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WITH PLANT FOOD

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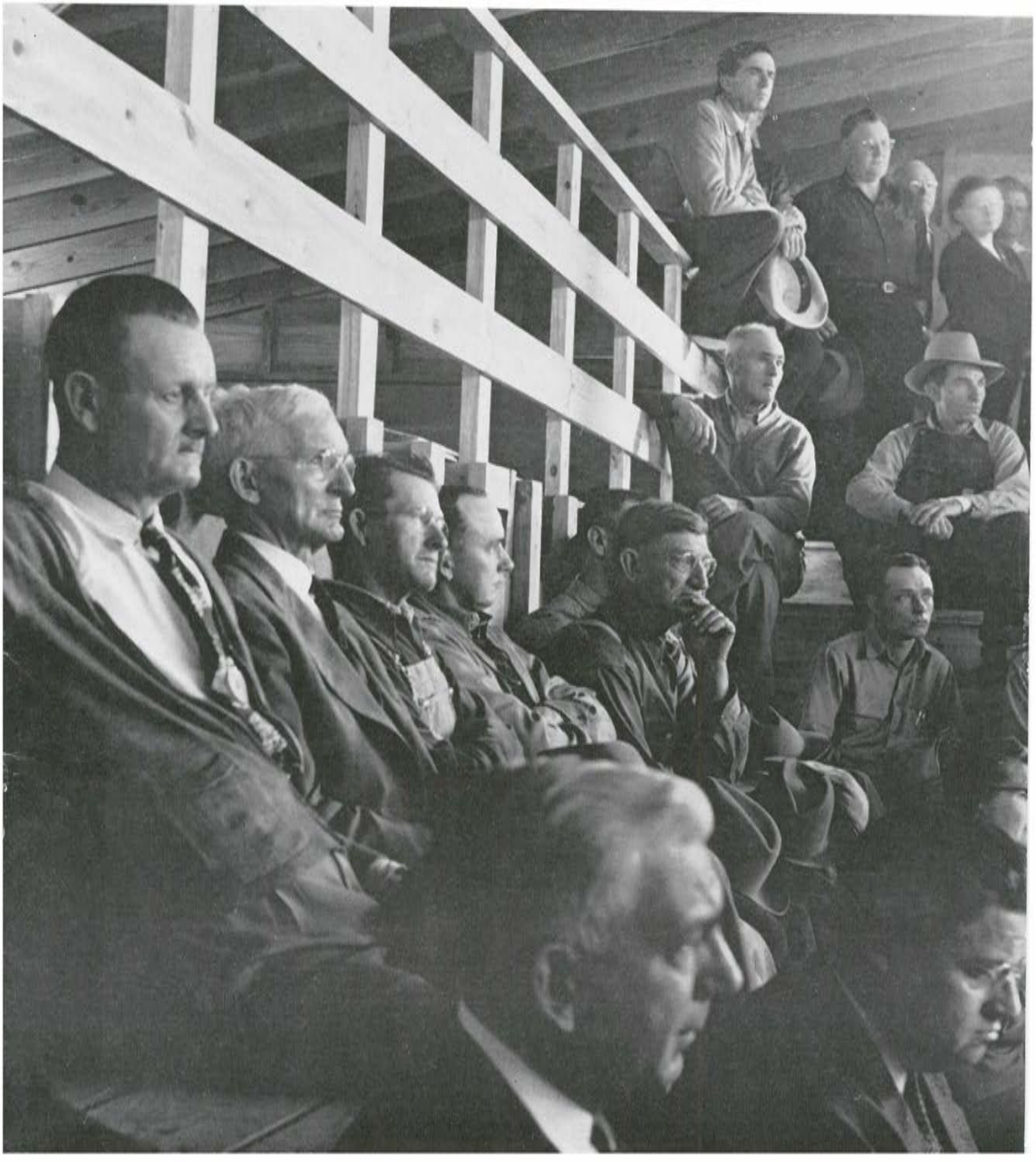

Better Crops
WITH PLANT FOOD

The Whole Truth—Not Selected Truth
$1.00 for 6 Issues, 20¢ Per Copy

Santford Martin, Editor
Selma Bushman, Assistant Editor
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Published bimonthly by
The American Potash Institute Inc.
1102 16th Street, N.W.
Washington 6, D. C.

Washington Staff:
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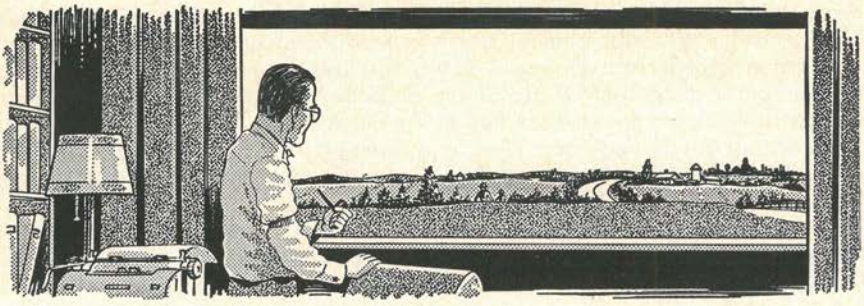
Vol. XLVI Washington, D. C. No. 4

CONTENTS

ON THE COVER

. . . the face of the American farmer reflects, perhaps, the purest image of human freedom. Freedoms Foundation winner Ralph Mills took this picture a few years ago and named it "Assembly of Free Men". No better media could be used to call your attention to our special section on winter meeting aids now available to you. For easy order, turn to pages 10-23.



Whether fed or confed . . .

COURAGE AND DEVOTION NEVER TOOK SIDES

By Jeff McDermid
(Elwood R. McIntyre)

AS A "kid comrade" or mascot of Rousseau Post No. 14, Grand Army of the Republic over 65 years ago I helped them lay memorial flowers on cemetery mounds where brothers of the eternal bivouac lay in peaceful armistice. I even marched on Decoration Day with my Father, right behind Comrade Blowers and the bright and tasseled Post colors. They are now folded away in the county archives as part of the long laden shelves of military history.

Anything these old boys stood for I stood for. Raised with the traditions and over-told tales of the G. A. R. campfires, I believed explicitly in all the glories and miseries common to the vets of the vanished 60's—1860's, that is. I felt a degree above many of the kids in our neck of the woods who had no near relations in the Civil War.

Although the veterans were often inconsistent, they never spoiled my faith and patriotism. For example, when Congress debated a bill to return the captured Confederate battle flags back to the gray-clad warriors of the Lost Cause, our elderly boys in blue raised a wrathy rumpus. But nobody complained when our G. A. R. entertained the famous Virginia spy, Belle Boyd, referred to as the Secesh Cleopatra. They marched in together to hear her evening lecture at the old opera house on Cook street—having sold a few hundred tickets of admission at 75 cents apiece around town.

It was a nice way to honor one who was a party to the "late unpleasantness." She was a woman spy in the service of Stonewall Jackson, a "fearless female" of energy and courage never reconciled.

It was noteworthy because the sequel to her life story was her death and burial at Kilbourh (Wisconsin Dells) in August 1900. It was just one more lecture and 26 miles away from her stage appearance that same week before our G. A. R. Little did our boys anticipate this sudden tragic end to Belle Boyd in our neighboring town.

The dim devotion of the century's turning still has its moments of reverence and glory. Every Memorial Day a special ceremony takes place at Belle Boyd's

grave, marked with a granite headstone by a local admirer of her bravery and achievement, worth tribute under any respected American flag.

About a decade ago Governor Battle of Virginia sent the Wisconsin Dells Legion Post a state flag for use at the Belle Boyd grave. In 1962, Governor Nelson of Wisconsin sent a state flag to the Elliott Grays Chapter of the United Daughters of the Confederacy. Virginia accepted it to use in honoring the fallen comrades of the 36th Wisconsin Infantry who lost their lives in the sanguinary battles around Richmond in 1863.

Belle's lecture opened with anecdotes about her term in the Old Capitol Prison in Washington, where the Supreme Court building stands today. The prison warden was William P. Wood, who was particularly lenient to women prisoners, when there were any. Belle told how Detective Lafayette Baker and Wood asked her to confess and take the oath of allegiance.

She saucily refused, saying: "If I ever sign such a devilish document, may my arm be paralyzed. If it is a crime to love the South and its people, then I am a criminal. Please leave the room!"

The customary church announcements by Wood on Sundays were also in the lecture. Belle said he shouted: "All who want to hear the Lord God preached according to Jeff Davis, go down to the yard. All who want the scriptures preached according to Abe Lincoln, go into Room 116 and wait." In 1867 Belle's book of adventure appeared—"In Camp and Prison."

To Belle—who was born in 1844 and whose father was an orderly for Gen. Garnett—spying was an exciting and provocative game. Her home, in the Shenandoah Valley near Harper's Ferry, was raided early in the war. The raiders ordered the "Rebel flag" taken down and the U. S. banner displayed on July 4. Belle disagreed. In the struggle she shot and killed one of the federals but was soon set free.

After the war Belle went on the stage to do standard parts in the popular drama of the times. It is not likely she was ever much of an actress. She was married twice—first to a Union naval officer whom she met and converted to the Confederate cause during a mission to England, then to a talented but penniless character actor named Nat R. High.

Following memory's faded rays back to my boyhood summer of 1900, I can still see the parties to the lecture negotiations at our home. Father was Commander of the Post. Nat High solicited the aid of our Post to boost the lecture. Mother brought out her ginger cookies and fresh lemonade. We sat on the screened-in back porch. Belle Boyd left all the details to her husband, never coming near the discussion.

