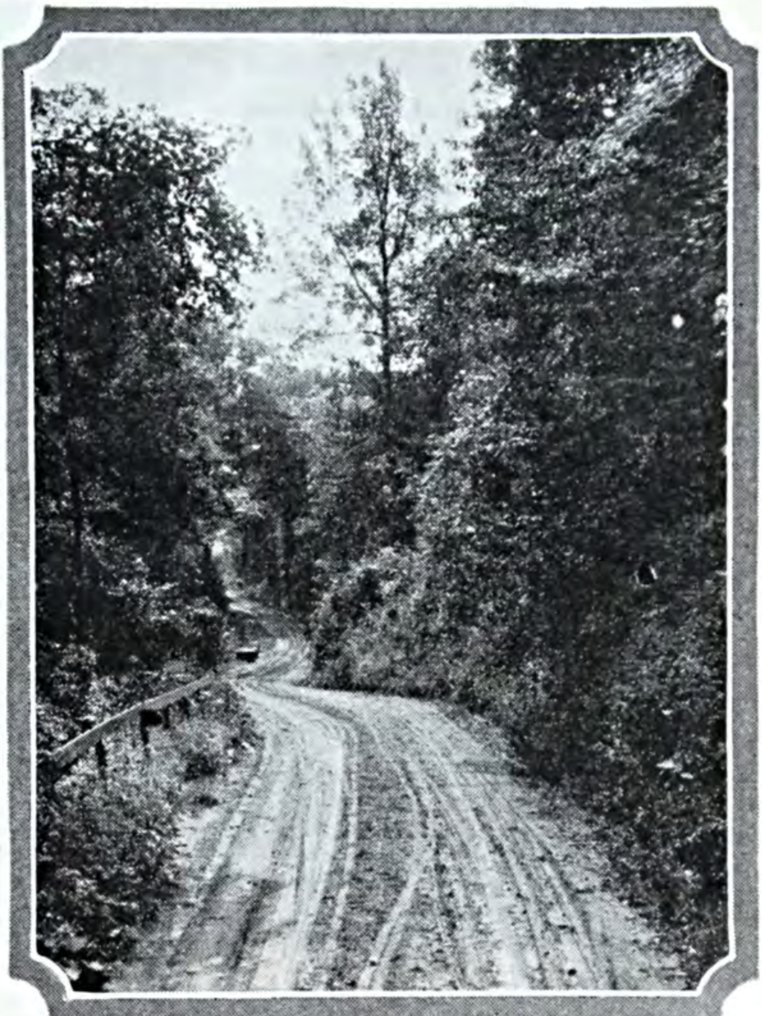
John Muir, the great naturalist, enjoyed strolling over these grassy slopes finding what nature always had to offer him—refreshment and inspiration. At the left is the second building of the University of Wisconsin to be devoted entirely to dairying. At the right is Agricultural Hall.

In front of the Administration Building of the Department of Agriculture at Washington is a small plot of creeping bent grass, the variety developed by the late Dr. C. V. Piper and found most satisfactory for golf greens and lawns. The photograph, taken about the first of April, shows the thickness of the turf and the velvety texture of this grass in comparison with the ordinary lawn next to it. The man with the headless golf stick is O. B. Fitts of the U. S. Golf Association which is cooperating with the Bureau of Plant Industry in some of its turf work.



While the per capita consumption of beef dropped from 79.5 lbs. in 1907 to 55.6 lbs. in 1915, it has steadily increased since until in 1924 it was 62.2 lbs. There is always a demand for fine, juicy steaks and breeders of such quality Shorthorns as these need not worry about the "surplus".

An invitation to See America First! That our summer vacationists are responding is evidenced in the thousands of cars with their camping outfits to be seen now on almost any highway, and the fact that there are in the United States more than five times as many passenger automobiles as there are in all the foreign countries combined. Since 1916 the United States has spent $400,000,000, and the states have spent as much on good roads and their maintenance. This winding road with its refreshing coolness is in northern Ohio.



Winning dairy cattle judging team in the contest recently held at the Boys' and Girls' Club Round-up at Purdue University. From left to right they are: Maurice Byrkett, Roscoe Davis, and Everett Stanley, all members of the vocational agriculture class in the Knightstown High School—Harry Ainsworth, Coach, on right.

This publicist's conception of the Farm Bureau as an agency of organized agriculture, is that of a bureau of seven drawers. In his mind, apparently, organization, research, finance and publicity are of equal importance. Seemingly, too, legislation, transportation, and marketing command equal attention and appreciation from the men who constitute the agricultural agency, which, under the leadership successively of John R. Howard of Iowa, O. E. Bradfute of Ohio, and Sam H. Thompson, of Illinois, has sought to meet some of the needs of present day agriculture.

Assistant Secretary of Agriculture R. W. Dunlap greets six home economics extension workers from Arkansas, Florida and Texas who are sailing for 4 months' study of utilization of farm materials in the home and for market in England, Denmark and France.

The Editors Talk

"This, then, being the state of our present affairs and differences let it be acknowledged on all hands, and let all be convinced that are concerned, that there is not only a possibility, but a probability, yea a compelling necessity of a firm union in this great body."

Henry Vane, 1656.
Ex-Governor of Massachusetts—
from which a great convention followed.

CONVENTION—
N. F. A.

WHEN Spencer Carter, president of the National Fertilizer Association, was young he was looked after by an old colored mammy, a kindly soul who gave him much good advice.

Among other things "Mammy" told Spencer Carter was "when you ate anything that did not agree with you, the thing to do was to keep on eating it until it did."

Whatever its medicinal value we agree that it is excellent advice to follow in overcoming difficulties. We might add, too, that such advice is often necessary in trying to get something out of conventions. Not all conventions attract—not all repay—. To go on until they do is all that is possible. We are particularly glad therefore, to record that the recent convention of the National Fertilizer Association at White Sulphur Springs could be profitably taken and enjoyed the first time.

To achieve success demands the right spirit—the right organization to make all classes feel at home and something for everyone to go for. The recent convention fulfilled all these requirements in abundance. Congratulations must be extended to many people, particularly to the executive secretary, Charles J. Brand, to the assistant secretary, John D. Toll, who was in attendance some days previous working hard seeing that everything was ready—to the president, Spencer Carter—to the chairman of the Soil Improvement Committee, W. D. Huntington—the staff of the committee and the speakers who gave freely of their time.

The executives are to be particularly congratulated for inviting many members of the staff of the scientific bureaus of Washington and members of Agricultural Colleges. Only by meeting together will the commercial and scientific groups understand how most effectively to work out their mutual problems. We hope such invitations will continue.

The committee who arranged for the entertainment of the ladies and for the tennis and golf tournaments are also to be congratulated.

What was there to go for? There is no more important question. If we are honest with ourselves many and varied are the reasons that take each of us to a convention. In the last analysis, however, any convention is a failure unless out of it grows a clearer definition of our major problems and the formulation of an intelligent, courageous, and mutual policy towards these problems for future guidance. All that executives can do is to provide this opportunity. Real success depends on the response that is given. Followers are as necessary as leaders.

This essential opportunity was provided in full measure. The response means that accomplishment will continue. The more seriously we regard this purpose, the more we attend the many and excellent addresses provided—the greater the value of the convention. The future holds many and serious problems for the fertilizer industry. Economic laws and pressures work faster and more surely than any person or printing press. We shall be compelled to meet such situations. The fertilizer industry has done so with courage and intelligence during the depression of recent years. It will continue to meet future problems in the same spirit.

In achieving success, the opportunities and the power of the annual convention are not to be overlooked.

——o——

IT is human nature to quickly observe the obvious. We therefore readily note anything that is big—the big potato—the big hotel—the big crop—the big plant. Anything that in size is larger than the average. We soon come to desire size—to think because a little is good, more is better.

SIZE

This is particularly true of populations. Ten thousand people living together in one center have certain possible advantages. A population of 20,000 is bigger and 100,000 is obviously so much larger that we all tend to become boosters for bigger populations. We feel that the reflected glory of living in a city as one of a million is much greater than living as one of a smaller number.

But, is size alone a valuable index to worth and usefulness? In some cases—yes. Under many conditions—no.

The habit of boosting for larger populations in towns and cities seems particularly undesirable, for in addition to the well known evils of congestion on human life the growth of large centers of populations tends to develop unfavorable differences between city and rural populations. City and country become hostile to each other. People in large centers are apt to lose sight of the fact that our national life has a common basis and a common and mutual purpose.

In well-distributed centers of smaller manufacturing populations, life is healthier—man not being so far removed from basic rural activities—better understands the country. He realizes that his ultimate prosperity and happiness depend on such activities. There is a better understanding between city and rural life.

The use of mere size as an index to worth and usefulness is a mass habit and not necessarily a good one. It needs much more careful examination.

The one field in which bigness possibly counts heavily is in the realm of ideas. It is precisely in this field that we are too often content with the smaller size.

——o——

BON VOYAGE!

NOW is the time for all good students to go to Europe.

It is not our purpose to advertise shipping companies, but we cannot help noting that many large liners have left the port of New York within the last few weeks carrying thousands of students to places abroad. The number apparently includes all types and classes and represents all degrees of financial stability—in fact, it is surprising to find on what slender means of both time and money young America will venture forth to see and conquer the intricacies of European travel.

Postcards from Rome or Paris, or points between are no longer a novelty in our daily mail. This is all to the good. We appreciate the post cards—they bring back memories. We appreciate more, the greater breadth of outlook and the hopeful, better understanding that must result between peoples of different races.

In agriculture particularly, does the dictum apply that no man knows a country who only knows his own. We may not yet be ready for the intensive methods of crop production as followed on the northern plains of Europe or the polders of Holland, or on the eastern plain of England, but any man is poor in spirit who is not inspired to greater efforts at the sight of intensively cultivated grain fields—a rich, golden color without a weed in sight —as will soon be seen in northern Europe.

Experience has taught us that it is only human to make superficial comparisons between what we see on our travels and similar things we have left behind. It is only with more experience and a larger viewpoint that we learn how to get the most out of our travels by studying the conditions that have produced the differences we so readily observe. When we can correlate cause and effect and sympathetically analyze the reasons for different practices, then are we in the best position to help our own community and country.

May many more students find the opportunity to travel abroad. We hope the number will increase. We wish them Godspeed and a safe return!

—o—

SHORT CUTS

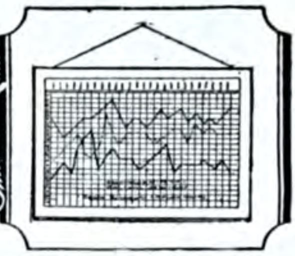
SHORT cuts are very necessary in business, in government, in social organizations. They save time, they produce results. In fact, short cuts are the foundation of success—in an emergency.

But, if history teaches us anything, it is that when the emergency is over, the work must be done all over again, if it is to last. Every war teaches us that, or at least it tries to. The short cuts of war are the most expensive work ever undertaken.

The more complex and involved our social and business life becomes, the less permanent place is there for short cuts, the greater the folly of any man tempted to adopt the practice. Better a longer view, a more studied adjustment to environment, a determination to accomplish less but well; and that takes courage, to do what we do, so that once is enough.

When we are tempted to take short cuts, let us go and do something else. Go on a hike, play golf or go fishing. We may not catch any fish, but we will save a lot of money—not to mention time—in putting ourselves right with the world, when the short cut has run its usual course.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Man's Great Competitor

The intensity of man's struggle with the insects is seldom shown more effectively than in a new Department of Agriculture motion picture on the Japanese beetle. The film shows the life history of the bug, the damage it causes to orchards, vegetables and lawns, and measures adopted for control. There is one "close up" that causes mere man to wonder about whether even the meek among humans will ultimately inherit the earth. In this bit of film a single apple is shown attacked by 300 beetles. If man wins it will be through ingenuity; the insects depend on boundless energy and prolificacy.

Alfalfa Leaves Don't Pump

How many times have we heard haymaking farmers say that alfalfa loses its moisture better in the cock or windrow than in the swath because the leaves do not become dry and brittle so soon and act as pumps to bring the moisture out of the thicker stems. Investigators at the Ohio State University say this is not so. As a practical haymaking proposition, they say, this effect is of no importance as the leaves act the same whether the alfalfa is cured in the shade or in the sun. They took 90 samples, half of them stems with leaves and half of them stems with the leaves removed. After drying for the same period the percentage of moisture in the samples was practically the same in the leafy and the leafless, the former retaining 57 per cent of moisture and the latter 56 per cent. But this does not mean alfalfa should not be cured in the windrow or cock. The saving of leaves and in quality is worth the trouble.

Big Feeders Use Co-ops

There long has been an impression that only the small feeder of livestock who handled less than a carload could derive advantage from marketing his finished beeves through the local shipping association. But a record of recent experience in Adams county, Illinois, is pretty convincing evidence that even those big feeders who are well known on the central markets can do better by turning over their cattle to the association. Not long ago out of 27 carloads shipped by the local association during a week there were 12 straight carloads consigned by as many owners, and one of these was sold by the producers commission association at Chicago at the top of the day's market. In the same county one of the largest cattle feeders marketed 10 carloads at one time through the cooperative shipping association. If an association has a good reputation the shipper gets the benefit of this prestige, and in addition he gets insurance and expert service in handling stock and in collecting claims.

The Life of a Rope

You may come to the end of your rope too soon unless you know certain facts about lubricants and pulleys, say farm mechanics at the University of Illinois. Internal wear brings many a rope to its end too soon, and one cause is a pulley of the wrong size. A rule laid down is that the diameter of the pulley should be at least eight times the diameter of the rope. Coatings will reduce rotting and external wear. A mixture of beeswax, black lead and tallow is recommended as a coating; another is made of resin, black lead and tallow. Pine tar alone is said to be good. Satisfactory rope lubricants include boiled linseed oil, tallow, and lard. Mixtures of tallow and black lead or of tallow and graphite can be used both for coatings and for lubricants. Putting on lubricants hot while the rope is running over a pulley produces better penetration. Mineral oil is a good penetrator and protects against dampness but damages the fibers.

Mohair

The Department of Agriculture and the Department of Commerce are planning to cooperate in getting up a bulletin to aid goat raisers in producing a better quality of mohair and in solving some of their marketing problems. G. T. Willingmyre of the Department of Agriculture is chairman of the committee.

New Orchard Cover Crop

A letter from an Indiana professor of horticulture to a horticulturist of the U. S. Department of Agriculture refers to a trip they took last August when they visited two men who had tried cheat as an orchard cover crop because it could be obtained easily at a nearby elevator at about one-eighth the cost of rye. Here is the letter in part:

"Last week I had an opportunity of visiting some of these test plots, and all the growers are enthusiastic about it. I found one grower over in Posey county who had got behind with his cultivation, and where he had planted rye it was tall and woody and certainly is going to be anything but a good thing for the orchard. The cheat in the same orchard made a much finer grass-like stem which disked down very readily. It throws up its stalk growth much later in the spring, which is a decided advantage in a cover crop which lives over."

T. B. Going

As the fight for the eradication of animal tuberculosis continues, estimates of the time required for a complete clean-up show a steadily increasing optimism. Dr. J. A. Kiernan, in charge of the eradication work for the Department of Agriculture, predicts that within 12 years more than 80 per cent of the counties in the United States will have less than one-half of one per cent of the disease in their herds. These areas will then be labeled "modified-accredited."

There are now relatively few recalcitrants who hold out against the tuberculin test and who refuse to see the economic and health benefits that come from the eradication work. A good example of beneficial results comes from Sullivan county, New Hampshire, where there has been a 90-per-cent clean-up of dairy herds. Since the wholesale testing a committee of dairymen has sold 1,374 head of tested cows and it is estimated that local buyers have disposed of equally as many, making a total of at least 2,500 head. The county agent, H. N. Wells, says local estimates are that these cows brought an average of $25 more each than they would have brought if the campaign had not been carried on. Right there is a $62,000 argument, and, in addition, there is now a steady market for surplus cattle.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

An Afternoon on a Rittergut

By Dr. Guy A. Peterson

Madison, Wisconsin

EDITOR'S NOTE:—*This completes a story started in last month's issue.*

IT would be worth a great deal if every American farmer could see the care that is taken to get good seed. Since they do not expect good harvests from poor seed, the oats they were drilling were as plump and pretty as though they had been hand picked. An electrically driven cleaner and grader, operating on the gravity system and equipped with an automatic treating and drying device was the machine that had done the "hand picking." By this severe process of selection they have not only been able to materially reduce the number of pounds seed required, but at the same time have raised their yields. The light-weight, cracked, and misshapen kernels are more valuable for feed than for fertilizer, so the majority of the large farmers, and many of the small ones, spare no pains in cleaning their seed.

They do seem to waste a lot of man power in getting the grain into the ground though, for I believe that a good American farmer, if he had such excellently prepared seed bed to drill in, could sow quite as much and do quite as well as these three men with an overseer to direct them.

A large four bottom gasoline tractor outfit was plowing in the distant corner of the farm. Much of the plowing on large farms is now done by steam or gas pulled tractors, although many of the largest operators plow with a sub-surface outfit that is pulled back and forth across a field by means of two steam engines that wind a cable around a drum. These plows are monster affairs that dig down to 10, 12, and even 14 inches.

After spring plowing, the land is handled much as it is in the corn belt, except that the roller and cultipacker is more universally used. Preparing the fall plowed land is a complicated process, however. First they distribute fertilizer on top. Very little land on the better farms is put into a crop without first being given an application of commercial fertilizer. When speaking of fertilizers, I might add that I never saw a manure spreader in use in Germany. They must not be known there for we saw none at the great machinery exposition at Hamburg, and the inspector had never heard of the machine.

After the fertilizer has been scattered, the men driving horses or boys driving oxen go over the field with a very heavy wooden tooth drag called a "Krummler." Lighter harrows and rollers followed this heavy machine, and men drilling beets with the same kind of a drill that is used for other grains were following the rollers.

We left the beet seeders to take a cross country walk over fields of sprouting peas and beans to get to the potato planter. In going there, we stopped to watch about a dozen girls digging and scraping the dirt from some roots that the early frost of the fall before had frozen into the ground before they could be harvested.

On this farm, as on most farms, the potatoes were being dropped by hand. A "Locher" or hole-making machine was first driven over the field. This made little digs every 12 inches, in rows about 18 inches apart. Girls, barefooted, dirty, and tired, then followed these rows, dropping a whole potato into each hole. Few farmers cut seed potatoes there, but plant an entire potato. This lessens disease danger, and gives the new plant a sure start.

After the potatoes had been dropped, another man followed with a machine which covered three rows at a time by hilling them over with three sets of reversible disks. Potato planters are being introduced, but there is much discussion as to whether they are reliable. I was on one large farm where they were starting a new planter, and at least a dozen fashionably-dressed farmers, wearing high boots and swinging their canes, walked back and forth across the field discussing the pros and cons about potato growing.

Kuehne had not yet returned when we got back to the farmstead, so I delivered the family my farewell greeting, passed the time of day with the bookkeepers, and said goodbye to my companion the Inspector. It took so long to make all these adieus or "Auf Wiedersehens," that the whistle of the train coming into the station frightened me into a run with three blocks yet to go. I made it though, perhaps a little redfaced for the exertion, but the well wishes at the farm had been worth the extra effort.

Part of the Willow plantation described last month

N. F. A. Annual Convention—1926

(*From page* 10)

' surpluses conveys the impression ıat there is now no need, nor in e future will there ever be need ' increased production. This im-·ession is quite erroneous. Our ›pulation is increasing at the rate ' 15,000,000 people every 10 years. he conservation of soil fertility , therefore, an urgent need and ust increase as the farms are lled upon to support an ever-creasing population. Steps to-ard such conservation will be ıdertaken in a world-wide way hen the First International Con-·ess of Soil Science is held in this ›untry in the summer of 1927.

HORACE BOWKER reviewed e present status of fertilizer re-arch. He pointed out that many ' the fellowships established with e Agricultural Colleges had run ıeir allotted course of three years. ı practically every case the in-stigations have produced data elding a genuine contribution to ır knowledge of the food require-ents of crops in the varied cir-ımstances of soil, climate, plant seases, and other environments. r. Bowker continued by outlin-g seven fields in which research ight well be continued. They ›ver briefly: rates of application, ıitable analyses, methods of appli-ıtion, the best forms of ammonia ıd potash, the influence of fer-lizers on the maturity of crops, ıe influence of fertilizers on the ıality feeding value of composi-on of the crop, and the extent to hich diseases, as the root rot of ›rn and wilt of cotton, can be ›ntrolled by the use of fertilizers.

The Corn Belt system of growing over, alfalfa, and other legumes for their beneficial deposits of nitrogen which they take from the air and build up in the soil, has worked out so successfully in practice in that section that its fame has spread to the Hay and Pasture Belt where "it most emphatically does not fit conditions" declared John B. Abbott, of Bellows Falls, Vermont, Consulting Agronomist of the Soil Improvement Committee, in an excellent address on the problems of the Hay and Pasture Belt. Mr. Abbott pointed out that the hay crop in this section occupies 70-90 per cent of the crop land. Only a small portion of that hay acreage is newly seeded each year in clover—most of the area is in grass. Therefore, it is both logical and practical to fertilize and lime new seedings, supplement manure with acid phosphate and top-dress regularly grasslands with fertilizers high in nitrogen.

If farmers in the South used as much fertilizer on cotton for its profitable production as is recommended by the agricultural colleges, experiment stations and extension leaders, practically three times more than is now being used would be required, according to J. C. Pridmore, of Atlanta, Georgia, Director of the Southern Division of the Soil Improvement Committee. Director Pridmore pointed out that in 1925 the total tonnage used on cotton was 2,296,366 tons and the amount recommended was 6,496,750 tons. The address continued, showing the educational problem involved in profitably increasing this tonnage.

Four reasons why farmers of Virginia and North Carolina may be expected to increase their use of fertilizers were given by W. F. Pate, of Raleigh, North Carolina, Agronomist in charge of operations of the Soil Improvement Committee in these states. Briefly, the reasons are: the soils are low in plant food, most of the farmers understand that fertilizers are profitable, the educational sources of the states have shown by experiments that the use of fertilizers is profitable, and in 1925 about 20 per cent of the land was not cultivated. The only serious drawback to the increased use of fertilizers is the price of the product raised.

More than 40 years of research by the agricultural experiment stations of the country on problems of soil fertility have built up a great storehouse of valuable information for farmers, as well as sales arguments for fertilizer salesmen, declared H. R. Smalley of Washington, D. C. Great credit and all possible honor should be given the pioneer scientist who plowed the first furrows in the most important field of agricultural research. Director Smalley pointed out that there are several hundred highly trained agronomists engaged in various phases of research today finding out new facts. Still many problems of soil fertility have not been solved. However, much has been done and the results of some recent work are of great value to the farmers and the fertilizer manufacturers as well as the experiments conducted in Ohio, Michigan, Delaware, New Jersey, New York, and other states. Finding out the facts in research work is the only sound basis for increasing fertilizer consumption.

Two new simple tests to determine the presence or absence of the nitrogen and potash requirements of corn were ably discussed by G. N. Hoffer, Pathologist of the U. S. Department of Agriculture, working in cooperation with Purdue University at Lafayette, Indiana.

The method is based on testin the corn stalk. In making th test, corn plants are used durin the latter part of the growing sea son to determine the relativ amounts of nitrogen and potassiu salts available to them during th season. It has been found, afte several years of research, that th lack of potash is indicated by th presence of iron compounds in th joint tissues of the corn stalks. simple test for iron has, therefor been devised which would indicat that the corn had not received suffi cient potash. Other tests have bee devised to determine whether suffi cient nitrogen was available to th corn plant during the growing sea son. The need of phosphates ca also be determined.

Dr. Hoffer pointed out that thes three tests, with stress on the firs two—the nitrogen and potassiu deficiencies—were checked carefull in a field survey conducted durin September and October, 1925. Th survey covered central Kansas, Ne braska, Iowa, Indiana, centra Ohio, and a part of Michigan. Th tests were carefully checked b laboratory tests.

The outstanding result from th survey was the almost constan presence of reserve potassium salt in the western part of the area sur veyed in Kansas, Nebraska an Iowa, and the deficiency of potas salts in many parts of souther Illinois, Indiana, and Ohio. Espe cially was the deficiency noted i the sweet muck soils of Michiga and Indiana.

It is believed that the test ca be made of practical value fo county agents in supplementin fertilizer recommendations fro other sources.

From the point of view of busi ness problems, two excellent ad dresses were given, one on th elimination of waste through sim

(*Turn to page* 48)

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Ninety-five million tons of manure are produced in Iowa each year. What is the value of this manure? According to the results given in Bulletin No. 236, published by the Iowa Agricultural Experiment Station, it is $1.97 per ton. The range is from $1.00 to $3.00 per ton. These figures were obtained by calculating the value of actual crop increases secured from the use of manure on 43 cooperative experimental fields. About one-half of this immense store of this valuable plant food is lost by improper storage and handling. The bulletin is worth studying carefully. (The Economic Value of Farm Manure as a Fertilizer on Iowa Soils, By W. H. Stevenson, P. E. Brown, L. W. Forman).

"Michigan Fertilizer Bulletin," State Department of Agriculture, Lansing, Michigan, Bulletin No. 43, 1925 Report.

"Fertilizer Suggestions for Calhoun County Soils," Michigan State College of Agriculture, East Lansing, Michigan, Circular Bulletin No. 88, November, 1925. M. M. McCool, J. O. Veatch.

"The Use of the Ohio Standard Fertilizers" as suggested by The Department of Soils, Ohio State University; The Department of Agronomy, Ohio Agricultural Experiment Station, Columbus, Ohio.

Soils

For many years it has been the general belief among agricultural people that Gypsum (land plaster) produced injurious effects in the soil. It is reputed to cause a rapid decay of organic matter. Some authorities believe it brings about an acid condition in the soil. Others have recommended it as a substitute for lime. In certain sections of the country, it is used as a fertilizer. In Bulletin 232, Iowa State College of Agriculture and Agricultural Experiment Station, Director C. F. Curtiss discusses in detail results of experiments covering about four years. The object of these experiments was to secure scientific and practical data which would bring about a better understanding of the part gypsum plays in soil fertility problems. Results of experiments discussed in this bulletin point definitely to the value of use of gypsum on oats, clover and alfalfa. They show that it does not hasten decay of organic matter; it does not produce injurious effects in the soil; it does not produce an acid condition in the soil, but rather because of its beneficial effect on certain crops on certain soil, it should be considered both as a direct and as an indirect fertilizer. In view of past unfounded beliefs and in the interest of judicious use of all fertilizing materials, the bulletin should prove of value and interest to agriculturists and farmers.

"Liming the Soil," College of Agriculture, Agricultural Experiment Station, Berkeley, California, Circular 305, May, 1926. P. L. Hibbard.

Crops

J. K. Wilson, Professor of Soil Technology, Cornell University, writing in Journal of the American Society of Agronomy, Vol. 18, No. 3, March, 1926, presents some interesting and valuable information on "Effect on Nodulation of Supplementing the Legume Bacteria of the Soil with Artificial Cultures".

Carefully controlled experiments with vetch, peas, red clover, alfalfa, sweet clover, and soy beans, were conducted. A careful analysis of the results of this study aid materially in clearing up certain aspects of legume bacteria activities in the soil. Some of the outstanding developments from this study are (1) legume bacteria may become inactive or entirely disappear from soil, apparently in direct proportion to the increase in acidity of the soil. (2) frequency of host plant in rotation does not prevent bacterial inactivity under unfavorable soil conditions. (3) augmenting the proper bacterial flora in a soil naturally unfavorable to such bacteria temporarily results in producing a larger number of nodules. (4) liming a soil deficient in proper bacteria does not materially increase nodule development. (5) acid soils containing proper bacteria have their development augmented by applications of lime (6) soil having favorable pH reactions and proper bacteria do not show material increase in nodule development by addition of proper legume cultures.

