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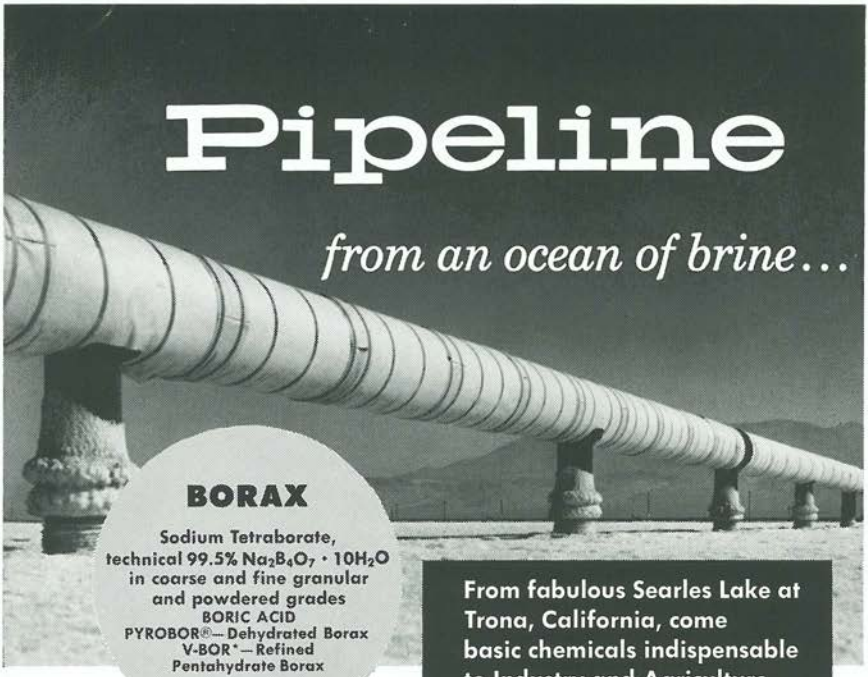

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The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Editor*

Editorial Office: 1102 16th Street, N. W., Washington 6, D. C.

VOLUME XXXIX NO. 7

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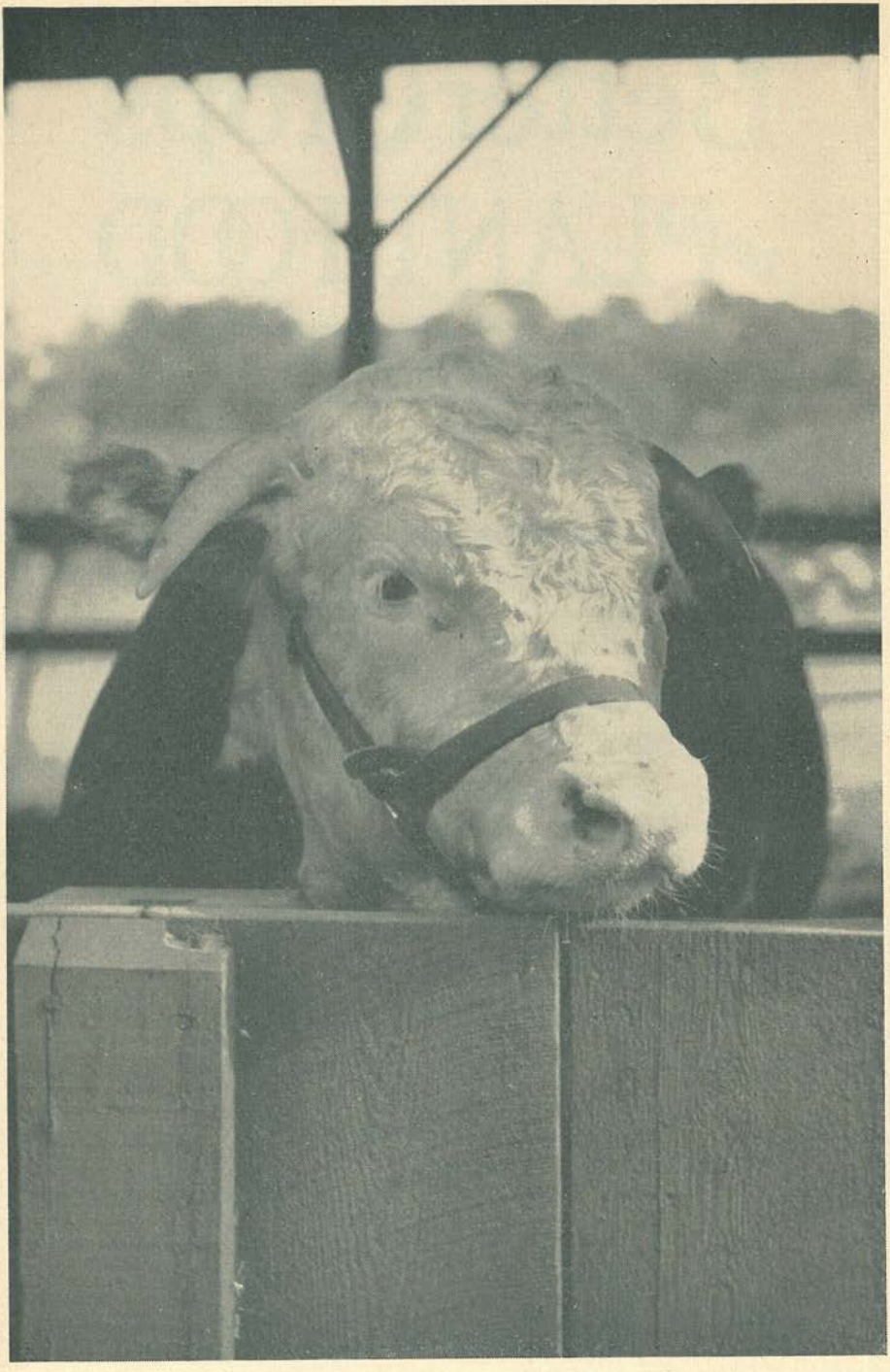

Waiting for the Blue Ribbon

Better Crops with PLANT FOOD

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As It Once Was . . .

On the Milk Route

Jeff McDermid

(Elwood R. McIntyre)

BACK in 1880, an adventurous country-minded city man named Woodbury, resident of Massachusetts, decided he had worked too long in the cramped confines of a city. So after much to-do and maneuvering, he finally found himself a farm worth a few thousand dollars and moved out there for keeps. He tried a side line, too, which he thought would give steady work to his elder son and bring in some extra income sorely needed to properly extend and maintain his new enterprise. This consisted of a milk route, including a one-eyed mare, a new wagon, an old sleigh, harness, ice chest and tongs, and 65 milk cans—plus such accumulated good will as the taciturn New Englanders would vouchsafe.

"It's yours for a mere song," declared the Man from Lowell who unloaded the lactic task on Mr. Woodbury. "His song pleased me and I went with him to find out more about it, as George (the son) said he would like to drive the milk route if I would buy it," thought he. He had agreed to take the farm for three years—instead of an outright purchase—with 10 of the cows and enough hay to last until fresh grass.

At the time, customers paid nine cents a quart in Boston for fluid milk delivered. So Woodbury went up to ride the rounds and check the venture. It was a cloudy day and chilly. "I shivered some and had misgivings, because at each stop it seemed the man was gone too long. The customers were scattered widely, but the man ex-

plained that it was an advantage to have them that way, as it provided more chances to get new ones. However, that fact made it all the colder for me."

He observed that the Irish citizens used much more milk than did the Americans. The man told Woodbury that it was an advantage to have so many Irish customers because they always bought lots of cabbage in the fall.

"I was disappointed to find so many wholesale customers," said Woodbury, "because they did not pay as much by two cents a quart as the retail customers. I figured from this that the man was really selling all his milk for an average of six cents. He supplied the boardinghouses for seven cents a quart. This made me think I had better change my figures to find profit in my estimates."

WOODBURY got a slight shock when they reached the tag-end of the route. Here he found the "churners" located. After the route was supplied they took whatever milk was left and churned it into butter. "What they did with the butter I don't know, because most of them lived in basements where I would seldom think of going to buy butter."

These churners paid three to four cents a quart for the milk that was left. "It really was pretty well churned before they got it," interpolates Woodbury, who knew from experience how rough the ride could be. Deciding despite this to buy the route himself, as he hoped in time to produce all the milk on the farm and supply only the very best article, Woodbury thought of something else.

"Do folks ever water their milk, or how do they fix it?" The seller of the route declared he never, never, never did anything of that kind himself but he related a couple of ways by which, when milk was short, some unscrupulous venders eked out their volume. Woodbury resolved to forget such practices, cheap as the ingredients were. "Pure water and pure milk shall always be my formula," was the laconic resolve. In those far-off placid days no stern and scientific inspectors opened his cans to take samples for dirt and butterfat. So it was strictly up to the honor of the distributor.

After signing the farm lease and buying the milk route, Woodbury went up into New Hampshire to buy eight cows. Then he owned a total of 18 head. He hired a man in Lowell and bought a rubber outfit of clothing for George to wear on wet days. He cautioned George in an honorable way to be very careful not to let any of the rain water get into the milk cans. "This must be avoided as much as possible lest we give cause for suspicion of watering," George was advised.

GEORGE liked the new assignment, but he had it in for the mare and wanted his Father to get another horse. This mare seemed to have a mind of her own. Her tail was bobbed and she was blind in one eye. When she got going nicely she would suddenly stop in her tracks as if something important which she must reflect upon had struck her. "No persuasion would induce her to move again until her reflections were concluded. She would stand there in a silent meditative mood, quite oblivious to every means of urging her forward. Then suddenly she would start in a way to make all the cans rattle and jump, and go off full speed as though she was conscious she had lost precious time that must be made up," explains Woodbury.

This mare knew every customer and where to stop every time. Sometimes when she thought she had waited long enough she would trot along to the next customer, leaving George to run after her. In spite of George's dislike of the critter, Woodbury decided she was such an old hand at milk vending he should retain her as part of the supposed good will.

The total outlay necessary for Woodbury to begin his enterprise was $1,200, including the route, the cows, and one horse. He had saved the capital orig-

inally intended for a farm purchase so he was able to pay his way for awhile.

He and his boys were fairly good milkers, but they got tuckered the first night milking 18 cows. It took them about an hour and it meant early rising. They had a cooler with strainer cloths fastened over the top of it, into which milk was poured. From thence it was drawn by faucets into the cans. "My cows then were giving about 120 quarts a day, or perhaps 7 quarts apiece. Every alternate day George went up the river and got about 80 quarts more for our customers," it is stated.

ONE important factor in the milk business puzzled Woodbury. He needed instruction in the art of feeding a dairy herd. "I had often read of cows being managed as machines, but hitherto I had allowed my cows to run their own machinery," was his thought. The seller of the route and the farmer from whom the place was leased tried to explain their own feeding systems.

"They recommended giving cut hay twice a day—cut and moistened with water and a quantity of shorts and oil-meal mixed with it some hours before milking." Hence we see the cut-and-carry idea of feeding forage is not a new thing, with all the 1955 farm journals stressing its advantages. They were told to feed one peck of shorts (middlings) and one quart of oil meal to each cow daily. They were warned that too much oil meal would produce garget and caking of the udder, resulting in loss instead of gain.

But Woodbury was so charmed by the rich yellow carotene in his milk which he presumed came from oil meal, he ventured to use it more freely. Customers were delighted with the richness of the product and they got extra trade. But Woodbury found he was running the machines too high. "Several of them began to have caked udders, hot and inflamed, and two of them were never gotten back into good condition again, although I rubbed on arnica and tried all other remedies I could think of. This was my first farming lesson and it proved a dear one."

A FEW weeks later the man who sold them the farm said he wanted to spend his vacation with friends on the Merrimac river and asked Woodbury to board his young colt in the interval. But they did not reckon on George. He surprised his folks by hitching up the colt to the milk wagon, and the rattling cans made so much racket that the shouts of his parents were unheard as he drove off with the frisky animal.

The colt was off and away before George was firmly seated. His first spring set the cans agoing. The louder the cans banged the faster went the colt and George was powerless to stop him. He arrived at the conclusion it would cost less in the long run to have a quick smashup right near home.

Let Woodbury resume: "So he aimed the colt for a schoolhouse by the roadside not far off. But a maple tree about six inches through came first and one of the front wheels struck that hard. With the collision George lit on his feet in the road, safe enough; but the wagon-top went end over end until it landed bottom up in a big ditch. The cans distributed themselves joyously in all directions and the colt went clear of the wagon and fell down, to the detriment of his glossy hide and my friend's new harness."

Woodbury told his wife that the lesson would be a valuable one for George, but she was so thankful of the

(*Turn to page* 42)

Residual Fertility Insures Alfalfa after Drouth

By P. E. Johnson[1]

Department of Agronomy, University of Illinois, Newton, Illinois

THE "insurance" value of residual fertility for quickly establishing summer-seeded alfalfa was demonstrated again in 1954 on soil experiment fields in drouth areas of southern Illinois. The first three months' growth of tops and roots of summer-seeded alfalfa reflected residual benefits of limestone, phosphates, and potash which had been applied previously in soil build-up and maintenance programs. By the spring of 1955, differences were still more striking among plots with different treatment combinations.

Spring seedings of legumes and grasses in wheat generally have been very successful on properly limed and fertilized soils in this area; however, practically all conventional spring seedings failed in 1954. The legume seed germinated slowly during the dry spring months and later the stand was killed by extreme drouth and heavy wheat growth. The mild winter and spring produced some of the highest small grain yields in the history of the area to the detriment of the legume stands.

Re-establish Rotation

Because spring-seeded legumes were lost on several experimental fields in 1954, it became imperative to summer-seed alfalfa, to maintain the regular rotation of corn, soybeans, wheat, and legume hays. This is a typical rotation for the area. Corn follows legume hays and depends on stand-over legumes to improve soil structure and tilth as well as supply some nitrogen for 100-bushel corn yields which are possible when minerals and water are in ample supply.

To prepare for summer-seeding of alfalfa on experimental plots, the wheat stubble was plowed or disced immediately following the combine. Volunteer wheat was allowed to germinate. Then in late July a firm seedbed for alfalfa was prepared by further discing and rolling. Near August 1, alfalfa was seeded at the rate of 14 pounds per acre, in a very dry, powdery soil. Light rains followed, and vigorous green seedlings began to appear on certain plots. Soon an interesting pattern was noted on the Brownstown Soil Experiment Field, due to varying vigor of seedlings on differently treated plots. (See Fig. 1)

Thus with no additional treatments, we were able to re-establish alfalfa quickly on certain plots and continue the rotation.