How Mr. High ever managed advance arrangements and did monologues to brighten up the lecture is still a mystery. He was the first real actor I had ever seen. Dark and slight, he had a shy and reserved manner, a good voice and a friendly but apprehensive smile. When Belle died, Nat High's main source of precarious income was gone.

Belle made her social debut in Washington in 1860. She was fair-haired with blue eyes and a nice figure. Her first chance as an army courier came from Turner Ashby, cavalry scout. In later years she was called "the beautiful heroine of Virginia." In my mind's eye Belle Boyd at 56 was no longer pretty, but she had character and courage beyond usual measure. That was her enduring quality.

Probably her big drama occurred when she left Winchester afoot and through rifle fire to get tidings to General Jackson in the Valley campaign.

In one of her lecture notations, she remarked:

"Hope, fear, the love of life and a desire to serve my native land filled my

breast with more than feminine daring and lent extra power to my limbs to carry me safe to Stonewall and my comrades."

And these notes are just one more recollection of mine of the proud years of the old Grand Army and their brethren of the Confederacy. They have since all answered the call to "Fall In!" by the Great Officer of the Day. He is leading the old cohorts past the golden throne. But before the last roll-call, these old soldiers of both sides—the Men of Grant and the Men of Lee—were deeply proud to be Americans. THE END

TRY IT WITHOUT HIM

THE next time your city businessman friend complains about farmers and their "farm program", you might quote some figures to him—something like these:

Farmers are important customers of business and industry. Each year, farmers spend:

$2.5 billion for new tractors and other motor vehicles, machinery and equipment.

$3.5 billion for fuel, lubricants, and maintenance of machinery and motor vehicles.

$1.5 billion for fertilizer and lime.

Products bought annually by American farmers contain 320 million pounds of rubber—enough to put tires on nearly 6 million automobiles.

Farmers use 27 billion kilowatt-hours of electricity each year—more than Washington, D. C., Baltimore, Chicago, Boston, Detroit, and Houston combined.

These and other farm purchases create millions of jobs that help America grow.

—*Staple Cotton Review*

FARMERS WHO ADJUST CAN COMPETE

By
Frederick A. Hughes
Farm Management Specialist

OUR agricultural surpluses and resulting low prices have prompted many people to express concern for farmers.

Most economists agree that some resources must be taken out of agriculture if satisfactory adjustments are to be realized.

Economists also agree on two major income problems in agriculture:

1 The commercial farmers whose production is outpacing demand, causing lowered prices and thus lowered income.

2 The smaller farmer who lacks the production resources to realize a good income under any price level.

Our agricultural production now comes and will continue to come primarily from the commercial farmers. And in the future, there will be fewer but larger farms, only the operators who have the managerial ability and are willing to make adjustments.

The Unit Demonstration Farm program conducted by Pennsylvania's Cooperative Extension Service has demonstrated to farmers that profitable adjustments can be made.

Initiated in 1956, this program assigned specialists from various fields to work as a team with the county agent. The job was to stimulate cooperating farmers to follow certain practices recommended by the Cooperative Extension Service: (1) *Complete farm account records,* (2) *a lime and fertilizer program based on soil tests,* (3) *Dairy Herd Improvement Association,* (4) *forage analysis,* (5) *insect and weed spray programs, plus others.*

. . . BY BUILDING

PENN PROGRAM SHOWS

Pennsylvania State University

Progress on 30 farms in three counties from 1956 to 1960 was studied to learn: (1) Extent of adoption of practices, (2) change in soil fertility levels, (3) physical changes in the organization of the farms, (4) changes in production levels, (5) the effect of adjustments on financial returns.

Fertility Levels Improve

With soil testing came a definite increase in lime and fertilizer use on these farms. Average buildup in fertility levels was most striking for potassium.

For example, from 1956 to 1960 soil tests showed potassium increasing 83 lbs. per acre (from 68 to 151 lbs.) on Crawford County farms, 66 lbs. per acre (from 99 to 185 lbs.) on Fayette County farms, and 57 lbs. per acre (from 95 to 172 lbs.) on Adams County farms. Table 1 shows this.

Phosphorous levels showed the greatest change in Fayette County, increasing from about 7 lbs. per acre average in 1956 to 21 lbs. in 1960. The increase was 6 lbs. in Crawford County and 5 lbs. in Adams County. High clay and organic matter soils accounted for a slower phosphorous buildup in Crawford and Adams Counties.

The pH level of the soils changed very little during the period, although all farmers were required to apply

SOIL FERTILITY

Up to 83 pounds *more* potassium per acre

CROP YIELDS

37 more bushels of corn

Over 1 *more* ton of hay per acre

MILK PRODUCTION

1,500 *more* pounds per cow

93,000 *more* pounds per farm

NET INCOME

$3,100 *more* profit on larger farms

$660 *more* profit on smaller farms

TABLE 1. AVERAGE SOIL TEST VALUES ON UNIT DEMONSTRATION FARMS 1956–60, INCLUSIVE
(Note Striking Fertility Buildup for Potassium)

COUNTY	P.H. 1956	'57	'58	'59	'60	Phosphorous* Lbs./Acre 1956	'57	'58	'59	'60	INCREASE	Potassium* Lbs./Acre 1956	'57	'58	'59	'60	INCREASE
Adams		6.7	6.9	6.7	6.9		20.4	20.5	31.6	25.6	5.2 lbs.		94.9	120.1	199.7	172.4	57.5 lbs.
Fayette	6.8	6.6	6.6	6.6	6.6	7.4	15.8	12.5	20.1	21.1	13.7 lbs.	99.1	130.7	138.3	190.7	184.6	65.5 lbs.
Crawford	6.2	6.0	6.3	6.2	6.4	3.2	4.6	6.2	9.7	9.2	6.0 lbs.	68.0	73.3	91.2	18.6	151.2	83.2 lbs.

* Morgan System.

lime according to soil test results. The average pH level of the soils in Adams and Fayette Counties was adequate at the outset. So during the period only liming materials necessary to maintain this level were applied.

The average pH on Crawford County farms was lower than desired at the outset. Although liming materials necessary to raise the pH levels were applied, response has been slow. As with phosphorous, slow pH rise was due to high base exchange soils.

Yields Increase

There was a shift by the farmers in crops grown during the period. More farmers were growing corn for grain and silage in 1960 than in 1956, while straight timothy stands had decreased.

Definite increases in alfalfa, trefoil, and mixed hays were apparent. Cutting dates for hay crops were advanced two weeks, permitting a third and fourth cutting of hay on farms that formerly made only two cuttings.

Improved soil fertility, better varieties, earlier cutting dates, and other recommended crop practices resulted in greatly increased yields. Bushels of shelled corn per acre increased from 57 bushels to 94 bushels. Tables 2 and 3 show these trends in yields and cutting dates.

The yield increase of corn on Crawford County farms was *from 45 bushels to 104 bushels*—quite astounding to local people who know this is 90-day corn country. In fact, most people considered husking corn an unprofitable crop because of the short season.

Building—Equipment Changes

As crop yields increased, adjustments had to be made on buildings and equipment. Fifteen of the 30 farmers built new silos, 10 added to their dairy barns to house more cows, and 11 made other building changes.

Additional forage production and the desire to make high quality forage stimulated 75% of the farmers to buy hay conditioners and 51% to buy forage harvesters. About 50% of the

TABLE 2. AVERAGE PER ACRE YIELDS OF SPECIFIED CROPS ON UNIT DEMONSTRATION FARMS, 1957–1960.

CROPS	1957	1958	1959	1960	INCREASE
Corn	56.9	78.2	85.6	94.0	37.1 Bu.
Oats	54.9	54.1	54.4	56.8	1.9 Bu.
Wheat	29.1	34.4	27.2	33.6	4.5 Bu.
Hay	2.1	2.8	3.3	3.3	1.2 tons

TABLE 3. AVERAGE CUTTING DATES OF FORAGE FOR COOPERATORS IN 1957 AND 1960.

Cutting	Average Cutting Date	Number of Farms	Average Cutting Date	Number of Farms
	1957		1960	
First	6/13	32	6/ 1	33
Second	8/11	24	7/23	28
Third	9/ 1	5	8/26	21
Fourth	—	0	9/24	5

cooperators bought bulk milk tanks and bulk feed bins.

Many of these new purchases were not made until 1960 when incomes were considerably increased.

Changes in the home also resulted, with 57% remodeling and 33% adding new rooms to their houses.

Livestock Improves

Improvements in livestock management was evident on most of the farms. Milk production per cow increased over 1500 lbs. and total milk production per farm more than 93,000 lbs.

Farmers credited much of this increase to more and better feed—especially during summer when more supplemental feeding as green chop or dry forage became a common practice.

The extra feed from the improved soil fertility program made this possible.

The average number of dairy cows increased by only 5 head, indicating the cooperator's desire to *improve what he has before expanding for the sake of getting big.*

Credit Easier to Obtain

Many of the adjustments—such as additional fertilizer, new buildings, and new machines—required additional capital by the farmers.

Bankers served on the original committees to pick the cooperators. And watching the strides of these farms, they were not as reluctant to loan funds to farmers who followed recommendations and showed progress.

As a result of their records, fertilizer use, and improved management practices, cooperators found it much easier to obtain necessary credit.

TABLE 4. MILK PRODUCTION, NO. OF COWS AND HEIFERS ON PENNSYLVANIA DEMONSTRATION FARMS, 1957–1960.

	1957[a]	1958	1959	1960	INCREASE
Average pounds of milk sold per farm	227,104	267,902	284,524	319,527	92,423 lbs.
Average milk per cow	8,774	9,368	9,701	10,267	1,493 lbs.
Average No. dairy cows	25.9	28.3	29.3	31.1	5.2 cows
Average No. dairy heifers	17.3	16.9	18.1	20.2	2.9 heifers

[a]Adams County not included.