The outstanding development of this study is that there is a definite relation between pH reactions and development of the legume bacteria in each of the legume studies. In order to attain success with the above legumes it is clear that the safest course is to provide enough lime to neutralize the soil and to inoculate the seed when grown with a culture for the particular legume seed planted.

"Farm Management Problems on Irrigated Farms in Hay and Potato Areas of the Yakima Valley, Washington," United States Department of Agriculture, Washington, D. C., Department Bulletin No. 1388, *March,* 1926. *E. R. Johnson, S. B. Nuckols.*

"Irrigation Number," American Potato Journal published by The Potato Association of America, Washington, D. C., Vol. III, No. 6, *June,* 1926.

"Bulbs in Florida," Agricultural Experiment Station, Gainesville, Florida, Press Bulletin 382, *April,* 1926. *Harold Mowry.*

"Some Tests in the Culture of Peppers," Agricultural Experiment Station, Urbana, Illinois, Bulletin No. 274, *April,* 1926. *J. W. Lloyd.*

"Sudan Grass," Agricultural Experiment Station, Agronomy Section, Ames, Iowa, Bulletin No. 233, *March,* 1926. *H. D. Hughes, F. S. Wilkins.*

"Certain Physical and Chemical Changes of Grimes Apples During Ripening and Storage Period," Agricultural Experiment Station, Ames, Iowa, Research Bulletin No. 91, *April,* 1926. *H. H. Plagge, A. J. Maney, Fisk Gerhardt.*

"Culture of Greenhouse Lettuce," Agricultural Experiment Station, Horticultural Section, East Lansing, Michigan, Circular Bulletin No. 89, *March,* 1926. *John W. Crist.*

"Garden Flowers," Agricultural Experiment Station, East Lansing, Michigan, Circular Bulletin No. 92, *April,* 1926. *Alex Laurie.*

"Buckwheat in Michigan," Agricultural Experiment Station, East Lansing, Michigan, Circular Bulletin No. 151, *April,* 1926. *C. E. Cormany.*

"Sweet Clover," Agricultural Experiment Station, East Lansing, Michigan, Circular Bulletin No. 152, *April,* 1926, *C. R. Megee.*

"Peppermint Growing in Michigan," Agricultural Experiment Station, East Lansing, Michigan, Special Bulletin No. 153, *March,* 1926. *J. R. Duncan.*

"Hardy Shrubs," Agricultural Experiment Station, East Lansing, Michigan, Special Bulletin No. 154, *May,* 1926. *C. P. Halligan.*

"Spring Grains," College of Agriculture, Experiment Station, Lincoln, Nebraska, Bulletin 213, *March,* 1926. *L. L. Zook.*

"Plant-Growing and Plant-Growing Structures," New Jersey State College of Agriculture, New Brunswick, New Jersey, Extension Bulletin 51, *March,* 1926. *C. H. Nissley.*

"Preliminary Pecan Experiments," Agricultural Experiment Station, State College, New Mexico, Bulletin No. 145, *January,* 1925. *Fabian Garcia, A. B. Fite.*

"Johnson Grass Eradication," Agricultural Experiment Station, State College, New Mexico, Bulletin No. 146, *April,* 1925. *J. C. Overpeck.*

"Net Requirements of Crops for Irrigation Water in the Mesilla Valley, New Mexico," Agricultural Experiment Station, State College, New Mexico, Bulletin No. 149, *June,* 1925. *Dean W. Bloodgood, Albert S. Curry.*

"*Growing Early Cabbage,*" *Agricultural Experiment Station, State College, New Mexico, Bulletin No.* 151, *January,* 1926. *A. B. Fite.*

"*Alfalfa Field Registration,*" *Agricultural Experiment Station, Fargo, North Dakota, Circular* 30, *March,* 1926. *H. L. Bolley, O. A. Stevens.*

"*Potatoes, Certification for Seed in North Dakota,*" *Agricultural Experiment Station, Fargo, North Dakota, Circular* 31, *May,* 1926. *H. L. Bolley, W. G. Couey.*

"*Dependable Fruits,*" *Ohio Agricultural Experiment Station, Wooster, Ohio, Bulletin* 394, *April,* 1926. *J. H. Gourley and C. W. Ellenwood.*

"*Cabbage Fertilizers,*" *Virginia Truck Experiment Station, Norfolk, Virginia, Bulletin* 50, *January* 1, 1925. *H. H. Zimmerley, M. M. Parker.*

"*Cantaloupe Culture with Plants Started under Glass,*" *Virginia Truck Experiment Station, Norfolk, Virginia, Bulletin* 51, *April,* 1925. *M. M. Parker.*

"*Part 4, Cereal Crops,*" *State College of Washington, Spokane, Washington, No.* 134, *May,* 1926. *E. G. Schafer, Leonard Hegnauer.*

"*Wheat Growing in Wisconsin,*" *Extension Service of the College of Agriculture, University of Wisconsin, Madison, Wisconsin, Circular* 198, *March,* 1926. *E. J. Delwiche, B. D. Leith.*

"*Flax in Wisconsin,*" *Extension Service of the College of Agriculture, University of Wisconsin, Madison, Wisconsin, Circular* 203, *April,* 1926. *A. H. Wright.*

"*Leading Commercial Varieties of Canning Peas,*" *Agricultural Experiment Station, Madison, Wisconsin, Bulletin* 382, *April,* 1926. *E. J. Delwiche, Earl J. Renard.*

Economics

A useful and practical circular has been published by the Experiment Station of Illinois on the organized marketing of large peach crops (Circular 307), May, 1926, Urbana, Illinois, J. W. Lloyd). It deals with the subject of selling cooperatively and how to form a local association for such work.

"*Farm-Accounting Associations,*" *University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California, Bulletin* 403, *May,* 1926. *Edwin C. Voorhies.*

Diseases

Black root-rot is a serious menace to successful tobacco production in the Connecticut valley. The fungus causing this disease is found in most of the tobacco soils of the valley. Its activity is stimulated by low temperature during the growing season and high lime conditions in the soil. There are but two known methods of combating the disease: First: through the control of lime conditions in the soil and Second: through the use of root-rot resistance strains of tobacco. Bulletin No. 229, April, 1926, "Soil Re-action and Black Root-rot of Tobacco, by P. J. Anderson, A. Vincent Osmun, and W. L. Doran, reports the results of research work on this disease. It is published by the Massachusetts Agricultural Experiment Station.

"*Root-rot of Tobacco in Kentucky and its Control, a Progress Report,*" *Kentucky Agricultural Experiment Station, Lexington, Kentucky, Bulletin No.* 262, *December,* 1925. *W. D. Valleau, Ralph Kenney, E. J. Kinney.*

"*Root Disease of Sugar Cane in Louisiana,*" *United States Department of Agriculture, Washington, D. C., Department Circular* 366, *May,* 1926. *R. D. Rands.*

"*Some Common New Mexico Plant Diseases,*" *Agricultural Experiment Station, State College, New Mexico, Bulletin No.* 148, *June,* 1925. *R. F. Crawford.*

"*Club Root of Cabbage,*" *Extension Service of the College of Agriculture, The University of Wisconsin, Madison, Wisconsin, Circular* 200, *April,* 1926. *R. E. Vaughan, F. L. Wellman.*

"*Hot Formaldehyde for Potato Seed Treatment,*" *Extension Service of the College of Agriculture, The University of Wisconsin, Madison, Wisconsin, Circular* 202, *April,* 1926. *R. E. Vaughan, J. W. Brann.*

Insects

"*Service and Regulatory Announcements,*" *United States Department of Agriculture, Insecticide and Fungicide Board, S. R. A. Insecticide* 54, *May,* 1926.

"*The Codling Moth in Walnuts,*" *University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California. Bulletin* 402, *April,* 1926. *H. J. Quayle.*

"*Sting on Apples,*" *Agricultural Experiment Station, Entomological Section, East Lansing, Michigan. L. G. Gentner.*

"*The European Red Mite,*" *New Jersey Agricultural Experiment Stations, New Brunswick, New Jersey, Circular* 187, *April.* 1926. *Clyde C. Hamilton.*

"*The Eastern Tent Caterpillar,*" *New Jersey Agricultural Experiment Stations, New Brunswick, New Jersey, Circular* 188, *April,* 1926. *Clyde C. Hamilton.*

"*Boll Weevil Poisoning Recommendations for* 1926," *North Carolina State College of Agriculture, Extension Folder No.* 20, *May,* 1926. *W. Bruce Mabee.*

N. F. A. Annual Convention—1926

(*From page 44*)

plified practice by J. Watson, Jr., and the other on business problems of the fertilizer industry by E. L. Robins, a well-known member of the National Fertilizer Association for many years and now Vice-President. Mr. Watson pointed out that the returns representing a total tonnage of 3,223,000 tons, which is 43.1 per cent of the estimated total sales of fertilizers in 1925, included 709 separate grades. "It is possible, therefore, that the entire membership has manufactured 1,000 or more different analyses. These and other facts given by Mr. Watson show that there is a tremendous waste in the multitude of grades that have no correspondence in the needs of plants or deficiencies of various types of soil. Continuing the speaker pointed out the results of simplifying factors in other industries, and the conclusion was reached that there is no doubt that a great saving can be made in the fertilizer industry along the same lines.

The address of Mr. Robins was especially instructive and well received. He pointed out in a talk on "The Business Problems of the Fertilizer Industry" what should be the most profitable and sensible attitude towards the carry-over of fertilizer tonnage. Mr. Robins pointed out that the season started off well, particularly in the South, but left some carry-over especially of acid phosphate, which if not handled properly is liable to give some trouble. "Approximately, there is 15 per cent carry-over of acid phosphate, but I take it that this surplus if sensibly handled does not necessarily mean disaster. The proper thing to do is to take what you have on hand from what you used last year and buy the difference for next year's supply—thus by October 1st possibly, you would not have any surplus."

Mr. Robins continuing, said "500,000 tons of acid phosphate on hand need not worry anybody, if you know it is there and you take steps to correct it". In conclusion he said that the fertilizer program should be—produce only what you think you are able to sell, then put out a price that carries a moderate profit and stand by it.

From the fertilizer production viewpoint, the address of Harry A. Curtis, Professor of Chemical Engineering, Yale University, on a review of the nitrogen situation, was of outstanding merit. We feel that this paper as well as some others should receive longer treatment, so that we shall discuss this subject given by Dr. Curtis at greater length in a future issue.

GREAT credit must be given to Mr. B. A. McKinney for his work on cost accounting. He gave an excellent address on "Cost Accounting for Manufacturers of Sulphuric Acid and Acid Phosphates".

We understand that this subject is to be printed in pamphlet form and we would heartily recommend every member of the industry, needing such data, to obtain a copy.

There is no one better fitted to talk about the manufacture of sulphuric acid than Dr. P. C. Hoffman of the Virginia-Carolina Chemical Corporation, Richmond, Virginia. Dr. Hoffman gave in detail in his address on the "Development of Sulphuric Acid Manufacture in its Relation to the Fertilizer Industry", a great many facts of practical value.

F. S. Lodge of the Armour Fertilizer Works, Chicago, pointed out that there was a potential capacity for producing 10,000,000 tons of fertilizer per year, and that the maximum consumption had been around 7,000,000 tons. He therefore could not see why anyone would want to build a new fertilizer factory at this time. The main thing calling for a re-adjustment of factories was the need of greater efficiency and use of concentrated material.

THE report of the Secretary, Charles J. Brand, showed that the National Fertilizer Association now has 165 active members, 72 associate members, and 6 contributing non-members. Twenty-six new members were added to the active list. Mr. Brand said that the "Fertilizer Review" had found a place and was being widely used as a source of information for reprinting purposes. The "Review" is sent to all leaders in agriculture and organizations associated with agriculture. Economic questions are discussed twice a month in a letter sent from the Secretary's office.

W. D. Huntington, Chairman of the Budget Committee, outlined a budget calling for the expenditure of $250,000—$100,000 of which was to go to the Soil Improvement Committee work. The budget was carried without opposition.

Excellent weather prevailed throughout the week, giving plenty of opportunity for the guests to enjoy the golf and tennis tournaments and other social activities. The registration totalled 375, an excellent showing, and plans are already underway for just as successful a gathering in 1927.

Potash Experience

(*From page 5*)

The experience of a farmer with clover in this Coastal Plain section is interesting. C. A. Coppedge of Lilian, Northumberland county, Virginia, has a farm made mostly of Norfolk Sandy Loam. This soil has a rather open sandy subsoil. Mr. Coppedge runs a rotation of corn, wheat, and grass and clover—the grass and clover usually being seeded on the wheat in the spring of the year.

In the fall of 1923 when his wheat was sown, 16 per cent acid phosphate was used on one part of the crop, and a fertilizer analyzing 12 per cent phosphoric acid and 5 per cent potash on the other part. Four hundred pounds per acre of each kind were used. One thousand pounds of ground oyster shells per acre had already been applied to all of the land. Then on March 5, 1924, a mixture of medium red clover, alfalfa and timothy was seeded on the wheat at the rate of 15 lbs. per acre. Mr. Coppedge says the seed was adapted, known origin, and quality.

Last year (1925) 2½ tons (estimated) hay was cut from the part on which the fertilizer containing potash was used—and from the part where 16 per cent acid phosphate was used alone, only 1 ton (estimated) per acre was saved.

In commenting on it Mr. Coppedge says, "Potash and known origin, adapted, quality clover seed almost guarantee a crop here". Of course, Mr. Coppedge does not wish to leave the impression that potash alone should be used, but that the fertilizer should contain potash.

The experience of this farmer is supported by results obtained on State experiment stations in this State and Delaware.

Wormy Winter Apples

(*From page* 17)

on the ground as the infested apple usually drops off about he time the worm is full grown.

The worm soon finds a somewhat sheltered place on the ground or tree trunk and spins a cocoon. About 10 days later it comes forth as a full grown moth, one of the so-called second brood of Codling Moth. Moths of this brood soon start laying eggs and only a part of the worms of this brood enter the apple through the blossom end, many starting in at the rough spot on the cheek of the apple or where a leaf or twig lies against a fruit. In southern Indiana the first worms of this second brood are usually ready to enter the apple by July 10. Unfortunately this brood have been found to be entering the apples over a period of probably five or six weeks or more.

Most commercial apple growers apply a spray early in July, and at least one more the last of July or the fore part of August. At least one spray should be applied for the second brood of these pestiferous worms, even in the small home orchard. As the yearly weather conditions make quite a variation in the time this second brood of moths appears each year, it is best to keep in touch with the local County Agricultural Agent or the Entomology Department of the State Experiment Station. The best time to apply either one or two of these second brood sprays is best determined in that manner.

The weather is liable to be very hot at the time of the second brood Codling Moth sprays. If the temperature is above 85° in the shade it is not safe to use the combined arsenate of lead and lime-sulphur spray. (This spray is usually made up with 1½ pounds of arsenate of lead and 1¼ gallons of liquid lime-sulphur to each 50 gallons of spray.) Under such conditions it is much safer to use bordeaux mixture (2 pounds copper sulphate and 6 pounds hydrated lime) in place of the lime-sulphur, adding the usual amount of arsenate to the bordeaux mixture.

Most seasons the northern third of states such as Ohio, Indiana and Illinois, can use lime-sulphur during the entire summer without injury to the apple foliage or fruit. However, in these sections temperatures above 85° in the shade often occur and are unsafe periods for using lime sulphur sprays. Spraying should be delayed a few days under such weather conditions, or bordeaux substituted for the lime-sulphur.

AS the second brood Codling worms enter the apples at almost any point, it is especially necessary to use every means of thoroughly coating the foliage of the tree. This is best done by first moving under the tree with the spray rod and covering all of the under side of the leaves, then stepping out and applying the spray to the entire outside and upper surface of the leaves and fruit. It will take from six to twelve gallons of spray to the tree for this application.

Many apple growers in recent years have been very much disappointed because they still had wormy apples even after applying three or four summer sprays. This number of sprays will insure a crop of apples but a large number of fruits are sure to be infested with worms unless a late July or early August spray is applied.

Potatoes are followed by wheat and clover seed

Deciding a County Agent's Program

(From page 20)

prices ran like this.

Alfalfa hay	$ 7.50 ton.
Corn	.87 bu.
Wheat	1.00 bu.
Clover seed	10.00 bu.
Beans	3.00 bu.
Potatoes	1.00 cwt.

There was still another step to be taken. With cost of production and average prices it was easy to see how much chance a man had to come out smiling at the end of the next five years by sticking to any given crop or system. For example, if potatoes cost $100 an acre to grow and they sold at an average price during August of $1.00 per cwt. it would take about 90 sacks to pay the cost of production. But an ordinarily good farmer in this county on suitable land can average 125 sacks to the acre, so it appeared that the consistent potato grower had a chance.

But look at the figures on oats.

A potato harvesting scene in Malheur county

Cost per acre $38.25. Price 50c bushel. Yield necessary to pay cost of production 76.5 forgetting any interest on investment; 100 bushels if this item is counted. Not so good. Better shy off when a man wants to sell you some nice seed oats. You can scarcely expect to average year after year 100 bushels of oats unless you have an exceptional oat proposition. Better stay with the alfalfa and fight the weevil than grow some crop that costs more and brings no more income.

The survey showed that a painstaking grower might reasonably expect to make his living by sticking to potatoes and clover seed. If he wanted to dairy, the results indicated that he could do it most economically by getting as large a share of his feed as possible from grass pastures rather than by growing hay and grain and feeding all summer. Of the grain crops, wheat offered by far the best promise as a cash crop in spite of the fact that so many of our best people have been telling us that wheat growing may not be as bad a crime as murder but it is classed at least with manslaughter.

Mr. Breithaupt has eliminated from his general recommendations all of those crops which his surveys show to be unprofitable. For the general farmer with suitable land and personal qualifications to produce diversified crops he suggests this plan. The farm should be divided into four fields. We will start with a cultivated crop, say potatoes. They are dug in July or August for the medium early market. Wheat is seeded on the potato land without plowing. After the wheat is taken off the next fall, clover is seeded right into the stubble without plowing. The next year a crop of hay and a crop of seed and the same the fourth year. Then to potatoes.

The system makes plowing necessary only once in four years, gives plenty of hay for farm animals, distributes labor and provides crops for sale which appear to offer the largest chances for profit over a period of years. The potato money comes in August, the wheat money a little later, and the clover seed money during the winter. The cultivated crop cleans the land of weeds and the clover crop is followed by maximum yields of wheat and potatoes.

And it is working—elsewhere than on paper. As proof, talk to the growers if you live out that way and if you don't, see the following figures for Malheur county:

	Acres, 1919	1924
Alfalfa	37,251	25,803
Clover	245	2,524
Potatoes	215	1,680
Corn	1,750	5,500

* * *

California Spuds

(*From page* 12)

and enjoyable ones, they have been held at the home of Mrs. L. E. French, our Flower Club leader.

"Today we are celebrating the close of the Potato Contest and I am sure that each member feels that he has gained an experience worth while, so much so that he would be willing to take part in another similar contest next year.

"We value our experience and appreciate the prizes which have been offered to the worthy ones, but most of all we appreciate your presence here today. Next year as each one works in his plot he will know that you are equally taking interest and watching the success he attains.

"We want to thank our congressman and assemblyman for being present and for setting an example for our coming congressman and assemblyman."

Fertilizers for Special Crops

(From page 23)

heavier soils where large amounts of manure are used, additional potash is not necessary. Acid phosphate alone will be found the most economical fertilizer.

Without manure the analysis 3-12-6, 3-10-4, and 4-12-12, have been used with excellent results. On soils more deficient in plant food more nitrogen can be used.

Tobacco is a heavy feeder. The crop demands large amounts of plant food. It is advisable to supplement the manure with commercial fertilizers. The manure can then be used for a larger acreage of general crops. From 200 to 300 pounds per acre of 2-12-4, or 3-12-6, or mixtures of this ratio have given good results.

It is recommended that all the potash be in the form of sulphate of potash rather than muriate. The quality of the tobacco is improved by the use of this form of potash. Where no manure is used the 4-8-6 and 5-8-7, from 600 to 1,200 pounds per acre, are recommended.

Experimental work with canning peas does not warrant heavy applications of fertilizers. Local conditions should be studied. It is a good practice to seed to clover in the peas, and thus fully utilize the residues of fertilizers or manure applied. Peas are rather heavy feeders of potash. Phosphoric acid should also be supplied; nitrogen should be secured by inoculation.

On heavy soils in a poor state of fertility, 200 to 400 pounds 0-12-6, or 0-16-8, are recommended. For heavy soils in a good state of fertility 200 pounds of acid phosphate (20 per cent) are recommended. On lighter soils more potash is considered profitable. Analyses 0-12-12, or 0-14-14, or even higher grade combinations in the same proportion are recommended.

It is believed that the proper use of fertilizer will tend to make vines more resistant to diseases.

Cabbage and leafy vegetables are heavy feeders of nitrogen. This element must be supplied in the most economical manner. Clover should be grown in the rotation where possible. The kind and amount of fertilizers to use will be controlled by the price received. Under intensive conditions a high grade fertilizer 4 to 8 per cent nitrogen, 8 to 12 per cent prosphoric acid, and 6 to 10 per cent potash is recommended. The amounts suggested are 600 to 1,200 pounds per acre. Where manure is used the amount should be reduced to 200 to 400 pounds per acre and contain relatively higher percentage of phosphoric acid.

ONIONS grow best on sandy and muck soils. Onions and other bulb and root crops are heavy feeders of potash, and, for this reason, fertilizer should contain relatively large amounts, especially when onions are grown on black sands and mucks which are deficient in potash.

The lighter colored sandy loams will also require larger amounts of nitrogen, from 4 to 8 per cent nitrogen can be used; about as much nitrogen as potash when commercial fertilizers are depended on entirely to supply all the plant food. Under these conditions from 1,000 to 1,500 pounds per acre, using mixtures high in potash are recommended.

Sugar beets should be grown on heavier more fertile soils like the well drained silt and clay loams. The crop is a heavy feeder; the sugar beet makes a heavy demand on the potash of the soil. The low price paid per ton of sugar beets does not, however, warrant large applications of fertilizer. It is best to plant the rotation so that the beets can utilize fertilizer residues. However, to force growth some fertilizer is necessary.

On the darker colored soils, in a good state of fertility, about 200 pounds of a 2-12-6, 3-10-10, 4-12-12, etc., will give good results. Certain conditions may warrant 4 to 6 per cent nitrogen; 10 to 12 per cent phosphoric acid, and 8 to 12 per cent potash.

On muck and peat soils much more potash should be used; 400 to 800 pounds of an 0-12-12, or 0-10-20, is recommended.

The home garden can be kept fertile with fertilizers high in nitrogen. Lawns should be topdressed every four to six weeks with fertilizers high in nitrogen.

The Bulletin is very practical; it contains 13 illustrations, many of them on methods of applying fertilizers, and the suggestions and recommendations, of which the above is a brief summary, are based "largely on cooperative experiments that have been carried on with farmers in various sections of the State".

It is particularly pointed out that whether fertilizers can or cannot be used at a profit, will depend on the conditions peculiar to each case. Because the prices received by the farmer for his produce vary, and because the amount of manure available varies considerably, there can be no hard and fast rule as to the kinds and amounts of fertilizers that should be used for different crops. However, because of the scarcity of stable manure in the vicinity of cities, the substitution of commercial fertilizer is becoming increasingly necessary, and even where plenty of manure is available it is frequently profitable to supplement it with commercial fertilizers.

This Bulletin is a practical and excellent guide to the solution of these problems in the fertilization of cash crops.

* * *

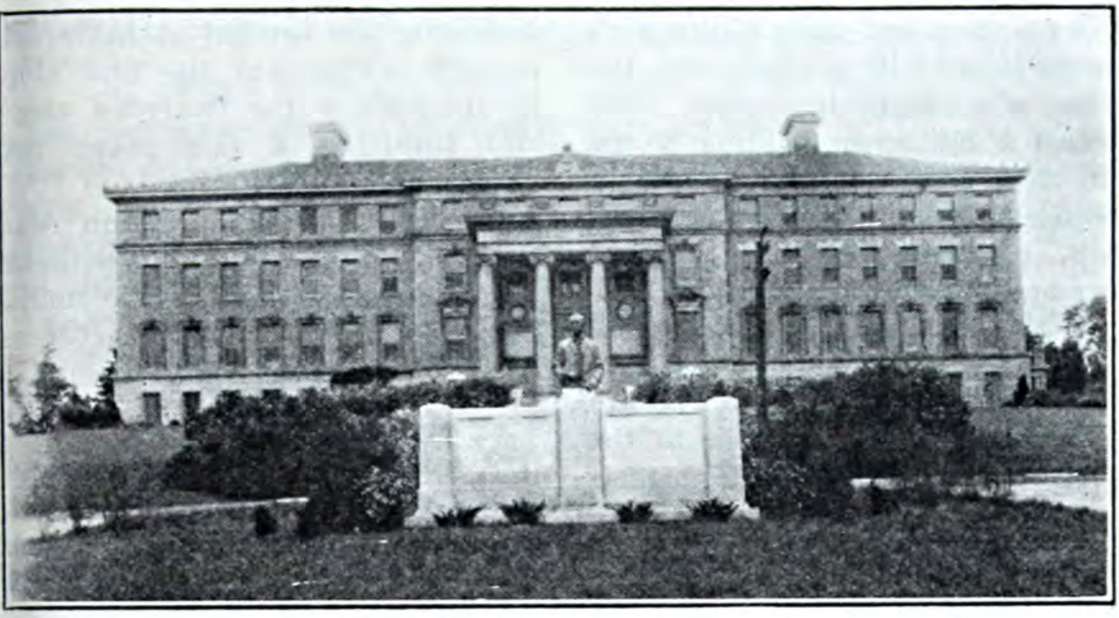
A Strawberry Festival

(*From page* 13)

secure the yield per acre and the quality of the fruit for most profit, it takes more and higher grade fertilizer than formerly used. The larger amounts are now the general practice.

In selecting the grade of fertilizer to use and the time to apply it farmers have learned from experience that large percentage of phosphate is necessary to hasten the ripening period and a large quantity of potash to give firmness and carrying qualities to the berries. They have also found that quickly available nitrogenous fertilizers should not be used in the spring as the quality of the berry is affected adversely. For this reason, the time of application of the fertilizers has changed so that the custom now is to apply at two periods. First, an application of 1000 pounds or more per acre in August and next, the same amount in November, cutting out completely the spring application of fertilizers.

After talking with a number of successful growers in the community, it seems to be the accepted opinion that it takes large quantities of high grade fertilizers applied in the summer and the late fall to produce the necessary yields and keeping qualities for successful strawberry growing and the farmers in this section are doing that very thing.



Agricultural Hall and the Hoard Memorial

Wisconsin

(*From page* 28)

eral government provided $15,000 yearly to Wisconsin, and the other states, for purposes of agricultural investigation. In this way, the experiment station was still further encouraged to carry on the research work which has helped to develop and improve the agriculture of the Badger state.

It is not surprising that with statesman-like agricultural leadership that it should have been early realized that the sons of farmers, expecting to "carry on" in farming should be given some of the benefits of a college education. It was the full appreciation of this need which resulted in the establishment of the first short course in agriculture in America.

The wisdom of the pioneers in this educational experiment is shown, in part, by the fact that more than 6,000 young men have enrolled in the classes in the 40 years since the project was first started. The success of short course men, very many of whom have gone back to the farm, has been outstanding.

The spirit of adventure, which lead to the establishment of this course, encouraged its founders and sponsors to venture a field in meeting other needs. Accordingly it was in 1890 that the fifth annual announcement of the short course stated that Dr. S. M. Babcock and E. M. O'Connell would give a course in which would be taught the use of the newly devised Babcock milk test. This was the beginning of the first dairy school in America.

Appreciating the power of the printed page the Wisconsin station men early enlisted it in the service of the state. The first bulletin of the Wisconsin Experiment Station appeared in 1883. Since then, 378 popular bulletins have been published, and 65 technical treatises have reported research results. The range of bulletins embraces very many different lines of subjects, from the care of children to the care of farm animals, and from ways to make clothes last longer, to ways to conserve soils and means to safeguard plant and animal life.