Need All Three

Limestone, phosphates, and potash are needed to produce top yields on these gray and yellowish gray silt loam soils, according to long-time experiments. See data in Tables I and II. These soils over tight clay subsoils might be termed multiple-deficiency soils. The absence or presence of any one of the above minerals also resulted in marked effects on survival and/or growth of alfalfa seedlings on Brownstown and West Salem Soil Experiment Fields, as illustrated in Figs. 1 to 4.

Limestone was of most importance

[1] Photos by H. L. Garrard.

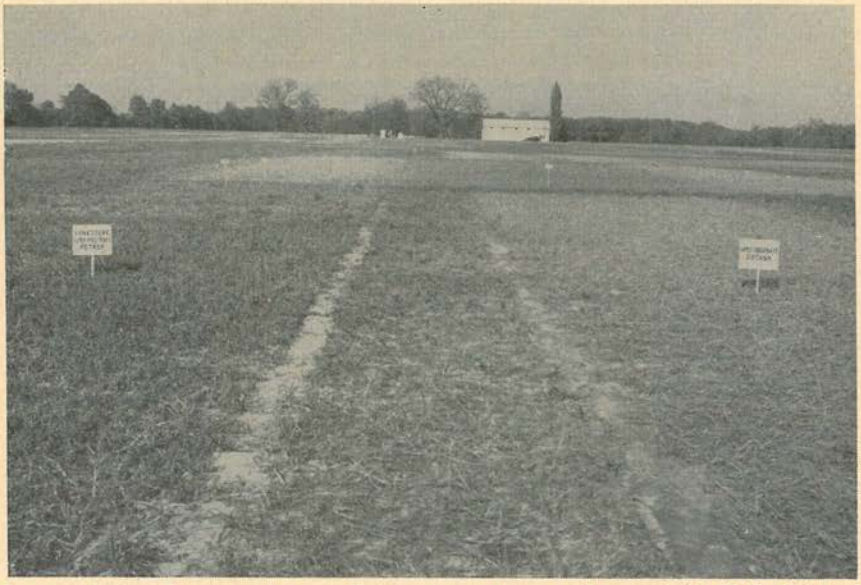


Fig. 1. Limestone made the difference between a green carpet of 3-month-old alfalfa, left, and grassy weeds, right. Variable growth pattern in background due to different treatments. Brownstown Soil Experiment Field, Brownstown, Ill., Nov. 15, 1954.

on seedling survival in the first few months. Alfalfa grew vigorously from time of emergence on limed plots with minerals. On unlimed plots with pH of 4.3 to 4.8, the alfalfa germinated, but most seedlings soon died, and the unlimed plots were mostly bare of legume growth by November. (Figs. 1, 2, 3). Surviving alfalfa on unlimed plots had very little top growth and also small roots. Very few alfalfa plants ever survive the first winter on unlimed plots.

Phosphorus and potassium in addition to limestone (LPK) gave the best top and root growth. Leaving out either phosphorus (L-K) or potassium (LP-) retarded the fall growth. (Figs. 2 and 3). Potash seemed relatively more important than phosphates in seedling growth, especially at West Salem.

On unlimed plots at Brownstown, additions of phosphorus alone (-P-) or phosphorus and potassium (-PK) gave little benefit on alfalfa survival, but did promote more growth of grassy weeds. (Figs. 1 and 2). Most of the material shown from the -PK plot at Browns-

TABLE I.—AVERAGE WHEAT AND HAY YIELDS ON KEY PLOTS, BROWNSTOWN SOIL EXPERIMENT FIELD, BROWNSTOWN, ILL.

Treatments** (Started 1940)	Wheat yields 3-yr. av., 1951–53 Bu.	Mixed hay yields* 4-yr. av., 1950–53 Tons
O	2	.2
LPK	24	2.0
−PK	8	.4
L−K	23	1.4
LP−	17	1.5
L− −	12	1.1
−N− −	3	.5
− −P−	8	.4
− − −K	2	.2
LNPK	32	2.1
−NPK	14	.7
L−PK	24	2.0
LN−K	17	1.2
LNP−	22	1.8

* Only one hay crop removed.
** Treatments: L=4 T. limestone initial, plus 2 T. every 8 years.
N=20 or 40 lbs. N on wheat; 40 or 80 lbs. N on corn.
P=200 lbs. 0-20-0 drilled with wheat; same ahead of corn.
K=Averaging 50 or 25 lbs. K_2O per year, half each ahead of corn and wheat.

town, (Fig. 2) are residues of grassy weeds which had been killed by recent freezes. Few weeds grew and no legumes survived on unlimed plots with potash but without phosphates (–K).

Yield Comparisons

Table I gives average wheat and hay yields from Brownstown plots similar to the six illustrated in Fig. 2. Only one hay crop of spring-seeded mixed legumes and grasses is removed. Clover seed ordinarily is combined from the second growth. Note great variability of yields according to treatment combinations.

However, total hay yields do not tell the whole story on benefits from treatments. Plots with largest yields also usually have the greatest proportion of legumes in the hay. Unlimed plots have very few legumes to survive. Plots low in potash or phosphates may have less legumes and more timothy. So the actual value of hay per acre cannot be told by tons alone, because the quality and proteins per acre also varied due to soil treatments.

In Table II are given wheat and hay yields from five West Salem plots from which alfalfa samples were taken, as shown in Fig. 3.

Dense Grain Injures Clover

As indicated earlier, 1954 wheat yields were far above the previous 4-year average. For instance, the top wheat yield in 1954 on the LNPK plot at Brownstown was 50 bushels, as compared to a 32-bushel average for the three previous years. But conditions which favored wheat in 1954 were fatal to most spring clover seedings—the basis of this story.

It might be a good policy to rely on more summer-seeded alfalfa where rank growth of small grains is expected, which may injure interplantings of spring-seeded legumes and grasses. Where native fertility is high, or where

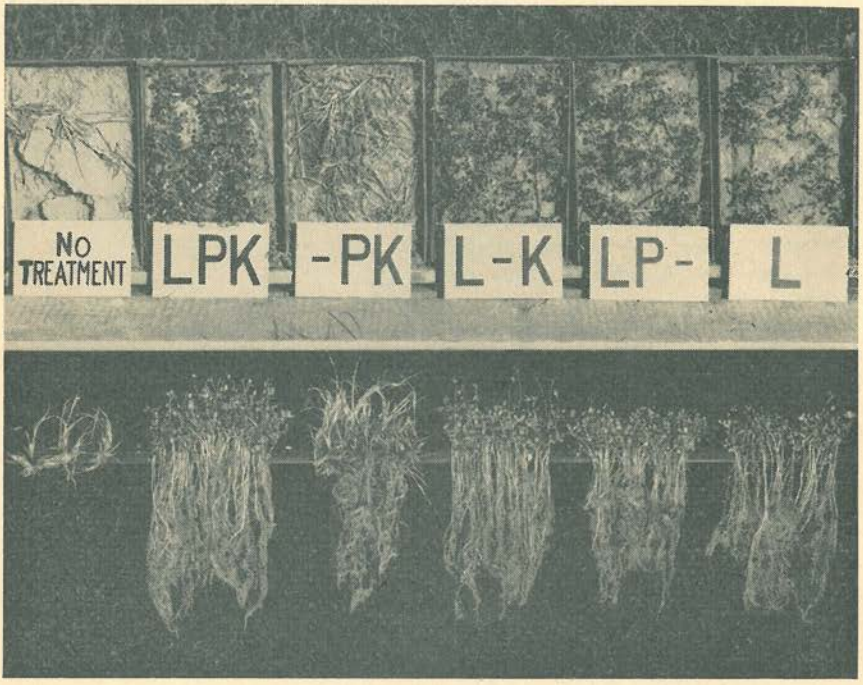


Fig. 2. Top: Excavated alfalfa samples in metal frames before washing, illustrating typical growth. Bottom: After washing away soil, showing 3-month root and top growth. Brownstown Soil Experiment Field, Brownstown, Ill., Nov. 15, 1954.

TABLE II.—AVERAGE WHEAT AND HAY YIELDS ON KEY PLOTS AT WEST SALEM SOIL EXPERIMENT FIELD, WEST SALEM, ILL.

Treatments** (Started 1912)	Wheat yields 4-yr. av., 1948–51 Bu.	Mixed hay yields* 4-yr. av., 1948–51 Tons
O	3	.1
LPK	26	2.4
L–K	18	1.3
LP–	17	1.4
L– –	12	.8

* Only one hay crop removed.
** Treatments: L=Limed about every 8 years to maintain pH of 6.5 or below.
P=Rock phosphate, residual, averaging 221 lbs. annually since 1912.
K=Averaging 50 lbs. K_2O annually, with 100 lbs. ahead of corn and wheat.

heavy fertilization including nitrogen is used to assure top grain yields, then summer-seeded alfalfa might be used. This would involve one more fitting of the seedbed for alfalfa, but would require no more seed or fertilizers.

Root Study Methods

Root growth studies of alfalfa were made in November after heavy frosts, and again in April. Typical sections of plots were excavated by using metal frames, such as shown in Figs. 2 to 4. For those interested in techniques of such root studies, equipment and procedures are about as follows. The 18-gauge metal frames, 12 inches long, 8 inches wide and 9 inches deep, are forced into the soil over the plants by the aid of a platform on which two men can stand. Under drouthy conditions, a sledge may be needed to drive the frame into the last few inches of unplowed soil.

The frame can be pried up easily after a small section of soil is dug away from one end. Thus, it is possible to bring out a block of virtually undis-

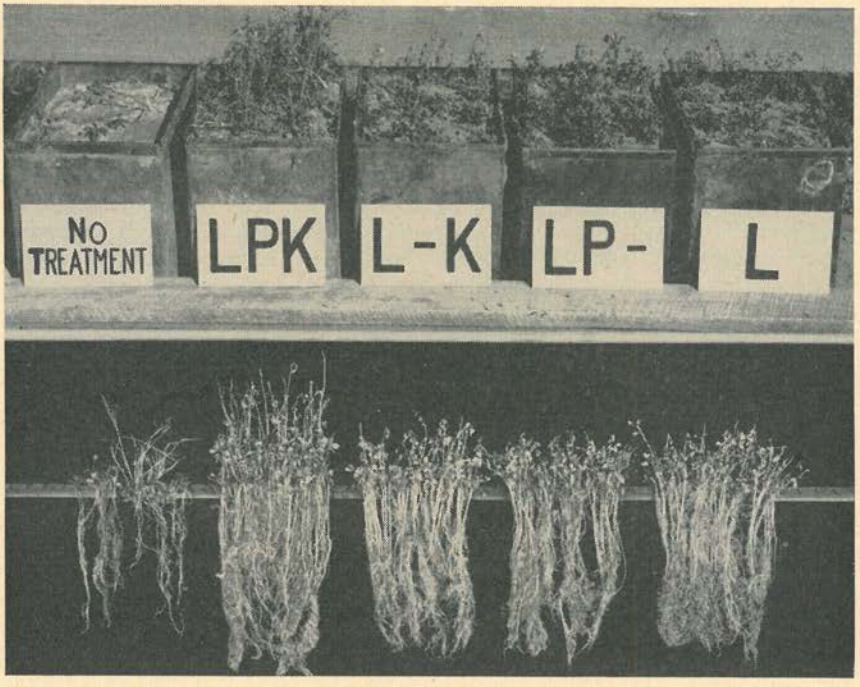


Fig. 3. Top: Excavated alfalfa samples in metal frames, showing relative amounts of top growth in first 3 months. Bottom: After washing away soil, showing differences in roots and tops from various treatments. West Salem Soil Experiment Field, West Salem, Ill., Nov. 16, 1954.

turbed soil with plants and roots intact to a 9-inch depth. Only a small part of the whole plot is damaged. These blocks of soil are placed on short boards for carrying to a source of water under pressure. A soil block in the frame is placed over a ¼-inch screen for washing. First, a stream of water is directed around the edges of the soil block until the metal frame can be removed. Then by a fine spray the soil is washed away, exposing the roots, showing the amount and condition of roots and proportion of roots to tops.

Fall Root Observations

In Figs. 2 and 3, it is obvious that any deficiency retards fall root growth of alfalfa. It is surprising to find so many roots produced by well-fed alfalfa in the first few weeks of life. Some roots of most vigorous plants which extend below the 9-inch level were broken off during excavations.

Materials shown from Brownstown unlimed plot (-PK) in Fig. 2 are only residues of grassy weeds after freezing. Where limestone was added (LPK) the alfalfa thrived and few grassy weeds were present. (Figs. 1 and 2). Only stunted weeds grew on the no-treatment plot nearby. Few weeds grew on unlimed plots without phosphate even with potash.

Only a few alfalfa plants still existed on the no-treatment plot at West Salem Field, along with occasional grassy weeds. Alfalfa tops were small, the roots slender and stunted, with slight chances for survival. The responses from phosphate and potash at West Salem were as great or greater than at Brownstown.

Early Spring Growth

By April 1955, at several experimental fields including Brownstown, West Salem, Toledo, Ewing, and Raleigh, the most vigorous early alfalfa growth appeared on plots with all three —limestone, phosphate, and potash.

No-phosphate plots (L-K) had comparatively stunted alfalfa, but most plants were still alive.

On no-potash plots (LP-), alfalfa was stunted also, with some plants apparently dead at Toledo and West Salem. Potash-starved alfalfa at West Salem showed severe heaving, with some plants lifted 2 to 3 inches, from alternate freezing and thawing of the soil.

Heaving Without Potash

The before-and-after photos of Fig. 4 illustrate spring top growth heights, amount of heaving and root growth conditions on three plots at West Salem Soil Experiment Field on April 5. In the top photo, before washing, note that the no-phosphate plot (L-K) has short plants, some of which are lifted slightly. Without potash (LP-), right, many plants are heaved badly and some are already dead. Complete-treatment plants (LPK) are more vigorous, with only occasional plants heaved slightly.

Root Studies in Spring

In the lower half of Fig. 4, the horizontal line represents the original ground level. Before washing, pins were thrust through all roots at the ground level. After washing, these ground-line marking pins were removed as the plants were mounted permanently for photographing. So the lower photo of Fig. 4 illustrated both the extent of root and top growth as well as location of crowns in respect to the ground line. Note scarcity of fibrous roots in upper zone on no-potash plot (LP-). Some apparently were torn off by heaving. On the no-phosphate plot (L-K), the tap roots are comparatively slender, and remaining fibrous roots are slightly darker in color as compared to the complete treatment plot.