TABLE 5. FINANCIAL CHANGES ON THE DEMONSTRATION FARMS—FROM 1957 TO 1960.

	Under Two Men		Two Men and Over	
	1957	1960	1957	1960
Total Receipts	$10,379.85	$14,087.05	$16,669.31	$22,950.49
Variable Expenses	6,340.20	9,606.75	11,428,80	15,022.11
Fixed Expenses	1,569.90	2,601.93	3,019.95	3,931.41
Total Expenses	7,910.10	12,208.68	14,448.75	18,953.52
CHANGES IN:				
Livestock Inventory	389.73	1,307.68	1,347.38	2,194.75
Feed and Supply Inventory	205.43	540.43	640.19	1,162.06
NET FARM INCOME	$ 3,064.96	3,726.48	4,208.13	7,353.78
Family Labor Income	1,758.99	2,385.34	1,893.28	4,823.65

Financial

The financial records were divided into two groups in the study: (1) Farms with less than 2 men, (2) farms with over 2 men.

Net farm income increased about $660 on smaller farms, over $3,100 on larger farms. It was interesting to observe that incomes dropped in 1959 compared to 1958. Table 5 shows this.

Part of this decrease was caused by weather conditions, but major adjustments underway on some farms also contributed. Increased costs from new investments occurred before receipts could be increased. Average milk prices remained about the same during the period.

In situations where prices are low and production efficiency poor, the larger farms stand to lose more money than smaller farms—but under good management they can be expected to return a greater income.

In many farm situations, production efficiency can be improved with a minimum of new investments—making receipts increase faster than expenses. When major adjustments are made, increased costs are often greater than receipts.

Major emphasis on the demonstration farms has been devoted to *improving existing resources rather than adding more resources.* When major adjustments were contemplated, budgets were used to determine how profitable they were.

From actual experience, the program cooperators agreed on two principles:

1 That they must constantly improve the management of all their resources to compete in modern agriculture.

2 That they must keep financial and production records for making sound decisions on future adjustments.

And they proved that excellently managed farms do not need to be excessively large to return a decent profit. **THE END**

FOR WINTER MEETING

AIDS

SEE PAGES 10-23

WINTER MEETING AIDS

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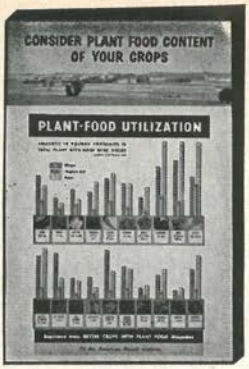

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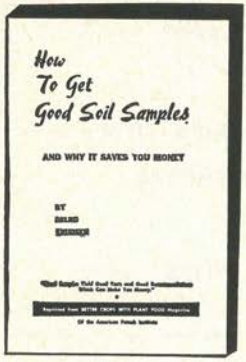

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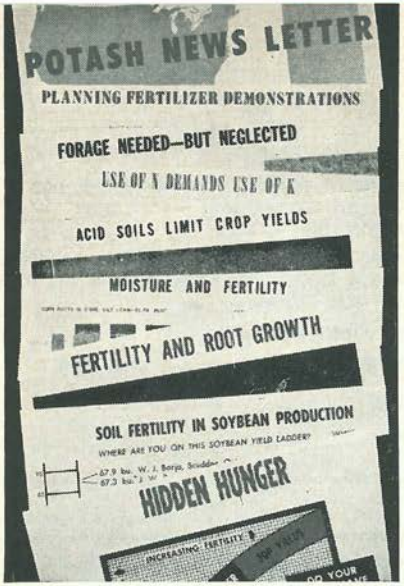

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GROWING ALFALFA SUCCESSFULLY

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Showing the value and uses of alfalfa . . . soil and nutrient requirements . . . cultural methods . . . latest management techniques . . . with special time-lapse photography to show how the plant feeds and grows.

THE TWO SHORTS BELOW ARE CONDENSED VERSIONS OF THE MASTER MOVIE ABOVE:

ALFALFA, QUEEN OF FORAGES

16MM, 368 FEET, 10 MINUTES RUNNING TIME

GOOD ALFALFA REQUIRES GOOD FERTILITY

16MM, 365 FEET, 10 MINUTES RUNNING TIME

ORDER COUPON BELOW

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I would like to book the movie checked below for the date indicated:

	Date	Alternate
Growing Alfalfa Successfully 16mm 975 Ft. 25 Mins.	_____	_____
Alfalfa, Queen of Forages (Extract) 16mm 368 Ft. 10 Mins.	_____	_____
Good Alfalfa Requires Good Fertility (Extract) 16mm 365 Ft. 10 Mins.	_____	_____

Name _____ **Address** _____

Organization _____ **Signed** _____

See opposite side for color slides.

ANNOUNCING:

TWO NEW SLIDE SETS

1 FERTILIZING BOTH SMALL GRAINS AND LEGUME SEEDINGS ($4.00) 40 SLIDES AND SCRIPT.

Built Around These Points:

1—High yields of quality grain important.
2—Are you using the best adapted variety?
3—Nutrient removal must be considered.
4—Fertility affects early growth, survival and yield of wheat and seedings.
5—Fertility affects survival and growth of legume year after seeding.
6—Fertilizer placement.
7—Alternate methods of seeding legumes.
8—Study the growing plants.

2 MAKING FORAGE FERTILIZATION PAY ($4.50) 46 SLIDES AND SCRIPT.

Built Around These Points:

1—The advantages of home-grown forages.
2—How high yields plus quality *can* equal top profits.
3—Know *your* limiting factor—to succeed.
4—Why liming is a "first."
5—Why you cannot afford to overlook the fertilizer bargain.
6—While watching your K needs, don't forget *balance*.
7—It pays to use legumes whenever you can.
8—Official recommendations: Proven route to a profitable manager.

Please send me:

Slide Set 1—(Fertilizing Small Grains and Legume Seedings)

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ON SOILS AND CROPS AS LONG AS SUPPLIES LAST

	Serial Number	Number Desired
Balanced Nutrition Improves Winter Wheat Root Survival	J-3-53	_____
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Potash Pays on Forage in New England	BB-6-54	_____
Shortages of Potash Limit Grape Yields	I-2-55	_____
Soybean Production in the Southern States	L-3-55	_____
Residual Fertility Insures Alfalfa After Drouth	BB-8-55	_____
Fertilizing Alfalfa in Kentucky	X-12-56	_____
Growing Azaleas and Camellias	N-5-57	_____
Row & Broadcast Potassium at Work on Corn	A-1-62	_____
Blueprints for Action in Soil Fertility	B-3-62	_____
How Fertility Level & Balance Can Affect Corn Production	C-3-62	_____
Role of Fertilization on Corn Diseases	D-3-62	_____
Growing Alfalfa Successfully	B-5-60	_____
Potassium in Row Fertilizer for Corn	A-3-61	_____
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Limiting Factors in Crop Production_____

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K-10-61

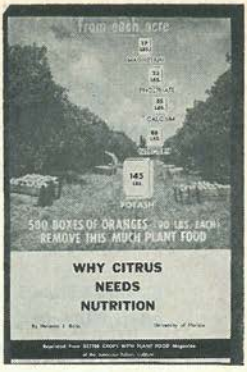
ON APPLES: Showing how apple nutrition can differ by region, often by orchard, sometimes by individual trees.

L-10-61

ON PEACHES: Showing why growers have turned to complete fertilizer treatment and three good weapons for fighting deficiency.

M-10-61

ON WESTERN ORCHARDS: Showing the role of NPK and certain minor elements, as well as a guide to potash hunger symptoms and leaf sampling schedule.



N-10-61

ON CITRUS: Showing the heavy drain on natural fertility and the importance of attaining and maintaining certain nutritional levels in citrus groves.

Q-10-61

ON PECANS: Showing why pecans demand liberal fertility and some basic keys to profitable production.

R-10-61

ON CHERRIES: Showing how balanced fertility increases not only yield, but also terminal growth, important to the fruit-producing capacity of a tree.

S-10-61

ON PRINCIPLES: Showing why success depends on right kind applied at right time in right place in right amounts—and 7 ways orchards trees differ from row crops.

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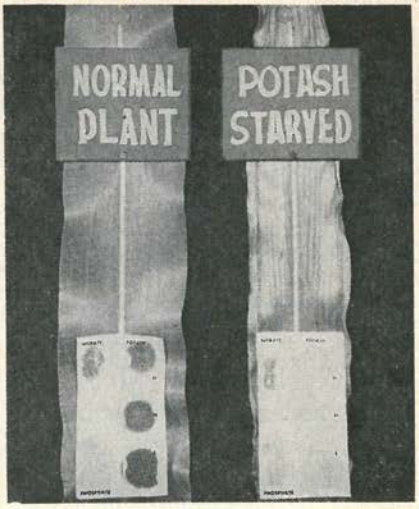
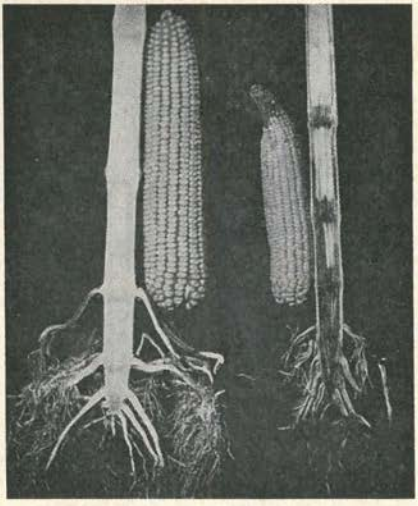
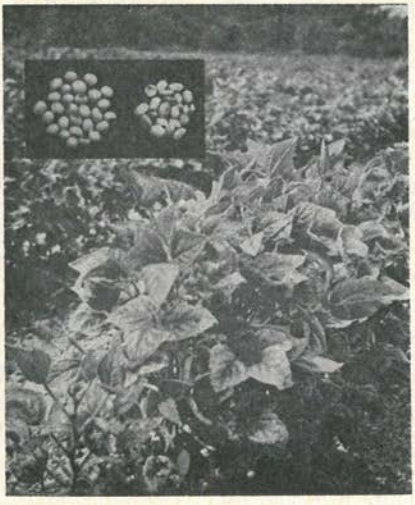
DEFICIENCY FACT SHEET...