As these educational ventures gave promise of successful fruition the leaders dared to meet, in a courageous manner, other challenges for service. Naturally enough, then, and quite in line with the policies of its predecessors, the Wisconsin legislature of 1895 passed a bill appropriating $5,000 for the purpose of conducting meetings among farmers. This, then, was the beginning of the farmers' institute movement in this country. At the first of these meetings, as in all the sessions which have since been held, affairs and policies of importance to the farmer were discussed. From their inception, the institutes were decidedly successful.

Failing health forced Dean Henry to resign, after investing 27 years in strenuous work and capable leadership. For the task of directing the college and experiment station, his successor, Harry Luman Russell, had been well prepared. After graduating from the University of Wisconsin in 1888, he did post-graduate work under Robert Koch, the famous German bacteriologist. He also studied in Pasteur Institute in Paris, and in Naples. In addition, he took advanced work at John Hopkins University.

Upon concluding his training, Russell accepted a call from his native state to assume the responsibilities of a position in the department of bacteriology at the Wisconsin College of Agriculture. It was in this position that he directed a pioneer fight on bovine tuberculosis of animals, for it was the young bacteriologist who brought the tuberculin test into the Mississippi River Valley from the laboratory of Koch in Berlin. The dairy herd at the college of agriculture was tested. In this, the first college herd tested west of the Appalachian Mountains, it was found that 20 of its 30 animals were tubercular.

IN 1890, S. M. Babcock as professor in the dairy department, devised his world known test for determining the amount of butterfat in milk. This was the first step in eliminating the "boarder cow" and furnished a fair gauge for buying and selling milk.

Babcock's great invention was the first of a string of tests without which producers of whole milk, cheese and butter manufacturers would be severely handicapped.

ASSOCIATED with Russell and Babcock were other pioneers each working zealously pressing back the frontier in his field. Among the number were the agronomists, who working under the direction of R. A. Moore, were undertaking to grow plants to meet Wisconsin's soil and climate conditions. Pedigreed seeds and new varieties were the direct result of this work in plant breeding.

To distribute the new varieties more widely, Moore formed the Wisconsin Experiment Association in 1901. This association was composed of members of the short course and representative farmers.

Hand in hand with this work in breeding plants went the work of controlling plant diseases. About 30 years ago, Wisconsin became a great producer of cabbage. By 1910 cabbage yellows had so ruined the cabbage crop that many of the best areas were being abandoned. After various methods of treatment had failed to control the situation, L. R. Jones of the plant pathology department, pioneered in developing resistant strains of cabbage. This not only helped to meet the situation but also blazed a trail leading to the solution of similar or related problems. For example, at the present time, work is being done on "mosaic" diseases,

Similarly the early feeding experiments carried out at the college of agriculture pointed the way to splendid progress in nutrition work and to learning fundamental facts on nutrition.

Kentucky Blue Grass

(*From page 27*)

the next year all the plots were mowed and the proportions of blue grass and other vegetation were determined.

Space will not permit a detailed discussion of the effects of all the treatments. Our study will be confined to the effects of three plots treated with mineral fertilizers designated as P (acid Phos.), PK (acid phos. and muriate of potash) and PKN (acid phos., muriate of potash, and nitrate of soda). As earlier stated the yields were determined as air dry hay and recomputed to the immature green weight.

FOURTEEN months after seeding it was found that P produced per acre the equivalent of 3,039 pounds green grass, PK 5,311, and PKN 6,259 pounds. In 1918, two years after seeding, the yields on the same basis were as follows: P, 6,924; PK, 9,042; and PKN, 14,420. The average yields from 1917 to 1924 were as follow: P, 6,961; PK, 8,474; and PKN, 11,865 pounds per acre.

The remarkable growth of Kentucky blue grass on this poor soil valued at $15.00 per acre, attracted at once national attention. In 1918 one of our national authorities on pastures from Washington inspected the plots and pronounced the growth of blue grass unexcelled even in Kentucky.

THE quick development of blue grass on Volusia and Westmoreland soils was equal to that on DeKalb soil at Snow Shoe. The average annual yields of Kentucky blue grass on the three soils were as follow:

Computed to pounds per acre immature grass.

	DeKalb	Volusia	Westmoreland
P	6,961	6,113	9,640
PK	8,474	9,107	10,403
PKN	11,865	13,428	14,541

The increased growth in the P treatment in excess of lime alone was as follows DeKalb soil 6,638, Volusia 1,401, and Westmoreland 3,052. The addition of potash to the P treatment caused the following increased yields: DeKalb soil 1,513, Volusia 2,994, and Westmoreland 763. Nitrogen added to PK caused the following increased yields: DeKalb 3,391, Volusia 4,321, and Westmoreland soil 4,138.

It will be seen from the above summary that both potash and nitrogen have brought about a large increase in yields of blue grass. The most outstanding feature of the results on Volusia soil is the large increased growth of blue grass where potash was used. In fact the potash used on this soil has shown a greater increased yield than phosphorus. This is true in case of all the crops grown on this soil. The importance of potash on this and especially DeKalb soil will be discussed in a later series of articles dealing with the crops in rotation.

The importance of the three fertilizer constituents is brought out more clearly in the next two papers dealing with the value of fertilizer in relation to the carrying capacity, computed acre value, and also in relation to the production of digestible nutrients on pasture as compared to a grain rotation.

* * *

Says Sam: The fellow who has time to sit down and think about his trouble wouldn't have so many troubles if he didn't have so much time. — *McHenry County Farm Bulletin.*

Little on Cotton

(*From page* 16)

it than a cotton of high lint per cent and short staple. The spinners are beginning to say to the cotton raiser: 'Give me a good staple cotton and we will give you a good market.' When a short staple cotton is raised, the cotton raiser is competing with the coolie who raises short staple cotton in India at 17 cents a day. They cannot raise any other kind in India. Whenever a spinner wants short staple cotton he goes to India to get it where he can get it cheap because labor is cheap.

"Some farmers will say, 'Give me a cotton that will lint high and I will make more money than a farmer who has not grown a high linting cotton.' That may be true, but will he do that for some time? Instead of building a good market, he ruins what market he has. Why is it that some communities receive a better price for their cotton than others? The answer is this—one produces a good staple cotton while the others do not. I have in mind now two communities. In one they have a good market and in the other the market is draggy. These communities are close together, about 16 miles apart.

"My advice to all farmers is to grow a good staple cotton and a good market will be built up."

Concrete examples and the knowledge he has learned are given by Mr. Little, concluding his interview:

"One of the greatest problems of the farmer is to make cotton hold as much of the fruit as possible. It seems as if cotton will produce more squares than it can support, so it will dump a large portion of them off. It seems to me there ought to be a way for cotton to hold more of the fruit. I have experimented along these lines to see if I could find out the reason for this shedding and find a way to prevent it if possible. I have grown cotton under the most ideal condition; I did not let it suffer one minute for water and attention, but still it would shed from one-third to one-half of the forms produced. So I began to examine the cotton more closely and I find that the stalks are very sensitive and anything of a trivial nature can affect them, causing a reaction to set in which causes more or less shedding, according to the severity of the shock.

"I find that a cotton that produces a large amount of pollen will keep more squares per stalk than a cotton that does not produce much pollen. I believe that a farmer who grows a cotton which produces a large amount of pollen will find that his cotton will yield better than the farmer who plants a cotton which does not produce much pollen.

"This next season I expect to learn more about this problem. In some of my breeding work I find some varieties of cotton will stand more breeding than others. On some of the varieties I lost a large per cent of the squares that were crossed while on others I lost very few squares.

"I find that a close-jointed stalk will produce more cotton on the same amount of rainfall than stalks with joint far apart. I also find that varieties with abundance of foliage will not stand the drouth as well as varieties with scant foliage, and an open type of stalk is a better producer than a close type of stalk."

That Price Disparity

(*From page 21*)

his year that a good yield, pro-uced not too expensively, is quite s necessary as a high price to give hem a fair average profit. Many og raisers are failing to profit by resent high hog prices because hey have few or no hogs to sell.

In some branches of agriculture, ideed, prices that rise above a ertain level are frowned on be-ause they restrict consumption. 'ooperative associations that dis-ribute citrus fruits, raisins, cran-erries and other fruits, have earned there is more money in irge consumption at reasonable rices than in restricted consump-ion at high prices. Banana im-orters try to prevent banana rices from rising above a certain evel even when there is a short rop, since high prices hurt future usiness. All business experience roves that prices are not the only hing that determines profits.

CONSIDER, for example, the esson indicated by a Government tudy of hog production costs in Ienry county, Iowa, and Warren ounty, Illinois, in 1921-1922. In this rea the production costs of differ-nt farmers varied from less than 3 to more than \$13 per 100 ounds of hogs. Farmers with the east cost made an average profit f more than \$3 per 100 pounds of ogs. Those with the highest cost uffered a loss of more than \$5 er 100 pounds. It is easy to uess which group worried most bout prices. Investigations made y the College of Agriculture, 'niversity of Illinois, into the osts of producing grain on Illi-ois farms have revealed that 'ithin a small group of 10 to 20 different farms operating under similar conditions the cost of growing a bushel of grain will vary at least 50 per cent during any given season.

IT is the margin between costs and prices that determines farm prosperity, and not the *level of prices* or even the *relationship* between agricultural and industrial prices. There is consequently no object in making a fetish out of what existed before the war. That basis may come back automatically, as the boom in industry declines and a better adjustment is brought about between farm production and markets. On the other hand it may never come back. A new "par" may be established below or above the old one. No one can say.

The great point to bear in mind is that farm prosperity is not dependent on the establishment of any fixed price ratio. A purchasing power basis even better than that of pre-war days might not insure farm prosperity if production costs increased, or if it were the result of very low yields. On the other hand, lower than pre-war prices might be quite consistent with a prosperous agriculture if production costs were likewise low and farm capitalization were conservative. Lower wages, lower taxation and lower interest rates would help to bring about that condition.

These ideas will not disturb you provided you agree with the writer that price relationships are not something you can tinker with by legislation or by any other artificial means. Of course, it is another story if you think, as many farmers do, that agriculture has a moral claim on the Nation for restoration of the relative price situation that existed before the war. Farmers holding that view will probably be much peeved when Government statisticians begin basing their price comparisons on a post-war instead of a pre-war period. Yet it should always be remembered that the pre-war base period was not adopted to justify any particular view as to what price relationships should exist between agriculture and industry It was adopted purely for convenience.

Statisticians do not undertake to say from the price ratios that have existed in the past what price ratios should exist in the future. As a matter of fact, it is improbable that the future can ever exactly repeat the past, because the things that make prices—supply and demand, production costs and financial conditions—are constantly changing. Prices adjust themselves to the changing situation. It is more practical for the farmers to deal with the factors in their business that are controllable than to worry very much about price relationships which apparently are not controllable.

* * *

Coming through the Alfalfa

(*From page 26*)

would do that I fed the sower myself. On the south side of the field we came to some pointrows by a kitty-cornered fence row. Said I to Harry, who was driving:

"We will leave these pointrows for now. Probably we will have some cleaning up to do when we get over the field and we will put the cleanings on these short rows."

That was the last I thought about that corner which had about three-quarters of an acre in it. Like the preacher's text, I never came back to it. Last spring it showed just seven sweet clover plants.

About a half seeding of oats was sown on this field before disking it twice. I wanted to seed a legume but as cheaply as possible, so I bought two crop mixtures of seed and put them together. When blended, it was about 30 per cent sweet clover, 30 per cent alfalfa, 20 per cent red clover, 14 per cent alsike clover and 6 per cent timothy. The whole batch was inoculated and sown on 18 acres. And although this particular field hadn't grown clover for 26 years as near as I can find out, this mixture developed into a wonderful meadow.

In 1925, this field furnished pasture for from 50 to 60 hogs, a carload of cattle for a while and on top of that, we threshed 22 bushels of sweet clover seed off of it!

JUST south of this field, bordering the river was a 10-acre field that my neighbor Bill Roach, who has lived around here for several years, says hasn't grown a crop of profitable proportions since he has known it. But fools can step

[la]vely where angels must pick their [w]ay. This had been in corn the [y]ear before I came into possession [o]f the place. I had always been [a]n alfalfa fan so I prepared for [a]lfalfa to be sown in July. We [li]med, four tons per acre, and then [p]ut on a home-mixed combination [o]f garbage tankage, muriate of [p]otash and 44 per cent phosphate. [W]e ran out of "soup" before the [w]hole field was fertilized so there [w]as a strip a rod or more wide [t]hat got nothing but limestone.

The bulk of the field came on [a]nd produced a complete fall seed[i]ng but that unfertilized alfalfa [c]ame on and produced an almost [c]omplete failure. Last spring the [g]ood alfalfa started early and be[s]ides carrying hogs, cattle and work horses, I cut about five tons of hay off it in August. I am finding that although phosphate is generally conceded to be needed on these depleted soils, potash seems to be about as necessary.

(To be continued next month)

* * *

Getting Edvcated on Quackgrass

(From page 8)

in his mind. One evening after all the chores were finished he called Billy out on the porch.

"Sit down son," he said, "I've got a proposition to put up to you. You'll finish high school next winter, and want to go down to the agricultural college the following fall. I have been hoping to have a little nestegg saved up to get you started right in college, but somehow it just seems like there are a dozen places for every dollar I get hold of. What with the high taxes, and the high cost of everything we have to buy, the little I have been able to put by for you won't go very far.

"Now I have been thinking a whole lot about your scheme for killing out that quackgrass and getting the land seeded to alfalfa, and darned if I don't believe it will work. So, if you still feel like tackling the job, here is what I am willing to do. I'll furnish the teams and tools, the buckwheat for seed, and the lime and alfalfa seed. All you can make out of the buckwheat will be yours for cleaning up the land. This ought to give you enough to start in college. Then if the alfalfa succeeds I will give you all of the first year's crop, and half of the succeeding crops as long as you are in college. Think it over and let me know in a week or so what you will do."

(To be continued next month)

* * *

There was a man in our town
And he was wise, you bet
For he held his cotton till prices rose
And soon got out of debt.
But when he found that he was out
In spite of drought or rain
He bought another farm or two
And got in debt again.

—JEANNETTE BLOUNT.

Jack and Jill went down the hill
To pick a bale of cotton.
When they got there, I do declare
The weevil the bale had gotton.
Back home they got and down they sot
As mad as Ebenezer
And both declared if they were spared,
Next year they'd plant Lespedeza.

—JEANNETTE BLOUNT.

Thoroughbreds

(*From page 4*)

to risk the means which I had acquired; provided they seemed to be calculated to advance the general good."

And as a true man of science, Peter Cooper ended, "If my life shall be such that I receive the glad welcome of 'well done, good and faithful servant', I shall then know that I have not lived in vain".

UNFORTUNATELY, we have in common use in this world, a single measure for gauging success—the dollar.

To all effort we attempt to apply this universal yardstick of gold—with totally unsatisfactory results. It is as if we tried to calculate the *weight* of Betelgeuse in inches, or the height of Washington Monument in ounces Troy.

Much of the effort of good men can be measured only in terms of service to the world—service for which other men are too selfish or too ignorant to set a value.

And many men cannot accept rewards in the form of dollars, for the reason that they have no use for the money except as it will purchase assurance of food, clothing, shelter. Of what avail is it to set before your thoroughbred Holstein-Friesian a bucket of gold as reward for breaking the world's butter-fat record? Or of endowing a thoroughbred hunting dog with a bushel of greenbacks, as payment for an excellent day's retrieving?

There are times when rewards seem as valueless as ashes in a pail. And one of these times is when men attempt to recognize those to whom a reward means nothing.

MEN of science are among the hardest working souls in the world's vineyard. Day and night they struggle in the laboratory and field, underpaid, uncomplaining.

Playing with fire, with cruel chemicals and with terrifying and little-understood electric phenomena, they plod onward, losing willingly fingers, eyes—yea, even their lives, that humanity may gain.

In the Arctic, intrepid explorers risk their lives and spend their own money merely that generations unborn may know what exists there.

In the field, agricultural men of science sweat and labor unceasingly with an unwilling soil and a still less willing peasantry, to learn the secrets of various combinations of soil, seed and chemical.

And, having learned through unselfish devotion to their work the combinations that will produce greater yields with less effort, they are then faced with the almost superhuman task of convincing men that they should adopt these new formulae of success.

"SCIENCE," said John Morley, "when she has accomplished all her triumphs in her order, will still have to go back, when the time comes, to assist in building up a new creed by which men can live," and that time is here now.

The scientist's work is not completed when he has found the Open Sesame for which he has been seeking, nor is it accomplished when he has announced the result of his discovery to the world, for "nothing is so detested as a new idea." He must not only announce it in stentorian tones, which can be heard over the crude rumblings of the commercial world, but he must also become, pro tem, propagandist and overseer, both educating his charges as to the value of what he has done and finally forcing them to adopt his new methods.

For this effort there is no reward!

But, as Marcus Aurelius penned thousands of years ago, "what more dost thou want when thou hast done a man a service? Art thou not content that thou hast done something comfortable to thy nature, and dost thou seek to be paid for it, just as if the eye demanded a recompense for seeing, or the feet should demand a recompense for walking?"

Men of science are "like vines which have produced grapes and seek for nothing more after they have once produced their proper fruit. As a horse when he has run, a dog when he has caught his game, a bee when it has made its honey, so a man when he has done a good act does not call for others to come and see, but he goes on to another act, as a vine goes on to produce again the grapes in season.

THOROUGHBREDS!!!

The outstanding mark of these men of science is their unselfishness. Hardly a one but could step out of his self-chosen treadmill tomorrow into work that yields much greater leisure, more fame, greater rewards. Hardly one but could, with little thought, protect his discoveries, name and patent them, then sit back to enjoy the sight of men scrambling over each other's head for the privilege of paying huge sums for these fruits of their brains.

Instead, cursed often with anathema, hampered bitterly by those who foolishly believe they are aiding, scourged by ignorant and sharp-tongued meddlers, ignored by those whom they benefit and maligned by their fellows, they go on, faithful to their trusts—THOROUGHBREDS.

Through many a hard-fought grapple with unyielding circumstance, they have won a fine confidence in themselves that rides serenely over the ingratitude of those they serve. They live for themselves alone—and for posterity.

The applause of men does not register on their tympanums—the praise of the outsider is sand in their mouths. Their real, vital reward is the inner consciousness of work well done—the feeling that they are not living in vain.

There are a few such thoroughbreds left in the world.

Garibaldi, THOROUGHBRED-EXTRAORDINARY, spoke to his men: "Soldiers, what I have to offer you is fatigue, danger, struggle, death; the chill of the cold night in the free air, and heat under the burning sun; no lodgings, no munitions, no provisions; but forced marches, dangerous watchposts and the continued struggle with the bayonet against batteries. Those who love freedom and their country may follow me!"

So, SCIENCE, beckoning, says: "O, ye faithful; what I have to offer you is obscurity, danger, poverty and death; the chill of contumely and the burning heat of criticism; no fame, no leisure, no comforts and no protection for your old age; but, instead, close application in stuffy laboratories, the study of old books, the contempt of your fellowmen ye seek to serve, and the continued struggle of truth against the batteries of ignorance. Those who love accomplishment better than gold, follow me!"

And thousands of thoroughbreds answer:

"I COME".

THIS IS AWFUL

He (pleadingly): "But you have gone out with worse looking guys than me, haven't you?"

She: (No answer).

He (more pleadingly): "I say haven't you gone out with some worse looking guys than me?"

She: "I heard you the first time. I'm just trying to think."

* * *

A visitor from the South tells this story: A Boston man who was staying overnight at the house of a certain colonel in Louisiana was so pestered by mosquitoes that he could not sleep. The next morning he said to the negro servant, "Doesn't the colonel have any mosquito screens in his room?"

"No, suh."

"Well, how on earth can he stand it?"

"Well, suh," came the reply. "I reckon its jes' dis way: In de fo' part ob de night de colonel's most gen'ly so 'toxicated he don't pay no 'tention to de skeeters an' in de las' part ob de night de skeeters is so 'toxicated de don't pay no 'tention to de colonel."—*Pennsylvania Farmer.*

* * *

Skeptical Lady: Can you wear this coat out into the rain without hurting it?

Fur Salesman: Madam, have you ever seen a skunk carrying an umbrella?

STRONG EVIDENCE

"Did you behave in church?"

"Course I did. I heard the lady back of us say she never saw a child behave so."

* * *

Once an old darkey visited a doctor and was given definite instructions as to what he should do. Shaking his head he started to leave the office, when the doctor said:

"Here, Rastus, you forgot to pay me."

"Pay yo for what, boss?"

"For my advice," replied the doctor.

"Naw, suh; naw, suh; I ain't gwine to take it," and Rastus shuffled out.

* * *

Dolan: Rafferty, your boy threw a lump of coal at my boy.

Rafferty: That's a Rafferty for you! When he feels that a principle is at stake, he doesn't think of expense."

* * *

NOT A WISE POLICY

Rastus Jackson, a thoroughly married negro, was one day approached by a life insurance agent.

"Better let me write you a policy, Rastus," suggested the agent.

"No, sah," declared Rastus, emphatically, "Ah ain't any too safe at home as it is."

Better Crops

he Pocket Book of Agriculture.

ugust 1926 10 Cents

ad: Change—Wheat Fertilizers for Sassafras Soils—Un-
ding Backs in Farming—Virginia's Fertilizer School—Utah

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

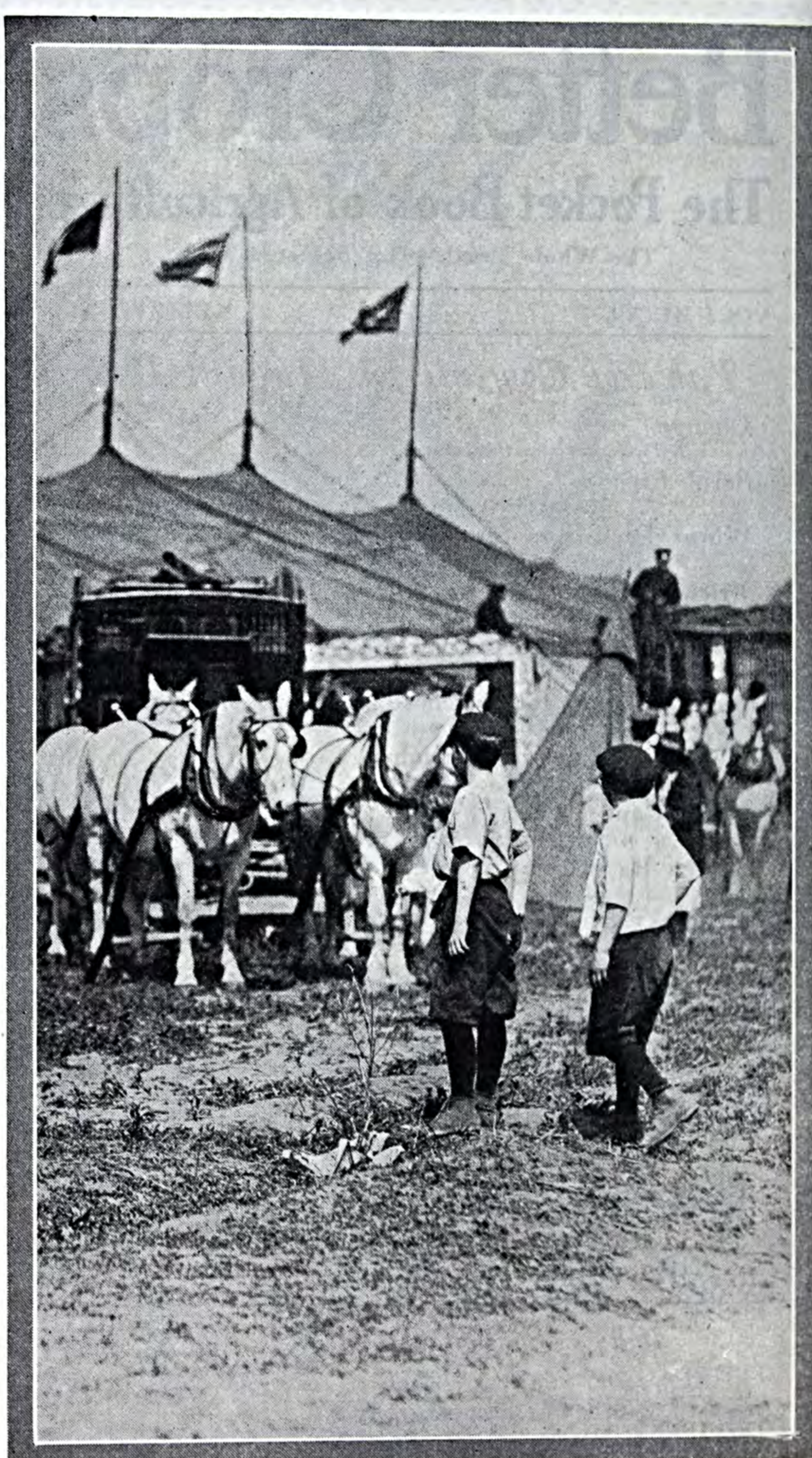
VOLUME VI NUMBER SIX

Table of Contents for August, 1926

Who's Who of BETTER CROPS

EDITOR.................................R. H. Stinchfield
CONTRIBUTING EDITOR.....................Jeff McDermid
MANAGING EDITOR.........................G. J. Callister
PRESIDENT...............................E. K. Howe
VICE-PRESIDENT AND TREASURER............H. A. Forbes

Editorial *Office:* 10 *Bridge Street, New York*



The days of real sport

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, A SUBSIDIARY OF THE POTASH IMPORTING CORPORATION OF AMERICA, 10 BRIDGE STREET, NEW YORK. SUBSCRIPTION, $1.00 PER YEAR; 10c PER COPY.

VOL. VI NEW YORK, AUGUST, 1926 No. 6

A few of Jeff's ideas of tomorrow.

CHANGE

By

Jeff McDermid

ANYONE taking an automobile trip these days must be impressed by the fact that the world is changing. At every turn one is confronted with fresh evidence that "nothing is permanent except change." At each bend of the road, at the crown of every hill, in all the valleys lies proof to him who can observe and think that we are in the midst of a violent upheaval of old ideas; proof that this world is no place for a set mind.

WHEN I was a lad I distinctly remember my grandfather telling my father that the safest investment was traction company bonds. The street cars were then extending their steel tentacles out beyond city limits and taking title to a new opportunity called interurban traction. I remember well grandfather's logical explanation of the perfect safety that lay in traction bonds—"people will always ride."

How true! "People will always ride!" And, as the gasoline automobile had not yet made its advent, how can we blame grandfather for his inability to pierce the veil of the future and foretell the coming of the bus?

People are still riding, but in busses. As we drive through the country we see, alongside the road, car tracks partially covered over with the cruel dirt thrown up by that merciless competitor, the free-running bus, which roars down the road spitting oil on the grave of what was once a "safe investment."

Those who tied up family fortunes in traction lines are now wondering just how they allowed themselves to get caught. The salvage is slight—it costs more to tear up the tracks and sell the rails for junk than the proceeds of the sale; the power houses may now send out juice for lighting purposes; but the cars lay rotting in sun-baked yards.

And yet today there are those who claim that the bus is here to stay—"nothing can ever replace the railless trolley!"

That in another twenty-five years folks will laugh at the slow, old-fashioned bus that crawls along a bumpy road at only forty miles an hour seems beyond their ken. Yet, an evening's careful study of the progress in air-transportation, projecting by curves into the future the improvements made so far, will prove to any thoughtful student that even the bus must some day take its place in the sun-baked yard along with the street car and peer wistfully into the heavens where men are sailing along at a hundred miles an hour on cool, boundless ways.

MEN seem prone to disbelieve their own eyes and senses—seem unable or unwilling to learn from experiences of the past. The history of the world is a history of change.

"He is less likely to be mistaken who looks forward to a change in the affairs of the world than he who regards them as firm and stable," wrote Guicciardini, and those who remain so close to their own affairs of the moment that they cannot perceive their rightful place in an era of constant and swift change must take the consequences.