Nutrient Reserves

To evaluate present fertility reserves on certain long-time plots, which resulted in growth differences described here, soil tests were made in 1955 for soil acidity, available phosphorus, and

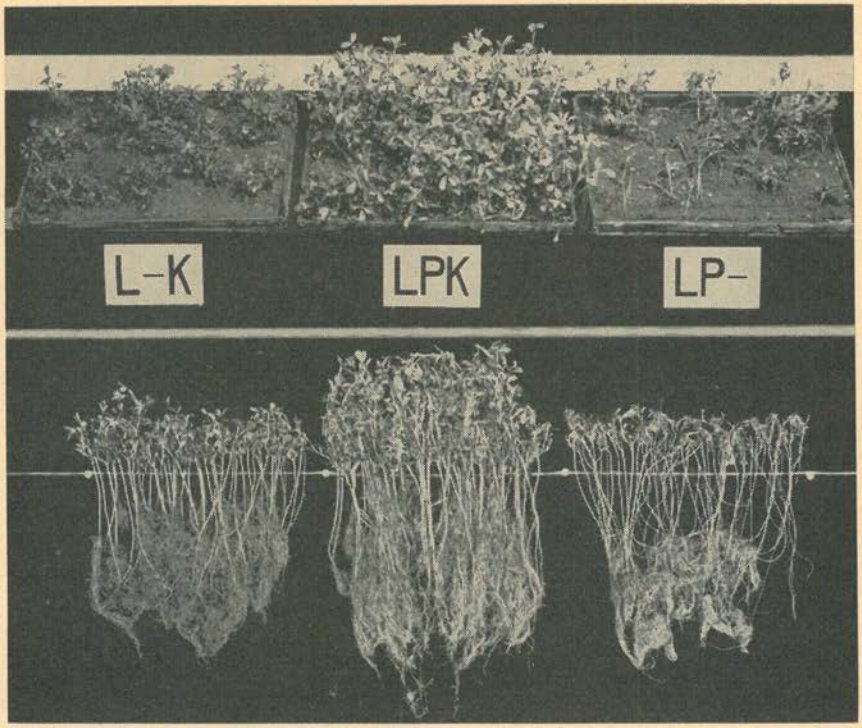


Fig. 4. Top: Excavated alfalfa from three plots before washing. Note heaved plants on right and stunted plants on left. Bottom: Same plants after washing away soil. Horizontal line indicates original ground line. West Salem Soil Experiment Field, West Salem, Ill., April 15, 1955.

potassium. According to Illinois soil test calibrations, additional phosphorus is advised for such rotations when the available phosphorus (P) is below 90 lbs. per acre, and potash is advised when available potassium (K) is below 200 lbs. per acre. Limestone is applied with the aim of maintaining a pH of 6.3 to 6.5, which means slightly acid, and never above the neutral point of pH 7.0.

Soil samples were taken from certain Brownstown plots, May 12, 1955, from beneath rapidly growing alfalfa. It is probable that available P and K might be lower in alfalfa root zones during the growing period than if soil samples were taken before planting a crop. Such comparisons should reveal any real differences in nutrient reserves. (See Table III.)

Six tons of limestone since 1940 at Brownstown have resulted in a pH range of about 6.1 to 6.3. Acidity of unlimed plots has changed little in 15 years, with pH ranges of 4.5 to 4.6.

Where yields have been highest, from recommended amounts of limestone, superphosphate, and potash, there seems to have been only moderate build-ups of available P and K in a 15-year period, as compared to untreated soil. With only 200 lbs. 0-20-0 on wheat and the same ahead of corn, no great accumulation of available soil phosphorus was expected.

The largest potash application, averaging 50 lbs. K_2O per year of rotation, along with lime and phosphates, has resulted in soil now testing 80 to 90 lbs. or "low" available K reserve in the alfalfa root zone. Where only half as much potash was added, (25 lbs. K_2O equivalent per year), present tests show "very low," that is, 40 lbs. or less of

(*Turn to page* 38)

How to Grow Corn Profitably

By Lamar Ratliff, Baldwyn, Mississippi

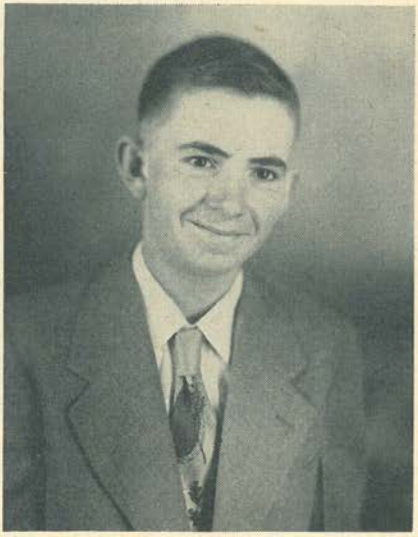
(A talk given at the annual convention of the American Plant Food Council, Inc., White Sulphur Springs, West Virginia, June 12-15, 1955)

MR. Chairman, distinguished visitors, and guests—the proper thing for me to say would be that I am glad to be here and to appear on this program. But I am going to tell the truth, I am not glad to be here right now because I am scared to death as you can see. Mr. Wilson* and everyone else have been nice to me and have certainly done everything possible to make me feel at home and to enjoy this wonderful trip. I have been wondering ever since Mr. Wilson invited me to appear on this program of what I could say that would be of interest to you gentlemen.

Mr. Taylor Smith, my county agent, told me not to be afraid and just to tell you of my 4-H experiences and how I made 218 bushels of corn on one acre. Since he has never advised me wrong yet, I am going to get over this stage of fright and tell you as best I can of my 4-H achievements.

I joined the 4-H Corn Club in 1950 when I was 10 years of age. I would like to say here that I think the 4-H organization is the greatest organization in the world for farm boys and girls. It helps you to train your Head, Heart, Hands, and Health to make the best better. It helps you to prepare to meet, to accept, and to solve the problems of life.

My first 4-H project was corn. It is my major project. Most of our farm is too steep for cultivation and is adapted to growing pine trees. I added forestry my second year and I have planted 49



Lamar Ratliff

thousand pine seedlings during the past four years. Last year I added the pig project because that is the best way to market my corn. I now have a registered Duroc sow and 16 pigs that I will top out in July or August.

Mr. Smith told me when I enrolled in the corn project in 1950 that if I would prepare a good seedbed, apply plenty of fertilizer, and keep the weeds out I could make 100 bushels of corn on one acre. My Dad didn't believe this was possible because he had never fertilized corn and had never made over 30 bushels on one acre, but he was anxious for me to try and he has encouraged and helped me all the way through.

The first year I broadcast 20 loads of barnyard manure and ploughed it under. I then applied 600 lbs. of 6-8-8

* Louis H. Wilson, Director of Information, American Plant Food Council, Inc., Washington, D. C.

and 200 lbs. of nitrate of soda in the water furrow. I planted Dixie 17 hybrid corn in 36-inch rows spaced 10 to 12 inches in the drill. I sidedressed the corn when it was knee-high with 200 lbs. of nitrate of soda. I made 179 bushels of corn which made me county winner. I was awarded $20 by the Peoples Bank & Trust Company for county prize. I had about 50 visitors that year, mostly local farmers and agricultural workers. I told Mr. Smith that I believed I could make 200 bushels on that acre. He suggested that I plant a winter cover crop, which I did. I broadcast 30 loads of barnyard the next spring and ploughed it and the cover crop under deep. I applied 800 lbs. of 6-8-8 and 250 lbs. of nitrate of soda in the water furrow and planted Dixie 17 hybrid corn in 32-inch rows spaced 10 to 12 inches in the drill. I sidedressed with 250 lbs. of nitrate of soda when the corn was knee-high. I made 187 bushels that year, which made me county champion again. I was also district winner that year. I was awarded $30 as county prize by the Peoples Bank & Trust Company. I was also given a 3-day educational tour through Arkansas, Tennessee, and Mississippi. I had about 100 visitors that year from different sections of the State.

I still believed that I could make 200 bushels on that acre and Mr. Smith and my Dad began to believe that I might make it. Mr. Smith helped me to get soil samples to send to State College and get tested. They told me to use a heavy application of lime or basic slag. In the spring of 1952, I broadcast 1,500 lbs. of basic slag and 34 wagon-loads of barnyard and ploughed this under. I then applied 600 lbs. of 6-8-8 and 400 lbs. of nitrate of soda in the water furrow. I then planted Funks G-711 Hybrid seed on 24-inch rows spaced 6 inches in the drill. I sidedressed with 400 lbs. of nitrate of soda when the corn was knee-high. My corn really grew off fast, but we were entering our first severe drouth. We have a 3-acre stock pond which is located above my corn project. One hot and dry day I got to thinking why can't I cut the spillway, dam up a ditch that runs along the end of my field, and irrigate my corn. I told my Dad what I had in mind. He said, "I don't know, that might kill the corn to turn the water in on it as hot and dry as it is." I said, "Let's go ask Mr. Smith," so we got in our pick-up and drove into Booneville to see what Mr. Smith said about it. He said, "Boy, if you can get the water to it, that's the thing to do." When I cut that spillway to the lake and dammed up the ditch and started running water down the furrows, you could almost see that corn turning so green it was black. I irrigated this way three times and it really paid off. We gathered 214.1 bushels off that acre. This was high in the County, State and Nation. The Peoples Bank & Trust Company awarded me $20 in cash and a $25 savings bond. I was awarded the Breeder's Gazette Gold Medal by Mr. Samuel Guard. He came all the way to Booneville and made the award at a Rotary meeting. He also gave me an 8-year subscription to the Breeder's Gazette. The Chilean Nitrate people gave me a Gold Wrist Watch, and Swift Fertilizer Company gave me $32.50. The Funk's Hybrid Seed Corn people gave me a cash award of $60. The American Plant Food Journal gave me $25. I also received a year's subscription to the Farm Journal and the Booneville Banner. I had over 300 visitors from several states that year.

But shucks I still wasn't satisfied—I believed that I could make 300 bushels on that acre. I figured that if I could get 30,000 plants, one ear to each stalk, 100 ears to the bushel that I could make 300 bushels. Mr. Smith told me he thought I was getting too many plants but to go ahead if I wanted to try it. I put 32,000 plants on that acre and that was too many. The sun couldn't get in and I dropped down to 165 bushels. This was still high in the county though.

You can see that disappointments

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Fig. 1. The fourth cutting of Coastal Bermuda hay is being baled on the farm of C. M. Reese, Andalusia, Ala., July 10, 1953. This grass was planted in April 1952 and produced about four tons of hay per acre in 1953.

A Good Summer Grass Team

By T. G. Amason[1] and B. F. Karick[2]

COASTAL Bermuda and Bahiagrass, Pensacola and Argentine, make a strong summer grass team. Coastal Plain farmers in rapidly increasing numbers are using these grasses in developing a new grassland agriculture. The rate of this trend toward grassland farming is illustrated by Dale County, Alabama, where the acreage of Bahiagrass grew from a 5-acre patch in 1949 to more than 10,000 acres in 1954.

Coastal Bermuda is considered by most of the farmers who have grown it as their "good land" grass. It can be made to grow on poor sandy soils, but has been most outstanding when planted on good land and given above average fertilizer treatment. It has produced enough pasture to carry more than the average number of animals per acre. It has made the largest acre yields of any hay crop grown in this part of the country.

This grass has shown farmers in our areas that it must have good treatment and that it will pay for good treatment. Even those farmers who formerly plowed, harrowed, raked, and burned to clean common Bermudagrass roots out of their cropland are planting Coastal Bermuda. Many are thinking of Coastal Bermuda as a grass that can grow in rotation with cultivated crops. Some are more worried about cultivation for row crops killing their grass

[1] Area Conservationist, SCS, Ozark, Alabama.
[2] Area Conservationist, SCS, DeFuniak Springs, Florida.

Fig. 2. The new stand of Pensacola Bahiagrass shown here, April 21, 1954, was seeded at a rate of 20 pounds per acre just ahead of the last cultivation of corn in late June 1953. This field is on Morris Farms, Geneva, Ala.

than they are about the possibility of Coastal Bermuda "eating their crops alive."

Bahiagrass is considered by farmers in our areas as the grass they can grow on any land, including very sandy land, wet soils, or plastic subsoils. Bahia responds to good treatment, but will grow under rather poor conditions and will stand rough treatment. Farmers use Bahiagrass for pastures, hay, and silage. Those who have cut green, succulent Bahiagrass were well pleased with the hay. Animals like the hay. Of course, hay that is mowed after seed is harvested is coarse and of lower

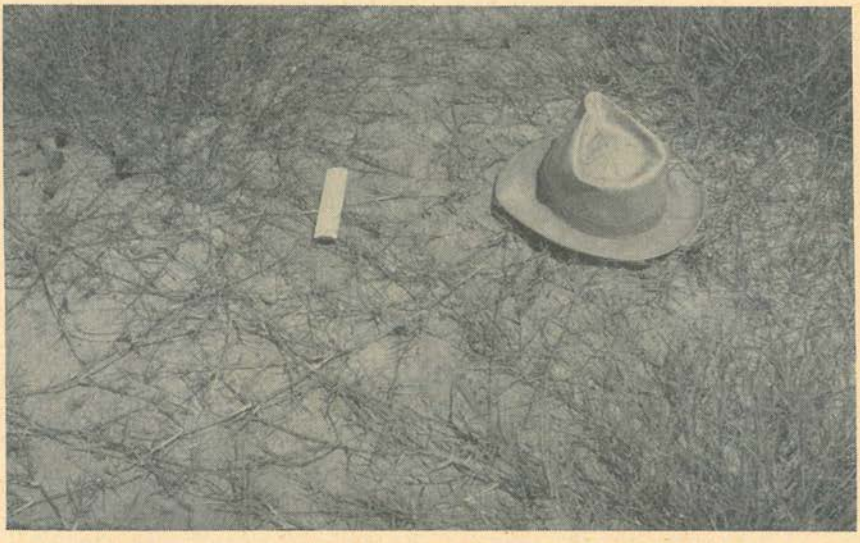

Fig. 3. C. B. Johnson, Geneva, Ala., planted Coastal Bermuda on March 18, 1953. This close-up photograph shows the spread of runners by June 1, 1953. Mr. Johnson cultivated for weed control.