...ON CORN



...ON SOYBEANS

Full color fact sheet . . . 9 x 12" . . . with large pictures on each side *showing* potash hunger signs on corn on one side and soybeans on the other . . . with brief text on prevention. Easy for classroom use . . . for office walls . . . for meeting distributions. Order below.

CORN & SOYBEAN FACT SHEET—1-62 **2¢ per copy**
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■ For fertilizer firms that like to identify themselves with sound educational messages.

■ For official agricultural advisers who like to tie their local newspaper report to an illustrated theme now and then.

Space at bottom of each mat for firm or official agency name.

NEWSPAPER MATS

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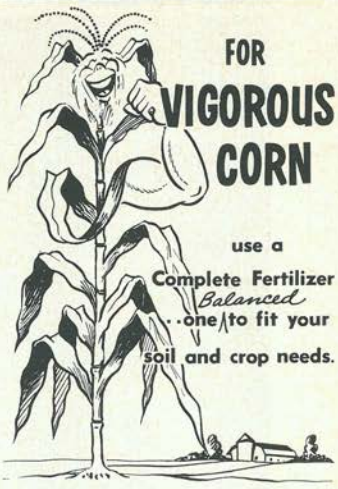

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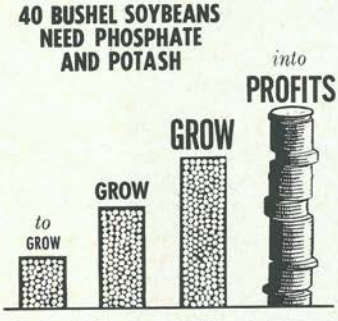

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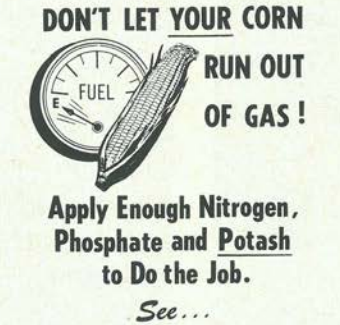

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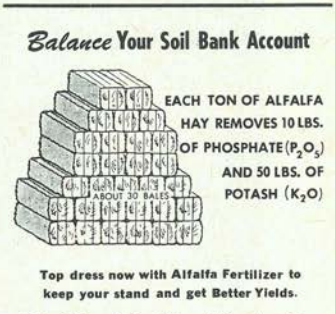

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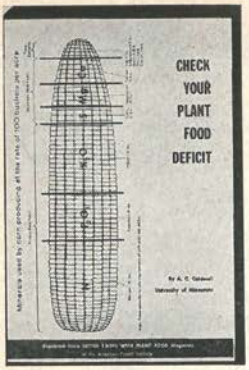
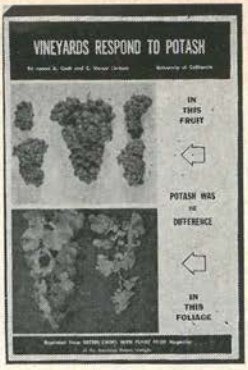


D-3-61

ON PLANT FOOD REMOVAL: gives production figures for corn, soybeans, oats, wheat, barley, alfalfa and other haycrops in a good crop year. Are your soils bankrupt?



F-6-61

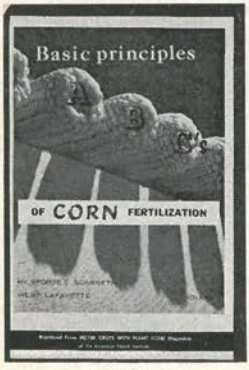
ON CALIFORNIA VINEYARDS: showing response to potash—in unusual vine improvement, petiole analyses, marked growth, yield, and quality, higher sugar-acid levels.

H-10-61

ON TURF GRASSES: establishing and maintaining lawns, greens and fairways with suggested fertilizer ratios and analyses.

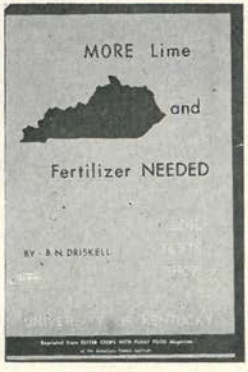
I-10-61

ON JOHNSONGRASS FOR HAY: considered a stubborn weed in some areas, farmers in the Black Prairie Belt of Mississippi have proved it a top hay crop. Proper fertilization and management is outlined.



J-10-61

ON CORN FERTILIZATION: some basic principles for a corn fertilization program.



O-10-61

ON NEED FOR MORE LIME AND FERTILIZER: shown by soil tests on corn, alfalfa, and pastures in Kentucky—with explanation of fertility trends and suggestions on nutrient needs.

T-10-61

ON PRESENTING EXCELLENT PAPERS: choosing subject matter, on quality presentation, along with some simple rules on slides.

U-12-61

ON CORN PLANTING: 50 bushels of corn per man hour of labor realized by Michigan farmer. How he did it is explained in this reprint.

DIVERSE SUBJECT REPRINTS

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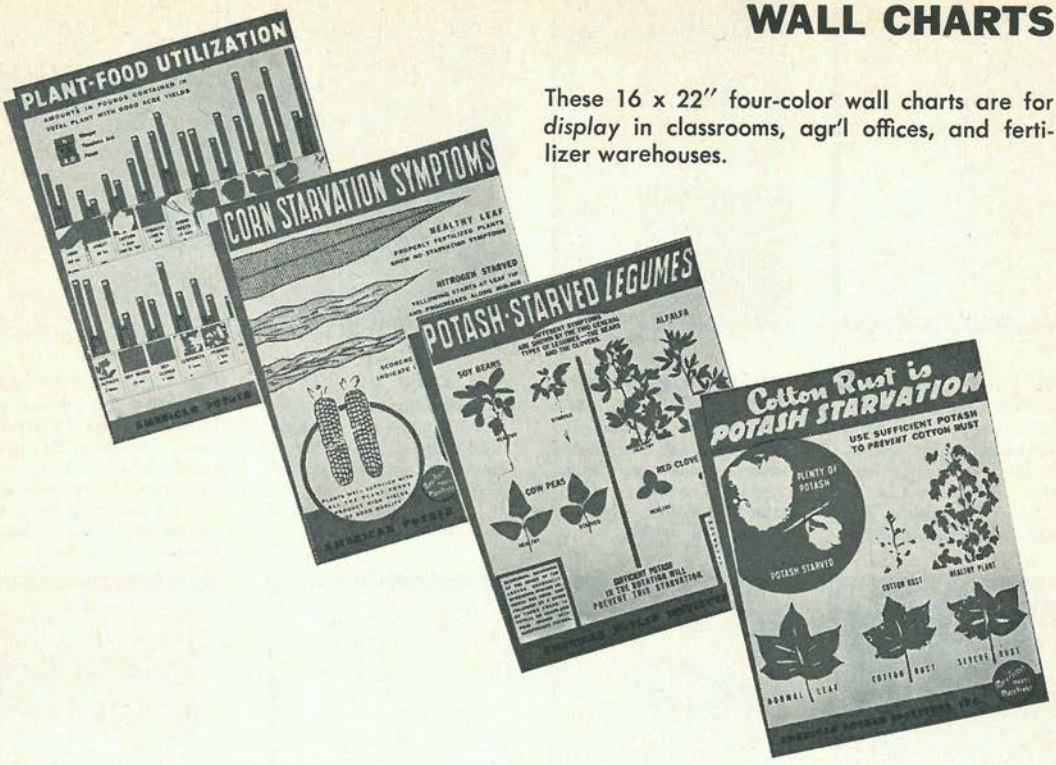
WALL CHARTS



These 16 x 22″ four-color wall charts are for *display* in classrooms, agr'l offices, and fertilizer warehouses.

Please send — **Number desired**

- ☐ **Plant-Food Utilization**—showing the nitrogen, phosphate, and potash contained in good yields of 20 important representative crops. _____
- ☐ **Corn Starvation Symptoms**—showing a healthy leaf, a nitrogen-starved leaf, a potash-starved leaf, ears from well-fed plants, and chaffy ears from potash-hungry plants. _____
- ☐ **Potash-Starved Legumes**—showing starvation signs in alfalfa, red clover, soybeans, and cowpeas. _____
- ☐ **Cotton Rust is Potash Starvation**—showing healthy plants, cotton rust plants, severe rust plants, bolls from adequate plant food, and bolls starved for plant food. _____

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PERSONAL SERVICES

. . . FOR AGRICULTURAL INDUSTRY

Through the years, American Potash Institute staff members have worked closely with agricultural industry—from fertilizer manufacturers to local farmers.

They often consult with individual fertilizer companies on problems unique to their region. They cooperate with farm leaders on local demonstrations—and frequently speak on programs set up by these leaders and industrial firms in the area.