Man has no way of telling what the future holds in any field of activity, but this he should be able to foretell: *Whatever Is Will Pass!* And, knowing this, he should plan accordingly, keep his mind free and active and be prepared to swing with the current of the world as it veers down new avenues of endeavor.

A single invention, history tells us, will often change the mode of living for millions of people, making profits for the wise, causing losses for those who look but cannot see.

Edison invented a way to record human speech on discs of soft wax. From this simple, clever laboratory product sprung a giant industry—the making of phonographs. Fortunes were made in the early days. Over ten millions of homes were supplied with machines and records, for a consideration.

Then came the radio! Huge talking machine companies, extended beyond their means and resting their fate on developments of the future, found themselves faced with a worthy competitor which furnished fresh music at no cost except the initial investment, which eliminated the hopping up and down to shut off the phonograph, insert a new needle and place a new record.

The phonograph people overstayed their market—were caught in the swirl of change and found themselves cast up on a barren island. They depended too serenely on "things as they are," and forgot that nothing is permanent but change.

Even in the radio industry itself men were caught—are being caught—through too complacent acceptance of the *NOW AND HERE*. I speak of the battery makers in particular to point a

(*Turn to page* 61)

SCRUB-FREE

By P. M. Farmer

THERE are now 140 purebred bulls in Union county and they have the field all to themselves. This situation is the result of a well planned drive begun a little more than five years ago by L. C. Brewer, at that time county agent. The work has been carried on in the last few years by County Agent R. O. Wilson, with the encouragement and assistance of Wayland Rhoads, field agent in animal husbandry, University of Kentucky.

At the beginning of this year the county had rid itself of all scrub bulls and had only four grades left. With the elimination of the last grade in April, Union county is the first in the United States to have only purebred sires for its cattle herds. In addition to holding first position in the eradication of scrubs and grades, it is third on the honor list in the Better Sires-Better Stock campaign carried on by the Bureau of Animal Industry and the various States. Five hundred and fifty livestock owners in the country have pledged themselves to use only purebred sires for all classes of stock. Only two counties in the country exceed this number.

It is reported that Campbell county in the same State is working hard to achieve the same goal reached by Union county. It has now reduced the number of grade and scrub bulls to 22, and enthusiasts in the movement are expecting to get rid of them by the coming fall.

R. O. Wilson, county agent (left), Wayland Rhoads, animal husbandman, Univ. of Ky., and the last grade bull in Union county, Ky.

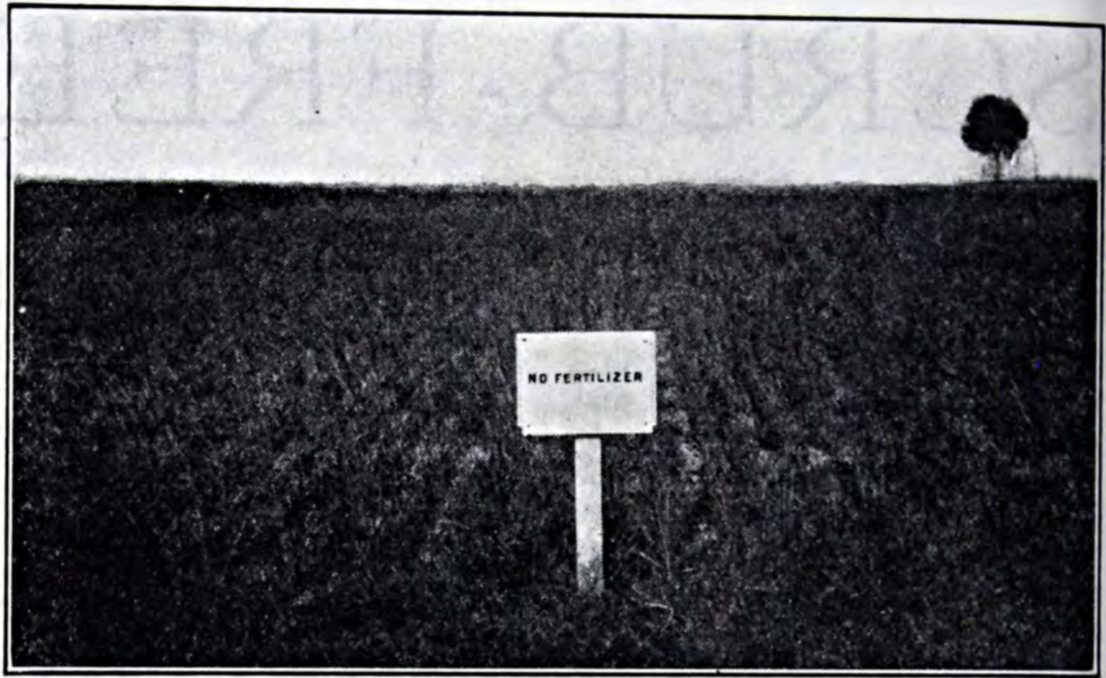


Plate I. No fertilizer treatment. Average annual yield 10.4 *bu. per acre for* 15 *years. Delaware Agricultural Experiment Station*

Wheat Fertilizers

By Geo. L. Schuster

Agronomist, Delaware Agricultural Experiment Station

THERE are about 2,250,000 acres of sassafras soils in the Atlantic Coastal Plain. Wheat, corn, clover and grass are important crops on these soils north of the cotton belt. The sassafras loams, sandy loams, and silt loams of the Delaware and Chesapeake Bay Region and adjacent territory are the principle wheat producing soil types of the sassafras series. These soils are well drained, remarkably retentive of moisture, and easy to plow and keep in good condition. They are yellowish brown to brown in color and of mellow structure underlain by reddish yellow material of a coarser nature.

There are more than 250,000 acres of this soil devoted to the crops mentioned. The average yield of wheat is between 15 and 16 bu. per acre—a yield that is too low for economic production. The farmer doesn't have anything to say about fixing the selling price of wheat but he does have something to say about the cost price. Such items as preparation of the seed bed, variety, seed treatment,

Plate II. Received 120 lbs. muriate of potash. Average annual yield 16.3 bu. per acre for 15 years. Delaware Agricultural Experiment Station

for Sassafras Soils

Valuable facts based on careful investigation

and use of fertilizers are all under the farmer's control and influence the cost of production.

The Delaware Experiment Station has 15 years' results with fertilizers on wheat that have been conducted on a Sassafras silt loam soil. A digest of these results are given in table I.

Net returns as used in table I.

Fifteen Years' Results With Fertilizers on Sassafras Silt Loam Soils

Treatment	Ave. annual Yld. bu. per A.	Ave. Test Wt.	Ave. U. S. grade	Ave. annual net returns per A.
No treatment	10.4	51.6	5	$14.38
Nitrate of Soda 125 lbs. per A....	12.7	52.5	5	15.11
Acid Phosphate 250 lbs. per A....	15.8	55.9	4	19.73
Muriate of Potash 120 lbs. per A..	16.3	56.7	2	19.99
N. P. amounts as above..........	20.5	55.1	4	23.69
N. K...........................	20.5	55.7	4	26.09
P. K...........................	22.7	58.0	2	30.12
N. P. K........................	28.9	58.8	2	38.08
Manure 5 T.....................	23.0	56.1	3	32.50

means that sum which remains after the cost of fertilizer, manure, cost to apply the same and interest on additional investment have been deducted from the selling price. The following values were used in determining the net returns from the use of fertilizers and manure: Nitrate of soda, $60 per T.; acid phosphate, $16; muriate of potash, $48; manure, $1.85; wheat, $1.25 per bu.; straw, $10 per ton; spreading fertilizers, 35c. per acre and interest on additional investment at 6 per cent.

The untreated plot gave an average yield of 10.4 bu. per acre with net returns amounting to $14.38. Where single fertilizer materials were applied muriate of potash ranked highest in increased yield and net returns. The yield was 16.3 bu. per acre with a gain of $19.99 above the cost of the fertilizer, cost of applying, and interest on additional investment.

Various combinations of two fertilizer materials were also tried and the combination of acid phosphate and muriate of potash gave the greatest returns. The yield was 22.7 bu. per acre with a net gain of $30.12. When nitrate of soda was added to the acid phosphate and muriate of potash there was a decided increase in the yields. The yield in this instance was 28.9 bu. with a net gain of $38.08 per acre. Manure gave a yield of 23 bu. with a net gain of $32.50 per acre.

IT may be said that muriate of potash is the first factor in increasing wheat yields and profit and that where this hunger has been satisfied, acid phosphate and nitrate of soda may be added with the expectation of further increases in yield and profit. This wheat was grown in a rotation of corn, soy beans, wheat and hay (clover and timothy). Wheat is not always grown under such conditions and fertilizer practice must necessarily be guided by the cropping scheme used as well as the soil type. Wheat that follows a heavily fertilized crop of tomatoes

(Turn to page 53)

Plate III. Received 120 *lbs. muriate of potash and* 250 *lbs. acid phosphate. Average annual yield* 22.7 *bu. per acre for* 15 *years. Delaware Agricultural Experiment Station*

These two entered a pig race last year and the youngster won

FRIENDLY RIVALS

By

H. Howard Biggar

THAT ton litter contests in hog production attract folks of all ages is well demonstrated in the case of two contestants in Iowa's contest in 1925. Charles Hughes of Randolph and Leroy Miller of Yorkton, without doubt, represent the age extreme in the United States, Mr. Hughes being 84 years of age and Leroy Miller, 10 years old.

AS a seeming coincidence, it is interesting to note that these two hogmen brought their litters together in a ton litter show held at Shenandoah, Iowa last fall, and the boy won out. His litter weighed 2,040 pounds and the litter shown by Mr. Hughes weighed 2,012 pounds, at the end of the six months' period.

The Hughes' litter represented the cross of a Poland China sow and Spotted Poland China boar. The litter ran in a pasture of blue grass and white clover during the summer. They had a ration of ear corn, skimmilk and shorts, with some tankage. The litter of young Leroy Miller was of the Poland China breed. The litter was allowed the run of the orchard. They received a ration of oil meal, tankage, corn, oats, separated milk and slop.

Mr. Hughes, although past four score years, is a boy in spirit and is a real booster for boys and girls club work. He feels that it means a new era for farming.

The *American Soil Survey Association*

By Dr. M. M. McCool

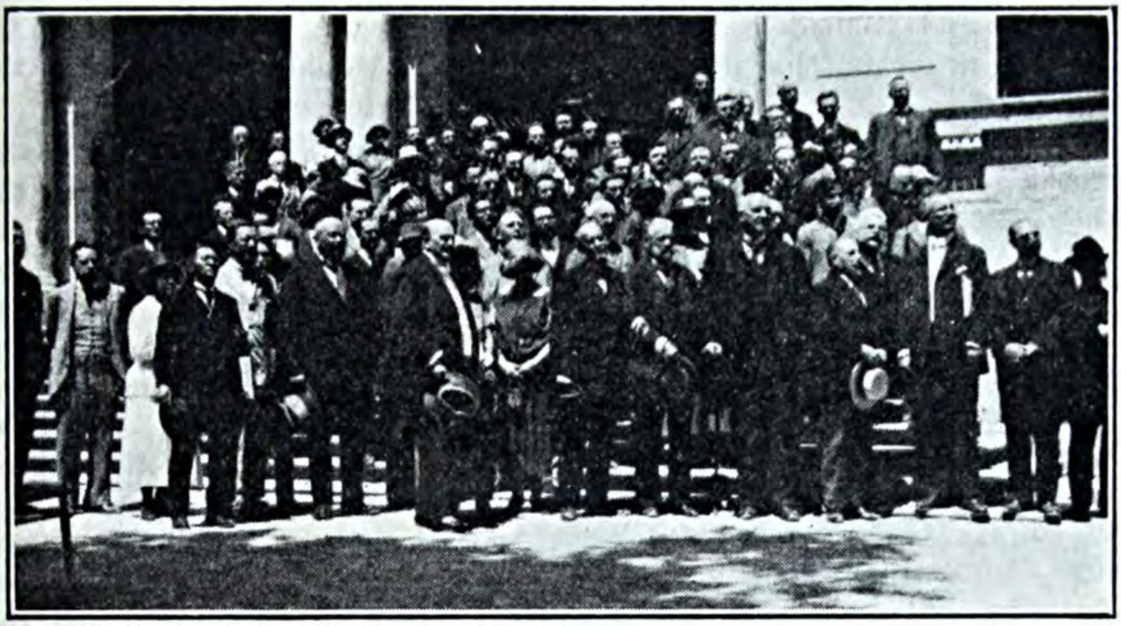
Professor of Soils, Michigan State College

THE American Soil Survey Association grew out of the conference of a few workers in the middle western states at Chicago during the Fall of 1919. It was organized for the purpose of establishing a closer relationship among soil survey workers, to provide a medium for the free discussion of problems arising in soil survey work and to aid in developing a closer cooperating relationship between the several states and the United States Bureau of Soils. To state it more briefly, the purpose of this organization is to bring about improvement in soil survey methods in America.

THE first get-together, an informal one, was held in a hotel in Chicago. Those present were Messrs. Condra, Marbut, Miller, McCool, Sauer, Whitson and Wiancko. The discussion for the most part consisted of the advisability of greater attention being paid to the correlation of soil types and the improvement in maps and reports of soil surveys. It has functioned from the beginning and each year the meetings are hot, and it is doubtful if the results obtained have been excelled or equalled over a given length of time by any similar organization in this country.

At the first meeting it was considered advisable to form an organization, temporary officers were appointed and one year later the first formal program, which was organized by President A. R. Whitson, was held at the University of Chicago. The success of the meeting exceeded the fondest hopes of those who were present at the first meeting. The attendance was reported to be 63 workers.

THE following year the meeting was held at the Michigan State College, East Lansing, Michigan, with M. F. Miller presiding, and again the outcome was gratifying. The secretary reported a membership of 136, distributed among 34 states, 8 Canadian provinces and the Philippine Islands. The third annual meeting was held at the University of Illinois, Professor A. T. Wiancko presiding. The attendance of 51 enjoyed one of the best programs of the Association. The fourth meeting was held in Chicago, under the presidency of Dr. F. J. Alway with a record attendance. The fifth was also held in Chicago, the writer presiding, and the sixth and last meeting likewise was held in Chicago, the president being Dr. G. W. Conrey.



Many nations were represented at the International Soils Congress held at Rome, Italy, in May, 1924. The next meeting is to be held in the U. S. A. in 1927. These meetings are doing much to advance Soil Science

One of the great accomplishments of the American Soil Survey Association has been the stimulation of the soil survey field workers. As a result of contact with the various others who are engaged in soils investigations and exchange of ideas, these men realize as perhaps never before, that they have a real job, and that the success of the soil survey program of America depends in no small measure upon them, that is, their attitude with respect to keeping up-to-date and also with respect to the quality of the work they do in the field. If the soil survey was ever a place for an unscientific, unprogressive, self-satisfied individual, such is no longer the case, and it is probable that the field workers realize that they owe it to the good of the cause to either advance with the modern conception of soil survey methods or to withdraw from the service.

The Soil Survey Association has done much to bring about changes in the system of soil classification. It is probable that such changes as have taken place within the last six years would not have come about short of a quarter of a century without an organization of this sort. It must be recognized that the success that has been attained is due in no small measure to the personality, broadmindedness, knowledge and experience of Dr. C. F. Marbut.

At the present time the soil survey is on a more scientific basis than it has ever been in its history. The workers in this country as well as in foreign countries realize that any soil classification that will meet what may be called world wide demands, must be fundamentally scientific. Quoting Dr. Marbut: "By this statement is meant that the classification must be based on the studies of the soil made for the single purpose of finding out the truth of its character, but no reference whatever to other considerations." In other words if we are to progress in this field, soils must be considered as any other natural body. They must be approached directly and studied as soils—soil characteristics must be studied and described.

The men engaged in soils work, who have attended the meetings of the Association are speaking of soil profiles and describing soil types by the horizons that make up the profiles. This is new—only a few years ago we did not follow such methods, but spoke only of "soils" and "subsoils." It is no longer considered to be good form to employ the term "subsoil," in the Association meetings. In sampling soil types for studying their various characteristics, the samples are no longer taken to arbitrary depths and separated and studied in the laboratory as surface and subsoils, but the horizons are sampled as they occur in the field and studied as such. It has been shown that they may, and usually do, vary greatly in their physical and chemical characteristics. The plant roots may come into contact with materials of vast differences, which are not brought out when the horizons are sampled and thrown together and studied. A few illustrations set forth by Marbut, some of which are quoted verbatim, may be cited to show the principles of the modern system followed in describing and classifying soils.

PROFILES and mature soils throughout the world, so far as our knowledge at present will permit us to generalize, consist of two main horizons: (1) Upper horizon, in which the material has been removed as compared with the lower horizon, a horizon, therefore, of extraction, and (2) Lower horizon, to which material has been added, a horizon of concentration. There are two main soil groups in the world, distinguished one from the other by the prevailing character of the material accumulated in the concentrated horizon.

In group 1, fine grained material has been transferred from the surface portion of this soil downward, accumulating in a lower horizon. In addition there has been a removal of oxides, alkalis, alkaline earths, organic matter, iron and alumina. It should be stated also that none of the mature soils in this group contain carbonates in any of the horizons. The horizon of extraction is usually called the A horizon and the horizon of concentration is called the B horizon, while the material below in which there has been no noticeable removal or accumulation is called the C horizon. It is the original geological material.

In cases of the soils of group 2, there may not have taken place a mechanical transfer of fine grained material from the upper part of the soil and its accumulation in the lower, but in the mature or fully developed soil, usually lime carbonate has accumulated in some horizon which is called the B horizon. The latter group of soil has been developed under arid or semiarid conditions.

Naturally each of these two main groups of soil may be divided into sub-groups. It is impracticable for these to be discussed in this article, but it is well to note that there are now recognized five distinct sub-groups in group 1, differing in the kind of material accumulated in the B horizon and also in the extent to which the oxides, etc., have been removed from the soil profile. Although the subgroups of group 2 are somewhat less well defined, yet eight of them may be identified in the field.

The northern or podsolized forested soils offer a striking example

(Turn to page 59)

New "Prunes" *for* Peaches

By
E. C. Auchter

Head, Dept. of Horticulture,
University of Maryland

A tree pruned moderately produces many shoots with numerous fruit buds

A FEW years ago nitrogenous fertilizers were never recommended for peach trees. It was felt that such trees would make too dense a growth, that the fruit would not color well, and that the buds and wood would not harden sufficiently to withstand cold winters. Damage from peach tree borers was very severe. Often as much damage was done to the trees by the person who was trying to cut out the borers as was done by the borers themselves. It was seldom that all of the borers were ever removed each year by the old wire and knife method.

At the same time many growers tried year after year to grow crimson clover cover crops on land which was not suitable for getting a satisfactory growth of this crop. Many orchards had been planted on the shale and soapstone soils throughout the Alleghany mountain regions. This soil was not a very fertile one. As a result of the poor soil root injury from borers, meager cover crops, and lack of nitrogen fertilization, it became necessary to prune the trees rather hard if enough new growth was to be developed to produce a crop of peaches.

Peach trees bear their fruit on the wood of the previous season's growth. When trees are headed back, a vigorous growth of new shoots generally takes place immediately below the points where the cuts are made. In order to have enough water and plant food available to cause sufficient growth of the buds left, it was necessary then to prune fairly heavy. This pruning, of course, reduced the number of buds and each of the

(*Turn to page 52*)

Long, tedious hours preparing for winter

Unbending Backs

By V. T. Bartle

University of Wisconsin

ONLY those who have worked, with wearying backs, at the bucksaw or pulled long hours on an old "crosscut" can fully appreciate the released and relieved feelings which followed the introduction of the power saw. Only those who have spent long hours of some of their boyhood days, smelling and watching the sawdust flung backward and forward, can really vision the backaches and tired feelings now saved, as the rugged teeth of the circular saw penetrate log after log and grow in a single day, a season's woodpile.

THE time was—and not so long ago—when farm boys and woodpiles just naturally went together. A familiar call, on frosty mornings, was that of the pioneer father, rousing his yawning sons from their "feather beds" to saw, split, and lug fuel for the greedy kitchen and sitting-room fires. Then, too, there were after-school sessions; and even holidays were not free from woodpile duties.

To father, Saturday seemed an ideal day for working the crosscut saw. With no school duties to intervene, the farm youth was free to go to the log pile and take a man's place at one end of the saw. Those were times when boys knew the true meaning of backache,—times when even the strongest sons were tempted to "ride the saw."

Is it any wonder, then, that

A season's woodpile in a single day

in FARMING

No. 3 of this interesting series of "progress" stories

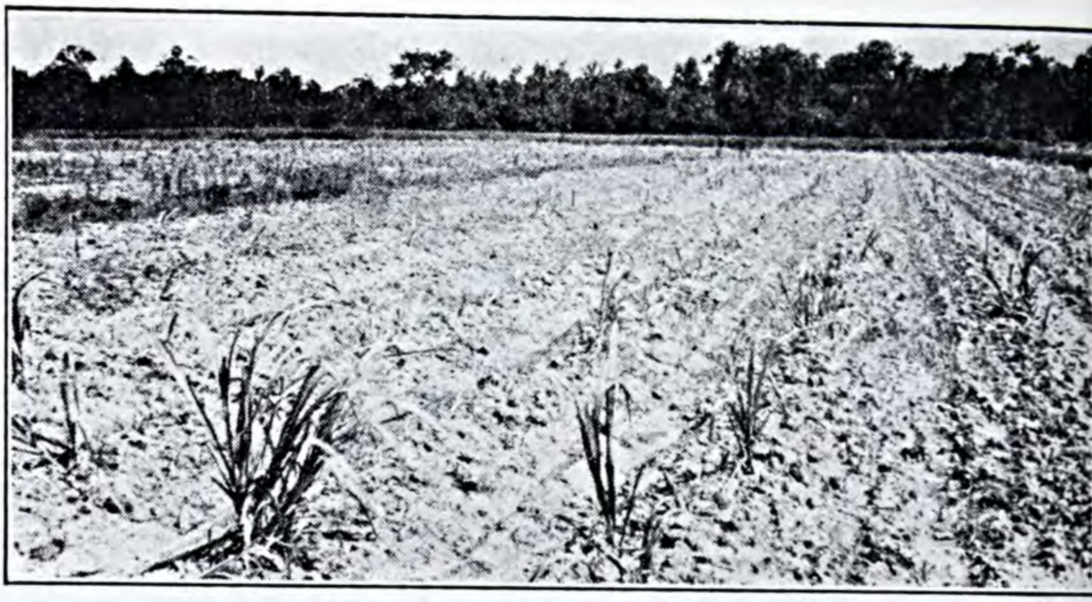
sometimes the farm boys, too well acquainted with the woodpile dreamed of what so many have thought were city advantages? The job of sawing, taken in moderation and with well sharpened and set saws, might have induced fond memories. Instead, long winters of drudgery at the woodpile undoubtedly induced many a youth to adapt himself to what he then thought were less tiring tasks in the neighboring city.

BUT fortunately for the farm youth, other farm boys dreamed too—dreamed of easier ways to "pyramid" the winter's woodpile. These dreams came true in the perfection of the circular saw and the drag saw, and, a bit later, in the application of the gas engine to the task of sawing.

Always revelling in "seeing the wheels go around," the farm boy is enjoying, today, the busy hum of the circular saw. The spinning of the saw, the magic of machinery harnessed to work, and the fragrance of the freshly-cut wood are as alluring to the machine-loving youth as is the flaming iron art of the village blacksmith. With this prospect in mind, he gladly aids in gathering "windfalls," old rails, and all available wood about the farm for an opportunity to watch and, eventually, to help operate the saw.

With the supply of wood gathered to be sawed, the farmer and his helpers may be seen transporting the sawing rig to the scene, and beginning an afternoon's, instead of a winter's job. One after another the logs are pressed

(*Turn to page 46*)



A field of cane which will "profit" little

SUGAR CANE

By The Editor

As a result of a recent visit to Louisiana

SUGAR used to be a luxury for the rich. It is now a necessity for everyone. The production of sugar within the United States is, therefore, a matter of interest to all.

Unfortunately, however, many sugar cane plantations do not give the yields they did years ago. Eastern Louisiana — famous as the "heart" of the Sugar Cane Belt of the United States produces large tonnages of cane sugar. Nevertheless, some growers are concerned with conditions that make the profitable production of cane in many fields a difficult matter. In some cases fields have been abandoned and others have corn planted in the gaps where the cane died out or failed to come on.

To help the sugar growers of the State, Dr. R. C. Tims, Assistant Plant Pathologist of the State Experiment Station at Baton Rouge, and others, have been conducting research work for some years. Dr. Tims has been working on the diseases of sugar cane and valuable results have been contributed to the sugar industry. Knowing the similarities between corn and sugar cane, and that Dr. G. N. Hoffer, plant nutrition specialist of Purdue Agricultural Experiment Station and the United States Department of Agriculture, had conducted research work on the diseases of corn, especially root rots, Dr. Tims invited Dr. Hoffer to take a preliminary trip through the sugar cane fields of eastern Louisiana. He wanted particularly to see if there was any similarity in the mal-nutrition symptoms of the two crops.

With this end in view, the party spent a day in eastern Louisiana inspecting sugar plantations. Tests similar to those made on corn stalks were applied to the cane plants. It might be noted that one part of the test on corn stalks is to examine the tissues at the nodes or joints of the stalk to determine if iron has concentrated in the nodes. The relative quantity of iron is found by using a solution of potassium thiocyanate on the fresh tissues at the nodes when the stalk is split open. The intensive red color indicates the relative concentration of iron. Research work has shown that undue concentrations are associated with a deficiency of potash. A test is also made to determine the amount of nitrogen. By studying the soil reaction and the growth of the plants the relative requirements for phosphates can also be found.

Applying these tests, which have been developed for corn, to the sugar cane it was found that nitrogen was usually present in sufficient quantities, but that the cane in many fields in the vicinity of the Reserve area carried abundant quantities of iron.

The interesting point is that if these tests on sugar cane are properly comparable to those made on corn, potassium deficiencies are indicated. While, of course, this is an indication only, it shows a possible field for further research to determine if such correlations are based on the sound scientific facts.

In addition, the soil in the root rot areas tested was markedly acid. Many of the cane plants were small and not very thrifty. This would indicate that phosphates were needed, as well as potassium.

It has been found in the Corn Belt that the continuous cropping of fields with corn and legumes and the removal of a large part of the crops from the lands have depleted the soil available potassium. Again, if these conditions are comparable with fields continuously grown with cane, it would seem to indicate the possibility that many cane fields represent unbalanced fertility conditions. This possible correlation opens up a field of scientific investigation that may prove very profitable to the sugar cane growers, while at the same time appreciating the importance of breeding resistant and high-yielding strains of cane, and studying all other factors in connection with sugar production.

The long history of the work of the Louisiana State Experiment Station on problems of sugar cane production would guarantee that the status of this problem will be thoroughly and practically worked out.

The way the cane should look

Ready for the most exacting epicures

A New Raspberry

By L. S. Richardson

United States Department of Agriculture

TRUCK farmers and home gardeners in certain sections of the Southeast have never included the raspberry in their garden menu for the simple reason that no variety grown in the United States was adapted to that territory. They can now add this most desirable fruit to their list of garden products, however, for the United States Department of Agriculture has come to their aid and perfected a variety especially adapted to much of the area where raspberries are not commonly grown.

The new variety is the long-talked-of Van Fleet raspberry. According to an announcement from the department, plants for starting purposes are available to growers this winter for the first time. They can be purchased from several southern nurseries, cooperating with the department in propagating the new variety, the names of which will be furnished by the department upon request.

The Van Fleet is adapted to the territory extending from New York and southern Michigan southward to central Florida and Louisiana. It is especially desirable, however, in Maryland, Virginia, North and South Carolina, Georgia, and Florida, where no other variety is adapted.