Fig. 4. Much of the Bahiagrass hay is made from mature grass after seed is harvested. This picture shows the heavy residue of Pensacola Bahiagrass after seed was harvested on the farm of C. B. Johnson, Geneva, Ala.

quality than hay made at an earlier stage of growth.

Farmers who have both Coastal Bermuda and Bahia usually state a preference for Coastal as a hay crop. They say it makes larger yields, has a higher percentage of protein, and is better hay than Bahiagrass. Almost without exception, they use the qualifying statement, "when planted on good land and fertilized well." Although it is generally agreed that Coastal makes better hay than Bahia, it should be explained that to date a high percentage of the Bahia hay was cut after the seed was harvested. A good many farmers use no other hay except Bahiagrass.

Frosted grass is a rather important part of the winter feed for cattle on farms of our areas. Both Coastal Bermuda and Bahia furnish a considerable amount of late fall and early winter grazing. Frosted Pensacola Bahia is used extensively for grazing before crimson clover and other types of winter grazing are available. Where the frosted grass is used for fall pasture, it must be grazed off before too late in the fall if reseeding crimson clover is to volunteer in uniformly thick stands.

Seed production is a source of additional income on many farms where Bahiagrass is grown. Farmers pasture the grass in early spring and either remove cattle or they stock at a rate that allows the grass to make seed. After seed is harvested in summer, the grass is either pastured again or is mowed for hay. Sometimes the coarse grass is harvested for hay after seed is harvested and the fresh, tender grass that comes out afterward is used for fall pasture.

Most of the Bahiagrass planted in our areas is of the Pensacola variety. Argentine was introduced after Pensacola was already pretty well established. Farmers who have Argentine like it. Argentine Bahia has not been in use long enough for an accurate appraisal to be made of its value as compared with Pensacola. We have seen no cases where farmers who already had Pensacola destroyed it and planted Argentine.

Acreage of Bahiagrass has expanded faster in our areas than Coastal Bermuda. Farmers give the following reasons for the more rapid spread of the Bahia grasses: 1) The word Bermuda still signifies pest to a good many

farmers. 2) The requirement that Coastal Bermuda be established by planting stolons has delayed acceptance. Poor stands from planting stolons that were dry when received at the farm have been a further delaying factor. 3) Labor and equipment requirements for planting Coastal Bermuda as compared with the convenience of seeding Bahia caused many farmers to prefer Bahia. 4) Soil requirements of the two grasses have further influenced acreages planted. Coastal does best and is easier to establish on the better, smoother land that is usually reserved for cultivated crops. Bahia is more convenient to seed on steep or other rough land than Coastal Bermuda is to plant and cultivate on such land. Bahia can be seeded at the last cultivation of row crops, and requires no cultivation.

Much of the difficulty of establishing stands of Coastal Bermuda has been overcome by farmers who have followed Dr. Glenn Burton's instructions. Digging stolons from home nurseries, careful handling of stolons to prevent drying, careful planting in moist soil (preferably the day after a rain), fertilization with nitrogen, and cultivation until the grass covers the ground have paid off in terms of early establishment.

Travis Peacock and C. B. Johnson are two Geneva County, Alabama, farmers who have been successful in getting good first-year stands of Coastal Bermuda. They did a good job of planting fresh stolons in moist soil in February and March, fertilized liberally, and cultivated to control weeds. They both emphasize the importance of cultivation. Farmers who neglected cultivation got slow establishment, sometimes failing to get stands.

Farmers in our areas have found that it pays to remove Coastal Bermuda tops before digging stolons. It is common practice to go over with a spring-tooth harrow and a rake a couple of times before collecting any stolons for planting. Stolons harvested in this way give better stands and also are easier to plant with a mechanical planter. Mechanical planters are used on farms where extensive acreages of Coastal Bermuda are being planted.

An example of what a farm stolon nursery can do is found on L. M. Reese's

Fig. 5. Dairy heifers on Pensacola Bahiagrass pasture on the farm of Clyde Coe, Dothan, Ala. This grass was seeded in the fall of 1950 on deep, droughty sandy soil and this photograph was made June 17, 1953. The grass has done an excellent job of crowding weeds out of the sod.

"Reese's Little Ranch" in Covington, County, Ala., where a tenth-acre nursery was established with stolons furnished by the Conecuh River Soil Conservation District. In addition to planting grass on his own land, Mr. Reese has furnished stolons to other farmers. He estimates that at least 250 acres have been planted during the past three years with stolons from this small farm nursery.

Our earlier statement about using both Coastal Bermuda and the Bahia grasses is supported by farmer practice. W. C. Walker of Crestview, Florida, has 155 acres of Coastal Bermuda and 120 acres of Pensacola Bahiagrass. During the dry summer of 1954, both grasses stood up well. He harvested 5 tons of hay off 5 acres of his Coastal Bermuda at one cutting, despite some grazing and the dry weather. He harvested 85 tons of hay from 80 acres of Bahia that had been grazed. He pastured 52 head of cattle during the early spring and during the summer harvested 3,500 pounds of seed from 40 acres of Bahia.

P. E. Robinson of Crestview, Fla., has 20 acres of Coastal Bermuda and 26 acres of Pensacola Bahia. He was well pleased with the grazing from these grasses during the dry summer and fall of 1954. His appraisal of the two grasses was, "Coastal Bermuda is better for grazing, if your land is good enough to grow it. It makes better hay and more per acre. But, on the other hand, you can grow Pensacola Bahia on nearly any kind of land and if you keep it mowed so the cows can have tender grass all the time, they will stay fat."

Dr. H. R. Evers, Andalusia, Ala., likes Coastal Bermuda as a hay crop. He says it is a good hay-producing grass for dry soils. He harvested 500 bales of hay from 7 acres in 1954. The stand of Coastal was not complete because of patches of common Bermuda. Dr. Evers believes Coastal is going to develop a complete stand in the Common Bermuda patches. He grows button clover as a winter cover on his Coastal Bermuda. He fertilizes with 100 pounds of anhydrous ammonia per acre and uses his Coastal for both hay and grazing.

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Fig. 6. C. B. Johnson, Geneva, Ala., is explaining his rotation where he plowed under a stand of Pensacola Bahiagrass and volunteer crimson clover for corn. The relatively short growth of the clover shown at the border between the plowed and unplowed parts of the field is due to grazing in late winter and early spring. Groups like this visit fields where rotations with grass are in progress to get firsthand information from farmers who are starting these rotations. Photographed April 9, 1953.

Fig. 1. Proper use of lime is vital to a sound grassland program.

Plan Before You Fertilize

By John E. Baylor

Department of Farm Crops, Rutgers University, New Brunswick, New Jersey

NEW JERSEY livestock farmers, like many other farmers throughout the Northeast, are in the middle of a long and difficult cost-price squeeze. During this period, the farmer best able to survive is the one who applies the most efficient crop management practices at his disposal to produce the highest yields of top quality roughage possible. Adequate and proper fertilization is one of the strongest links in the long chain of practices essential to attain these top forage yields.

And even many of our best farmers who have always carried out a liberal fertilization program are finding that still higher rates of fertilizer pay dividends when all sound cropping practices are put to work. At the North Jersey Dairy Research Farm, for example, Claude Eby reports that in 1954 he harvested well over 11 tons of green forage per acre on over 200 acres of grassland that had received on the average 600 pounds of fertilizer during that year and annual applications of the same amount for several years previous. However, on one 10-acre field that received an additional 400 pounds in 1954, he harvested nearly 1 ton per acre more hay—or about $40 worth of hay for the additional $11 invested in fertilizer. With this response on fertile acres, it would appear that the sky is still the limit for the majority of New Jersey farmers.

Conservative estimates indicate that the average alfalfa yield in New Jersey could be increased from the present 2.3 tons per acre to 4 tons per acre if farmers combined recommended fertilizer applications with all other good man-

Fig. 2. Precision placement of seed and fertilizer (band seeding) gets grass and legume seedlings off to a faster start—assures better stands under adverse conditions.

agement practices. Many of our pastures have the potential to produce an additional 4000-5000 pounds of milk per acre annually if fertilized adequately and otherwise managed properly.

But fertilizer alone will not do the job of filling silos, haymows, milk cans or tanks. There are at least four prerequisites to a sound grassland fertilization program. These include: 1. Following a planned soil sampling and testing program; 2. liming to pH 6 to 6.8; 3. matching the crop to the soil; and 4. using good seed of adapted varieties.

Fig. 3. Potash is the key to high yields and long-lived stands of alfalfa as indicated by above seven-year-old stand of alfalfa. Center—50# of potash annually. Surrounding plots—200# potash annually. All other treatments alike. (Photo courtesy—E. R. Purvis)

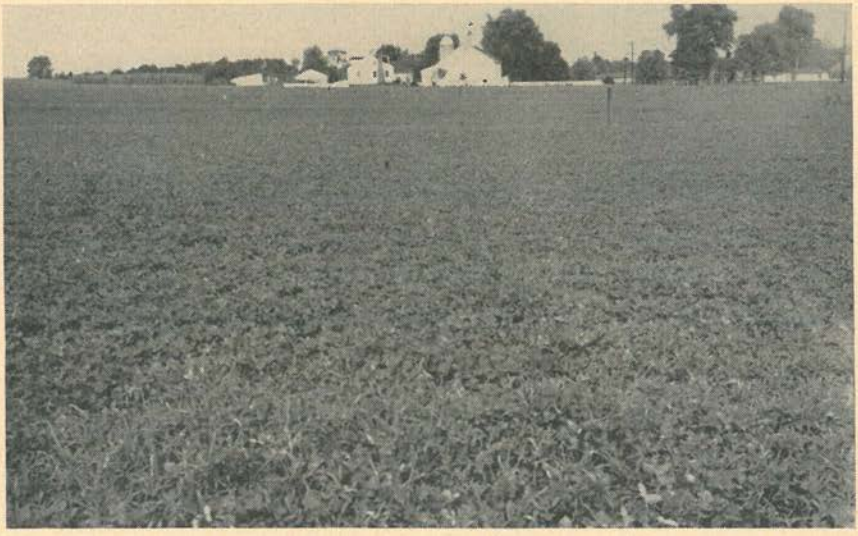

Fig. 4. An abundance of high-quality roughage, properly fertilized and managed, offers the greatest opportunity for higher profits and better living on Northeastern dairy farms.

Adding mineral fertilizers to any soil without first determining its pH and fertility level via a planned soil-testing program is unsound, uneconomical, and frequently wasteful.

Very little more need be said regarding the value of and need for adequate lime to maintain a pH most suitable for the optimum root development of both legumes and grasses. Research workers throughout the Northeast agree that for most species a pH of 6 to 6.5 (up to 6.8 for alfalfa) is most satisfactory. Unless this requirement is satisfied through the liberal use of lime, most plants will not respond to their fullest potential regardless of the fertilizer applied.

Growing species best adapted to particular soil conditions and crop needs is another must for top fertilizer efficiency. Alfalfa, for example, is the top-yielding legume in New Jersey on well-drained, fertile soils. On the other hand, alfalfa will not persist on soils where drainage is slightly off, and a

TABLE I.—LEGUMES—HOW THEY COMPARE

Factor	Alfalfa	Red clover	Ladino	Birdsfoot trefoil
Response to soil conditions				
Acid soil	P	F	F	F+
Wet soil	P	F	F+	G
Droughty soil	G	P	F	F+
Production and quality				
Persistence	Per.	Biennial	Per.	Per.
Speed of establishment	Fast	Fast	Fast	Slow
Use for pasture	G*	P	Ex	G
Use for hay	Ex	G	F+	G

* Requires high fertility and very careful management.

TABLE II.—GRASSES—HOW THEY COMPARE

Factor	Orchard grass	Brome grass	Reed canary grass	Timothy
Response to soil conditions				
Acid soil	G	F	G	F
Wet soil	P	G	Ex	F
Droughty soil	Ex	F	G	P
Production and quality				
Speed of establishment	Fast	Slow	Slow	Fast
Relative yield	Ex	V.G.	Ex	G
Use for pasture	Ex	Ex	F	P
Use for hay	F	Ex	F	G

fertilizer program geared to alfalfa on such soils would probably result in inefficient fertilizer usage. Birdsfoot trefoil or ladino clover or, under certain conditions, straight grasses would be more satisfactory. In every case, however, the legumes do best when grown in association with the proper grass.

No system of classifying grasses and legumes according to their responses to various soil conditions is entirely satisfactory. However, Tables I and II indicate generally how several of our most useful forage species can be expected to react under various soil and management conditions. And by selecting simple mixtures of similarly adapted grasses and legumes, it is possible to grow forage crops on a wide range of soils which, when properly fertilized, will produce high yields of quality pasture, grass silage, and hay.

Plant breeders have made tremendous strides ahead during the past 25 years. Today, for example, there are improved varieties of nearly every major forage legume and grass for the Northeast. Use of these improved and better adapted varieties is essential to a sound grassland fertilization program.

In New Jersey, Atlantic alfalfa developed at the New Jersey Experiment Station represents a striking example of the importance of locally adapted varieties for top performance. Over the past 5 years, Atlantic has outyielded the next best variety in competitive trials by nearly ½ ton per acre. If planted alone under good fertility conditions, any one of the competing varieties, would have appeared to perform well. But when compared with Atlantic under these same conditions, the adapted variety returned considerably more hay per acre.

For consistent top performance there is no substitute for certified seed of these improved named varieties. This does not mean that seed other than certified is no good. In many instances uncertified seed is in every respect equal to certified. But with uncertified seed one cannot be positive of this fact until after the land has been prepared, fertilizer applied, the seed planted, and the crop harvested. It is then too late to make a change.