To serve agriculture more fully, the 15 Institute agronomists work annually with many local, state, and national groups supporting soil improvement practices—from professional agricultural societies to commercial associations.

Service with these groups keeps the staff up to date on agricultural problems in their regions.

THERE'S A POTASH MAN NEAR YOU . . . CALL HIM!

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President

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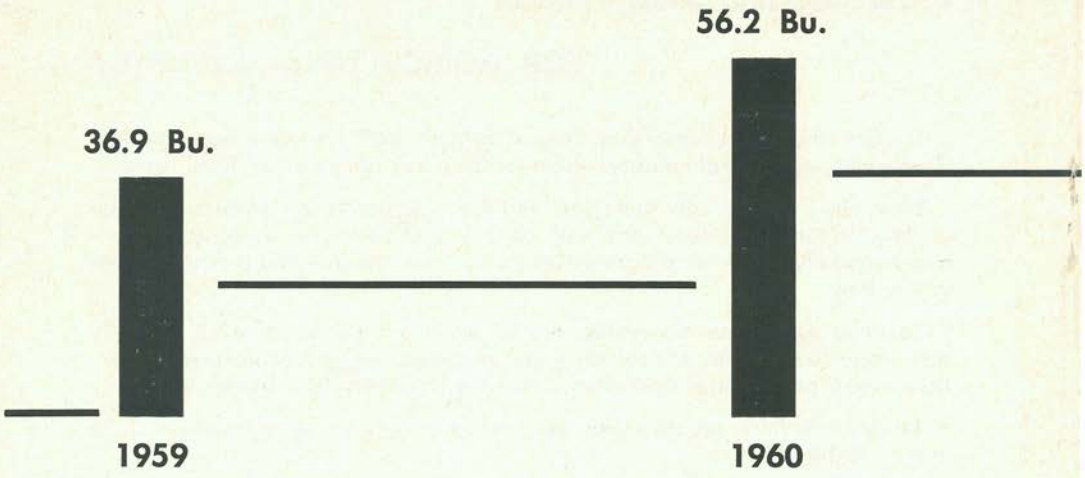
CORN YIELD INCREASES FROM FERTILIZER



4-H TELLS THE FERTILIZER S

It takes a continuous, long-time program to get the most from your fertilizer—and no one knows that better than the winner of Missouri's 1961 4-H Soil Fertility Achievement Award, Wayne Hartman.

The yields forming a stairway to more profits, shown above, are not the total corn yields the Missouri youth realized in his state's 4-H Soil Fertility Project—but just the *increases per acre* he realized from using fertilizer.

Wayne's story is worth telling for two reasons: (1) To share his technique for getting such increases, (2) to blueprint a state 4-H Project which we believe is unique in the United States.

Wayne's Experience

Wayne Hartman is from Nodaway County. As all 4-H members in the Fertility Project, his total project area covered 5½ acres, 4½ acres fertilized and one acre not fertilized. The unfertilized acre, or check strip, was maintained so Wayne could compare it with the area he fertilized.

Wayne's soil tested average in organic matter and potassium, high in phosphorus, and fair in lime since the pH was 6.3 with high calcium.

So, his fertilizer program consisted of 90+30+90 plowed down each of the first two years, followed by 75 lbs. of nitrogen sidedressed the third year.

And here is what happene

CORN YIELDS AND I

Area	1959
Treatment	111.9 b
No-treatment	75.0
Increases from fertilizer	36.9

From these results, Wayn (after all costs) from his part Included in this total profit w —or, explained another way, paid for the fertilizer, but al

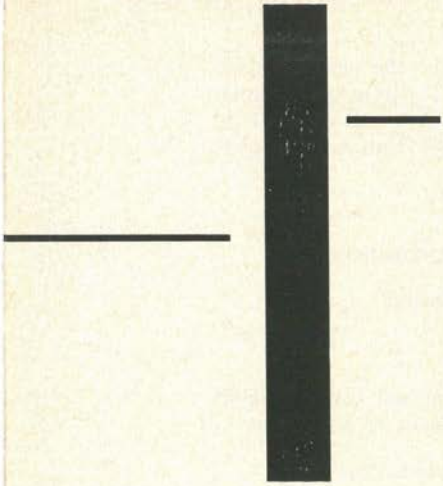
A Unique

Perhaps that is why the S Council of Missouri each ye Fertility Project in these way

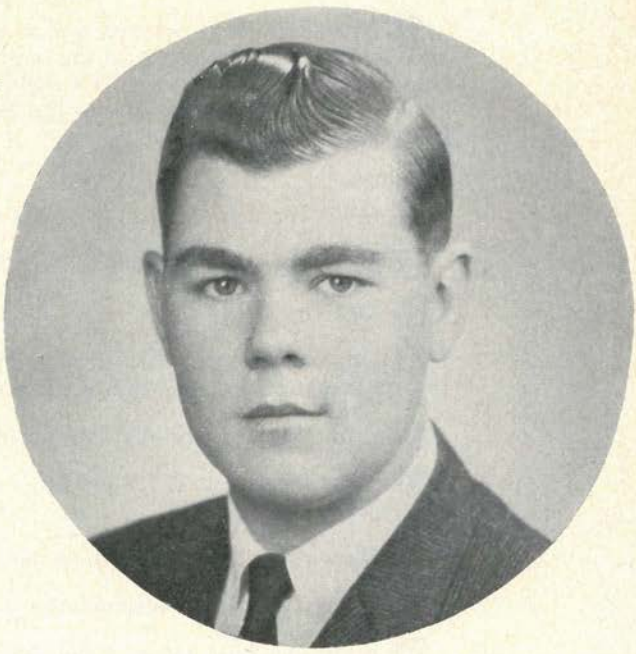
1 Awards 4 gold medals ment Winners and 4-H bolo

73.3 Bu.

. . . OR $278.10 PROFIT!



1961



. . . FOR 4-H YOUTH

WAYNE HARTMAN

STORY!

d:

NCREASES COMPARED

	1960	1961
u.	110.6 bu.	124.2 bu.
	54.4	50.9
	56.2	73.3

realized a $734.18 *total profit* of the crop for the three years. as $278.10 from using fertilizer the increase in yield not only so left Wayne $278.10 to boot.

4-H Project

il Fertility and Plant Nutrition ır supports the state's 4-H Soil :

in each county to the Achieve- es to all blue ribbon demonstrators of any soils or crops subject at all County Achievement Days.

2 Awards 4-H jackets to blue ribbon demonstrators at the State Achievement Day.

3 Awards gold watches, provided by the American Potash Institute, to state winners in the Soil Fertility Project for both Demonstrations and Achievement.

Last year's Demonstration Award went to Bill Bohnert of Jackson County, and Achievement Award to Wayne Hartman featured here.

Since no other state (to our knowledge) features such a project as part of their 4-H Club Program, we thought you might be interested in the project designed as outlined in Missouri:

Soil Fertility Project

Requirements

1 For older boys to continue at least three consecutive years.

2 To include a minimum of three acres of crop land. (Preferably five acres or more).

3 Grow the crops selected and make the normal landlord—tenant (4-H member in this case) divisions for each crop based upon the yield of the check plot. All increase in production over the check goes to the 4-H member who pays the fertilizer cost.

Procedure

1 Select the field or area and mark permanently.

2 Select the cropping plan to be followed.

3 Test the soil.

4 Use soil treatments based upon the soil test and field history, except on a permanent check strip of no treatment.

5 Grow the crop (or alternate) planned each year.

6 Make tissue tests of the growing crop at least two times each year.

7 Measure yields of treated vs. no treatment areas.

8 Keep a yearly and accumulative financial record.

9 Each year write a story about the project, including the marketing of the crop produced.

John Falloon
University of Missouri

FOR FUTURE SOIL SCIENTISTS

The George D. Scarseth Scholarship Fund is being established to give an opportunity to the many friends of the late George D. Scarseth to contribute to a fund, the purpose of which is to help train soil scientists of the future. It is hoped that those who benefit from this award will be inspired to carry on and enlarge the Scarseth philosophy.

The income from the fund will be used to establish scholarships for a graduate training program in soil fertility, with emphasis on the application of basic principles to the growing plant in the field.

The detailed procedures and criteria for administration and for the selection of the recipients of the scholarships are being developed by a committee of his associates.

Contributions may be mailed directly to the George D. Scarseth Scholarship Fund Committee, 112 West Stadium Avenue, West Lafayette, Indiana. The fund is being organized to comply with the regulations of the Internal Revenue Service for income tax deductibility.

3,500-Acre Farms, Strip Cities, 5,000-Head Herds

OUT OF A CRYSTAL BALL

EVER think of gazing into a crystal ball to see what life on a farm will be like tomorrow?

Arlon G. Hazen, dean of agriculture and director of the agricultural experiment station at the North Dakota State University, at Fargo, did, in a figurative kind of way.

Some of his recent and startling comments about possible farms of the future, based on consultation with heads of 16 departments at the University, follow:

In place of North Dakota's present 55,000 farms averaging 755 acres each and worth $39,569, in the future there will be only 10,000 but they will average 3,500 acres and each will be valued at $600,000.

Eighty-five per cent of the farms will be in corporation ownership; the average annual gross income will approach $225,000 and the net profit will be $50,000 per farm.

Capital requirements on the farm will be met through the public sale of stocks and bonds.

Each rural worker will produce enough to feed and clothe 125 persons —five times more than today.

Solar energy will be commonplace as a source of power.

Poultry may almost entirely replace red meat in the diet of man.

Dairy herds of 5,000 cattle each will be common.

Land may become totally zoned for farming, recreation and industrial uses, with strip cities and towns along major highways.