(*Turn to page 54*)

No. 5 of Professor White's series

Kentucky Blue Grass

By J. W. White

Soil Research Chemist, Pennsylvania State College

THE value of several, differently treated, pasture areas may be estimated in two ways: First, by feeding an equal number of grazing animals and determining the value of the products produced for a definite period; and, second, by determining the total weight of grasses produced on each area and computing the known feeding value in terms of digestible nutrients required for maintenance and production of animal products such as milk, beef, pork or mutton, and wool.

The first method is open to objection because of the variability of animals even of the same breed where a comparatively large number have to be included in each feeding lot. The increased number of animals also requires larger feeding areas, which introduce a serious error of soil variability. The second method has the advantage because smaller areas may be used, such as long, narrow plots which are known to reduce the error of soil variation.

The second method is used in this publication, although it involves more or less theoretical consideration. The yields of blue grass as determined are computed in terms of fresh green Kentucky blue grass available for grazing animals for a period of five months. The yield of grass for the second cutting is taken at 40 per cent of that produced at the first harvest, instead of 54 per cent as actually found, to allow for the grass destroyed under grazing conditions. The Cornell studies, cited earlier, show that when Kentucky blue grass is frequently cut it yields 13 per cent more than when cut less frequently, as in the case of a meadow. We may, therefore, assume that the yields of grass shown in preceding tables would be available for grazing animals.

The feeding value and carrying capacity are estimated in terms of dairy cattle producing different quantities of milk. Eighty pounds of green grass per head each day are used as the basis of computation. This figure represents the maximum amount of grass that would likely be consumed per day, and this quantity contains sufficient digestible crude protein (2.96 lbs.) to meet the demands for maintenance and milk production of an average 1,200-lb. dairy cow producing from 35 to 40 lbs.

(*Turn to page 50*)

Getting Educated on Quack Grass

By M. A. Crosby

United States Department of Agriculture

Editor's Note:—*This completes Mr. Crosby's story of the boy who whipped quack grass and incidentally earned a university education.*

"I don't need to think it over, Dad," said Billy, "I've been doing that ever since I mentioned my plan to you. I am all ready to tackle the quackgrass, and believe I will feel better earning my college money that way than to have you give it to me outright."

"All right son, hop to it! We're pretty well caught up on the work right now so you can start in right away."

The end of July saw Billy well started on his campaign on the 20 acres of quack infested pastureland. For the plowing an old "prairie breaker" had been rigged up with a rolling coulter and newly sharpened shear. This type of plow was used so that the long, thin furrow slice would be turned over flat thus bringing all the rootstocks to the surface. The land was broken to a depth of only about three inches, just deep enough to get under the lowest living rootstocks. More than usual care was taken with the plowing so as to insure every particle of sod being turned over and no "cut and cover" spots left. Due to the hot weather, and the care with which the work was done, some two weeks were consumed in breaking the 20 acres.

Following the breaking of the land came two weeks of hot, dry weather during which the thin furrow slice and its mass of quackgrass rootstocks were well dried out. Ten days after the plowing was finished the ground was gone over with a springtooth harrow. This ripped the sod to pieces and brought most of the dried out rootstocks to the surface. These were then raked up with a hay rake and burned. The harrowing was repeated every 10 days or so up to the middle of October, each successive harrowing bringing to the surface a few more rootstocks.

So thorough was Billy with his fall treatment of the land that only a compartively few quackgrass plants survived. As soon as these showed up in the spring the ground was thoroughly harrowed and such live rootstocks as were brought to the surface were carted off and destroyed. Several harrowings followed through May and early June, and the last week in June the land was sown to buckwheat.

The intensive and thorough tillage which the land had received made an ideal seedbed, and the buckwheat came up in a few days and grew amazingly. The lush growth soon completely shaded the ground, and when the plants arrived at full bloom the field closely resembled a vast bank of fluffy snow. Countless myriads of honey bees labored all day long gathering nectar from the snowy blossoms, and filled the air with the droning hum of their busy wings.

As harvest time approached Billy's buckwheat field became the talk of the neighborhood. No one had ever seen so promising a crop, and yields ranging all the way from 35 to 75 bushels to the acre were predicted. One day a buyer for a large seed firm heard of this famous crop and drove out to see it. After a careful inspection of the field he pronounced it the best and cleanest he had ever seen, and offered Billy \$1.75 a bushel for the whole crop. As this was 15 cents above the market price at that time his offer was accepted on the spot.

Harvest time arrived and soon the crop was cut and shocked. A week of warm fair weather and the buckwheat was dried out and ready for the thrasher. Then came a change in the weather that brought anxious days for Billy. Rain threatened daily and the thrashing outfit was several farms away. But Providence was kind, the rain held off, and at last the trashing outfit pulled into the field. Soon the huge separator was hungrily devouring a seemingly endless stream of bundles, while another endless stream of brownish-gray grain flowed into the wagons waiting to convey it to the granary. When the last load had been dumped into the bins and the measurements checked up it was found that Billy had over 800 bushels of marketable grain, besides a reserve supply for "flapjacks" and seed for the following year. A week later the 800 bushels had been delivered to the buyer and Billy had \$1,400 to his credit in the local bank.

"Well son," said old Bill, as Billy proudly exhibited his bank book, "that looks like you have a pretty good start toward your college expenses. If your alfalfa stunt comes through all right you will have earned the right to the best brand of education our agricultural college can dish up for you."

At odd times during the summer Billy had hauled out

The tangled roots of quack grass

some 60 tons of ground limestone for use on the land in preparation for his alfalfa venture. As soon as his buckwheat had been harvested this ground limestone was spread on the field and the land plowed. The following spring the land was harrowed until a fine seed bed was procured. Only a few shoots of quackgrass showed up and these were pulled up and destroyed. Western grown alfalfa from a non-irrigated section was purchased through the Farm Bureau. Experiments had proven that seed from this source was best for the locality. Nodule-forming bacteria culture was secured from the Agricultural College and the seed thoroughly and carefully treated, extreme care being taken to follow instructions to the letter. The seed was sown both ways of the field to insure an even stand, 10 pounds to the acre being used at each sowing.

FOLLOWING the seeding came warm, balmy weather with an occasional shower, and in a few days the young alfalfa plants began to push up through the mellow earth. Soon the field was covered with a thick stand of thrifty, vigorous plants. As time passed the dark green color of the young alfalfa plants was proof that the inoculation had been effective, and gave promise that unless some unforseen calamity intervened Billy's alfalfa venture was going to be a success.

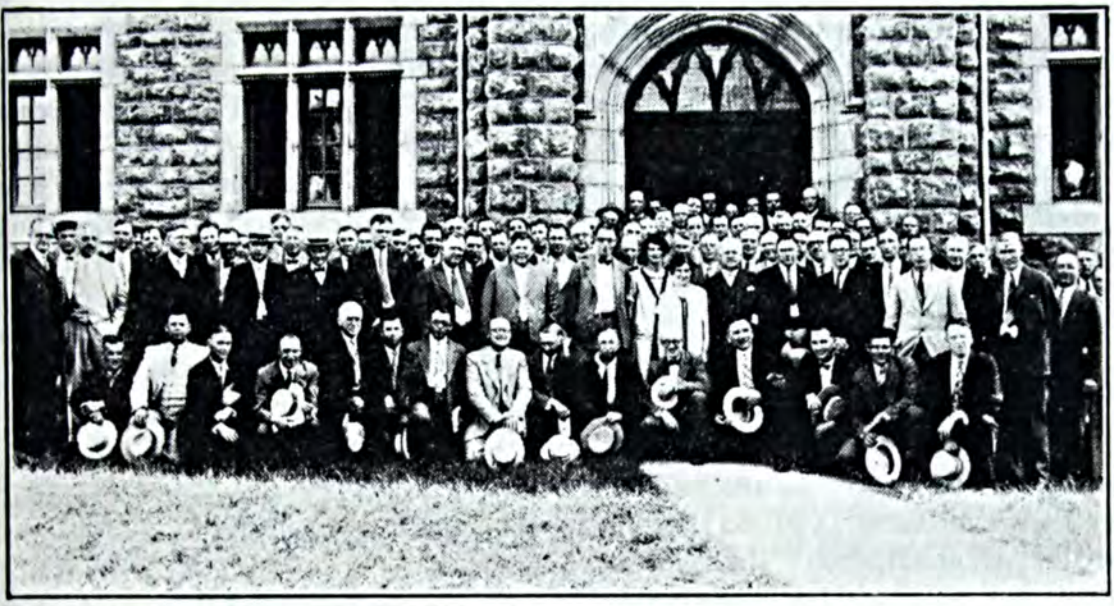
A few scattering weeds appeared in the field, and an occasional shoot of quackgrass struggled to push itself above the rapidly growing alfalfa. But Billy had no fear that these interlopers would materially injure his thick stand of alfalfa. The first mowing would check the weeds and grass while the alfalfa would come on with still greater vigor.

Two cuttings of alfalfa were made the first year. The first was made the last week in June and yielded 15 tons on the 20 acres, and the second cutting, coming in August, produced 30 tons, making a total of 45 tons for the first year's production.

For his 45 tons of alfalfa Billy received from his father $15 a ton, or a total of $675. This sum, added

(*Turn to page 54*)

The second cutting of Billy's alfalfa yielded one and one-half tons to the acre



The fertilizer salesmen who attended the short course

Virginia's Fertilizer School

By T. K. *Wolfe*

Agronomist, Virginia Agricultural Experiment Station

THE first Fertilizer School held for fertilizer salesmen by the School of Agriculture of the Virginia Polytechnic Institute convened at Blacksburg, Virginia on June 29 last. There were 150 people in attendance including 125 representatives of some 12 fertilizer manufacturers and distributors.

The object of the school was to acquaint the dealers in fertilizers with the latest results obtained through experimentation as to the use of fertilizers on Virginia's soils and crops. The hearty cooperation of the Southern Division of the Soil Improvement Committee of the National Fertilizer Association made the school possible. Certainly the school has made for a closer and more secure cooperation between the agricultural college and the fertilizer industry.

The unusual feature of the meeting was that no speaker was allowed to consume more than his allotted time. The success of the meeting is well shown by the statement made by a man prominent in the fertilizer industry. He said: "I have never seen so large a group of business men sitting without restiveness through two such long sessions. It speaks mighty well for the agronomists who addressed them."

The day was a busy one and the marked success was due largely to

W. F. Pate, Agronomist of the National Fertilizer Association, who made the arrangements for the school and Professor T. B. Hutcheson, Agronomist, of the Virginia Polytechnic Institute, Chairman, who steered the meeting in a masterly manner.

The address of welcome was delivered by Dean H. L. Price, of the School of Agriculture, who called attention to the close interdependence of agriculture and the fertilizer industry and to the necessity of considering the agricultural as well as the commercial value of fertilizers.

Honorable George W. Koiner, Commissioner of Agriculture of Virginia, in his address on the Agriculture of Virginia, touched upon the many natural advantages existing in the State from the standpoint of farming. He stressed the value of rotations and fertilizers for the upbuilding of Virginia soils. Recent changes in the Virginia laws relative to fertilizers were touched upon. The chief items of interest being the law requiring the naming of the source of material and the special labelling required when sulphate of potash was used as a source of potash.

Dr. A. W. Drinkard, Jr., Director, Virginia Agricultural Experiment Station, who followed Mr. Koiner, discussed the fertilizer work of the station. The station is now conducting some 3,000 fertilizer plats and since its inception much attention has been given to the study of fertilizer problems.

Prof. T. C. Johnson, Director, Virginia Truck Experiment Station, discussed the use of fertilizers in relation to the supply of organic matter for truck crops. He also pointed out that soil acidity in some instances has an important influence on the results of fertilizers. Throughout the entire address of Prof. Johnson attention was called to the value of organic matter in the sandy soils of the trucking region. He stated, "Our conclusion is that commercial fertilizer as a panacea in the trucking section is not sufficient but with organic matter added, an entirely different result is obtained."

Mr. C. J. Brand, Executive Secretary and Treasurer, National Fertilizer Association, gave a comprehensive and thought-provoking address on the Fertilizer Industry and the Farmer. He showed the close relationship between the value of agricultural products and the sale of fertilizers. He stated that when the purchasing power of the dollar dropped to 69 cents from 92 cents, the tonnage of fertilizer fell from 7,665,000 to 4,498,000. Mr. Brand forcibly indicated the value of fertilizers in increasing our food supply to feed our increasing population which by 2100 will be between 185,000,000 and 200,000,000, it is calculated. The speakers stated that fertilizer offers the farmer one of the best avenues for meeting present-day problems. The farmer, according to Mr. Brand, can better afford to buy fertilizers than any other major element in farm costs. "Commodities are 62 per cent above par, farms 47 per cent, interest on farm indebtedness 154 per cent, taxes 212 per cent, farm implements 135 per cent, fertilizers 125 per cent, and all farm costs 169 per cent. In other words, fertilizer expenses in terms of the commodities are the cheapest things the farmers can buy."

Professor T. B. Hutcheson, head of the Agronomy Department, Virginia Polytechnic Institute, followed Mr. Brand and spoke on Fertilizers for Tobacco. Professor Hutcheson is recognized as one of the leading agronomists of the South and no one in Virginia knows more about the use of fertilizers on tobacco than he. He called attention to the fact that all types of tobacco require a fertilizer analyzing 8 per cent phosphoric acid, 3 per cent ammonia and 3 per cent potash. However, the formula varies, especially in reference to the source of ammonia. He discussed the comparative value of muriate and sulphate of potash for tobacco and recommended the use of one-half of the potash from muriate of potash and one-half from either sulphate of potash or sulphate of potash-magnesia.

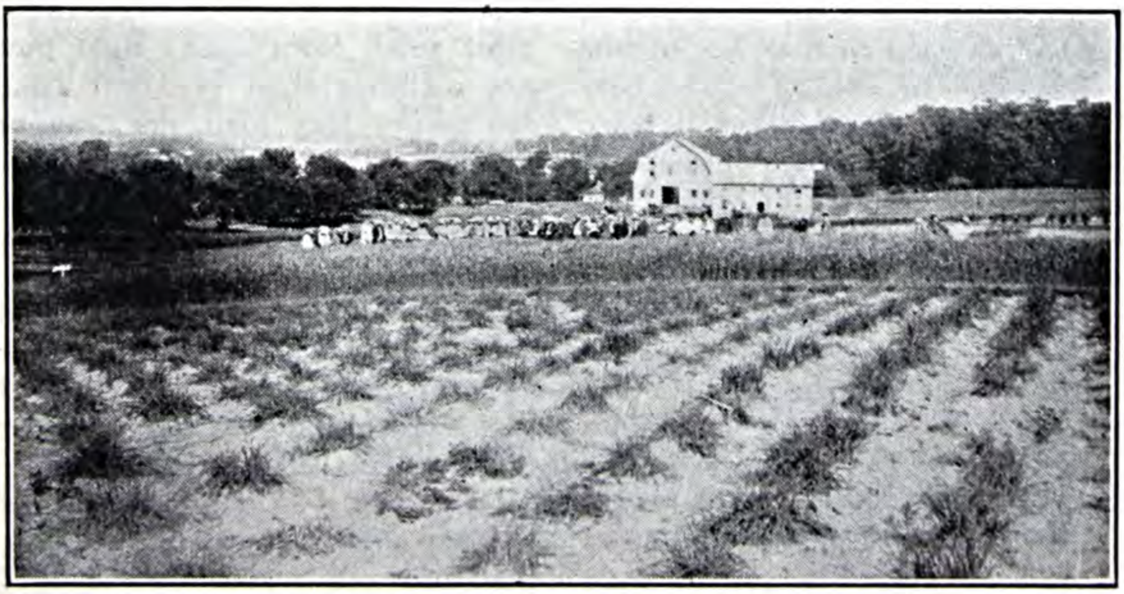
Director John R. Hutcheson, of the Virginia Agricultural Extension Service, was the first speaker of the afternoon. He discussed the relationship of extension work to the farmer and the fertilizer dealer and outlined the aims of the extension service. He concluded as follows:

"Our program is just the program of any other business. Our purpose is three-fold; (1) Help the farmers put a safe foundation under farming by living at home. And I do not know of any who can help this more than the fertilizer people. (2) Lower the cost of production of what they produce. In Charlotte county, Virginia, a survey showed that it costs from 11 to 49 cents per pound to produce tobacco. (3) Teach the farmers better methods of distribution."

At the special request of some of the salesmen Professor F. A. Motz, Extension Horticulturist, spoke on Fertilizers for Apple Orchards. The speaker very clearly and concisely outlined the indications of the need of fertilizers for apple orchards. Professor Motz stated that ordinarily a fertilizer made up of two parts of acid phosphate and one part of nitrate of soda should be used for fertilizing apples. Trees 12 to 25 years of age will require from 2½ to 5 up to as much as 10 pounds of the mixture. Trees up to 6 years of age will require from ½ pound to about 1 pound. For young trees, for the first few years after setting out, nitrate of soda was advised regardless of the richness of the soil.

A paper of much merit was presented by Dr. W. B. Ellett, Chemist, Virginia Agricultural Experiment Station, showing the proper

(*Turn to page* 60)



The Soil and Crop department answering questions

Coming *through* *the* Alfalfa

By I. J. Mathews

Winamac, Indiana

EDITOR'S NOTE:—*Mr. Mathews finishes telling his experiences with a worn-out farm. He started this story last month.*

I am looking out the window now on a piece of new alfalfa that was seeded in barley last spring. This emphasizes the fertilizer needs of such run down soils most forcibly. This particular 12 acres was in rye in 1923. In the spring of 1924, we plowed the ground, then immediately sowed the ground limestone, and planted corn. With this corn, we used 150 pounds to the acre of a half and half home-mixed muriate of potash and 44 per cent phosphate. Although 1924 was a poor corn year around here, we had as good corn as any of our neighbors. In 1925, I sowed barley on this field, we disked it twice and then I sowed two bushels of a mixture, one half of which was Utah common alfalfa and the other was Ontario variegated alfalfa. When the barley got about six weeks old, I noticed narrow strips through the field that seemed a little greener and more vigorous than the wider strips between. These became more and more pronounced and investigation showed that these green bands were the corn rows in which we had sown the fertilizer the previous year.

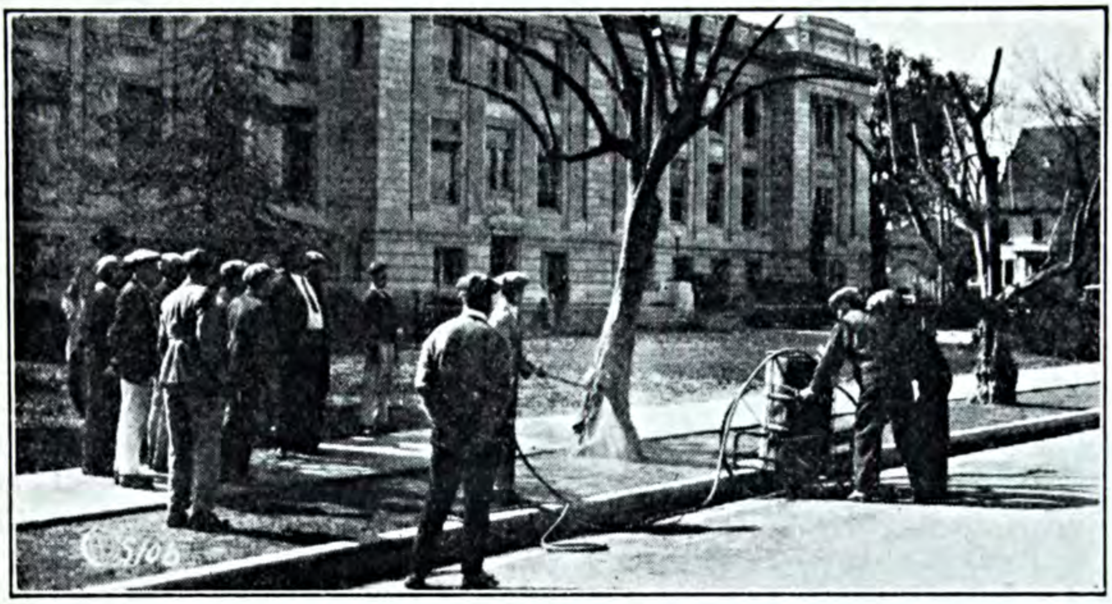
I could give more interesting details but many of them would merely give point to the general statement that the best treatment for an asthmatic farm is to stimulate its life processes with limestone, then feed it up with the proper fertilizers, and get the vagrant acres to working.

"BORROWED money at 8 per cent." I'm sure that got a raise out of my readers especially those fortunate enough to be able to borrow money at less. Eight per cent looks high and it is high. But if I may be permitted this frankness, most small town banks right now are realizing eight per cent from the money they loan, one way or another.

Be that as it may, the choice on this place was between eight per cent and a failure, between basic improvement or moving. We had accumulated a lot of trash in our 15 years of married life and it was less expensive to use eight per cent money than to move.

Of course, I heartily approve of cheaper money, but I must state that in my case, and in the case of

(*Turn to page 56*)



Smith-Hughes students doing spraying work under the supervision of one of the state horticultural inspectors. The spray outfit was assembled in the farm shop

Farmers *of the* Future

By Mark Havenhill

Instructor in Farm Mechanics, Woodland High School, California

DURING the early days of one of the greatest civil wars that the world had ever known, the nation recognized the fact that there must be more economic and scientific practises in agriculture if this great country of ours was to prosper. On July 2nd, 1862, President Lincoln signed a bill which became known as the Morrill Act, whereby each state could establish a college of agriculture and mechanic arts, and receive federal aid in maintaining it.

You are all familiar with these institutions and what they are doing, but do you know that less than one out of every 100 students go to college and probably not more than one out of every three of these studies agriculture? Therefore, it may be seen that after 63 years these institutions are not making a very deep scratch on the education of the masses.

During the early stages of another great war 55 years later, the attention of the great minds was again drawn to this educational problem. On February 23, 1917, another president, Woodrow Wilson, signed a bill known as the Smith-Hughes bill which again allows the states to establish another great educational system and again receive federal aid in maintaining it. This bill provides for the promotion of education in agriculture, the trades, and industries, in the secondary, or high schools. The trades and industries spoken of in this bill correspond to a very marked degree to the mechanic arts of the Morrill Act.

(*Turn to page 55*)

UTAH

By P. V. Cardon

Farm Economist, Utah Agricultural College

Quite a jump to the Beehive State, but we're here—let's enjoy Professor Cardon's hospitality

EXACTLY one year and six days after Congress on March 2, 1887, authorized the establishment of agricultural experiment stations in the United States, the Utah Territorial Legislature passed the bill sponsored by Hon. Athon H. Lund, which created the Utah Agricultural Experiment Station. That was on March 8, 1888. Two years later, this station was fully organized and functioning, at Logan, Utah, under the direction of Dr. J. W. Sanborn, who served also as the first president of the Utah Agricultural College.

Dr. Sanborn came to Utah from the University of Missouri for the express purpose of organizing the newly created experiment station. He remained in Utah four years, during which time he laid the foundation upon which his successors in turn have built one of the most successful experimental organizations in western America. Dr. Sanborn is now living in his native State at Pittsfield, N. H., on the farm founded by his ancestors nearly 300 years ago.

Dr. Sanborn was succeeded as President and Director by Dr. J. H. Paul, who served in this capacity from 1894 to 1896. Dr. Paul is now professor of Natural Science at the University of Utah. His successor as Director of the Utah Station was Luther Foster, who served until 1900 and then moved to New Mexico.

Director Foster was the first to hold the position of director after it had been divorced from the office of the president of the college. By 1896, the year he was appointed director, it had become apparent that the dual position of president and director was too much of a load for one man, so the board of trustees created two separate positions.

Succeeding Director Foster in 1900 came Dr. John A. Widtsoe, who later gained an international reputation as an authority on both irrigation agriculture and dry farming. He served as director until 1905, when he left the institution for two years and returned in 1907 as president of the Utah Agricultural College. Still later he was made president of the University of Utah, and is now prominently identified with the Church

(Turn to page 47)

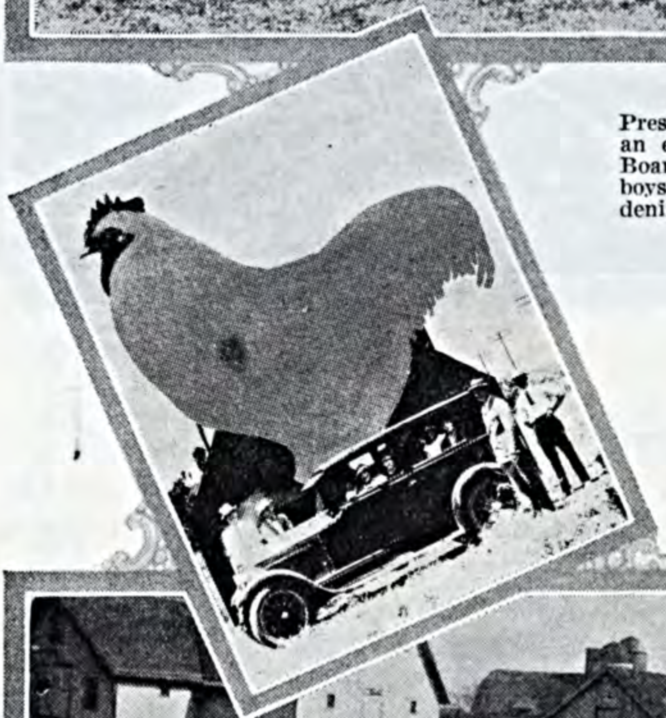
Better Crops' ART GALLERY of the month

Airplane view of the Utah Agricultural College and Experiment Station, Logan, Utah.

Besides the farms and barns shown in the background, the Utah Experiment Station has near-by farms on which investigations are being conducted with field crops, soils, sheep, dairy cattle, and hogs. In outlying parts of the state, also, there are several dry farm sub-stations, alfalfa-seed farms, and truck farming stations.

The administration building of the Utah Agricultural College and Experiment Station.

President Coolidge with the winners of an educational trip given by the Indiana Board of Agriculture. These are the boys and girls who won prizes for gardening and other farm projects in Hoosier Club work last year.



Something new in farm advertising. This sign, 24 ft. high advertises a large southern California poultry farm.

The agricultural committee, Chicago Association of Commerce, inspecting some of the brood mares at the Purdue University Farm.

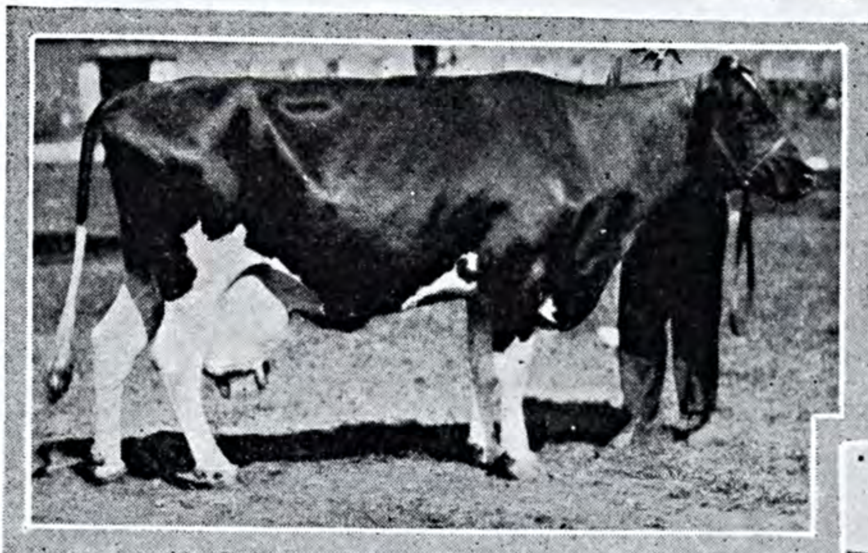
Harold P. Sheldon, newly appointed Chief United States Game Warden. He was former Fish and Game Commissioner of Vermont, and is the author of many articles and stories on fishing, hunting and wild life conservation.