Planting certified seed does not guarantee a successful harvest. But using certified seed of recommended varieties does guarantee varietal purity and trueness to type and provides insurance that the seed is suited to your conditions. Large-scale, trueness-to-type studies of all of the major forage crops for which certified seed is produced are now under way. They point out conclusively that lots of certified seed nearly always are almost completely true to type, whereas uncertified seed lots of

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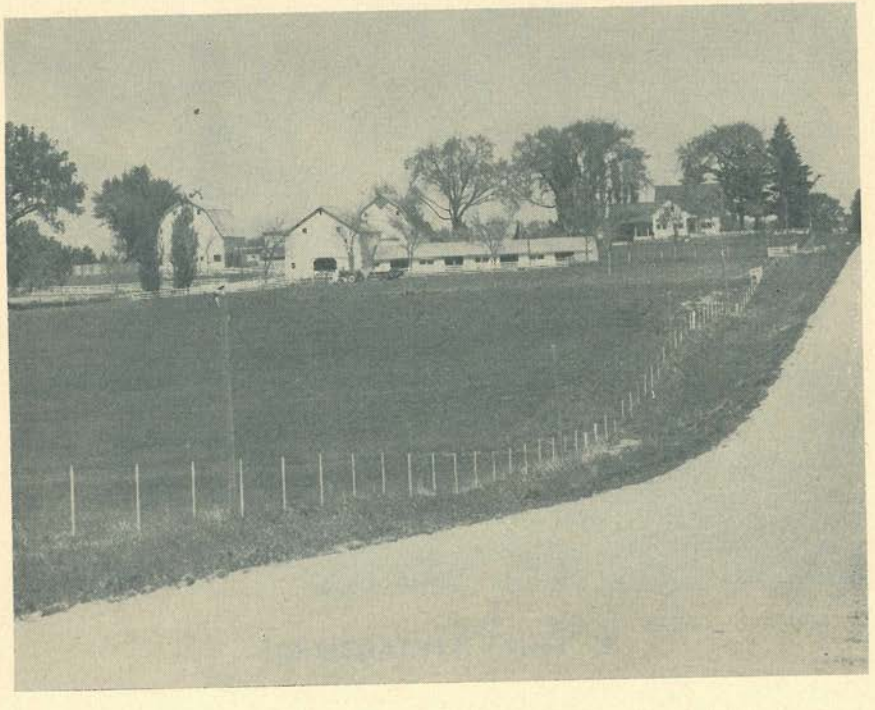
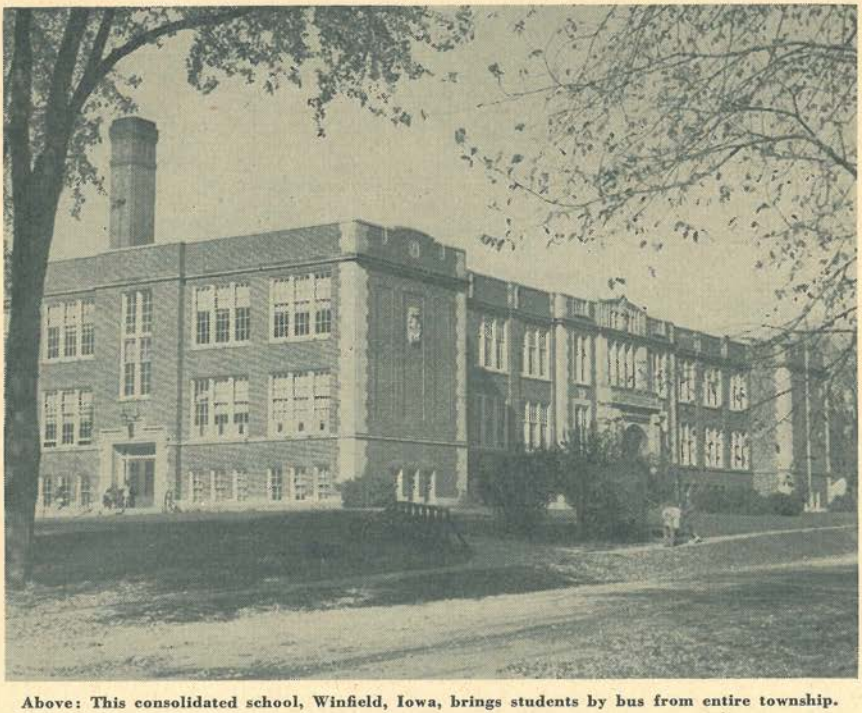
PICTORIAL

A "Fair" Arrangement

Rural Scenery



Pretty Country



Above: This consolidated school, Winfield, Iowa, brings students by bus from entire township.

Below: Farmers Cooperative Creamery, Keosauqua, Van Buren Co., Iowa.

The Editors Talk

Our Cover Picture

A surprisingly large amount of root growth is produced by summer-seeded alfalfa in the first three months of life, if, If, IF — if the seedlings have a fair chance from the time of germination. There are many factors which determine success or failure in alfalfa production. But a fast, vigorous start in life seems important for an alfalfa seedling.

The cover page illustrates the difference in topgrowth and roots of 3-month old alfalfa plants, with and without adequate potassium. In the story in this issue, "Residual Fertility Insures Alfalfa After Drouth," by Professor P. E. Johnson, University of Illinois, some of the many important fertility factors are discussed.

Alfalfa seems to be getting more attention lately as a forage producer which can be counted upon from year to year, even during drouthy periods. When drouth retarded forage crops as well as corn in many areas the last few years, alfalfa stood out as one forage which could withstand dry seasons, and still produce relatively good forage yields. Alfalfa certainly does better with plenty of rain or when irrigated. But established alfalfa can withstand late summer drouths better than shallower-rooted legumes. Furthermore, alfalfa can be seeded in late summer and on properly treated soils will establish a good stand for hay or pasture the next season.

We must admit that alfalfa has a large appetite for minerals. The upkeep is high, but benefits are large, both direct and indirect. The question is — can more alfalfa be fitted into the farming system to advantage? The answer would appear to be yes, in many cases at least.

Summer drouths are a constant threat in southern Illinois and many similar areas. It seems logical to produce some crops, as wheat and forages, along with corn, which take advantage of the more moist periods of the year. The 1954 wheat crop averaged the highest on record, while corn and soybean yields were low due to drouth and heat. Suppose one grew only corn there for the past two years. He would not be very happy, and neither would he be a very good customer. Perhaps he too would be looking to alfalfa or other crops which have a better chance of producing during dry cycles or years.

The agronomic feasibility of growing corn continuously by proper use of chemical fertilizers has received much attention recently. But everyone should not grow continuous corn, (which would mean corn only to many), for several reasons. One place where it does not seem logical to try growing only corn, even with adequate fertilizers, is on soils already in poor physical condition. Many soils exist which need physical improvement to aid soil aeration, foster spring drainage, and yet give more water-holding capacity. These Illinois long-time experiments, with deep-rooted legumes in the rotations, certainly have demonstrated that proper soil treatments and rotations can improve soil physical conditions, soil productivity, and net returns.

The Vertical Frontier

"Further production in agriculture to meet the needs of a growing population must depend upon an acceleration of the technological revolution which agriculture in this country has been undergoing with increasing rapidity during the past 15 years. The geographic frontier is gone—the vertical frontier of science and technology remains, bounded only by the capacity of men's minds."

We like that term "vertical frontier." It offers a challenge to each and every one of us to do his part in meeting the demands and problems of our American agriculture, the backbone of this country's welfare.

In illustrating the use of the term in his address before the Convention of the National Plant Food Institute at White Sulphur Springs in West Virginia, June 14 of this year, Ervin L. Peterson, Assistant Secretary of Agriculture, pointed out that 35 years ago we had in production in this country, in round numbers, 350 million acres of cropland. Today, our cropland base remains at approximately 350 million acres despite the fact that we have 60 million more people than we had 35 years ago. Several important factors contributed to this accomplishment. The elimination of horses and mules released about 75 million acres for food production. Shrinkage in exports released about another 20 million acres. We made better use of pasture and range lands. But most important, technological progress during the past 15 years has greatly increased output per acre, per animal, and per man-hour. And in this technological progress the more extensive and wiser use of plant foods has played a major role. Our agriculture now produces 44 per cent more than it did before World War II.

Mr. Peterson believes that the technological revolution in agriculture which is being experienced in more than research—more than knowledge—for research and knowledge are only the beginning. We must have knowledge, but it must be placed in the hands of farmers, farmers must be willing to accept and use it. Coming back to the use of plant food as a matter in point, he said, "The National Soil and Fertilizer Research Committee, comprising personnel from the Department of Agriculture and the Land-Grant Colleges, recently published their findings on fertilizer use and crop yields. They found that increased use of fertilizers would increase productivity in every section of the Nation. In the South, for example, which consumes 50 per cent of the total fertilizer nutrients in the Nation, yields of most crops are estimated to be only at one third to one half of their production potential. In the North Central States of the Midwest, the Committee states: 'It is believed that adequate fertilization accompanied by other improved practices can double present yields for the region as a whole.'"

Six major problems face our agriculture, according to Mr. Peterson: The problem of the wise use of lands, forest, and water. The problem of a proper market program relationship. The problem of keeping agriculture competitive with the rest of the economy. The problem of how agriculture may use its human resources to better advantage. The problem of making farm life more attractive. Thus again we see the application of the vertical frontier, "bounded only by the capacity of men's minds." Thus again, the challenge to all of us connected with agriculture. What we learn we can pass on. We can help in the acceleration of the technological revolution.

It is estimated that agricultural fairs attract six times major league baseball's annual gate. The Texas State Fair alone drew 2,380,000 visitors in 16 days.

Season Average Prices Received by Farmers for Specified Commodities *

Crop Year	Cotton Cents per lb. Aug.-July	Tobacco Cents per lb.	Potatoes Cents per bu. July-June	Sweet Potatoes Cents per bu. July-June	Corn Cents per bu. Oct.-Sept.	Wheat Cents per bu. July-June	Hay [1] Dollars per ton July-June	Cottonseed Dollars per ton July-June	Truck Crops ....
Av. Aug. 1909–July 1914....	12.4	10.0	69.7	87.8	64.2	88.4	11.87	22.55	....
1928.....	18.0	20.0	53.2	118.0	84.0	99.8	11.22	34.17	....
1929.....	16.8	18.3	131.6	117.1	79.9	103.6	10.90	30.92	....
1930.....	9.5	12.8	91.2	108.1	59.8	67.1	11.06	22.04	....
1931.....	5.7	8.2	46.0	72.6	32.0	39.0	8.69	8.97	....
1932.....	6.5	10.5	38.0	54.2	31.9	38.2	6.20	10.33	....
1933.....	10.2	13.0	82.4	69.4	52.2	74.4	8.09	12.88	....
1934.....	12.4	21.3	44.6	79.8	81.5	84.8	13.20	33.00	....
1935.....	11.1	18.4	59.3	70.3	65.5	83.2	7.52	30.54	....
1936.....	12.4	23.6	114.2	92.9	104.4	102.5	11.20	33.36	....
1937.....	8.4	20.4	52.9	78.0	51.8	96.2	8.74	19.51	....
1938.....	8.6	19.6	55.7	69.8	48.6	56.2	6.78	21.79	....
1939.....	9.1	15.4	69.7	73.4	56.8	69.1	7.94	21.17	....
1940.....	9.9	16.0	54.1	85.4	61.8	68.2	7.59	21.73	....
1941.....	17.0	26.4	80.8	92.2	75.1	94.4	9.70	47.65	....
1942.....	19.0	36.9	117.0	118.0	91.7	110.0	10.80	45.61	....
1943.....	19.9	40.5	131.0	206.0	112.0	136.0	14.80	52.10	....
1944.....	20.7	42.0	150.0	190.0	109.0	141.0	16.50	52.70	....
1945.....	22.5	36.6	143.0	204.0	127.0	150.0	15.10	51.10	....
1946.....	32.6	38.2	124.0	218.0	156.0	191.0	16.70	72.00	....
1947.....	31.9	38.0	162.0	217.0	216.0	229.0	17.60	85.90	....
1948.....	30.4	48.2	155.0	222.0	129.0	200.0	18.45	67.20	....
1949.....	28.6	45.9	128.0	214.0	124.0	188.0	16.50	43.40	....
1950.....	40.1	51.7	91.7	173.0	153.0	200.0	16.70	86.50	....
1951.....	37.9	51.1	163.0	304.0	166.0	211.0	19.50	69.30	....
1952.....	34.6	49.9	198.0	338.0	153.0	209.0	19.95	69.60	....
1953.....	32.3	52.2	79.7	251.0	148.0	204.0	17.45	52.60	
1954									
August.....	34.00	48.2	141.0	259.0	153.0	203.0	16.45	61.30	....
September...	34.55	53.0	116.0	236.0	153.0	207.0	17.25	61.60	....
October.....	34.67	53.6	93.2	212.0	145.0	208.0	17.55	60.20	....
November...	33.17	52.0	109.0	216.0	137.0	212.0	18.15	59.40	....
December....	32.67	50.0	105.0	254.0	139.0	212.0	18.55	59.60	....
January.....	32.51	42.4	113.0	283.0	140.0	214.0	18.75	56.80	....
February.....	31.69	36.8	117.0	297.0	140.0	213.0	18.55	55.20	....
March.....	31.87	....	118.0	310.0	136.0	212.0	18.25	53.40	....
April.....	31.93	....	217.0	315.0	136.0	209.0	17.65	53.40	....
May.....	31.51	46.0	223.0	315.0	140.0	213.0	17.45	53.10	....
June.....	31.43	39.5	121.0	382.0	140.0	206.0	16.35	52.00	....
July.....	32.11	38.0	88.0	279.0	140.0	197.0	15.25	54.00	....
Index Numbers (Aug. 1909—July 1914 = 100)									
1928.....	145	200	76	134	131	113	95	152	147
1929.....	135	183	189	133	124	117	92	137	137
1930.....	77	128	131	123	93	76	93	98	128
1931.....	46	82	66	83	50	44	73	40	107
1932.....	52	105	55	62	50	43	52	46	100
1933.....	82	130	118	79	81	84	68	57	90
1934.....	100	213	64	91	127	96	111	146	94
1935.....	90	184	85	80	102	94	63	135	116
1936.....	100	236	164	106	163	116	94	148	108
1937.....	68	204	76	89	81	109	74	87	114
1938.....	69	196	80	79	76	64	57	97	96
1939.....	73	154	100	84	88	78	67	94	98
1940.....	80	160	78	97	96	77	64	96	122
1941.....	137	264	116	105	117	107	82	211	138
1942.....	153	369	168	134	143	124	91	202	178
1943.....	160	405	188	235	174	154	125	231	270
1944.....	167	420	214	216	170	160	139	234	236
1945.....	181	366	205	232	198	170	127	227	240
1946.....	263	382	178	248	212	209	141	319	217
1947.....	257	380	232	248	336	259	148	381	262
1948.....	245	482	222	253	201	226	155	298	253
1949.....	231	459	184	244	193	213	139	192	232
1950.....	323	517	132	197	238	226	141	384	211
1951.....	306	512	233	346	259	239	164	307	269
1952.....	279	499	284	385	238	236	168	309	274
1953.....	260	522	114	286	231	231	147	233	240
1954									
August.....	274	482	202	295	238	230	139	272	223
September...	279	530	166	269	238	234	145	273	170
October.....	280	536	134	241	226	235	148	267	191
November...	268	520	156	246	213	240	153	263	237
December....	263	500	151	289	217	240	156	264	216
January.....	262	424	162	322	218	242	158	252	263
February.....	256	368	168	338	218	241	156	245	258
March.....	257	...	169	353	212	240	154	237	262
April.....	258	.	311	359	212	236	149	237	270
May.....	254	460	320	359	218	241	147	235	308
June.....	253	395	174	435	218	233	138	231	230
July.....	259	380	126	318	218	223	128	239	223