Changes in reproduction and new ways of controlling or preventing disease of both plants and animals (including man) probably will come about as a result of a much more thorough knowledge of the life processes.

Dairymen will be able to breed their cattle for a choice of male or female sex.

The national average annual rate of milk production per cow, now 6,500 pounds, will be doubled.

It will become possible to create new types of plants quickly and easily to meet changed conditions.

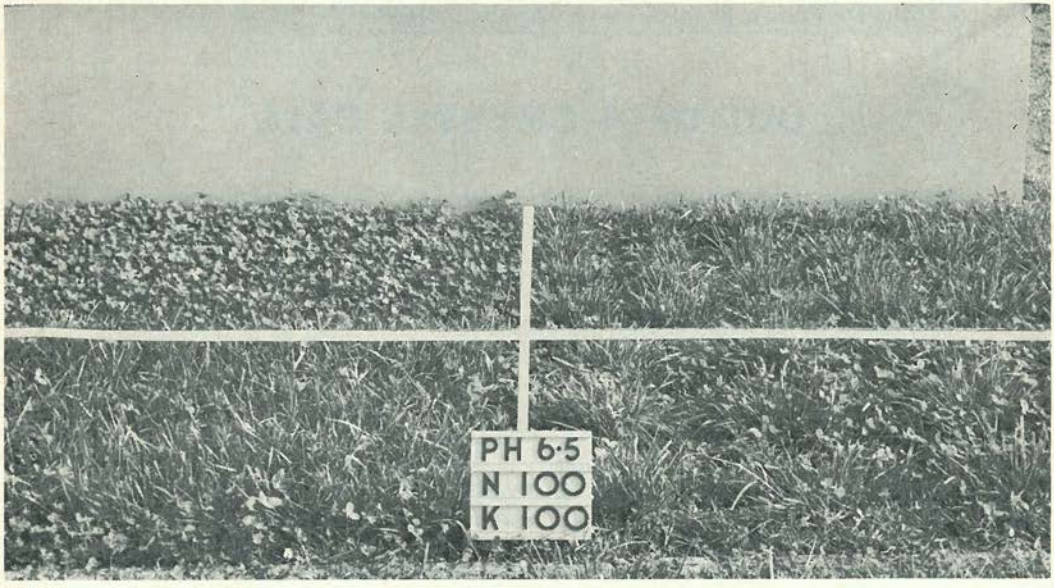
Many of these developments, Dean Hazen said, if they occur, will be brought about as a result of research and education in agriculture and the mechanic arts at the nation's land-grant institutions, of which the University of Fargo is one. These institutions, the dean pointed out, were created in 1862 by the passage of the Morrill Act and, he continued, in the 100 years since that time more progress has been made in agriculture than during the entire period of civilized man prior to 1862. Even greater changes, as he has indicated, may be ahead in the future.

—*The Northwest*

FOR WINTER MEETING

AIDS

SEE PAGES 10-23



With 100 lbs. N, it takes more than 100 lbs. K_2O . . .

Team TALL FESCUE with LADINO CLOVER

By
W. R. Paden
Clemson College

TALL fescue teamed with Ladino clover can provide a real tasty, nutritious forage diet for profit-producing cattle.

The secret of such a forage is to maintain the right ratio of grass and clover in these pastures. This can be a tough job, because fescue is such a vigorous grower that its response to high nitrogen fertilization will often crowd out the clover and all the beneficial nutrient effects that go with this legume.

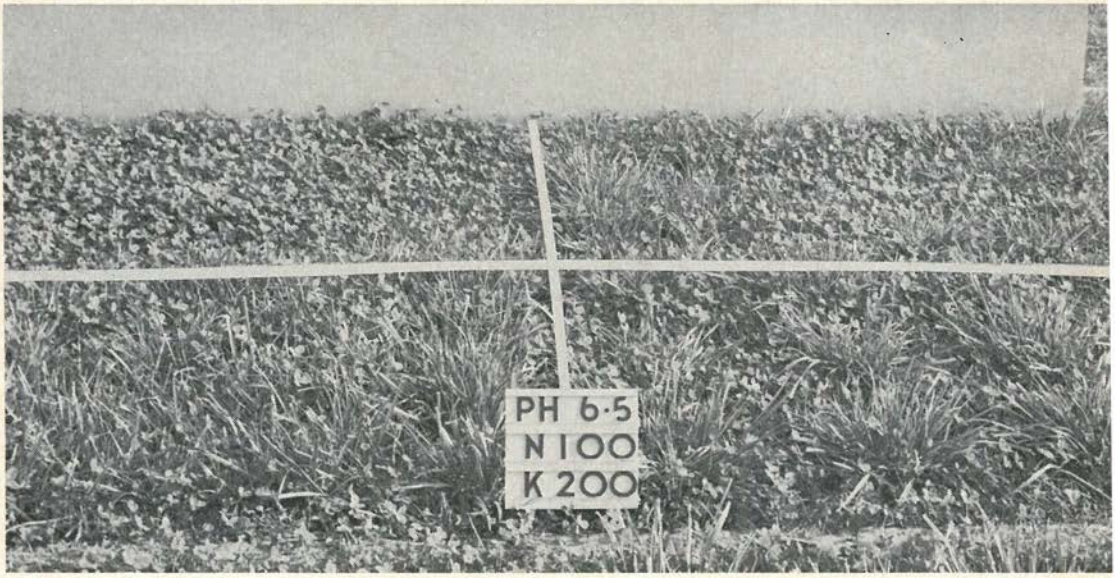
What, then, can be done to insure a good working ratio of grass and clover in such important pastures?

At Clemson we conducted an extensive experiment in concrete frame plots to determine total forage yields and seasonal clover-grass measurements resulting from different rates of nitrogen and potassium fertilizer and various spacings of tall fescue with Ladino clover.

The experiment included 125 plots, each 1/400-acre in size, arranged in 5 series of 25 plots each. All plots had a pH 6.5 level of acidity and the 5 series of soil are considered as 5 replications in the experiment.

Materials and Methods

The soil treatment (started annually



. . . to keep clovers in fescue, use at least 200 lbs. K_2O

—for profit-building forage

. . . through proper soil treatment and grass population management

in Fall, 1958) included the following:

1 Five rates of nitrogen (ammonium nitrate): none, 50, 100, 150, and 200 lbs. of N per acre.

2 A variable of five rates of potash (muriate)—none, 50, 100, 150, and 200 lbs. K_2O per acre—with each rate of nitrogen.

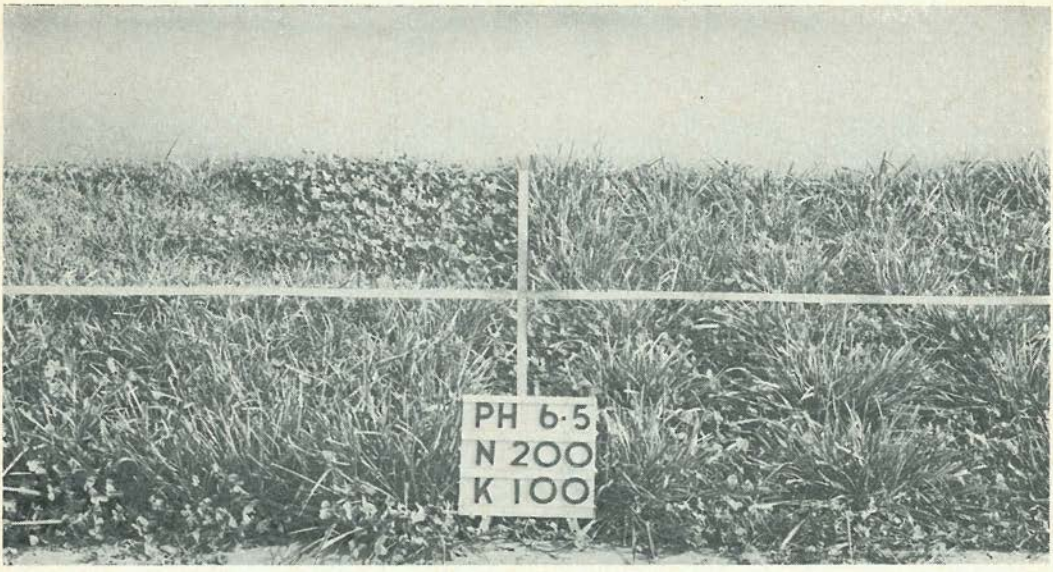
3 Superphosphate applied uniformly to all plots at 120 lbs. P_2O_5 per acre rates.

4 Immediately following initial treatment, each plot was treated with a pure culture inoculum and seeded uniformly to Ladino clover.

The grass population variables were developed through the following steps:

1 When the plots were inoculated and seeded to Ladino, each whole plot was divided into 4 equal subplots to receive small plugs of tall fescue from greenhouse flats.

2 The plugs were spaced to vary



With 200 lbs. N and only 100 lbs. K_2O, fescue overwhelms clover

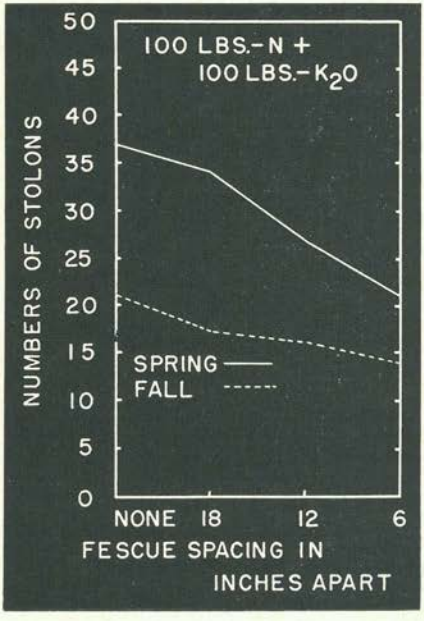


Figure 1—Even under a favorable ratio of nitrogen and potash application, clover declined as fescue spacings narrowed or thickened.