Dean J. H. Skinner of the School of Agriculture, Purdue University, enjoying a vacation in keeping with his calling.

A peacetime fleet of baby "caterpillars" making play of cultivating the world's greatest vineyard at Guasti, California.

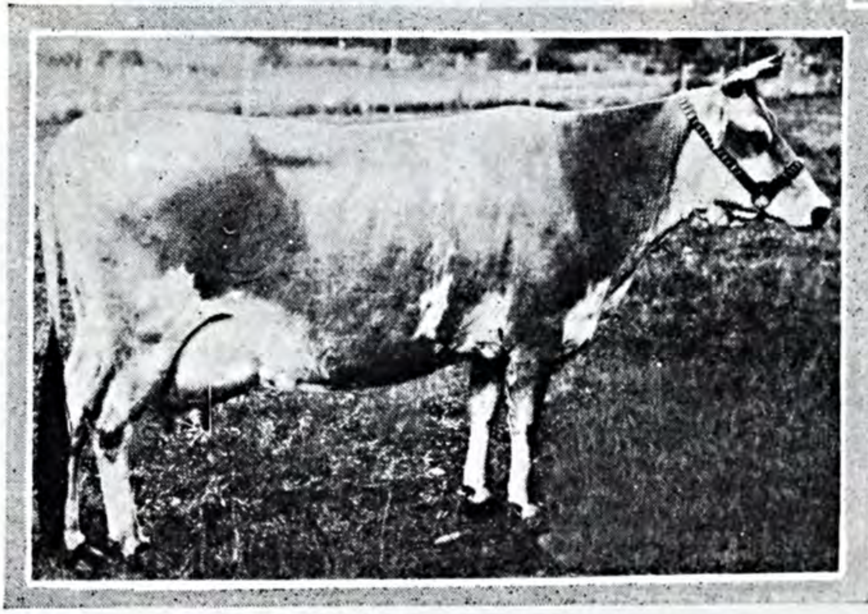
— A Page of

"Queens
World wh
earned th
"Who's W
Ag



BREED STARS REPRESENT FIVE STATES.

No section and no state has a monopoly on the production of breed champions. The honors of the five great dairy breeds have gone to widely distributed areas. Pennsylvania claims, by adoption, the Ayrshire champion, the Brown Swiss leader is a member of an Iowa herd, an Oregonian developed the Jersey record holder, the Guernsey officials found their title claimant in a Connecticut state and Minnesota is defending its claims to the production of the champion of the Holstein Friesian contingent. The latter, May Walker Ollie Homestead, 300043, was bred by Joseph Hackney, a north star state Holstein promoter. The sire of this noted cow was Piebe Laura Ollie Homestead King, 110474, her dam, May Walker of Arden, 186994. With a record of 1,218.59 pounds of butter fat or 1,523.23 pounds of butter in 365 days, she is acclaimed the champion butter producer in the United States. She was developed by the Minnesota Holstein Company at Austin, Minnesota.



OSBORNE OWNS

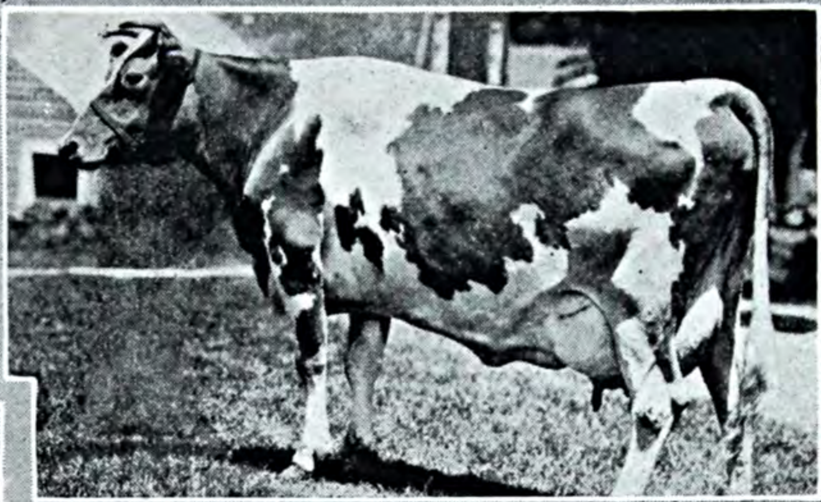
A five-year-old is the
breed. Her name is J
yearly test she produc
1062.30 pounds of fat
March. 1926, exceeds
previous champion, by
Girl is owned by Dr.
Thus the championshi
has passed from Illinois
the famous triple pla
nine—from Ti

JERSEY CHAMPION IS A WESTERNER

An Oregonian is the champion of the Jersey breed. Credited with the production, in a year, of 16,425 pounds of milk and 1,141,28 pounds of butterfat, Darling's Jolly Lassie has been accorded that high honor by the officials of the American Jersey Cattle Club. Some of the rather unusual things about this splendid record are the fact that its holder was but four years and twelve days of age when she began her record, that she was milked but three times a day during her entire record-making period, and that she carried a living calf seven of the months. She was bred and tested by Pickard Brothers of Marion, Oregon. And her name, when given in full is Darling's Jolly Lassie 435948. Except when used in the company of Jerseymen de luxe her name without her number, is ample.

ıampions –

ıe Dairy
rightfully
ce in the
American
re

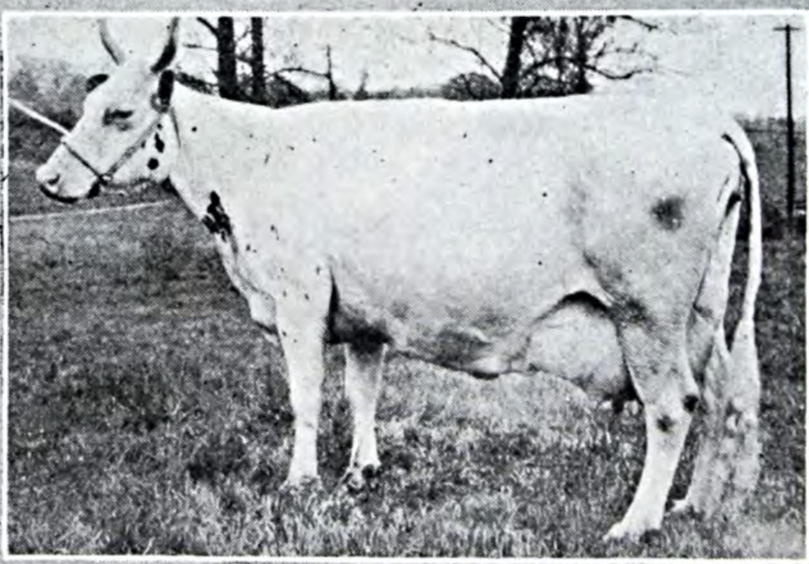


GUERNSEY CHAMPION A NATIVE OF CONNECTICUT.

As the world's champion Guernsey completed her world's record, visitors to the last National Dairy Show watched by means of a telegraphic score board, her progress. Some at the ringside even admitted that a cow race was quite as thrilling as a horse race.
On October 14, 1925, Anesthesia Faith of Hillstead completed a record that gave her premier position among all cows in the Guernsey breed. —19,741.9 pounds of milk containing 1112.5 pounds of butterfat.
The champion is owned by Mrs. John Wallace Riddle, of Farmington, Connecticut. This cow and 75 other females in the Hillstead herd are to be "at home" soon in the dairy barns of the Avon School for boys. This establishment will consist of old English buildings built of native stone and located in the middle of a 3,000-acre tract.

ISS CHAMPION.

' of the Brown Swiss
Girl. 11427. In the
pounds of milk and
rd, completed during
uction of Believe, the
ounds; June's College
e, of Hampton, Iowa.
the Yodellers breed
ta. to Iowa much like
oted Chicago baseball
rs to Chance.



AYSHIRE CHAMPION HAD FAMILY OF FOURTEEN

While Lily of Willowmoor holds the Ayrshire record in butterfat production, full championship honors of the breed have been given to Garclough May Mischief. As the Ayrshiremen base their ratings for premier honors on a point system, depending on both milk and butterfat production, May M'schief takes the lead. She was bred by A. M. Baird, Garclough, New Cunnock, Scotland. Percival Roberts, Jr., imported her for his herd at Narberth, Pennsylvania. She has a record of 25,329 pounds of milk containing 895 pounds of butterfat. She was born in February, 1906, and died in 1924 when within two months of being nineteen years of age. Ten of her fourteen calves were born in this country. The others were "Straight Scotch". The champion has six daughters with thirteen records that average 12,039 pounds of milk and 471 pounds of butterfat. She also has two advanced registry sons.

Five generations of purebred Belgian mares that are owned by the North Dakota Agricultural College, Fargo, North Dakota. Laura de Langemarck, to the extreme right is the dam, grand-dam, great and great, great grand-dam of this quartette. She was imported from Belgium.

Near the source of one of the world's greatest "drainage" systems—the Mississippi River. With its tributaries this great stream, whose modest beginning is pictured here, drains an area of approximately 1,250,000 miles. Its source is in northern Minnesota.

The Editors Talk

We live forward, but we understand backwards.—Danish Thinker.

THE question of using more concentrated fertilizers is a practical one. It is often discussed. Do you consider it a good idea or not?

CONCENTRATED FERTILIZERS

The arguments advanced in favor of concentrated materials are briefly; lower costs of handling and transportation and to insure a supply of fertilizer materials in the event that the supply of low grade materials, such as cottonseed meal proves insufficient for expanding fertilizer needs.

In accordance with this general movement there are now "high analysis" mixed goods, meaning any mixture containing 16 per cent or over of plant food; "double-strength" or double-analysis" mixed goods containing about twice the normal analysis, and also highly concentrated carriers of plant nutrients. These are particularly materials that contain large quantities of more than one plant food, as mono-ammonium phosphate, which supplies both ammonia and phosphorus in the one carrier. Interest is increasing in the use of such concentrated raw materials.

There is little doubt that all authorities support the use of "high analysis" mixtures as at present defined.

But regarding the extreme development of highly concentrated mixtures or materials, there are arguments involved in both the manufacture and the use of such fertilizers.

Spencer L. Carter, for instance, speaking before the convention of the National Fertilizer Association this year, pointed out that while the use of concentrated fertilizers is sound in theory, there are distinctly practical sides to the question. Continuing, he said that highly concentrated analyses alone would mean a reduced tonnage passing through the factory, which would require more working capital. Also, uses must be found for many low grade materials.

Some authorities have pointed out that "burn" may occur through too great a concentration of plant foods near the roots, though under proper conditions it has also been shown that concentrated fertilizers can be used without causing "burn."

It must also be observed that fertilizer materials may contain chemical elements as so-called impurities, that are beneficial to agriculture. Kainit, for instance, has beneficial effects other than supplying potash. The magnesia in many materials has also been found essential to prevent chlorosis of tobacco.

Thus, while the major trend is undoubtedly, and rightly so, towards a greater degree of concentration in fertilizer materials, there are other considerations that preclude at present our saying with any certainty, what is the final degree of such concentration that will be found the most practical and profitable.

Probably the recommendation of Professor Beaumont of Massachusetts in a paper read before the New England section of the Society of Agronomy is as sound as any. He said "Our recommendation in general will be for the material that furnishes a unit of plant food at the lowest cost—that there is in our fertilizer economics a place for both classes of materials, and that each material be considered in the light of the available knowledge concerning it."

Education is the cheap defence of nations.
—Burke.

THE RURAL LIFE PROBLEM IN THE EAST

ALTHOUGH similar in every section of the country, the rural life problem differs enough between East and West, North and South to need special thought. Fundamentally the problem in the East is different from any of the other geographical regions because of the greater competition between the agricultural and the industrial forces.

For generations there has been a constant drain of red-blooded young people from the farm to the city, and agricultural activities and social life on the farm have decayed on account of a deplorable lack of leadership. The young men and women with a high degree of initiative and leadership, with capacity of doing the big things of life, have been directed to the city, forgetting or perhaps never suspecting that the economic and social opportunities in the open country are unlimited, when directed by the right kind of leadership.

Rural decadence will of necessity result in national disintegration. Rome, in her desire to centralize all power and resources in the city, fell when that stage of reckless urban development was reached when her rural population was drained of its leadership. The power and world influence of a nation must surely pass away with the passing of material resources, for poverty is helpless and ignorance is the inevitable result of cancerous poverty.

Like characters beget like character, whether we will it or not, so it is important that our Eastern states bear this in mind. If draining the farms and farm homes of their initiative and leadership is continued, there necessarily will be left on the farm a lower type of civilization, a decadent civilization. Realizing that the permanency of our American democracy will be determined by the permanency of our agriculture and by the economic and social level of the farm, it is high time that the dominant forces of our agricultural and industrial civilization brush the cobwebs from their vision and read the handwriting on the wall "Any Civilization That Will Endure Must Be Based on a Prosperous and Permanent Agriculture".

Cotton is King or Slavery in the light of political economy.—David Christy.

MISSISSIPPI

THIS is being written at Poplarville, Mississippi. Mississippi produced last year next to the largest crop of cotton of any state in the South, nearly 2,000,000 bales. Texas was first. A large part of this cotton was produced on the famous Delta lands between Vicksburg in the south and the northern boundary of the state. This area of land bordering the Mississippi river has been cultivated during recent years very much more intensively than ever before. This possibly is due to the building and care of the levees of the Mississippi river.

Thus Mississippi is vitally interested in cotton. She has no large cities within her borders. Her interests are fundamentally in the soil and the crops produced. Almost anybody can tell you when the first boll weevil appears, or whether the wilt is bad, and lately the bad effects of the cotton flea. Methods for protecting the cotton crop are therefore of popular interest everywhere. Whether aeroplanes can be used for protecting cotton in a more commercial way is much more than an economic question.

Next to crop production and producing good seed, there is a growing interest in the use of fertilizers. The agricultural experiment stations of the state are leading the way in making good progress in finding out what are the best analyses and materials to use to cheapen the cost of producing cotton.

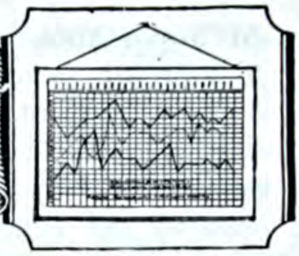
There are five stations in the state doing experimental work. The central or main station is located at the A. and M. College, Starkville, J. R. Ricks, director. The others are: the South Mississippi Branch Station at Poplarville, 70 miles from New Orleans, representing the coastal plains, E. B. Ferris, assistant director; the Holly Springs Branch at Holly Springs, located on the brown loam or loess soils in the northern part of the state, C. T. Ames, assistant director; the Delta Branch at Stoneville, representing the delta soils, W. E. Ayres, assistant director; and the Raymond Branch at Raymond, located on the brown loam soils of southwestern Mississippi with H. F. Wallace, assistant director, in charge.

During the last two or three years, under the supervision of Director Ricks, new plans for fertilizer experiments have been started. Among other important changes, fields have been leased which are adapted both in the type of soil and typography of the land for the best work in field experiments. A large number of fertilizer combinations are included in the experimental plans. The work will answer in a manner the two fundamental questions: What are the effects of each of the plant nutrients? and What amounts of each give the most profitable returns, particularly on cotton?

A very good experiment of this type is located on a farm leased by Director Ferris of the South Mississippi Branch Station. In addition to this the same type of experiment is being done in four or five counties under the supervision of the branch station.

This is very encouraging and the directors of the different stations are to be congratulated on the efforts they are making to solve cotton fertilizer problems. It is quite obvious that if the price of cotton remains low, the cost of production in which fertilizers play such an important part, will be a very vital problem. The western part of the Cotton Belt, as is well known, has not used so much fertilizer as North and South Carolina and the eastern part of the Cotton Belt generally. There is, therefore, greater need for experimental work and undoubtedly the work that the Mississippi experiment stations are doing will have a vital influence on the production of the big crops of cotton that the state usually produces.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

The Little Barred Hen

One hundred and eleven eggs in 111 days in a row is the record of a Barred Rock hen owned by the University of Tennessee. This is a world record for the breed and misses the world's record for all breeds by only 16 eggs. After the long, non-stop record she missed a day and then continued for a long period thereafter. Although she hasn't beaten the world she does hold in addition to the record for her breed, the world's record for all heavy breeds, and the southern record for hens of all breeds for continuous laying. The hen's name is U. T. Queen.

Regular Feeding More Important Than Regular Milking

Dairy specialists of the Department of Agriculture have been trying to find out if regular milking is as important as dairymen have long thought it. They found that with average to good cows milking at irregular hours had little effect on production. Irregular feeding, however, lessened production by about 5 per cent. It was also found that the old notion that cows give more milk if milked always by the same person was not backed up by experimental results. The difference was so small as to be hardly noticeable.

Scrape and Save

The evidence accumulates that corn growers in the United States for generations have been wasting time and labor in useless cultivations of their crops. It is now quite commonly conceded that weeds are the principal enemies of the corn grower and that when they are kept out it is unnecessary to disturb the soil.

Last year a member of Ohio's hundred-bushel corn club had started to cultivate his crop for the third time when he received a bulletin which counselled against cultivation beyond that needed for weed killing. After reading this advice he did not finish the row he had started and let all the rest of the field stand as it was after two cultivations. He grew 120 bushels to the acre, the second highest yield of the State for the year.

Experiments in 27 States show that fields in which the weeds are merely scraped off do as well as fields where the corn is cultivated. In fact, cultivation after corn has reached knee height is liable to do much damage to the roots which fill the ground between the rows. In Illinois one plot grown to corn for 25 years received nothing but scraping to remove the weeds and there was no appreciable difference in yield between it and the adjoining plot which was cultivated.

Save Red Clover

Dr. A. J. Pieters, Agronomist of the Department of Agriculture, says that the red clover crop in Delaware, Maryland, Virginia, West Virginia, Kentucky and Tennessee may be brought back to its old importance by the simple expedient of developing strains of clover resistant to anthracnose. At present there is only one known resistant strain—one developed by the Tennessee Experiment Station several years ago — but little seed is yet available. Farmers are advised to locate resistant clover and save it for future seeding. By following this practice year after year a strongly resistant strain will be developed.

Cotton and Rubber

Three members of the Bureau of Plant Industry have recently returned from a three-months' inspection trip in the West Indies and South America. They report the discovery of several new types of cotton, some of them with characteristics that may be of value in practical cotton breeding work here. One of the new cottons has bracts open or turned back from the buds and young bolls so that little protection is offered for boll weevils or other pests and diseases. It is thought that such cotton also could be picked with less trash or broken bract material and the grades would therefore be improved.

The scientists also visited rubber experiments being carried on by the Department in Haiti and the Canal Zone and made a short expedition to the West Coast of South America and into Colombia and Ecuador. They report that tapping experiments on 20-year-old para rubber trees near the North Coast of Haiti show that it is not impossible to produce rubber from this tree in suitable locations in the West Indies, Central America and Mexico.

The Best Silage

Results of new experiments by the Department of Agriculture show that the best corn silage is made if the corn is cut when 80 per cent of the ears are in the dough stage and 20 per cent in the milk stage. It was found that sunflowers are usually cut when too immature. Any time between the period when all plants are in flower and before the petals fall is usually good for harvesting this crop for the silo. Sudan grass may be cut at the early blooming or middle to late blooming stage.

Potash in "Quotes"

Down in Oklahoma they are having a good laugh at the expense of Henry C. Potts, Assistant Professor of Agronomy. Workmen had left a finely powdered substance on the floor of one of the rooms of the agronomy department. With a hasty glance Mr. Potts decided it was potash and thought it would do better work on one of his potato plots. It was sacked and put on the field. Later it was found that the material was Portland cement. The men who spread it over the potato patch are hoping they will not be asked to dig the potatoes.

Foot-and-Mouth Commission

The foot-and-mouth disease commission sent to Europe a year ago to study the disease and the methods of fighting it has just returned and is now in Washington working up the material for its report which it is thought will be issued some time late in the fall. Members of the commission are Dr. Peter K. Olitsky, of the Rockefeller Institute for Medical Research; Dr. Jacob Traum, of the University of California, and Dr. Harry W. Schoening, of the Federal Bureau of Animal Industry. They carried on work in France, Germany, England, Denmark, Sweden, Holland, Belgium, Switzerland, Austria, Hungary and Italy.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

The British County Agent in Action

By H. R. Cox

Specialist in Farm Crops, New Jersey Agricultural Experiment Station

IT may be a surprise to some readers of BETTER CROPS that Great Britain has county agents. But such is the case. Indeed, all the more progressive countries of Europe have systems of agricultural extension teaching.

In Britain the county agent is known as the county organizer. His duties are of a three-fold nature: (1) classroom instruction, (2) establishing experiments and demonstrations, and (3) advisory. Instruction is placed first. The British organizer is first of all a teacher. Broadly speaking he is a combination of the vocational teacher and the county agent, as we know them. In order to give a more intimate picture of the organizer and his job let me introduce to you several of his kind.

J. C. Wallace is organizer in Holland county of Lincolnshire. This county is in the fen country about 100 miles north of London and is one of the richest agricultural districts in England. It is outstandingly a region of arable farming rather than livestock farming, and is devoted to the growing of potatoes, fruit, sugar beets and a large variety of other crops. It is about 20 miles square, being approximately the size of an average county in eastern United States.

Mr. Wallace has his headquarters at the village of Kirton. Here there is a Farm Institute consisting of a group of buildings having a value of perhaps $60,000. The home of the organizer is a part of the group. In addition to the organizer there is a staff of assistants. The staff consists of a biologist, a chemist, an instructor in poultry-keeping and an assistant to the organizer, all full-time workers. During the winter of 1924-1925 there were 16 regular students attending the institution, boys between 16 and 22 years of age. In addition, there were 6 part-time students. Mr. Wallace admitted that the number of students is smaller than is justified by the facilities at hand but stated that the institution is only 3 years old and that the attendance should grow. It may be stated that the officials of the Ministry of Agriculture in London believe that the institute idea is something of an experiment, and they are not fully convinced that it will stand the test of time.

Attached to the Institute is an experimental farm of about 100 acres on which are employed from 12 to 14 laborers regularly and at times as many as 45. The lines of experimenting include extensive fertilizer trials on potatoes, clover and sugar beets; variety and seed source trials with potatoes, peas, cabbage, cauliflower, oats and sugar beets; trials on dates of sowing peas; trials on methods of and distances of sowing wheat.

This experimental farm has been in operation 4 years. There is an investment here of about $60,000. It is worthy of note that the difference between expenses and receipts is only about $1,000 a year on an average. The Ministry pays two-thirds of this deficit and the county council the remaining third. Much of the experimenting is carefully conducted and seems to be worthy of the name; some of it would probably not stand the close scrutiny of a research worker. This is the outstanding case in Great Britain of a fully developed county experimental farm. It is interesting to note that 750 farmers visited this farm in 1924. Apparently it has the enthusiastic support of the farmers of the county. It is a more popular branch of the organizer's work than is the Institute.

The time of the organizer and his assistants is largely taken up with the Institute and the farm, but they find opportunity to make farm visits and for attending farmers' meetings about the county.

The county of Derbyshire is more typically English than Holland county, being devoted largely to livestock husbandry with a large proportion of the land in grass. There are about 5,000 farmers in the county. The organizer, Mr. J. R. Bond, has a staff consisting of a horticultural instructor and a livestock instructor, who is a veterinary surgeon; he also has the part-time services of a poultry instructor who happens to be a public school teacher, a beekeeping instructor, an instructor in manual processes, and two women instructors, one of whom teaches butter and cheese making and the other cooking. Manual processes include blacksmithing, ditching, hedging and thatching.

EXTENSION work in Derbyshire represents the outstanding case in Great Britain in which instruction in day and night courses has been developed to a high degree. There is no farm institute in the county and the organizer does not believe in that method of agricultural instruction. He believes in spreading his efforts around the county and thus reaching more people. In 1922 there were day classes in agriculture held for men at 6 different centers with a total attendance of 147; and for women at 4 centers with an attendance of 77. The age of the students varied from 16 to 50 years, the majority being from 20 to 25 years of age. Besides these courses, there were organized series of night lectures for farmers at a number of points. Many of these night lectures were illustrated with lantern slides.

The staff in Derbyshire conducts less demonstration work than is the case in most of the other counties. Mr. Bond took me, however, to a farm on which he has been conducting pasture improvement demonstrations for a number of years, where I saw an excellent example of teaching by demonstration. The farmer and his neighbors are fully convinced of the value of the methods shown.

The agricultural staff in Derbyshire does a great deal of an advisory character, although Mr. Bond stateu that he never visited a farm except on request of the farmer and for his specific purpose. His office publishes a monthly paper called the "Derbyshire Young Farmer," having a circulation of about a 1,000 and a subscription rate of 50 cents a year. It carries advertising and more than pays for itself.

The cost of running the extension office in Derbyshire is about $25,000 a year, of which the Ministry of Agriculture pays about two-thirds and the county council the rest. The organizer has been an extension worker for 12 years. He has a flivver, many years old, with which he can stir up the dust with the best of them. He calls it a "Lizzie." Thus the twain shall meet.

Three counties in southern Scotland, Selkirk, Berwick and Roxborough are united in maintaining an organizer and his staff. The area covered by these workers is more than 1,000 square miles. The organizer is G. W. Howie and his headquarters are at St. Boswells. The staff consists of a horticulturist, a dairy instructress, a poultry instructress and a beekeeping instructor. There are 3 schools in this district where the staff teaches rural science to boys of 12 to 14 years of age. The course runs for 2 years and a session is held once a week. In addition to this instruction tnere are day and night schools held for older boys. As a part of the course in rural science to the younger boys the horticultural instructor maintains school gardens in which each student is allotted a small area for the raising of garden crops. The poultry instructress has a small poultry establishment near the school with a couple hundred birds which is managed by the students.

There are quite a number of experiments and demonstrations carried on by the staff in this district. All of them are conducted on farms rather than at a central station, and most of them are under the direct supervision of the organizer himself who is a crops and soils man. The lines have to do largely with fertilizer tests with potatoes and turnips, variety trials with oats and barley, and the improvement of permanent pastures by fertilization. Mr. Howie took me to one of the potato fertilizer experiments. It consists in comparisons of different amounts of potash in one group and different amounts of nitrogen in another, both series run in duplicate. Such tests are usually run for several years, but not on the same field. He also showed me an oats vari-

Mr. Howie looking at pastures *With his car in front of his office* *Talking to one of his beef cattle farmers* ety experiment which consisted of single plats of each of a half dozen varieties.

We also visited a pasture improvement demonstration, then in its second year, consisting of 4 plats of 5 acres each. Each plat is treated with different fertilizer applications. The measure of results is the increase in weight of the several flocks of sheep on the plats. This is the approved British method of gauging the results of pasture improvement.

Mr. Howie and his assistants have more or less consulting work to do. He also makes a practice of visiting, nearly every week, 2 or 3 of the farmers' markets of which there are a number in the district. Farmers' markets are common all over Great Britain. They are held largely for the purpose of selling livestock and other farm produce. The organizers use these markets as an opportunity of making contact with the farmers.

Mr. Howie drives a Morris-Cowley roadster on his official rounds. This probably comes nearer than any other make of car to being the flivver of Great Britain. He owns the car, as is the case with all other organizers, and receives 12 cents a mile for its operation on official business. He has a Truog soil tester in his office and believes that it is fairly useful. He has no stenographer but does his own typewriting; this is typical of the British extension offices.

One of the most notable differences between agricultural extension work in Great Britain and the United States is that in the former country it has come about by gradual growth, step by step, taking a certain direction here and a little different direction there; while in the United States the entire system as it exists in the northern and western States was largely created at one time and was superimposed on the several states, resulting in a fairly uniform system throughout.

The field tests conducted by the organizers are of quite a wide range and of varying character. Sometimes these tests are merely demonstration and are of value as such. More often they are intended to be experiments for the purpose of learning something, and here is a matter which is causing considerable comment among the agricultural authorities in Great Britain. There is a feeling among some of the leaders that most of this experimenting has been too carelessly done to justify definite conclusions being drawn from it. In this country we have wisely avoided this pitfall by recognizing the difference between experimenting and demonstration and in confining our extension activities to the latter phase.