Wholesale Prices of Phosphates and Potash **

	Superphosphate, Baltimore, per unit	Florida land pebble, 68% f.o.b. mines, bulk, per ton	Tennessee phosphate rock, 75% f.o.b. mines, bulk, per ton	Muriate of potash bulk, per unit, c.i.f. Atlantic and Gulf ports [2]	Sulphate of potash in bags, per unit, c.i.f. Atlantic and Gulf ports [2]	Sulphate of potash magnesia, per ton, c.i.f. Atlantic and Gulf ports [2]	Manure salts bulk, per unit, c.i.f. Atlantic and Gulf ports [2]
1910–14	$0.536	$3.61	$4.88	$0.714	$0.953	$24.18	$0.657
1928	.580	3.12	5.50	.669	.957	26.46	.607
1929	.609	3.18	5.50	.672	.962	26.59	.610
1930	.542	3.18	5.50	.681	.973	26.92	.618
1931	.485	3.18	5.50	.681	.973	26.92	.618
1932	.458	3.18	5.50	.681	.963	26.90	.618
1933	.434	3.11	5.50	.662	.864	25.10	.601
1934	.487	3.14	5.67	.486	.751	22.49	.483
1935	.492	3.30	5.69	.415	.684	21.44	.444
1936	.476	1.85	5.50	.464	.708	22.94	.505
1937	.510	1.85	5.50	.508	.757	24.70	.556
1938	.492	1.85	5.50	.523	.774	15.17	.572
1939	.478	1.90	5.50	.521	.751	24.52	.570
1940	.516	1.90	5.50	.517	.730	24.75	.573
1941	.547	1.94	5.64	.522	.780	25.55	.367
1942	.600	2.13	6.29	.522	.810	25.74	.205
1943	.631	2.00	5.93	.522	.786	25.35	.195
1944	.645	2.10	6.10	.522	.777	25.35	.195
1945	.650	2.20	6.23	.522	.777	25.35	.195
1946	.671	2.41	6.50	.508	.769	24.70	.190
1947	.746	3.05	6.60	.432	.706	18.93	.195
1948	.764	4.27	6.60	.397	.681	14.14	.195
1949	.770	3.88	6.22	.397	.703	14.14	.195
1950	.763	3.83	5.47	.371	.716	14.33	.195
1951	.813	3.98	5.47	.401	.780	15.25	.200
1952	.849	3.98	5.47	.401	.793	15.25	.200
1953	.878	....	....	....	.793	15.25	.200
1954							
August	.895	....	....	.388	.765	14.75	.184
September	.895	....	....	.388	.765	14.75	.184
October	.895	....	....	.388	.765	14.75	.184
November	.895	....	....	.388	.765	14.75	.184
December	.895	....	....	.405	.825	16.00	.193
January	.895	....	....	.405	.825	16.00	.193
February	.895	....	....	.405	.825	16.00	.193
March	.895	....	....	.405	.825	16.00	.193
April	.895	....	....	.405	.825	16.00	.193
May	.895	....	....	.405	.825	16.00	.193
June	.895	....	....	.360	.720	13.45	.175
July	.895	....	....	.390	.735	14.00	.193

Index Numbers (1910-14 = 100)

1928	108	86	113	94	100	109	92
1929	114	88	113	94	101	110	93
1930	101	88	113	95	102	111	94
1931	90	88	113	95	102	111	94
1932	85	88	113	95	101	111	94
1933	81	86	113	93	91	104	91
1934	91	87	110	68	79	93	74
1935	92	91	117	58	72	89	68
1936	89	51	113	65	74	95	77
1937	95	51	113	71	79	102	85
1938	92	51	113	73	81	104	87
1939	89	53	113	73	79	101	87
1940	96	53	113	72	77	102	87
1941	102	54	110	73	82	106	87
1942	112	59	129	73	85	106	84
1943	117	55	121	73	82	105	83
1944	120	58	125	73	82	105	83
1945	121	61	128	73	82	105	83
1946	125	67	133	71	81	102	82
1947	139	84	135	70	74	78	83
1948	143	118	135	67	72	58	83
1949	144	108	128	67	74	58	83
1950	142	106	112	68	75	59	83
1951	152	110	112	72	82	63	83
1952	158	110	112	72	83	63	83
1953	164	...	...	73	83	63	83
1954							
August	167	...	...	70	80	61	81
September	167	...	...	70	80	61	81
October	167	...	...	70	80	61	81
November	167	...	...	70	80	61	81
December	167	...	...	72	87	66	83
January	167	...	...	72	87	66	83
February	167	...	...	72	87	66	83
March	167	...	...	72	87	66	83
April	167	...	...	72	87	66	83
May	167	...	...	72	87	66	83
June	167	...	...	66	76	56	80
July	167	...	...	70	77	58	82

Wholesale Prices of Ammoniates **

	Nitrate of soda bulk per unit N	Sulphate of ammonia bulk per unit N	Cottonseed meal S. E. Mills per unit N	Fish scrap, dried 11–12% ammonia, 15% bone phosphate, f.o.b. factory bulk per unit N	Tankage 11% ammonia, 15% bone phosphate, f.o.b. Chicago, bulk, per unit N	High grade ground blood, 16–17% ammonia, Chicago, bulk, per unit N
1910–14	$2.68	$2.85	$3.50	$3.53	$3.37	$3.52
1928	2.67	2.30	7.06	6.63	4.92	6.00
1929	2.57	2.04	5.64	5.00	4.61	5.72
1930	2.47	1.81	4.78	4.96	3.79	4.58
1931	2.34	1.46	3.10	3.95	2.11	2.46
1932	1.87	1.04	2.18	2.18	1.21	1.36
1933	1.52	1.12	2.95	2.86	2.06	2.46
1934	1.52	1.20	4.46	3.15	2.67	3.27
1935	1.47	1.15	4.59	3.10	3.06	3.65
1936	1.53	1.23	4.17	3.42	3.58	4.25
1937	1.63	1.32	4.91	4.66	4.04	4.80
1938	1.69	1.38	3.69	3.76	3.15	3.53
1939	1.69	1.35	4.02	4.41	3.87	3.90
1940	1.69	1.36	4.64	4.36	3.33	3.39
1941	1.69	1.41	5.50	5.32	3.76	4.43
1942	1.74	1.41	6.11	5.77	5.04	6.76
1943	1.75	1.42	6.30	5.77	4.86	6.62
1944	1.75	1.42	7.68	5.77	4.86	6.71
1945	1.75	1.42	7.81	5.77	4.86	6.71
1946	1.97	1.44	11.04	7.38	6.60	9.33
1947	2.50	1.60	12.72	10.66	12.63	10.46
1948	2.86	2.03	12.94	10.59	10.84	9.85
1949	3.15	2.29	10.11	13.18	10.73	10.62
1950	3.00	1.95	11.01	11.70	10.21	9.36
1951	3.16	1.97	13.20	10.92	10.18	10.09
1952	3.34	2.09	13.95	11.27	9.72	9.16
1953	3.26	2.27	11.04	11.19	7.39	7.09
1954						
August	3.09	2.18	12.37	11.19	9.83	11.19
September	3.09	2.18	11.51	10.85	9.78	10.09
October	3.01	2.18	11.55	11.26	9.64	9.94
November	2.98	2.18	11.85	11.78	8.80	9.23
December	2.98	2.18	11.98	12.41	8.50	8.35
January	2.98	2.18	12.00	12.35	8.32	8.32
February	2.98	2.18	11.16	12.23	8.50	8.50
March	2.98	2.18	10.47	12.45	7.82	7.82
April	2.98	2.18	9.90	12.41	6.68	6.23
May	2.98	2.16	9.97	11.92	6.19	6.25
June	2.98	2.02	9.91	11.55	6.23	5.92
July	2.98	2.02	10.01	9.43	6.68	7.14
	Index Numbers (1910-14 = 100)					
1928	100	81	202	188	146	170
1929	96	72	161	142	137	162
1930	92	64	137	141	112	130
1931	88	51	89	112	63	70
1932	71	36	62	62	36	39
1933	59	39	84	81	97	71
1934	59	42	127	89	79	93
1935	57	40	131	88	91	104
1936	59	43	119	97	106	131
1937	61	46	140	132	120	122
1938	63	48	105	106	93	100
1939	63	47	115	125	115	111
1940	63	48	133	124	99	96
1941	63	49	157	151	112	126
1942	65	49	175	163	150	192
1943	65	50	180	163	144	189
1944	65	50	219	163	144	191
1945	65	50	223	163	144	191
1946	74	51	315	209	196	265
1947	93	56	363	302	374	297
1948	107	71	370	300	322	280
1949	117	80	289	373	318	302
1950	112	68	315	331	303	266
1951	118	69	377	310	302	287
1952	125	74	399	319	288	260
1953	122	80	315	317	219	201
1954						
August	115	76	353	317	292	317
September	115	76	329	307	290	287
October	112	76	330	319	286	282
November	111	76	339	334	261	262
December	111	76	342	352	252	237
January	111	76	343	350	247	236
February	111	76	319	346	252	241
March	111	76	299	353	232	222
April	111	76	283	352	198	177
May	111	76	285	338	184	178
June	111	71	283	327	185	168
July	111	71	286	267	198	203

Combined Index Numbers of Prices of Fertilizer Materials, Farm Products and all Commodities

	Farm prices*	Prices paid by farmers for commodities bought*	Wholesale prices of all commodities†	Fertilizer material‡	Chemical ammoniates	Organic ammoniates	Superphosphate	Potash**
1928.....	148	152	141	121	87	177	108	97
1929.....	148	150	139	114	79	146	114	97
1930.....	125	140	126	105	72	131	101	99
1931.....	87	119	107	83	62	83	90	99
1932.....	65	102	95	71	46	48	85	99
1933.....	70	104	96	70	45	71	81	95
1934.....	90	118	109	72	47	90	91	72
1935.....	109	123	117	70	45	97	92	63
1936.....	114	123	118	73	47	107	89	69
1937.....	122	130	126	81	50	129	95	75
1938.....	97	122	115	78	52	101	92	77
1939.....	95	121	112	79	51	119	89	77
1940.....	100	122	115	80	52	114	96	77
1941.....	124	130	127	86	56	130	102	77
1942.....	159	149	144	93	57	161	112	77
1943.....	193	165	151	94	57	160	117	77
1944.....	197	174	152	96	57	174	120	76
1945.....	207	180	154	97	57	175	121	76
1946.....	236	197	177	107	62	240	125	75
1947.....	276	231	222	130	74	362	139	72
1948.....	287	250	241	134	89	314	143	70
1949.....	250	240	226	137	99	319	144	70
1950.....	258	246	232	132	89	314	142	72
1951.....	302	271	258	139	93	331	152	76
1952.....	288	273	251	144	98	333	158	76
1953.....	258	262	247	139	100	269	164	77
1954								
August....	251	264	248	143	95	319	167	74
September.	246	263	248	142	95	308	167	74
October...	242	262	248	141	94	308	167	74
November.	244	262	248	140	93	301	167	74
December..	239	261	245	140	93	300	167	77
January...	244	264	248	140	93	297	167	77
February..	245	264	248	139	93	291	167	77
March....	244	265	248	137	93	275	167	77
April.....	247	265	248	135	93	252	167	77
May.....	244	263	248	134	93	243	167	77
June.....	243	263	248	131	90	242	167	70
July.....	237	262	248	132	90	240	167	74

* U. S. D. A. figures, revised January 1950. Beginning January 1946 farm prices and index numbers of specific farm products revised from a calendar year to a crop-year basis. Truck crops index adjusted to the 1924 level of the all-commodity index.

† Department of Labor index converted to 1910-14 base.

‡ The Index numbers of prices of fertilizer materials are based on original study made by the Department of Agricultural Economics and Farm Management, Cornell University, Ithaca, New York. These indexes are complete since 1897. The series was revised and reweighted as of March 1940 and November 1942.

[1] Beginning July 1949, baled hay prices reduced by $4.75 a ton to be comparable to loose hay prices previously quoted.

[2] Potash salts quoted F.O.B. mines; manure salts since June 1941; other carriers since June 1947. Beginning June 1954, muriate of potash quoted on both mine and port basis.

**** Where range of prices for fertilizer material is quoted, average figure is used. The weighted average of prices actually paid for potash is lower than the annual average because since 1926 over 90% of the potash used in agriculture has been contracted for during the discount period.**

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, the State Experiment Stations, and Canada, relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

"Relation Between Soluble Phosphorus in Fertilized Soils and Growth Response of Pasture Forage," Agr. Exp. Sta., Univ. of Fla., Gainesville, Fla., Bul. 558, Feb. 1955, J. R. Neller, H. W. Lundy, and D. W. Jones.

"Fertilizer Usage in Kentucky, 1940-1954," Agr. Exp. Sta., Univ. of Ky., Lexington, Ky., April 1955.

"Distribution of Fertilizer Sales by Counties for the Period July 1, 1954, Through December 31, 1954," Agr. Exp. Sta., Univ. of Ky., Lexington, Ky., May 1954.

"Effects of Fertilizers and Stand on Corn and of Stand on Soil Moisture," Agr. Exp. Sta., Univ. of Minn., St. Paul, Minn., Tech. Bul. 214, April 1955, F. E. Shubeck and A. C. Caldwell.

"1954 Fertilizer Analyses and Registrations," State Dept. of Agr., St. Paul, Minn., H. A. Halvorson and R. E. Bergman.

"Know Your Fertilizers," Agr. Ext. Serv., Miss. State College, State College, Miss., Pub. 193, March 1955.

"Fertilizer Experiments Southeast Missouri 1954," Agr. Exp. Sta., Univ. of Mo., Columbia, Mo.