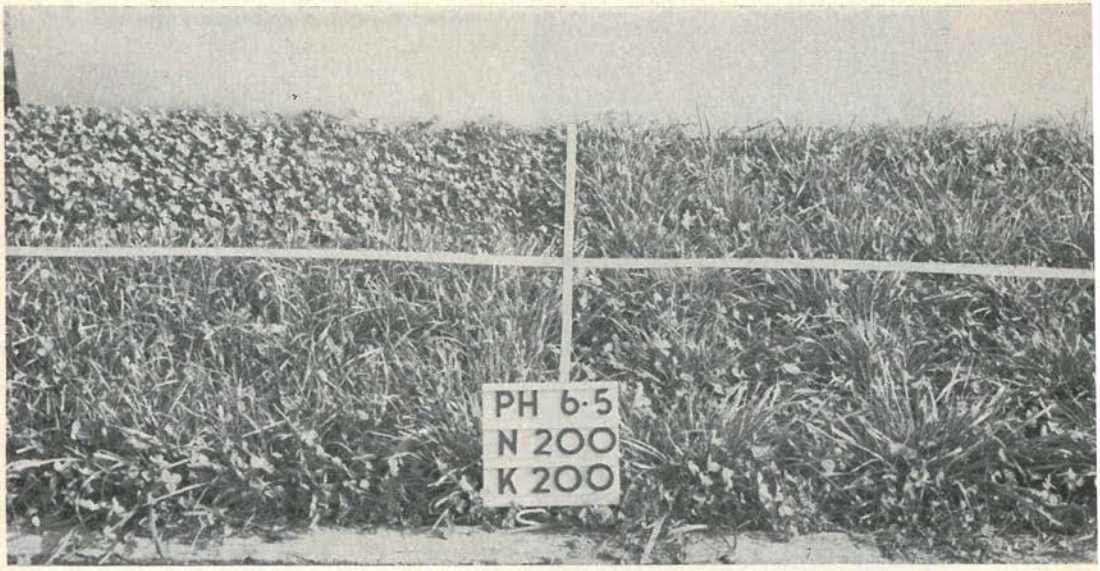
grass population with clover: on 12-inch centers in one subplot, 18-inch centers in another, 6-inch centers in another, and no fescue in the fourth subplot.

3 The plots were clipped frequently during the first season (1959) while the forage was becoming established, and throughout the second season (beginning spring, 1960) forage clippings were made for weight studies on dry matter basis.

4 The clover stands were carefully measured during the second season (1960).

Botanical Makeup

As we observed the clover stands making varied responses to the different soil treatments and fescue spacings, we realized a definite system of measurement should be used to record these differences. So we placed a meter stick on the surface, counted the number of clover stolons passing under it at 4 definite locations, and averaged them.



. . . while 200 lbs. K_2O with 200 lbs. N helps clover persist

The *spring count* was taken when temperature and moisture conditions were most favorable for stolon development and growth, the *fall count* after higher temperatures and lower soil moisture of summer had caused the usual die-back of succulent clover stolons.

The general results showed this:

1 Clover count was *highest* where potash rates were highest without nitrogen—and where no fescue was included in the stand.

2 Clover count was *lowest* where nitrogen rates were highest without potash—and where inches between fescue plugs were reduced or fescue stand thickened.

Figures, 1, 2, and 3 show the specific influence of spacing (1) and fertilization (2 & 3) on the clover stand:

Figure 1 shows how different fescue spacings influenced fall and spring clover count under a favorable ratio (100 lbs. each) of nitrogen and potash application. Although there

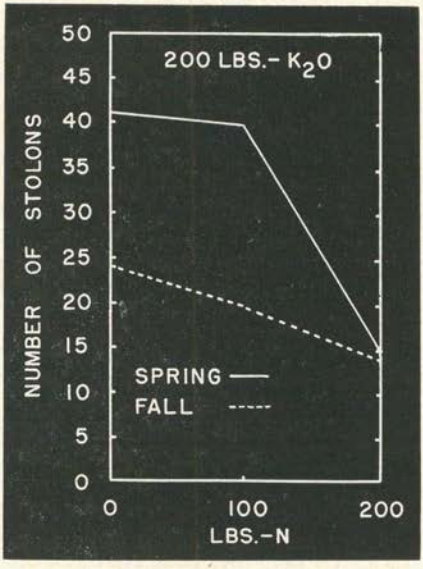


Figure 2—Here is what happened to the clover stolon count (at 12" fescue spacing) when nitrogen was increased and potash was held at a constant 200 lbs. K_2O per acre.

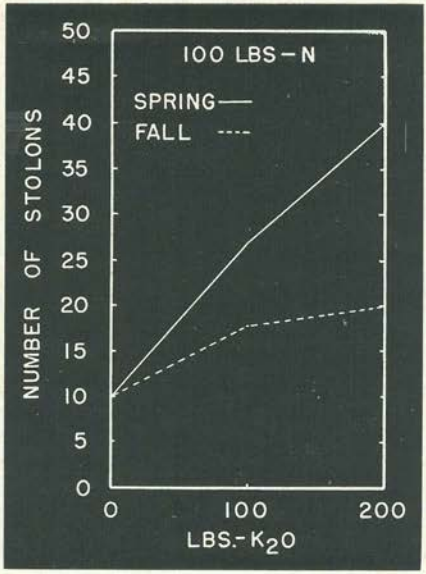


Figure 3—Here is what happened to the clover stolon count (at 12" fescue spacing) when potash was increased and nitrogen was held at a constant 100 lbs. N per acre.

were less clover stolons in fall than spring, they followed the same general trend—showing that clover declines as fescue spacing narrows or thickens.

Figure 2 shows what happened to the clover count (at 12" fescue spacing) as *nitrogen* was increased (from 0 to 100 to 200 lbs. per acre) and potash was held at a constant 200 lbs. per acre. In spring, clover declined very little up to 100 lbs. N treatment, but sharply declined between 100 and 200 lbs. N per acre, even with 200 lbs. potash. In fall, clover declined only slightly all the way up to the 200 lbs. N treatment.

Figure 3 shows what happened to the clover count (at 12" fescue spacing) as *potash* was increased (from 0 to 100 to 200 lbs. per acre) and nitrogen was held at a constant 100 lbs. per acre. In this case, as potash rate increased, the number of stolons (or density of clover stand) increased accordingly, beginning with a very sparse stand where there was no potash applied. Although there were less clover stolons in fall than spring, the trend was generally the same—denser clover stand with heavier potash applications.

Forage Yields

Figure 4 shows what different combinations of nitrogen and potash rates did to forage yields on plots using the 12" fescue spacing with clover. These yields represent the sum of weights (oven-dry basis) secured from 7 clippings. They range from 2.41 tons per acre from the no-nitrogen—no-potash treatment to 3.70 tons from the 100 lbs. nitrogen—200 lbs. potash treatment. As expected, grass growth increased with increased nitrogen, while

TABLE 1. NUTRIENT COMPOSITION OF FORAGE, REPRESENTING 12-INCH SPACING OF FESCUE

Soil Treatment lbs./acre		Nutrient Percentages			
N	K_2O	N	P	K	Ca
0	0	3.32	.51	2.97	1.10
0	100	3.31	.56	3.80	.97
0	200	3.25	.57	4.05	1.07
100	0	3.30	.55	1.90	.78
100	100	3.12	.52	3.75	.72
100	200	2.95	.50	3.90	.68
200	0	3.57	.53	1.85	.75
200	100	3.28	.51	3.73	.72
200	200	3.30	.50	4.41	.62

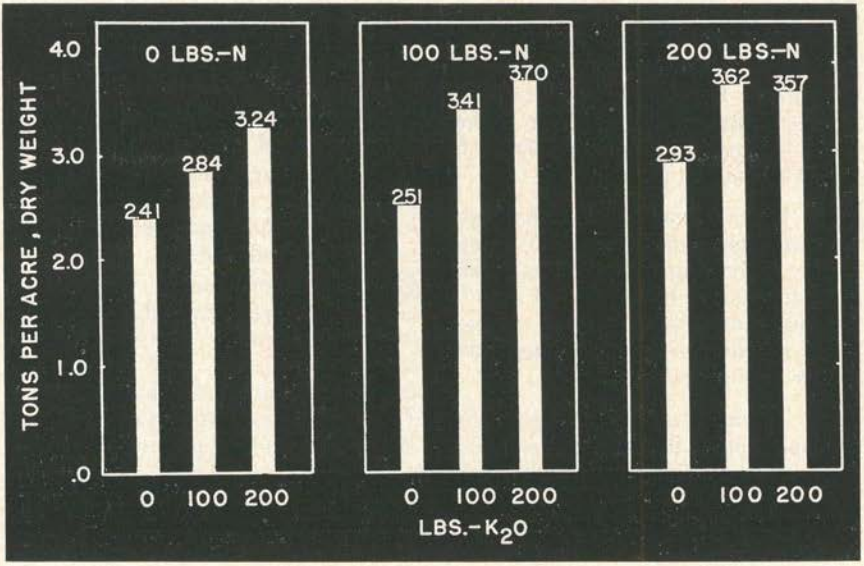


Figure 4—Here is what different combinations of nitrogen and potash rates did to forage yields on plots using 12" fescue spacing with clover.

clover growth thickened with increased potash.