The organizers and their assistants seem to be well trained for the most part and to be of a high type. They are probably more broadly educated than our own people. They are a little older and more mature than our people and their tenure of office has been somewhat longer. I found a number who had been in agricultural extension work for 15 and 20 years.

As to salaries, it would seem that the county organizers were about as well paid in proportion to the cost of living as in our country. In England the salary range is from $2,000 to $3,500 a year for the organizer, less, of course, for his assistants. In Scotland the organizer starts at about $1,200 a year. As a result of the lower salary range in Scotland some of the Scotch extension people have been lost to England. A number of women extension agents have been employed in Scotland. The thrifty Scot has learned that women work for less than men.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

One of the most interesting of the bulletins which have come to hand this month is a resume of the county agricultural agent work under the Smith-Lever Act 1914-1924. This is U. S. Department of Agriculture Miscellaneous Circular No. 59 dated May, 1926, and written by William A. Lloyd, in Charge of the Western States, Office of Cooperative Extension Work. The bulletin starts with a bit of history as to the origin of farm demonstration work and follows down through the important projects which have been worked out within the decade. This is a bulletin which should prove not only interesting for County Agents and Vocational Teachers, but to everyone who is interested in the improvement of American agriculture.

Fertilizers

"Fertilizers for Irish Potatoes," Agricultural Experiment Station, Fayetteville, Arkansas, Bulletin No. 206, *May,* 1926. *J. R. Cooper, C. W. Rapp.*

"Making the Most of Manure," Timely Soil Topics, Ohio State University, Columbus, Ohio, Radio Lecture No. 6, *No.* 97, *June,* 1926.

"Cabbage Fertilizers," Truck Crop Investigations, Virginia Truck Experiment Station, Norfolk, Virginia, Bulletin 50, *January* 1, 1925. *H. H. Zimmerley, M. M. Parker.*

Department of Agriculture Immigration, Richmond, Virginia, Bulletin No. 233, *July,* 1926.

Soils

"Soil Survey of Iowa Woodbury County," Agricultural Experiment Station, Agronomy Section, Soils, Soils Survey Report No. 40, *May,* 1926. *Ames, Iowa.*

"Influence of Nutrient Supply on Earliness of Maturity in Cabbage," Agricultural Experiment Station, Horticultural Section, East Lansing, Michigan, Technical Bulletin No. 75, *March,* 1926. *J. B. Edmond, E. P. Lewis.*

"Soil Productivity as Affected by Crop Rotation," United States Department of Agriculture, Washington, D. C., Farmers' Bulletin No. 1475, *May,* 1926. *Wilbert W. Weir.*

Crops

"Directions for Grading and Packing Illinois Peaches," Agricultural College and Experiment Station, Urbana, Illinois, Circular No. 310, *June,* 1926. *J. W. Lloyd.*

"Productiveness of Varieties of Winter Wheat in Illinois," Agricultural Experiment Station, Urbana, Illinois, Bulletin No. 276, *June,* 1926. *Robert W. Stark.*

"Cost of Producing Field Crops in Three Areas of Illinois 1913-1922," *Agricultural Experiment Station, Urbana, Illinois, Bulletin No.* 277, *June,* 1926. *Emil Rauchenstein, R. C. Ross.*

"Reducing Grain Losses in Threshing," Agricultural College and Experiment Station, Urbana, Illinois, Circular No. 311, *June,* 1926. *I. P. Blauser.*

"Timothy-Pro and Con," Crop Talk, Ohio State University, Columbus, Ohio, No. 35, *June,* 1926.

"Muskmelons," United States Department of Agriculture, Washington, D. C., Farmers' Bulletin No. 1468, *April,* 1926. *W. R. Beattie.*

Economics

"Farm Economics," June 25 *Cotton Report, Cooperative Extension Work in Agriculture and Home Economics, Alabama Polytechnic Institute, Auburn, Alabama, Vol.* 1, *No.* 13, *July* 6, 1926.

Diseases

"The Mint Flea-Beetle," Agricultural Experiment Station, Entomological Section, East Lansing, Michigan, Special Bulletin No. 155, *June,* 1926. *L. G. Gentner.*

"The Mexican Bean Beetle," North Carolina State College of Agriculture, Raleigh, North Carolina, Extension Folder No. 22, *June,* 1926. *C. H. Brannon.*

"The Clover Leaf Weevil and its Control," United States Department of Agriculture, Washington, D. C., Farmers' Bulletin No. 1484. *W. H. Larrimer.*

Insects

"*Leaf Scorch Disease of Strawberries,*" *Agricultural Experiment Station, State College Station, Raleigh, North Carolina, Technical Bulletin No.* 28, *April*, 1926. *Frederick A. Wolf.*

"*Potato Wilt and Its Control,*" *Oregon Agricultural College Experiment Station, Corvallis, Oregon, Station Bulletin* 221, *March*, 1926. *M. B. McKay.*

"*European Canker of Pomaceous Fruit Trees,*" *Oregon Agricultural College Experiment Station, Corvallis Oregon, Station Bulletin* 222, *March*, 1926. *S. M. Zeller.*

* * *

Unbending Backs in Farming

(*From page* 15)

against the rapidly revolving teeth of steel which, with apparent ease, sever "in twain" the most stubborn logs.

The circular saw rig is now attached in one of several ways, but always with an idea of saving time and physical energy. Many farmers have the gas engine and the circular saw on separate frames with the latter either stationary or portable; but the newer types of circular saws are built on the same frames as their engines, and are portable.

Some agricultural engineers are now recommending that the circular saw be attached to a special frame, and be hinged to the tractor. By this device, the pulley power of the tractor may be used.

Farmers who have to do much sawing of heavy logs find the drag saw more convenient. The drag has an advantage over the circular saw in that it requires less physical labor in operation. The sawing edge is raised, lowered, and drawn back and forth on the log through the operation of transmission lines, run over pulleys, by power from the gas engine.

Certain types of drag saw rigs now in use, have what is known as a moving log slide. When the saw is in operation, the logs pass slowly along the slide by means of a series of rollers, a cable, and a log hook. As the log is passed beneath the saw a definite distance, the sawing edge is lowered, and sawing commences. In other words, the machine is so regulated, that the length of time to raise and lower the saw is equal to the time required for the log to advance in position for the next cut. Such a device, although slower in action than the circular saw, makes it possible for one man to operate it while attending to such duties as the splitting and piling of logs, already sawed, into equal lengths.

True to its name as a general farm labor saver, the gas engine now invariably functions in furnishing the power for wood sawing apparatus. Farmers, fortunate in having two engines, use one to do the heavier work of wood sawing, feed grinding, and threshing, and reserve the engine of lesser power for such tasks as water pumping, milk separating, and running the washing machine.

However, engines with three to five horsepower are sufficiently capable of sawing most farm supplies of wood.

These and other powerful farm machines are doing much to lighten the labors of the farmer. Instead of discouraging the prospective farmer with the back-breaking tasks, such inventions bring a promise of greater enjoyment to be derived from the business of farming.

The power saw is only one of the miracles of modern farming.

Utah

(From page 28)

of Jesus Christ of Latter Day Saints, commonly known as the Mormon Church. For several years past, also, he has been associated in the work of adjusting affairs on federal reclamation projects.

Dr. P. A. Yoder, now engaged in sugar cane investigations with the United States Department of Agriculture, was director of the Utah Experiment Station from 1905 to 1907, when he was succeded by Dr. E. D. Ball.

Dr. Ball directed the affairs of this station through a longer period than any of his predecessors or, thus far, his successors, having served from 1907 to 1916. He will be remembered by agricultural investigators in all parts of America as the first director of research in the U. S. Department of Agriculture, a position from which he resigned in 1925.

With the succession of Dr. F. S. Harris to the directorship in 1916, a young, highly-trained investigator in the newer school of agricultural thought, assumed the leadership of Utah's experimental forces. Dr. Harris, an agronomist by profession, was an assistant at the Utah Agricultural College during Dr. Widtsoe's administration, and later took his doctorate at Cornell University. For five years he was director of the Utah Experiment Station, from 1916 until 1921, when he was elected president of the Brigham Young University, a position still held by him.

Dr. Harris was succeeded as director by Prof. William Peterson, incumbent, who already had established himself as a leader in the labor of promoting the rural welfare of Utah. Born and reared to young manhood on a ranch, he brought to his position as director an intimate knowledge of the most important phase of agriculture in this State, the range livestock industry. A geologist by profession, a keen student of the native rock origin of Utah soils and an investigator of possible surface and underground water supplies, he is unusually well qualified to deal with the major problems confronting his state today.

There are upwards of 40 investigators on the staff of the Utah Experiment Station, each of whom is striving to contribute something in his special field that will help to advance the type of agriculture peculiar to irrigated mountain valleys, Alpine summer ranges, and vast stretches of desert winter range.

AT different times during the last 35 years the staff of this station has included the names of some of America's best known agriculturists. Besides those already named, a few of the leaders include Secretary of Agriculture W. M. Jardine; U. P. Hedrick, widely known horticulturist; F. D. Farrell, president of Kansas State Agricultural College; J. M. Stephens, associate agriculturist in charge of Dry Land Agriculture, U. S. Dept. of Agriculture; J. T. Jardine, director Oregon Agricultural Experiment Station; A. C. Cooley, in charge of demonstration work on federal reclamation projects; F. B. Linfield, director Montana Experiment Station, and many others.

As for the work in field crops, the following statement by Prof. George Stewart, agronomist, is enlightening:

"Farm crops work at the Utah Agricultural Experiment Station falls under five chief headings, cereal investigations, dry farming, rotations and manuring, irrigation, and alfalfa seed problems.

Cereal Investigations

"It has been found that practically all common cereal varieties consist of several pure lines. The most common variety of winter wheat in Utah is Turkey, and of spring wheat Dicklow. Both of these varieties have been carefully selected and a pure line of each variety has been isolated and is being distributed in the state. The chief problem in the case of Turkey wheat is drouth resistance. Kanred wheat is somewhat superior to ordinary Turkey in Utah, but our selected strain of Turkey is fully as good, if not slightly better than Kanred. A pure line of Dicklow wheat has been selected for spring planting under irrigation; this strain is somewhat shorter and stiffer of straw, and yields somewhat more than ordinary Dicklow. It is at the present time competing in the State for acreage.

"Selection alone will not accomplish the entire purpose of cereal improvement. Hybridization has therefore been resorted to and crosses between such varieties as Sevier and Kanred, Sevier and Dicklow, and Sevier and Federation have indicated that considerable is to be expected by uniting the good qualities of these varieties. The good quality and high yield of Dicklow can apparently be maintained and at the same time there can be added to it a certain degree of rust resistance, of drouth resistance from the Sevier parent. When completely ripened, the Dicklow variety is rather bad to shatter. This is completely overcome in the cross mentioned. The cross between Sevier with Federation has given us somewhat stronger straw and it may be that the yield will be as good as in the Dicklow-Sevier cross, although as yet it has not been possible to test this.

Dry-Farming

"One or two rather interesting things have come out of the dry-farming tests. The old idea that two or three pecks of seed to the acre was sufficient on the dry farm has been completely refuted, six pecks having been found much more desirable and much safer.

"The value of summer fallow was formerly thought to be almost entirely a question of the storage of water. It is now known that the accumulation of plant foods, especially nitrates, is almost, if not fully as important, as is the storage of water. There is no doubt, in the Great Basin, that summer fallow is required in order to get good yields, but curiously enough, wheat followed by potatoes or by corn will permit as good a yield of wheat the next year as will summer fallow, the question, therefore, is whether or not corn, potatoes, or other cultivated products, such as beans, might be grown profitably as regards their own production. Continuously cropped land becomes very foul with weeds and becomes unfavorable in its structure for further cropping.

Rotation and Manuring

"Seven different rotations without alfalfa failed entirely to maintain the productivity capacity of the soil, but when alfalfa is added, the problem is almost entirely solved, if just a little farm manure is added to critical crops. The yield of crops is fully as good when alfalfa is grown five years followed in turn by potatoes, sugar beets, peas or beans, sugar beets and small grain, as a nurse crop to re-seed the alfalfa. When only three years of crops in this rotation receive manure, the yield of beets, potatoes and grain are almost identical with the same crops grown under constant cropping when the land is receiving a manuring of 10 tons to the acre every year. That is, the rotation is taking the place of about 70 per cent of the manure. In spite of this, however, rotation by itself, even with alfalfa, does not maintain the productivity of the soil as measured in crop yields.

"It is evident, therefore, that a combination of crop rotation and farm manure is highly important.

Irrigation

"It has been clearly established that when land must be irrigated in order to establish the crop, it is much better that it be irrigated before the crop is seeded rather than afterwards. Crops should never be left to suffer for water, as they do not fully recover from the setback. Some diseases readily attack plants suffering from lack of moisture. This is particularly true of sugar beets. One of the worst sugar beet diseases, *Phoma beta,* is almost entirely prevented by maintaining a moisture supply in a combination of manuring, rotation and irrigation. Excessive quantities of water are wasteful for seed production.

Alfalfa Seed Problems

"Most of the reasons why alfalfa will set seed in one locality and not in another are at the present unknown. Some investigators feel that moisture is the important factor. Others feel that the time at which the seed crop is allowed to begin growth overshadows the moisture supply. Still others feel that the presence of bees or of even certain weather conditions are the determining factors. This problem is now being investigated on an exclusive alfalfa farm in the Uintah Basin, which is one of the best seed-producing sections in the United States. It is hoped that it will be possible on this farm not only to determine these factors, but ultimately to produce higher-yielding strains for seed production, and also to find some strains that will be adaptable to the most strenuous conditions of the northeastern part of the United States and adjacent parts of Canada, both as regards cold resistance and yield. In order to bring about these results, nearly all common varieties are being tested. Unfortunately the results from these investigations have only just begun."

The close of day out where the West has begun

Kentucky Blue Grass

(*From page* 19)

of 3.5 per cent milk per day. Three types of 1,200-lb. cows are used in the computations; those producing 20, 35 and 50 lbs. of milk per day. In making these computations, it is recognized that a cow producing more than 25 lbs. of milk per day should be provided with sufficient concentrates other than the feed secured in the pasture to furnish the necessary total digestible nutrients for maintenance and production.

Feeding concentrates to grazing dairy cattle has been shown to be an economical practice. The animal is kept in better physical condition throughout the summer and goes into the winter feeding period more capable of a uniformly high milk production. A 1,200-lb. cow, yielding daily 30 lbs. of 3.5 per cent milk, will require for maintenance and production an average of 2.49 lbs. digestible crude protein and 18.51 lbs. total digestible nutrients. Eighty pounds of green Kentucky blue grass will furnish 2.96 lbs. digestible crude protein and only 12.72 lbs. total digestible nutrients (Henry's Feeds and Feeding, pp. 747 and 739). The difference of 5.79 lbs. of total digestible nutrients should be supplied by supplementary feed.

Green pasture grass, especially Kentucky blue grass, is a high protein feed with a nutritive ratio of 1:3.3, which should be modified with supplementary feed to a ratio of at least 1:6.6. Table 1 shows the computed value of pasture on the basis of five months of continuous grazing (May 10-Oct. 10). The feeding value of the pasture is based on the difference between the cost of feed on pasture and on a dry ration.

The cow producing only 20 lbs. of milk daily is maintained on pasture without supplementary feed. Her dry ration, off pasture, consists daily of 8 lbs. alfalfa hay, 35 lbs. corn silage, 1 lb. gluten feed, ½ lb. cottonseed meal, ½ lb. linseed meal, and 4½ lbs. corn and cob meal.

The cow producing daily 35 lbs. of milk is fed, in addition to pasture, 8 lbs. of corn and cob meal per day; dry ration (off pasture); 10 lbs. alfalfa hay, 35 lbs. corn silage, 6 lbs. corn and cob meal, 1½ lbs. wheat bran, 1 lb. gluten feed, 1 lb. linseed oil meal, and ½ lb. cottonseed meal per day.

The cow producing 50 lbs. milk per day is fed in addition to pasture 10½ lbs. corn and cob meal,

Table 1. Computed Value* of Kentucky Blue Grass Pasture Furnishing 80 Pounds of Green Grass Per Day for a Period of 150 Days**

	Cost of Feed for 150 Days		
	Pasture	Dry ration off pasture	Difference in favor of pasture
1,200-lb. cow, 20 lbs 3.5% milk per day....	....	$44.67	$44.67
1,200-lb. cow, 35 lbs. 3.5% milk per day....	$19.20	56.74	37.54
1,200-lb. cow, 50 lbs 3.5% milk per day....	33.84	71.12	37.28
Average	$17.68	$57.51	$39.83

* The sweet clover is not included in this or subsequent computations.

** The authors acknowledge the valuable assistance of Prof. S. I. Bechdel in the computations of dairy rations used.

Table 2. Computed Acre Value and Carrying Capacity of Kentucky Blue Grass Pastures in Relation to Fertilizer Treatment

Treatment Soil	Annual Cost Fertilizer and Lime Treatment	DeKalb Soil: Acres Required Per Cow	DeKalb Soil: Annual Acre Value	Volusia Soil: Acres Required Per Cow*	Volusia Soil: Annual Acre Value	Westmoreland Soil: Acres Required Per Cow*	Westmoreland Soil: Annual Acre Value
Untreated ..	....	...	....	40.67	$ .98	4.09	$9.73
Ca	$2.25	37.1	$1.08	2.54	15.68	1.83	21.76
CaP	4.04	1.72	23.15	1.96	20.32	1.24	32.12
CaPK	5.35	1.41	28.24	1.31	34.05	1.15	34.63
CaPKN	10.56	1.01	39.43	0.89	44.75	0.82	48.58
CaNP	8.52	1.43	27.85	0.99	40.23	1.01	39.43

* Average pf. three checks.

2 lbs. wheat bran, and 1 lb. gluten feed per day; dry ration (off pasture) 40 lbs. corn silage, 12 lbs. alfalfa hay, 6 lbs. corn and cob meal, 3 lbs. wheat bran, 2 lbs. gluten feed, 1 lb. cottonseed meal and 1 lb. linseed meal per day.

The cost of feed is based on Pennsylvania prices from January 1 to October 23, 1924. The prices per hundred weight are as follows: Cottonseed meal $2.77, linseed meal $2.38, gluten feed $2.30, wheat bran $1.73, corn and cob meal $1.60, alfalfa hay 90c, and corn silage 30c.

The figures in column 3 of table 1 should not be confused with acre value, but represent the value of an area capable of producing 12,000 lbs. of green grass throughout a period of 150 days. Table 2 shows the acre value and carrying capacity in relation to several fertilizer treatments. The carrying capacity is obtained by dividing 12,000 (pounds green grass necessary for summer maintenance per head) by the yield in pounds per acre of green grass. The acre value is obtained by dividing the acres required to supply 12,000 lbs. green grass into $39.83, which represents the average value of 12,000 lbs. green pasture grass as shown in table 1. The annual cost of fertilizer treatment shown in the second column is computed on the basis of Pennsylvania market prices for raw materials applied as home-mixed goods. Limestone is computed on the basis of one ton applied over a four-year period at a cost of $9. A detailed discussion of pasture fertilization, involving the use of home and factory mixed goods, will be given in the succeeding pages.

The relative value of mineral fertilizers on the three soils is clearly shown in the above table, both in relation to increased acre value of pasture and decreased acreage required to maintain a dairy animal. The addition of acid phosphate to the limed land increased the acre value of DeKalb soil $22.07, Volusia soil $4.64, and Westmoreland soil $10.36.

Potash applied to the land treated with limestone and acid phosphate increased the acre value on DeKalb soil $5.09, Volusia soil $13.73, and Westmoreland soil only $2.51. In like manner nitrate of soda applied to the land treated with limestone, acid phosphate and potash gave an increased acre value as follows: DeKalb soil $11.19, Volusia soil $10.70, and Westmoreland soil $13.95. The value of the re-inforced manure is on an average $8.42 below that of the complete fertilizer.

The use of a complete fertilizer on the limed land has increased the acre value on an average $31.41 as compared to $22.99 for manure. The acre value of summer pasture, where complete fertilizer was used, is $44.25 on an average of the three soils. This value may appear high due to the fact that our conception of the value of pasturage has been based on the present existing grazing land too often found on areas unsuited for the best development of economic grasses.

The relative value of the several soil treatments in the production of Kentucky blue grass may be emphasized by computing the acres required to maintain an average herd of 20 dairy cows for a period of 150 days. The following summary shows the reduction in acreage brought about by the several treatments shown in Table 2.

Computed Acres of Pasture Required for Maintenance of 20 Cows for 150 Days

Soil Treatment	DeKalb Soil	Volusia Soil	Westmoreland Soil
Ca	742.0	50.8	36.6
CaP	34.4	39.2	24.8
CaPK ...	28.2	26.2	23.0
CaPKN ..	20.2	17.8	16.4
CaMP ...	28.6	19.9	20.2

* * *

New "Prunes" for Peaches

(*From page* 13)

buds left got more water and plant food, and thus made a better growth. However, this heavy pruning tended to dwarf the tree and such heavily pruned trees were not capable of producing much more than one and one-half bushels per tree when in full bearing.

Orchard fertilizer experiments in the past few years have demonstrated clearly, that contrary to our former belief, nitrogen is a very desirable fertilizer to apply to peach trees. Many experiments show that yields have been increased two or three times by the use of nitrate of soda. The discovery that Paradichlorobenzene would thoroughly control borers was very valuable and important. It is not necessary now to cut or injure the tree with wire and knives in searching for borers. Neither are any of the borers missed when this material is applied about the tree trunks.

The growers have gradually come to realize that it is better to grow the kind of cover crop which will thrive under their conditions. As a result instead of attempting crimson clover in many orchards, a mixture of rye and vetch is used. By sowing this mixture during the middle of August, excellent cover crops are generally secured. This means that large amounts of organic matter can be plowed into the soil. As a result such soils absorb and hold moisture better and gradually become more fertile.

As a result of the change of fertilizer and cover crop practices, and the newer methods of borer control, it seems sensible to suppose that peach trees can be pruned lighter, thus making a bigger tree, capable of bearing much larger crops. Experiments carried on by the Department of Horticulture at the University of Maryland have shown that this is true.

Wheat Fertilizers for Sassafras Soils

(*From page* 8)

or potatoes may not respond as much to applications of potash as wheat that follows wheat, corn or soy beans.

Proper fertilizers do more than increase the yields, they increase the quality also. Quality is determined largely by the test weight per bushel, although other factors such as foreign material and moisture content enter into the final classification. The test weight on the unfertilized plot averaged 51.6 lbs. This would grade according to the U. S. grain standards No. 5 if it meets the other requirements of foreign material and moisture content. Nitrate of soda does not increase the grade any. Acid phosphate raises the test weight and makes it eligible for No. 4 grade. Muriate of potash raises the test weight and makes it eligible for No. 2 grade. Combinations of two or three fertilizer materials do not raise the test weights any higher. Some of them do, however, as aforesaid increase the yield. Manure makes the wheat eligible for No. 3 grade.

The grade of wheat produced has an influence upon the net returns. The same value was used in figuring net returns from all plots as given in table I, but there is usually a difference of about three cents per bushel between the grades, i. e., if No. 1 wheat is selling at \$1.28, No. 2 will probably be \$1.25, No. 3 \$1.22, No. 4 \$1.19, and No. 5 \$1.16. The range in the grades is from No. 5 on the unfertilized and nitrate of soda plots to No. 2 on the muriate of potash, acid phosphate-muriate of potash, and complete fertilizer plots. The difference in the price of grades No. 2 and 5 is nine cents. Muriate of potash alone makes this possible. However, the addition of acid phosphate and nitrate of soda increases the yields of the higher grade thereby making possible greater net returns.

Plate IV. Received 120 lbs. muriate of potash, 250 lbs. acid phosphate and 125 lbs. nitrate of soda. Average annual yield 28.9 bu. per acre for 15 years. Delaware Agricultural Experiment Station

Getting Educated on Quack Grass

(*From page 22*)

to his buckwheat money gave him a bank account of over $2,000, a very comfortable sum with which to begin his quest for an education.

"Son," said old Bill, as Billy was about to board the train which would convey him to the Agricultural College, "this is a proud moment for your old dad. You have earned your own money for a good start in college, and the best thing about it all is that you earned it by combining good horse sense and hard work. And not only have you earned this money for yourself, but in so doing you have left the old farm in better shape than it was when you started. You have made more than two stalks of alfalfa grow where one of quackgrass grew before, thereby outdoing that old proverb about the fellow who made two blades of grass grow where one grew before. When you get started in your college work you are pretty sure to run up against problems that look kind o' hopeless, like that field of quackgrass did two years ago. When these 'weedy fields' bob up in your college work you just go at 'em the way you did that 20 acres of quackgrass and you'll make the grade all right."

"All right Dad, I'll do my best. But I'll never forget that I could never have done anything without your help and sympathy, and that it was our success, not my success. Good bye, Dad! Will be back home for Christmas."

* * *

A New Raspberry

(*From page* 18)

Besides being suitable to sections where no other varieties will grow, the Van Fleet has many other desirable qualities. It is highly resistant to the diseases of raspberries which have largely prevented their culture in the South. It is characterized by its vigor, health, and productiveness of the bush, and its late ripening season. It is probably not suited for a general market berry, but is of considerable value for home use and local markets.

Its fruit is dull red in color, medium in size, and will not decay so quickly as the other sorts. It is very hardy and starts growth early in the spring. In 1923 canes of the Cuthbert variety were killed to the ground by hard freezes at the department station in Maryland, while those of the Van Fleet close by were uninjured and matured a full crop.

The new variety is a cross between the common red or Cuthbert raspberry and a wild raspberry imported by the department from Temperate Asia. Seed was first sent to the department in 1910 and planted at Chico, California. The late Dr. Walter Van Fleet, at that time superintendent of the United States Plant Introduction Garden at Chico, hybridized it, propagated it, and carried it along for many years in exhaustive tests before it was released to cooperators..

Thus, the Van Fleet raspberry is another of the many instances of the use of foreign wild plants in developing a wider range of plant and crop growth in this country.

Farmers of the Future

(From page 27)

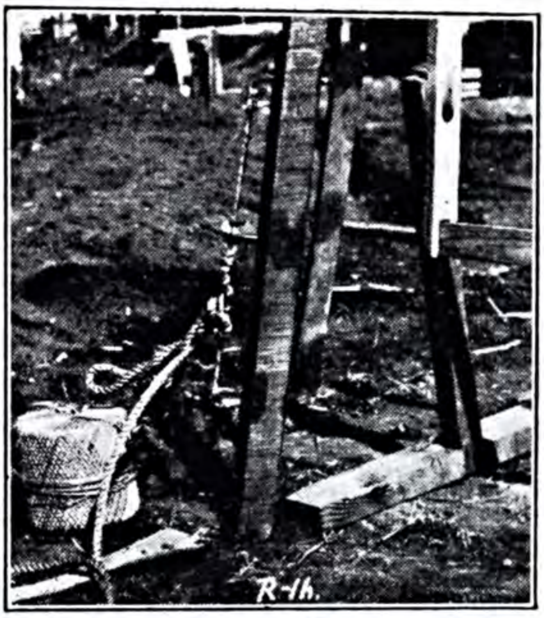
It is a significant fact that within a year after the signing of the Smith-Hughes Act, every state in the Union had signified its intention of taking advantage of it and had committees or legislation under way leading toward its adoption. This was not the case following the passage of the Morrill Act. Nearly the first 40 years after its passage was spent in establishing schools, gathering together faculties, finding out what to teach and how to teach it and in arranging courses of study. In about one-fifth of this time the secondary schools have gotten under way. They have well defined courses in the trades and industries, in fact many trades and industry schools were already established and had only to make such changes as were necessary to conform to the Smith-Hughes law. With agriculture however this was not the case. It was evident that there should be two divisions, one dealing with agricultural phases and the other with the mechanical phases of the farming business. In the smaller schools both of these units are handled by one teacher, but as the number of students increases, two or more teachers become necessary.