"Selecting Your Nitrogen, Sidedressing and Topdressing Materials," Agr. Ext. Serv., N. C. State College, Raleigh, N. C., Ext. Cir. 386, Jan. 1955, E. R. Collins.

"Studies on the Boron Requirements of Young Apple Trees Grown in Sand Culture," Agr. Exp. Sta., Wooster, Ohio, Res. Bul. 754, Jan. 1955, J. M. Beattie.

"Using Commercial Fertilizer in Your Home Garden," Agr. Exp. Sta., Okla. A. & M. College, Stillwater, Okla., Cir. 627, E. L. Whitehead.

"Distribution of Fertilizer in Oklahoma Counties by Grades and Material for the Period January 1, 1955 to April 1, 1955," State Dept. of Agr., Okla. City, Okla.

"Some Effects of Fertilizer on the Yield and Maturity of Southern Peas," Agr. Exp. Sta., Tex. A. & M. College, College Station, Tex., Prog. Rpt. 1757, Feb. 1955, D. R. Paterson and H. T. Blackhurst.

"Fertilizer Trials on Irrigated Wheat in the Panhandle of Texas," Agr. Exp. Sta., Tex. A. & M. College, College Station, Tex., Prog. Rpt. 1767, March 1955, K. B. Porter.

"Effect of Renovation and Fertilizer on Bermudagrass Pasture," Agr. Exp. Sta., Tex. A. & M. College, College Station, Tex., Prog. Rpt. 1777, April 1955, E. D. Cook and W. R. Parmer.

"Grain Sorghum Fertilizer Trials, High Plains of Texas, 1954," Agr. Exp. Sta., Tex. A. & M. College, College Station, Tex., Prog. Rpt. 1789, May 1955, E. L. Thaxton, Jr., D. L. Jones, and J. Box.

"The Fertilizer Situation for 1954-1955, Supplemental Report," USDA, Wash., D. C., April 1955.

Soils

"Effect of Rainfall Characteristics and Soil Management Practices on Soil and Water Losses in Northwest Arkansas," Agr. Exp. Sta., Univ. of Ark., Fayetteville, Ark., Bul. 548, Dec. 1954, R. P. Bartholomew, D. A. Hinkle, and K. Engler.

"Soil Survey, Antigonish County, Nova Scotia, Canada," Dept. of Agr., Truro, Nova Scotia, Can., Rpt. 6, Aug. 1954, D. B. Cann and J. D. Hilchey.

"Organization and Operation of Farms in the Claypan Area of Southern Illinois with Special Reference to Wayne County," Agr. Exp. Sta., Univ. of Ill., Urbana, Ill., Bul. 579, Aug. 1954, A. J. Cross and J. E. Wills.

"Will Lime on Acid Soils Help Cotton?" Agr. Exp. Sta., La. State Univ., Baton Rouge, La., Ext. Pub. 1173, Oct. 1954, I. W. Carson.

"Lime Your Soils for Better Crops," Agr. Ext. Serv., Univ. of Mo., Columbia, Mo., Cir. 651, Jan. 1955, O. T. Coleman.

"Soluble Phosphorous in Soils of Ohio," Agr. Exp. Sta., Wooster, Ohio, Res. Cir. 27, April 1955, P. F. Pratt, N. Holowaychuk, and H. H. Morse.

"Water in Oklahoma," Agr. Ext. Serv., Okla. A. & M. College, Stillwater, Okla., Cir. 628, E. Roberts and C. E. Bunch.

"Successful Sprinkler Irrigation," Agr. Ext. Serv., Univ. of Wyo., Laramie, Wyo., Cir. 141, Feb. 1955, G. O. Woodward and R. O. Gilden.

Crops

"Bromegrass in Alaska," Univ. of Alas., Palmer, Alas.

"Arkansas is Our Campus, 1954 Annual Report," Agr. Ext. Serv., Univ. of Ark., Fayetteville, Ark., Cir. 474.

"Cotton Experiments in North East Arkansas During 1954," Agr. Exp. Sta., Univ. of Ark., Fayetteville, Ark., Mimeo. Ser. 30, Jan. 1955, J. O. Ware, B. A. Waddle, C. Hughes, and J. F. Jacks.

"Eastern Arkansas Cotton Variety Tests for 1954," Agr. Exp. Sta., Univ. of Ark., Fayetteville, Ark., Mimeo. Ser. 31, Jan. 1955, J. O. Ware and C. Hughes.

"Annual Report of the Arizona Agricultural Experiment Station for the 6th Year Ending June 30, 1954," Agr. Exp. Sta., Univ. of Ariz., Tucson, Ariz.

"Topworking Citrus and Other Trees," Agr. Ext. Serv., Univ. of Ariz., Tucson, Ariz., Cir. 220, Oct. 1954, H. F. Tate.

"Growing Arizona Cotton," Agr. Ext. Serv., Univ. of Ariz., Tucson, Ariz., Cir. 222, Dec. 1954, C. C. Ellwood.

"Small Grains in Southern Arizona," Agr. Exp. Sta., Univ. of Ariz., Tucson, Ariz., Bul. 260, Dec. 1954, H. P. Cords and A. D. Day.

"78th Annual Report of the Ontario Agricultural College and Experimental Farm, 1953," Dept. of Agr., Ottawa, Ontario, Can.

"Range Experiment Station, Kamloops, B. C., Progress Report 1947-1953," Exp. Farms Serv., Dept. of Agr., Ottawa, Ont., Can., Aug. 1954.

"Dominion Blueberry Substation, Tower Hill, N. B., Progress Report 1949-1953," Exp. Farms Serv., Dept. of Agr., Ottawa, Ont., Can., Nov. 1954.

"Central Experimental Farm, Tobacco Division, Progress Report 1949-1953," Exp. Farms Serv., Dept. of Agr., Ottawa, Ont., Can., March 1955.

"Winter Wheat Improvement in Ontario, Twelfth Annual Report," Dept. of Agr., Ottawa, Ont., Can., April 1955.

"Introducing Wiltmaster, a New Processing Variety of Tomato for Delaware," Agr. Exp. Sta., Univ. of Del., Newark, Del., Bul. 310, Nov. 1954, E. P. Brasher.

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How to Grow Corn Profitably

(*From page* 13)

happen in 4-H Club work just as they do in everything else, just as they will all through life. But I still believed that I could reach that 300-bushel goal. I was determined to try again. Mr. Smith advised me to subsoil my land to increase the water-holding capacity and to try with about 28,000 plants. I subsoiled, broadcast 35 loads of barnyard, ploughed it under, then I applied 750 lbs. of 6-8-8, 400 lbs. of nitrate of soda, and planted Funks G-711 hybrid on 40-inch rows spaced 8 inches in the drill. I sidedressed with 350 lbs. of nitrate of soda when the corn was knee-high. We had another severe drouth. Of course this didn't bother me like it did everyone else in the county because I had a 3-acre pond full of water. I irrigated 7 times and made 218.5 bushels. It was all corn and no glue. This was high in the State. I won $70 in cash, a $25 savings bond, $25 from American Plant Food Journal, and an all expense trip to Chicago to the National 4-H Club Congress. I had about 500 visitors from all over the United States, Alaska, and Hawaii.

I was disappointed 'cause some Yankee farmer from Iowa beat me last year, but he better stay on his toes because I still believe I can make 300 bushels on that acre and I am trying again this year.

I have enjoyed telling you about my corn production and I want to thank Mr. Wilson and Mr. Truitt** for making it possible for me to make this wonderful trip and I thank all of you for being so nice to me. If any of you are ever in Mississippi be sure to come to see me. Thank you.

** Paul T. Truitt, President, American Plant Food Council, Inc.

Plan Before You Fertilize

(*From page* 22)

the same variety may range from 100% true down to nearly 100% off type. Seed of this kind may prove to be an expensive investment in a modern grassland program.

Weed, insect and disease control, proper harvesting and preservation, and efficient utilization of the forage produced are also of paramount importance to obtain maximum returns from properly fertilized pasture and hayland.

Yes, in the Northeast our greatest potential for increased milk and meat profits on the dairy farm is grass—*well-fertilized grass*. But fertilizer alone isn't enough. For our thousands of acres of grassland to pay off best they must be properly limed, established to high quality seed of the best adapted varieties and crops, and then fertilized for maximum economic production.

Residual Fertility Insures Alfalfa After Drouth

(*From page* 11)

available K. This potash application has been very effective and profitable, but has not increased the reserve supply of available potassium in the soil.

Where soils are still acid and yields have been low, so that requirements for and removals of P and K have been less, there has been a greater accumulation of unused nutrients. For instance, on the unlimed (-sPK_2) plot, the P test was 51 and the K test was 200 lbs. per acre.

Long-time Changes

Detailed soil test studies made at Ewing Field in 1945, about 35 years after first treatments began, indicated how long-time build-up and maintenance applications had had considerable effect on changing the available nutrients as well as the acidity. In 1945, the untreated plots had a pH of 4.3, with 20 lbs. or "low" available phosphorus (P)*. The available potassium (K) was 80 lbs. per acre, also in the "low" range.

After 35 years, the complete treatment plot (LPK), with crop residues, limestone, rock phosphate, and potash, had a pH of 6.6, with 200 lbs. or "very high" available P* and 163 lbs. or "high" available K. No excess reserve of available potassium had built up after 35 years from the average application of 50 lbs. K_2O per acre.

LPK plots which had 50 lbs. K_2O per year for the first 18 years, and 100 lbs. K_2O from 1929 to 1945, tested 232 lbs. K, or "very high."

LPK plots originally treated with 50 lbs. K_2O annually until 1928, but no potash thereafter, were down to 63 lbs. available K by 1945.

With only limestone and rock phosphate (LP-) for 35 years, the available

* (By Ill. P_2 Test, including some acid-soluble phosphorus).

TABLE III.—SOIL TESTS FROM SAMPLES TAKEN UNDER GROWING ALFALFA. BROWNSTOWN SOIL EXPERIMENT FIELD, BROWNSTOWN, ILL., MAY 12, 1955.

Plot treatments*	Soil acidity		Lbs. available phosphorus per acre		Lbs. available potassium per acre
	pH	Tons limestone required.	By Ill. P_2 test	By Ill. P_1 test	By Ill. K test.
No treatment	4.6	5	20 (L−)	18	48
L sP K_2	6.2	1+	26 (L)	22	80
−sP K_2	4.6	5	51 (S+)	47	200
L −K_2	6.3	1	18 (L−)	14	140
L sP−	6.3	1	22 (L)	20	40−
L−−	6.3	1	14 (L−)	14	40−
L sP K_1	6.1	2−	22 (L)	21	40−
L rP K_2	6.2	1+	78 (H−)	12	85
L rP K_1	6.2	1+	84 (H)	12	40−

* Treatments: K_1=25 lbs. K_2O per year; K_2=50 lbs. K_2O per year.
sP=superphosphate; rP=rock phosphate.

K was down to 42 lbs. per acre, with 200+ lbs. available P* and a pH of 7.1.

Summary

1. It is encouraging to know that summer-seeded alfalfa can be established quickly, if soils have adequate limestone, phosphate, and potash. (Summer seedings may not be feasible in areas with short growing seasons.)

2. A large mass of roots is developed in the first three months by summer-seeded alfalfa, if properly nourished.

3. Large root systems apparently help alfalfa on certain soils to survive winter hazards such as heaving from intermittent freezing and thawing.

4. It may be a good policy to rely on more summer-seeded alfalfa where rank growth of small grains may injure spring-seeded legumes.

5. Testing soils and applying needed nutrients is an important form of crop "insurance."

A Good Summer Grass Team

(*From page* 18)

Dr. Evers grows Pensacola Bahia on 725 acres of his land and uses it for hay, pasture, silage, and seed production. He grows crimson clover on his Bahia sod in winter. He mows the grass for hay in late summer so as to get good volunteer stands of clover. He plowed up 50 acres of Bahia sod in the spring of 1954 and planted cotton and peanuts on the land. He estimated a 25 per cent increase in yields following sod, in spite of the extremely dry summer. He attributes the increased yield to a better stand of cotton and peanuts than he got on land where no sod was turned. Fall-planted oats were much more vigorous on the sod land in the winter of 1954-55 than on other similar land where no sod had grown.

Ivan Ivey of Houston County, Ala., grows both Coastal Bermuda and Pensacola Bahiagrass. He says, "Coastal is the best grass for good land. I get lots more hay from it than from Bahia. I graze the Coastal and the crimson clover in the spring and then remove the cattle to let the clover make seed. I generally mow Coastal Bermuda grass for hay three times each summer. The Coastal hay is prettier in color than Bahiagrass hay, but the cows eat both. I cut my Bahiagrass hay after seed was harvested. I use Bahia mainly for grazing and Coastal for hay.

"For the lazy man I think Bahia is the best grass. It requires less labor to establish and less attention to grow. On light sandy soils, Bahia is the best grass also. If you are ever in doubt as to whether the land will be cultivated, you want Bahia, as Coastal Bermuda would be hard to handle without a lot of work." Experience of farmers who have used Coastal Bermuda in rotations does not agree fully with Mr. Ivey's opinion, but we are giving his opinion as he expressed it.

Olaff Ivey of Houston County, Ala., has 35 acres of Coastal Bermuda and 50 acres of Pensacola Bahia. In appraising the two grasses, he says, "Coastal Bermuda will produce more beef during the period of maximum growth. Bahia does better with less fertilizer, however, hogs will not eat Bahia as well in summer when it becomes tough. Bahia responds more quickly and gives grazing earlier after cold weather. In the spring when grazing is short, Bahia comes out early and helps fill the gap in grazing. Bahia is best in healing old washed-away land and healing the sore spots. Bahia stands dry weather better and lasts longer into the fall."

The question of which grass is more drought resistant has not been definitely agreed upon. Dr. Burton reported in his latest bulletin that Coastal showed greater drought resistance at Tifton than did Pensacola Bahia. Dr. C. E. Hutton, Superintendent Northwest

Florida Experiment Station at Milton, said, "We have found both grasses to be drought resistant but no attempt has been made to study the degree of such resistance." Several farmers in our areas have expressed the opinion, based entirely on their observations, that Pensacola Bahia was more drought resistant during recent dry summers.

We have observed both Coastal Bermuda and Pensacola Bahiagrass growing under what may be considered average treatment on a large number of farms in our areas. Under these conditions, both were highly resistant to drought.

Use of perennial grass sods in crop rotations is a growing practice in our areas. Most farmer experience in these areas has been with Pensacola Bahiagrass. Coastal Bermuda can be used in rotations since farmers in some areas have used it. Preliminary unpublished results of rotation experiments in progress at Tifton, Georgia, have shown that row-crop production in rotations with Coastal Bermuda is not likely to be limited by the difficulty of handling the grass sod. Dr. Burton reported favorably on his experience in growing corn after Coastal Bermuda sod. In dry seasons, cultivation for row crops has tended to reduce stands of Coastal Bermuda.

Farmers in our areas are not far enough along with their grass rotations to have any crop yields that can be given at this time. The practice of plowing up well-established sod and following with a cultivated crop has created keen interest among farmers. L. A. Hilton, Crestview, Fla., W. B. Anderson and Dr. H. R. Evers of Covington County, Ala., and J. F. Byrd and T. A. Hartzog of Dale County, Ala., are farmers who plant perennial grass in their crop rotations.

Our experience and observations to date convince us that farmers will learn to manage these grasses in rotations so planting costs, after the initial sod is established, will be almost eliminated. There is considerable evidence that Coastal Bermuda can be maintained on the land if cultivation of the row crops is done when the soil is moist.

Pensacola Bahia has come back to good stands in several cases after a row crop was grown. This reestablishment was from surviving clumps of sod and from seedling plants. Farmers in our areas advise sowing additional seed at the last cultivation of a crop following Bahia sod, even though there is seed already in the soil. They believe it is good insurance to sow more seed.

Farmers who have sown Bahiagrass at the last cultivation to establish initial stands advise sowing at a higher rate than you would use in the spring. About 20 pounds of seed per acre usually gives a good stand. Seed may be sown either ahead of the cultivator or behind it. If sown ahead, the final cultivation should be shallow to avoid covering seed too deeply.

Good stands of Bahiagrass have resulted from seeding with crimson clover in the fall. The grass plants have developed satisfactorily after clover seed matured the following spring. Where crimson clover is sown for the first time, we usually get better results during the first half of November than we do from early fall seedings. Bahia seed sown in November germinates in the spring, thus avoiding winter-killing of seedlings. Bahiagrass may be seeded on prepared seedbeds after crimson clover matures seed or after oats are harvested.

J. M. Cain, Tuscaloosa, Ala., first vice-president of the Alabama Association of Soil Conservation District Supervisors, planted Coastal Bermuda grass stolons in 4-foot rows on his crimson clover early in the spring of 1954. Later, the rank growth of crimson clover was mowed, windrowed, baled, and hauled off. The sandy soil was lightly scarified by the scratching of the side-delivery rake and the pickup baler used in the haying operation. This scarification aided in getting the grass runners to take root. No other cultivation was given. Mr. Cain got complete coverage by the end of the

summer. This will be a cheaper method of establishing a stand of Coastal Bermuda, if it works as well on other farms.

Crimson clover is the most popular legume for use in combination with Coastal Bermuda and Bahiagrass. The reseeding varieties of crimson clover volunteer each fall provided grazing is light enough in the spring to permit the plants to make seed. Adequate phosphorus and potash are necessary. Either mowing or grazing in late summer to remove heavy top growth of grass helps to insure a good volunteer stand of clover in the fall. Where pasturage is short in the spring and crimson clover is grazed closely through the seed-producing stage, reseeding in the fall will be needed.

The white clovers can be grown with these grasses on soils where they are adapted. Lupine, annual lespedeza, and Alyce clover have been grown with these grasses, but crimson clover is the most extensively used legume.

Dr. C. E. Hutton, Superintendent, Northwest Florida Experiment Station, Milton, Fla., grew ladino clover with both Coastal Bermuda and Pensacola Bahia. He reports that beef gains were about equal (above 500 pounds per acre) from the two combinations.

Farmers are finding new ways to use these valuable grasses. They are learning through experience that when they use pasture they can do some profitable feeding. Melborn Ivey and his father, E. G. Ivey, of Houston County, Ala., bought 20 steers in November 1953 weighing a total of 7,095 pounds and put them on a Pensacola Bahiagrass, oats, and crimson clover pasture. They sold these steers November 26, 1954, when they weighed 16,925 pounds.

From October 8 until November 26, 1954, these steers were fed 1,640 pounds of ground snapped corn, 1,470 pounds of cottonseed meal, 5,000 pounds of molasses, 4,200 pounds of peanut hay, and 970 pounds of mineral mixture. The total cost of feed, mineral mixture, purchase price of the steers, commission at sales barn, veterinary fees, and trucking was $1,513.01. The steers sold for $3,091.89 and gave a profit of $1,578.88. It is not possible to separate the gains made on pasture from the total, but it is important that when pasture with some supplemental feeding was used, a good profit was returned.

On Cloverdale Farm, Graceville, Fla., steers on Pensacola Bahiagrass pasture supplemented with 2 pounds of range checkers per day gained 1.87 to 1.95 pounds per day. These gains were made during a 9-month grazing period.

We are often asked the question, "How far north will Pensacola Bahia grow?" Several plantings have been made north of Birmingham and have succeeded. Established sod withstood the severe winter of 1950-51 when extreme cold in late November and again in February tested its cold resistance.

Protection of outlets into which water is emptied is an important problem in our areas. Both Coastal Bermuda and Pensacola Bahia have been used successfully for outlets. Louie Searcy of Ariton, Ala., has outlets protected with Pensacola Bahia sod. D. L. Yarbrough, Prattville, Ala., a Superivisor of the Central Alabama Soil Conservation District, who pioneered with parallel terraces, uses Coastal Bermuda in the outlets.

Some owners of large tracts of timberland pasture cattle in the woods to reduce fire hazard. At certain seasons, grass in their woodland range gets too tough for cattle to do well on it. Dixon Lumber Company, Covington County, Ala., during the past four years has planted 2,500 acres of their open areas and old crop fields to Pensacola Bahiagrass to take their cattle through periods of short range feed.

Individual farmers have planted from 100 to 2,500 acres of perennial grasses for hay, pasture, silage, and for use in rotations with cultivated crops. Acreage of both grasses and the number of farms on which both are being used are rapidly increasing.

On the Milk Route

(*From page* 5)

outcome that she didn't mind the expense of about $45 involved.

In the midst of these worries the cabbage flies appeared with threats to wipe out the vegetables which the milk-route Irishmen seemed to desire. He had 9,000 hills to plaster with fine plaster of Paris. He got himself a fine supply of Chemlsford with some hair sieves to put it on with. He and the boys did the plastering of the cabbages after the cows were milked and while the dew was still on. A sieve half full of plaster was enough for 50 hills, turning the plants snow white. Then came a drenching shower and again the next morning the process was repeated with many aching backs.

IN his year-end comment Woodbury observed that "although farming presents many attractions to those who love nature, those who get into farming for a living will not be likely to find much time for anything but his crops. He is too busy even to think of nature, and the poets have to sing her praises for him."

A cow got sick. The vet didn't know what ailed her. He gave her salts and bored her horns, but she died and he bought another. He disposed of three dry cows and replaced them with others which had recently calved, obtained from the back towns where milk was not sold commercially. The dry cows sold for $50 each as a rule. To replace them, it was necessary to fork out about $20 more. It cost over $100 a year to get replacements.

"My total receipts for milk," quoth Woodbury, "were $2,330 after paying for what I had bought. I charged half of George's time to the milk route, which was little enough." His summary of intake and outgo shows $150 in wages and $104 for his board, $156 for upkeep of the horse, $15 for shoeing, $30 for wagon repairs, $10 for revenue tax, $73 for debt loss, $30 for can depreciation, $35 for same on harness, $5 for milk books, or $608 total expenses.

After paying for milk bought, the net income figured by Woodbury amounted to $1,772. Otherwise his entire farm income, milk plus sale of cabbages, potatoes, onions, currants, cranberries, and hay, was $2,820. From this sum he deducted expenses for rent at $650 a year, help, feed, cows bought, tools, fertilizers, blacksmithing, groceries, clothing, reading matter and pew-rent and minister, a total of $2,226. This left him a wage of $594 for himself and family.

He states that he really earned $926 if the wages to George and other sundries not paid for in cash were reckoned into the whole. "But there were five of us to earn it and we worked hard, so Mary and I did not earn all that money by ourselves." They found some comfort in estimating that living in Boston would have cost them $1,630. To have earned a net gain of $926, they figured that they must have had a total income of $2,556 there—"which was certainly more than I ever had."

HE did pay the children a little to encourage them. To the smaller ones for weeding onions the rate was one cent for a 10-rod row. To each of the boys he gave a bank book with an initial $5 deposit, and to the girl Lina he gave a reward of two music lessons each week at Lowell. The second year he hired one man all the time and an extra hand in hay harvest. He paid him $300 a year and gave the boys a little better deal. Yet his net income return for the second season of late,

cold weather was only about $550.

In the spring of the third year the milk price was cut. The Lowell milkmen never combined and some of them started to lower their prices. As a result Woodbury had to take a drop of a cent per quart which affected his daily profits about a dollar. After an accumulated series of adversities and mishaps, the windup of the third year showed $2,681 in revenue and $2,636 in expenses, or only $45 left.

Dairying failed to earn the income for Woodbury that he had fondly hoped it would. So in desperation he read up on all the Florida literature he could find—and there seemed to be plenty of it even in those days. Then he went on a scouting expedition by himself, sailing from New York for Savannah. He went to several spots of note and finally located a plantation of a sort near Palatka.

On returning he said to Mary, his wife: " I think we shall have unusual cause to be thankful down there, with no winter before us and the trees loaded with oranges just in their prime. And they tell me we can raise bananas there too. We shall have new potatoes and green peas in January. Think of it!"

Like all wives, Mary made many objections to the move but finally said she was willing to go to Florida if her husband thought it was for the best.

Woodbury first went to New York City to arrange for the shipment of seeds and many building and household supplies and while there he talked with Mr. Henderson, seedsman and author of a popular book of the times, "Gardening for Profit." The venture was a partnership this time, a contract made with a certain Mr. W. The family set off on their ship, with George waving a Colt revolver and Fred possessing an imitation Bowie knife. Woodbury observed with deep uneasiness that the boys were "imbibing Southern ideas." They took train at Savannah after paying an extra fee for excess baggage.

To make a long story bearable, the

fever and ague got them. In those days Florida did not maintain its sanitary standards and even the doctor they appealed to for aid was sitting in his bed taking whisky and quinine. The hammock lands of the low areas did not produce well. Much of the glow of the rainbow had faded out—so after a few months of chills and aches, Woodbury returned a sadder and a wiser man to the cold and rigor of his native New England.

His memoirs fail to reveal whether he ventured once more in the complex business of dairying. One of his sons did and suffered a loss from fire, not fully covered in a policy with the Old Mutual of Worcester.

When we of our times glance through pages of such meager living and back-breaking toil so bravely and willingly accepted as the lot of farmers, it startles us with the contrast of modern agriculture. Fellows like Woodbury exist today, anxious to get back onto the sacred land tinged with recollections of their youth. I doubt if many of them would succeed much better than he did unless they had ample capital or credit, and a wealth of background in the art of milk production and marketing.

No organization of dairymen was operating then to increase the sale of their surplus. What there was the "churners" took and sold cheaply in filthy surroundings. Milk was unsafe and easily spoiled. Coarse strainers left visible dirt. Infants seldom cried for it but often cried afterwards, with indigestion and scarlet fever.

It's good for us to see what progress we have made and then vow to make more. If Woodbury were here today what would he say about the milk-vending machines and the dairy desserts sold on every corner? How he would ponder on the power machinery used to manage the dairy herds of today! June Dairy Month meant nothing in his life. But we hope it meant much to you—so have another milk shake and a hunk of aged cheese!

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DISTRIBUTORS

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Requests should be made well in advance and should include information as to group before which the film is to be shown, date of exhibition (alternative dates if possible), and period of loan.

Request bookings from your nearest distributor.

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The following literature on the use of fertilizers in profitable soil and crop management is available for distribution. We shall be glad to send these upon request and in reasonable amounts as long as our supply lasts.

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S-5-40 What is the Matter with Your Soil?
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THE AMERICAN POTASH INSTITUTE

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Asked what he did for recreation when he got to town, one of those long, lean Texas cowboys reluctantly confessed, "I most always go dancin' if there is one."

"Why, nobody'd guess you knew how to dance," the questioner exclaimed in surprise.

"Heck, I can't dance a lick," the cowhand admitted, "but boy I sure like to hold 'em while they do!"

* * *

"How are the roads around here?" he asked.

"Fine," came the native's reply. "We've abolished bad roads in this county."

"Sort of a big job, wasn't it?" asked the motorist.

"Nope," the farmer replied, "wherever the going is especially hard, we don't call it a road, we call it a detour."

* * *

He: "Your roommate likes the way I kissed you last night."

She: "How did she see us?"

He: "She didn't. I showed her."

* * *

The shapely beauty was parading down the beach with her boy friend who had his arm around her. Suddenly a police officer rushed up and said to the girl, "Miss, nude bathing is not permitted on this beach."

Just then the boy took his arm away and sure enough she had a bathing suit on.

The Washington Biological Survey puts metal bands on wild birds to study their migratory habits, recently ordered new bands with different and more detailed wording.

They now read, "Notify fish and wild-life services, Washington, D. C." Formerly the bands said simply, "Wash. Biol. Surv."

Unofficial explanation of the change is that an irate citizen's letter complained: "Sirs, I shot down one of your pet crows and followed instructions. I washed it, biled it, and surved it. It was terrible. Stop fooling the people!"

* * *

"My little boy is very polite," said Brown, jovially. "Only the other night in the bus he pointed out an empty seat to a dear old lady and raced her for it."

* * *

The motorist was about to give up as lost, when he saw an old man approaching. "Hi!" he shouted, "do you know the way to Margate?"

The old man shook his head. "No, I don't."

The motorist drove on slowly. When he had gone about a mile he heard shouts behind him. He stopped and looked around. The old man had been joined by another and they were waving him back. Slowly and painfully he backed his car down the narrow road.

"Well?" he asked.

"This is my friend George," said the old man. "He doesn't know either."

Cauliflower: left, boron treated; right, brown curd with boron deficiency

Alfalfa yellows and rosetting due to boron deficiency

Apples with external cork cracks, necrotic areas and dwarfed

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Tobacco with die-back of terminal bud rolling of upper leaves

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