The agricultural courses were very naturally patterned after those given in the colleges of agriculture and four-year courses were outlined. It was found however that the high school student was different from the college student, he still had some English and mathematics to learn and had to have time in which to do it. He would not study at home and was not yet mentally developed to the point of being able to grasp some of the more difficult basic principles.

This of course necessitated a revision and simplifying of both the agricultural and mechanical courses and shortening of the courses so that now in many cases the courses have been cut down to two years. This readjustment has led to two different methods of teaching, one called the individual project method wherein each student takes up some problem such as growing an acre of corn, raising a litter of pigs, starting a poultry flock, caring for an orchard, or raising a pet lamb, the other is the class project method in which the whole class undertakes to work out a problem such as feeding a carload of cattle or sheep, spraying an orchard, dehorning cattle or docking lambs. Both methods are good and many times the one followed depends largely upon the teacher, the cooperation of the parents, and the general system of farming followed in the locality where the teaching is done.

What will be the result of this educational system? It is probably too soon to foretell. However one advantage stands out clearly. Out of every 100 students who enter school, statistics show that about 35 enter the high school where they may at least be exposed to this agricultural education. With many "it takes" as is shown by the fact that by far the larger number of Smith-Hughes students take up the work the second year that they are in high school. Also there will probably be at least one-fifth of our future population that will know more about agriculture than was possible prior to 1917.

One of the difficulties encountered—perhaps it is not a difficulty, but a good thing—is that the boys from the country, who have a good country life basis for an agricultural education, have had all



Machine for making rope from binding twine made by students

they want of the country and start in to educate themselves for some job in town. On the other hand the town boys long to get into the country and take agriculture so that they won't be "so green" when their longing is satisfied. Perhaps this is as it should be, these town lads will learn to take the advice of the county agent and the extension specialists and will make the better farmers.

But the question yet remains, where are our future farmers coming from? Are they going to be boys raised in town, who have taken agriculture in the high school and migrated to the farm, or are they going to be the more sensible country lads, who realize that having been raised on a farm, they know a whole lot about it and that by taking the agricultural course they can make farming a more enjoyable job than one that would bring in the same return in town.

One thing seems certain, our future farmer is going to be a better educated man, is going to know more about his business. The day is not far distant when the man who has failed at everything else will also have failed at farming.

Coming Through the Alfalfa

(From page 26)

many others I have known, one can pay eight per cent for lime or necessary fertilizers, and have quite a lot of money left after the increases due to treatment have been used to discharge the interest accrued. I doubt if many farmers can profitably use 8 per cent money on ordinary farm operations but on basic improvements, for those things that are necessary to make the land produce, they can.

Vagrant acres! This is one of the very malignant cancers on the body of profitable farming. Farmers do something that very few other property owners do—they pay taxes to the center of the road hence there are some unavoidably vagrant acres on every farm, since in most states the owner of livestock pasturing on his own road is liable if damage comes to an autoist who runs into the owner's cow while pasturing on her master's land. It's a funny world we live in at that.

When I looked this place over, I found that while the deed called for 122 acres, there were only about 100 acres that could be plowed before further laborious work was performed. Some well-meaning but poorly directed soul in the years gone by had planted rods and rods of osage orange hedge. As these had grown, rather than trim them the owner had just crowded back a little farther into the field. Had he lived on the farm 25 years longer, he would have been farming a little circular spot in the middle of a ten-acre plantation of osage orange. Besides these hedge rows, the farm was ridden by fence rows that

(Turn to page 60)

Selling Service with Fertilizer

By Weller Noble

Chairman, California Soil Improvement Committee

This is part of an address delivered before the California Fertilizer Association. It contains formulas for better business

THERE is no such thing as a perfect salesman—but everyone of you can strive towards perfection. In your efforts to accomplish this, there must be a service rendered. The first duty, although you perhaps do not all agree, in my opinion is to the customer. To properly serve the customer, a salesman's qualifications should include—

FIRST: A knowledge of fertilizers.

How many of you have really studied the subject? Do you know the elements that compose the average soil, namely nitrogen, phosphorous, potassium, calcium, magnesium, iron, alumina, carbon, sulphur and silica?

Do you know the approximate amounts of nitrogen, phosphoric acid, potash, lime and sulphur contained in the average soil and the amount of insoluble matter called silica, or sand?

Do you recognize promptly the various types of soil, ranging from sandy loams to adobe; and know the difference between nitrogen and ammonia, phosphoric acid and bone phosphate, or tri-calcium phosphate, muriate and sulphate of potash?

Do you know, in a general way, how nitrate of soda and blood are used in fertilizers, sulphate of ammonia, tankage, potash, nitrate of lime, ammo-phos, superphosphate, treble superphosphate, fish meal and other materials are manufactured?

Do you know the chemical formulas for lime and gypsum and the approximate reaction in the soil from their use, and the benefit, if any, to be obtained under certain conditions?

There is nothing secret about the fertilizer business. You can secure volumes in almost any library that will give you all of this data, and some relating to chemical formulas, soils, etc., and you need not be a chemist to read such works and benefit thereby.

Do you know how our fertilizers are prepared, and all the common questions that would be asked by a farmer relative to the various amounts of plant food in them?

You cannot gain the respect and confidence of your customer if you do not know your goods.

SECOND: Do you recognize the common scales and insect pests, such as black, red, purple, citricolo and San Jose scale, thrips, mealy bug, wooly aphis, leaf hopper, red spider, tuber moth, wire worm, cut worm, eel worm, silver mite, phylloxera, asparagus centipede, red humped caterpillar, and other common forms of pests? Also, in general, how they spread—and at least the usual methods of eradicating them?

Do you know the dosage used in fumigating different sized citrus trees? Do you know at least some of the arsenical, lime-sulphur, bordeaux, nicotine and oil sprays, their method of preparation and approximate value for different purposes?

Do you recognize readily the different forms of gummosis, chlorosis, curl leaf, brown rot, black measles, pear blight, California vine disease, die-back, sour sap, pea and tomato wilt, fusarium wilt and rhizoctonia, and other common diseases?

I am not endeavoring to give a full list, but to mention some of the more common diseases, scales and insect pests, readily found in almost every section in California.

Can you be of any assistance to the farmer in helping him through your authoritative knowledge of the subject?

I have known of salesmen endeavoring to sell fertilizer for the express purpose of setting a crop of oranges on trees so badly infested with black scale that most of the sap was absorbed by the scale, leaving an undernourished fruit bud and with a result, naturally, that practically all of the fruit dropped from the trees in June or July. Another instance, also, of where the soil was so badly impregnated with fusarium wilt that not one potato seed would sprout, whether fertilizer was applied or not. The inevitable result went further than an actual loss sustained by the farmer—the fertilizer industry received a black eye, not through the malicious act, perhaps, but most certainly through the woful ignorance of the salesmen.

THIRD: Do you have a fair knowledge of pruning orange and lemon trees? Of long and short pruning of deciduous trees? Of types of pruning used for berries and vines? Of proper thinning on sugar-beets, cotton and strawberries? Of best methods of propping trees? The best method of smudging and a fair knowledge of tree surgery?

Do you know the approximate amount of irrigation required to mature a crop, plus the season's rainfall? Is it not a fact that on most of our orange groves, the same amount of water has been applied year after year, irrespective of the season's rainfall, size of trees, or the amount of fruit maturing on the trees?

Do you work with the farmer along the lines of using more or less irrigation, dependent upon the season's rainfall or size of crop?

There is no question but that excessive amounts of water are applied in some sections in California, and there is a great deficiency in others.

Do you recognize hard-pan and plow-sole?

Do you carry a soil auger to show the depth of rainfall penetration and the need of early, midseason or late irrigation?

Do you know cultivation? Do you make a study of it by keeping up with what is being done elsewhere, or are you satisfied with what you find in your immediate district?

I venture to say that there would be a wide divergence of opinion relative to shallow and deep cultivation and sub soiling if each of you expressed his ideas on the subject today. Therefore, be fortified with all the authority obtainable when questions are asked by your prospective customer, so that at least he will understand that you have made a study of the subject.

I have heard of a salesman stating to a customer that his grove required deeper cultivation, but when asked for a recommendation as to depth, the salesman was entirely at sea. In fact, all he knew of deep cultivation was that he had heard some one state that all groves should be cultivated deeper.

In my opinion, it is the duty of every one of you to not only work on the sales end of your business, but to keep abreast of the times and to constantly add to your fund of knowledge through studying not only field conditions, but to keep up with all well-known authorities.

Summing up then, what I have just spoken on, I would say your obligation to the customer is to leave no stone unturned in your endeavor to see that he makes a profit by the purchase of your goods. To sell him fertilizer with the malicious attempt to defraud, or through ignorance of the business by which a loss is sustained, amounts to practically the same thing so far as your standing with the customer is concerned and its attendant effect upon the industry.

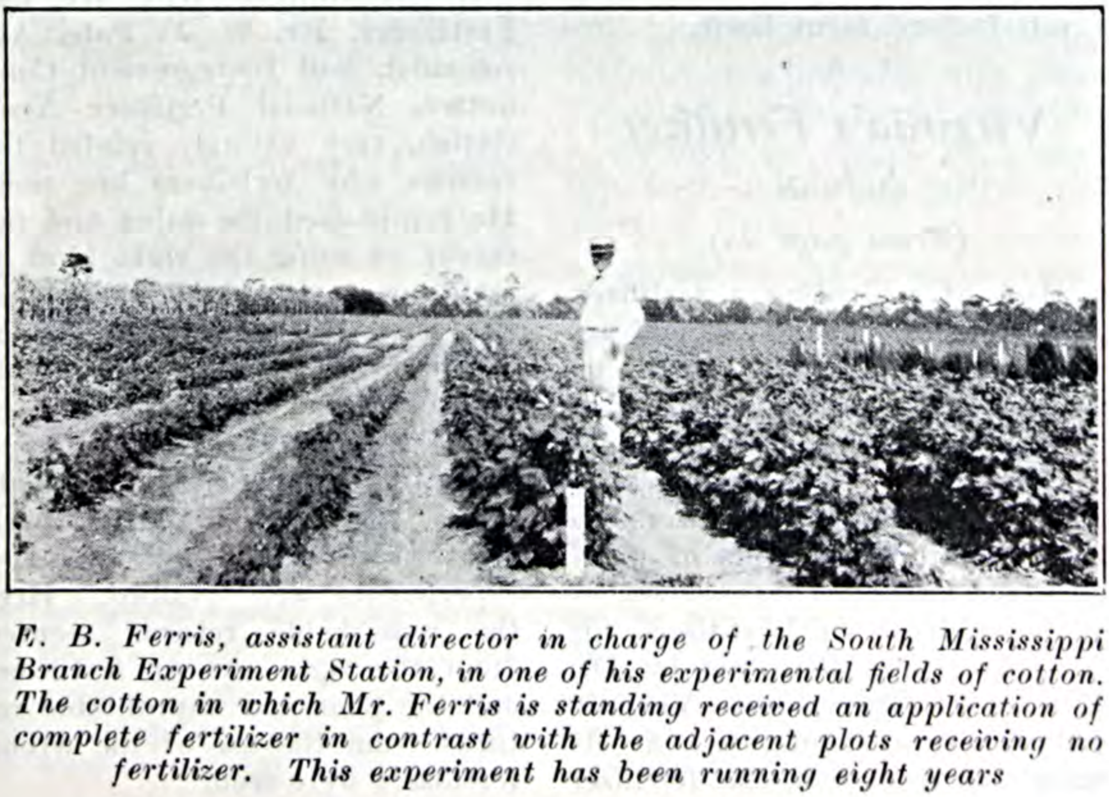
(To be continued)

* * *

Am. Soil Survey Ass'n

(From page 12)

of one sub-group of group 1. They are characterized by at least three divisions of the profile, irrespective of their parent geologic formation. They are A, B and C. The outstanding or striking characteristics are—a layer of forest litter, a thin coating of humified soil which breaks very sharply into a gray horizon, below which lies a brown and somewhat heavier horizon and frequently loosely cemented together, especially in the sandy types. Below this brown horizon lies the parent material. In this northern province, of course, exist many soil types differing greatly in detail. One of the most important distinctions that can be made is between calcareous and non-calcareous soil and parent material.



E. B. Ferris, assistant director in charge of the South Mississippi Branch Experiment Station, in one of his experimental fields of cotton. The cotton in which Mr. Ferris is standing received an application of complete fertilizer in contrast with the adjacent plots receiving no fertilizer. This experiment has been running eight years

Coming Through the Alfalfa

(From page 56)

had been widened a bit each year until each one had appropriated a strip of considerable width.

It took plenty of elbow grease and some patience. While I was grubbing the osage hedge out, I seriously threatened to borrow a coat of armor from the town museum. The osage out, we had increased the tillable area of the farm by six acres. These acres produced the best crops we had and the added crop will just about pay the expense of grubbing the trees out.

We have just got our furnace in, we have a semblance of a water supply, new wall paper, paint and varnish have told their story and we have what will in a few years be a beautiful planting of ornamental shrubs around the house—and 60 acres of good alfalfa. Limestone, fertilizers, good seed, efficient livestock—blended with judgment, this recipe will put any farm, run-down or run out, where it can help the owner to develop a satisfactory farm home.

* * *

Virginia's Fertilizer School

(From page 25)

method of evaluating a fertilizer, both from the commercial and agricultural standpoints, based on the chemical analysis. The title of this paper was the Evaluation of a Fertilizer. The comparative value of different fertilizers as based upon the elements of plant nutrients contained was shown.

The address on Fertilizers for Virginia Crops, delivered by Dr. T. K. Wolfe, Agronomist, Virginia Polytechnic Institute, had as its basis the results of the fertilizer experiments conducted in Virginia and their application to farming conditions. The needs of the different soils and crops of Virginia so far as fertilizers were concerned were indicated. It was shown that all soils of Virginia need phosphorous for all crops, the heavy soils which have not been properly handled and the sandy soils need nitrogen and potassium in addition to phosphorous for the ordinary crops. In case of special crops such as tobacco and potatoes, even when grown on the heavy soils, a complete fertilizer is needed. The relation between soil type and the type of agriculture was indicated by means of a map of the State.

Professor George W. Patteson, Jr., Extension Agronomist, Virginia Polytechnic Institute, indicated the latest findings in reference to the fertilization of pastures and meadows in his address on Value of Fertilizers for Hay and Pasture Crops. He briefly outlined the characteristic needs of the hay and pasture plants in reference to soil, fertilizer and lime requirements.

In his address, Why We Use Fertilizers, Mr. W. F. Pate, Agronomist, Soil Improvement Committee, National Fertilizer Association, very fittingly related the reasons why fertilizers are used. He emphasized the value and necessity of using the right kind of fertilizers in the right amounts as the chief reason for the use of fertilizers was to secure profitable increases in yield.

The school was concluded by a visit to the experimental plats where the soil fertility experiments with wheat and lysimeter experiments were studied. Here the remarkable returns secured from the right use of fertilizers and the poor and unprofitable returns from the use of the wrong fertilizers were seen.

Change

(*From page 4*)

lesson. With the coming of radio for the home the market for batteries was tripled and quadrupled. Factories multiplied in every town, village and hamlet. Smokestacks belched flame far into the night. Haggard workers on overtime plugged along at their machines, exchanging needed hours of rest for the opportunity to swell their purses on time-and-a-half.

Then into their midst, like a Gargantuan monster, strode the battery-less radio. With a shriek of dismay, men making batteries rushed to cover, making hurried plans as they fled!

How can we have sympathy for men who rest their all on such scanty assurance as the fact that what is wanted today will be wanted tomorrow? Cannot these men read, think, hear? Are they unable to interpret past history in terms of the future?

OFTEN, we find that one industry warms in its bosom the child that will soon grow up only to slay its foster-parent.

Even now we have before us an example that is worthy of study, not for itself alone but because it points out a principle in this vast subject of change.

Last night I witnessed a demonstration of the new "talking films," the invention of Dr. Lee deForrest. On the silver screen before me was re-enacted a vaudeville skit with perfectly synchronized voices and movement. All that was lacking to make the reproduction perfect was the color of the original and a stereoscopic effect to add the planes which my eyes see but which the single plane of the silver sheet so far makes impossible. The demonstration took place on the moving picture screen of a vaudeville theatre, one of a new chain of forty just being erected by a group of financiers.

Had I been one of these financiers I should have gone home from that demonstration in sober thought—in fact, in fear and trembling for the future safety of my investment! Certainly, I should not have had the temerity to throw on the screen this: "If you like the Phono-films and would like to see and hear more of them in this theatre, let us know by your applause."

Naturally, hearing the enthusiastic, violent wave of applause that swept over the audience, I should first have been delighted that something new was in my hands to please my present audiences. But I fear that back in my mind would persistently have appeared the picture of where that audience of mine would be five or ten years from now! And that picture might clearly show the audience in their own homes—seated comfortably around a machine on the tiny screen of which was being thrown, by radio, a series of vaudeville acts, with sound and voice perfectly synchronized, with color realistically reproduced and with a stereoptican reality of planes that fairly put the original in the home—in motion!

Impossible? Does anyone have the temerity to say that such a development is impossible, after studying the past history of the progress of other inventions in the world?

Very well, then, I shall let you in on a secret! *Radio movies for the home, with sounds synchronized on the film are already a reality!* The man who says a thing cannot be done is always interrupted by someone who has already done it. Threatening the very soul of all film-theatres and vaudeville houses, this invention gives in the home what formerly was possible only in the theatres.

From the time when David built the first tabernacle men have congregated together to hear a speaker, to witness a demonstration, to be amused or be educated. This congregating was necessary. How else could the speaker get his message over to a great group of people? But with the coming of the radio millions of folks in their own homes listen in comfort to a voice thousands of miles away. No longer is the congregating place necessary, as pastors who broadcast their sermons will tell you sadly.

Two hundred and fifty men board the Twentieth Century Limited at New York City each day—bound for Chicago. Each pays about fifty-five dollars for the privilege of being transported a thousand miles in twenty hours. They congregate on the same train because only in this way can they go that distance in such a short time for so little money.

But let a simple air-device, plane, cycle or other invention be perfected which will take a man, individually, to Chicago for about the same cost in about the same time—and watch the railroad travel drop.

Men and women attend the theatre today, paying five dollars for a seat to see a play. Why? Because only by presenting the plan before hundreds of witnesses, each theatre-goer thus paying his small, fractional share of the night's expenses, can the producers afford to invest the necessary money in salaries, scenery and rent. But let a device be perfected, which carries that play *to the home* for about the same price, and watch theatre patronage drop.

Men do not congregate together merely to enjoy each other's company. Parties of two in a theatre rarely speak to adjoining parties of four. Each party goes, sits, enjoys the spectacle, and returns.

So, we may soon witness a change—the bringing into the home of the amusement, replacing the sallying forth of the home-lovers to the places where now amusement is afforded.

"THE great world spins forever down the ringing grooves of change," said Tennyson, and Ovid, strumming a similar lyre, chanted, "There is nothing in the world that remains unchanged; all things are in perpetual flux, and every shadow is seen to move." But Byron pictures in a few short lines the saddest part of change—its effect on the fortunes of men:

"Ships, wealth, general confidence—
All were his;
He counted them at break of day,
And when the sun was set! Where were they?"

We do not object to change, if that change represents an improvement in our mode of living, if it broadens our outlook, helps pack into our short life a few more of the things for which we long. But when these changes affect us and our work, our livelihood, then we struggle and squirm.

None of us are immune to the effects which quick-coming changes make on the world of men. Some of these changes hit us unawares —we are unready for them, did not know they were coming. Others slowly undermine the solid terrain upon which we stand until suddenly we stand looking down into a chasm, fearfully.

The question for each of us to study is this: What changes could come in the near future which might affect materially my living, my work, my family?

Printing ink makers go along serenely, making ink, making money, making plans for the future, seemingly unaware that in a little laboratory a group of men are developing a method which eliminates the use of ink on the printing press by electrically carbonizing the paper pulp where the type hits it!

If they hear of the invention they laugh. And in just the same way carriage makers laughed at the first horseless carriage

Gasoline makers extend their filling station chains serenely, developing oil wells and increasing the size of distilleries seemingly unaware that many men are working on the problem of replacing gasoline with alcohol. If the gasoline men think of this counter-movement or development in fuel they merely smile condescendingly, much as the suspender manufacturers smiled when told that belts would some day gain almost complete domination over galluses.

Automobile manufacturers proceed hastily to spread their giant plants to still greater proportions while a twenty-eight-year-old, financed by men of vision, demonstrates a model *electric* automobile with only fifty moving parts which gets its power through radio waves from a central station!

That anything could come of this invention seems beyond the realms of probability to these super-wise auto-makers, and they give the lad the same merry haw-haw that they, themselves, received when they first stuttered down the pike in the coughing Twin One of 1900!

Barbers, eight years ago, left their trade to take up other work, claiming that there was no money in it—other labor paid higher returns per hour. Now they wish they were back, for the coming of bobbed hair has cut the barbers' unproductive time in the average shop from 60 per cent to only 15 per cent, and barbers are making big money.

Grocers, watching the advent of the chain store, felt secure because of their personal hold on their trade. They overlooked the fact that huge buying power with its consequent reduction in prices over-the-counter more than offset any desire on the part of women to trade with men they knew.

Publishers, spending ninety cents out of every subscription dollar for sales cost, laughed with ill-concealed amusement at the first man to give his publication away; but when thirty, forty and fifty such magazines began to make sweeping headway against old traditions their laughter gave way to sober reflection.

Fertilizer manufacturers continue to make up their formulae of plant food based on certain well-established combinations of nitrate, potassium and phosphorus. Is there no possibility of discovering any additional incentives to plant growth?

CHANGES wrought by the advent of new inventions constitute only a portion of the total changes which the world sees. Men's minds change, habits alter and national consciousness veers with the coming of new generations.

To be able to study out in advance just what changes are next due to visit us is impossible. I admit it. But the proposition I leave is this:

Nothing is permanent. Do not expect solidity. Be prepared for abrupt altering of your life affairs. Get ready for the New. Keep your mind open. Do not laugh at small beginnings. Study the Past. Selah!

TRY THIS

Motor Cop (after hard chase): "Why didn't you stop when I shouted back there?"

Driver (with only five dollars, but presence of mind): "I thought you just said, 'Good morning, Senator'."

Cop: "Well, you see, Senator, I wanted to warn you about driving fast through the next township."—Middleburg Blue Baboon.

* * *

A woman's secret society has been formed in America, reports a London paper. It sounds impossible over here.—*Central European Observer.*

* * *

Motorists, riding near a farm orchard, stopped the car, got out, climbed the fence, and gathered a bag of apples.

To complete the "joke" they slowed down as they went by the farmhouse, and called out to the owner: "We helped ourselves to your apples. Thought we'd tell you."

"Oh, that's all right," the farmer called back. "I helped myself to your tools while you were in the orchard."—*DeLaval Monthly.*

* * *

Dan Smith says it's a good thing hens don't know what masons get for laying bricks.

NOT THAT KIND OF CHICKEN

"I suppose," queried the finicky city board, "that you hatch all these chickens yourself?"

"Nope," retorted Farmer Penfield, "we keep hens to look after them details."—*Legion Weekly.*

* * *

"And this, darling, is a stork."

"Don't be silly, mother. Don't you suppose I know there isn't any such thing?"—Prairie Farmer.

* * *

A MYSTERY TO HER

Fussy old gent (reaching for wallet): "How do you sell them red flannels, miss?"

Saleslady: "You got me, mister, I don't understand how we do it either."—Farm Life.

* * *

Fair Motorist—Really, I didn't hit you intentionally.

Irate Victim—What have you got that bumper on your car for if you aren't aiming to hit some one?"—*Pennsylvania Farmer.*

* * *

Customer: "Are you sure this suit won't shrink if it gets wet?"

Mr. Epstein: "Mine frendt, effery fire company in dis city has squirted vater on dot suit."

* * *

The human machine is the only one that comes without a book of directions.

BETTER CROPS

The Pocket Book

TABLE OF CONTENTS

MARCH, [illegible]

APRIL, [illegible]

MAY, [illegible]

BETTER
The Pocket Boo

TABLE OF CONTENTS

MARCH, 1926

APRIL, 1926

MAY, 1926

CROPS

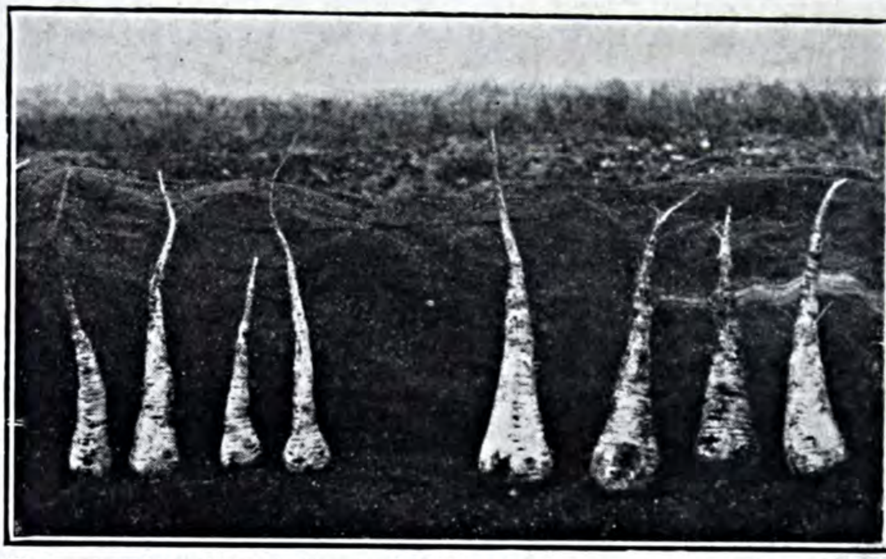
f Agriculture

Iarch 1926 to August 1926

JUNE, 1926

JULY, 1926

AUGUST, 1926



These parsnips were grown on 2 plots of muck soil just being brought under cultivation. Those on the left are from plot where no fertilizer was used and yield was 411 bus. per acre. Those on right are from plot where 200 lbs. of sulfate of potash was applied and yield was 483 bus. per acre.

If your name were stamped on every piece of produce you sell —

would you be proud or ashamed? **Are your crops of the quality that brings good prices and repeat orders . . . or must they be sold wherever possible for whatever you can get?**

Quality is not a matter of luck. Every season brings fresh proof of the great benefit in both yield and quality that results from proper fertilization. The table at the right shows how the sugar content of certain crops grown on muck soil was affected by different fertilizer treatment. The percentage of sugar in these crops is a good index of their quality. Note the improvement where potash was applied.

There are many other proofs of how greatly you can control the quality of your crops by following a sound plan of soil management adapted to your special soil and crop needs. Consult your county agent or state experiment station and follow their advice.

Effect of fertilization on yield and quality of certain root crops on muck soil (Michigan Agricultural Experiment Station.)

Fertilizer Application	Table Beets Av. 3 yrs.	Table Carrots Av. 3 yrs.	Parsnips 1924 1 year	Onions—1924 1 year	
	% Sugar	% Sugar	% Sugar	% Immature Onions	% Sugar immature Onions
No Fertilizer	4.2	2.2	9.2	42.1	0.8
Phosphoric Acid	4.5	2.3	9.0	8.5	1.2
Potash	6.9	3.1	6.7	9.3	1.2
Phosphoric Acid and Potash	6.2	3.2	8.0	3.4	1.0
Complete Fertilizer	6.3	—	7.6	1.4	1.2

POTASH IMPORTING CORP. OF AMERICA
10 Bridge St., Dept. BC, New York
Atlanta San Jose, Calif. Baltimore
Sales Agents—H. J. Baker & Bro., 81 Fulton St., New York.
West of Rockies—Meyer, Wilson & Company, San Francisco Calif.

Genuine German
POTASH

PICA BRAND POTASH PAYS