Nutrient Composition

Table 1 shows the nutrient composition of the forage (determined by standard methods of analyses) resulting from different soil treatments. For example:

1 Phosphorous percentage (from the uniform 120 lbs. P_2O_5 treatment) varied only slightly.

2 Nitrogen percentage did not vary greatly, though treatments producing more grass showed somewhat higher N than those producing more clover. The opposite was true in case of calcium, since higher potash treatments favoring clover growth resulted in slightly higher calcium levels in the forage.

3 Potash percentage increased as potash application rate increased, reflecting the traditional theory that legumes (in this case, clover) are luxury consumers of this nutrient. So, increased potash rates not only resulted in higher yields, but also in higher K_2O composition of the forage —showing 4.05% from the 200-lb. potash treatment without nitrogen contrasted with only 1.85% from the 200-lb. nitrogen treatment without potash.

Yet, associated with the higher potash concentration in the forage were the higher clover yields.

In Conclusion . . .

The purpose of this experiment was to learn how different thicknesses of fescue stand and different levels of both nitrogen and potassium will affect the clover in a clover-grass stand.

By clipping to simulate rotational grazing and by counting live stolons per meter line in the spring and fall, we learned the following facts:

1 The thickness of the fescue stand definitely influences clover survival. For example, the medium range (12" spacing of fescue plugs) is far more favorable for a balanced clover-grass stand than either the thinner (18") or thicker (6") spacings.

2 Various nitrogen levels had little effect on the clover stand alone, but definite effect on the clover with the grass. For example, increasing nitrogen rates and thickening fescue stand tended to reduce the clover in the combination stand.

3 Various potash levels had significant effects throughout. For example, increasing potash rates thickened the clover by itself and also in the different fescue stands, and resulted in less seasonal variations in the stands at higher levels.

4 The interaction of various nitrogen and potash levels had less effect than each nutrient operating separately. For example, the nitrogen tended to stimulate grass growth to the point of reducing the clover stand, while the potash tended to stimulate both grass and clover and a high clover survival.

5 By increasing nitrogen and potash levels, higher total yields of forage, in good grass-legume proportion, were produced.

6 Different forage *yields* and *composition* were caused by different fescue thicknesses. For example, the highest yield and best composition came from the intermediate thickness (12″) of grass with a medium level of nitrogen and a high level of potash.

THE END

SURVIVAL OR FAILURE

WHICH FOR *YOUR* ALFALFA INVESTMENT?

THE lime and fertilizer you put on your alfalfa fields this fall may have a lot to do with your stands and yields in 1963.

And fall soil testing can mean the difference between survival and failure in your alfalfa fields.

Meeting the exact fertility need is more critical for alfalfa than any other crop, according to Lowell Hanson, extension soils specialist at the University of Minnesota. If alfalfa doesn't come through the first winter, you've lost your whole investment in seed and preparation.

Fertility is a must for alfalfa stands and high yields. In one survey of farmers, unfertilized fields showed an average stand reduction of 18 percent. Fertilized fields had only a 9 percent plant loss.

Individual fields low in fertility often have no alfalfa stand at all the second year, unless they get fertilizer and lime. Potash is important in saving stands—with soils in central and northeast Minnesota often needing 200 pounds of 0-0-60 each year.

Both phosphate and potash make a big difference in alfalfa yields. In Lake of the Woods county, on the Hanson and Stone farm near Baudette, adding phosphate on demonstration plots boosted yields from the first two cuttings in 1961 by 2.1 tons per acre. *Adding potash along with phosphate meant another 400 pounds of hay.*

The Lake of the Woods county tests were on low-phosphorus, low-potassium soil.

Alfalfa is a high-yielding crop when soil is ready for it. It's also a hungry crop. Four tons of alfalfa hay need 180 pounds of nitrogen, 40 pounds of phosphate, and 180 pounds of potash. With a good fertility program based on soil tests, the extra plant food you add can mean *$30 to $50 worth of high quality livestock feed per acre each year.*

Minnesota News

ONE ROUTE TO MORE PASTURE

A. T. FIELDER of Faulkner County, Arkansas, can give you proof that pasture plants respond to fertilizer treatment in direct proportion to the amount used—even on newly cleared ground.

Fielder bought an additional 40 acres of land and had it cleared of scrub hardwood by bulldozer. Before seeding to Bermudagrass in the spring, County Agent J. O. Hill and Fielder had the soil tested for a Bermudagrass-legume summer base sod.

The soil indicated a pH of 6.1. No lime was applied. Organic matter was 1.9; phosphate, 30; potash, 130; and calcium 800. All plant food was in the very low to medium category.

To establish Bermudagrass, 30 pounds of nitrogen, 60 pounds of phosphate, and 30 pounds of potash was recommended at seeding. This could be supplied in 300 pounds of 10-20-10. Recommendations also called for a topdressing of 30 pounds of nitrogen early in July.

A good stand of Bermuda was obtained. The ground was covered by the first of July.

But Fielder wanted to know the effects of varying amounts of fertilizer. Three random selected plots of one acre each were chosen in the pasture. Uniformity of slope, soil color, texture and growth of native vegetation were factors considered in selecting the plots.

Clipping data was assembled by clipping a 16 square foot area under wire cages from each plot. The grass was air dried to about 25 percent moisture, weighed and converted to an acre basis.

The plot showed that four times as much fertilizer produced more than four times as much forage. Twice as much fertilizer produced more than twice as much forage.

It proved to Fielder that additional plant nutrients applied even to newly cleared ground will pay good dividends on money invested.

Arkansas Farmer

PLOT TREATMENT, WITH CLIPPING DATA, WAS RECORDED AS FOLLOWS:

Treatment	Supplied	Clipping Date	Dry Wt. Per Acre
I. 600 lb. 10–20–10	100 lb. Nitrogen	June 2	2590 lb.
40 lb. Nitrogen	120 lb. Phosphate	July 31	4492 lb.
	60 lb. Potash		7082 lb. Total
II. 300 lb. 10–20–10	50 lb. Nitrogen	June 2	1360 lb.
20 lb. Nitrogen	60 lb. Phosphate	July 31	2450 lb.
	30 lb. Potash		3810 lb. Total
III. 150 lb. 10–20–10	12 lb. Nitrogen	June 2	910 lb.
0 lb. Nitrogen	24 lb. Phosphate	July 31	680 lb.
	12 lb. Potash		1590 lb. Total

The answer seems obvious when this occurs ➡

FERTILIZE SOYBEANS?

By Werner Nelson
In *Solutions* Magazine

THE answer is yes—on soils low in fertility. Most states now recommend that soybeans be fertilized directly if the soil tests low in P and/or K.

Crops of course vary in fertility requirements. For example, potatoes will respond to P and K on soils fairly high in these elements. Corn might not respond. In the same manner corn may respond to P and K on a soil medium in fertility but soybeans may not. Thus it becomes very important that the grower know the fertility level of his soil.

Plant Food Removal

Many growers are thinking in terms of 40 bushels or more per acre average—and are getting it. Such yields take plenty of nutrients as shown in Figure 1, using P_2O_5 and K_2O as an example. These nutrients must come from the soil or from added fertilizer. We all know what happens when we replace only one-half of the money we draw out of our bank account.

Why Not A Top Image?

Manufacturers of cars, soft drinks, etc., try to keep the image of their product before the American public. Can we keep an image of top soybeans before the grower? Likewise we need to recognize the appearance of soybeans which have insufficient nutrients. Side by side comparisons are the best means of convincing the grower and the county leaders.

Soybeans Respond!

Many examples can be given of how soybeans respond to fertilization. Responses on soils low in P and K in northeastern Iowa are shown in Tables 1 and 2. Both direct and residual responses to K were highly profitable.

Many of our field trials have not evaluated the residual response of soy-

TABLE 1. YIELD RESPONSES FROM DIRECTLY APPLIED AND RESIDUAL FERTILIZER [2]

Pounds per acre		Yield Response		
P_2O_5	K_2O	Direct Application Bu/A	Residual Bu/A	Total 2-yr. response Bu/A
30	0	0.7	0.2	0.9
60	0	1.3	0.1	1.4
0	30	2.4	1.0	3.4
0	60	4.7	2.9	7.1
60	60	6.4	2.9	9.3

[2] Yield of check plot was 21.3 bushels.

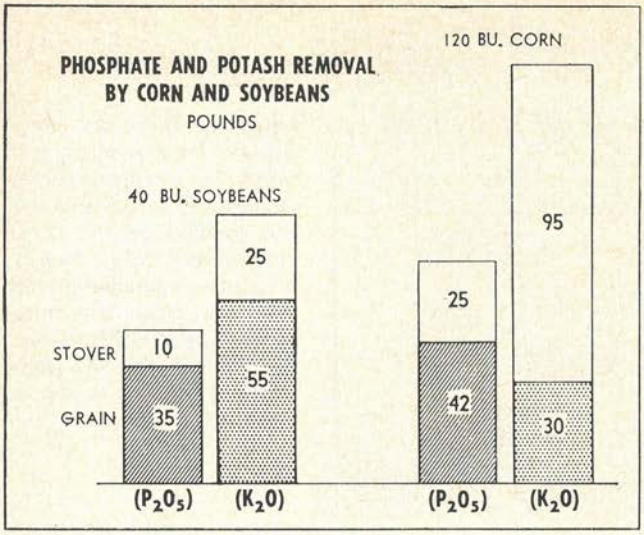


Figure 1—Soybeans remove considerable P_2O_5 and K_2O in a 40-bushel crop. These nutrients must come from the soil or added fertilizer.

beans to fertilizer applied on either corn or soybeans. Heavy applications may prove highly profitable when the second and even the third year increases are considered.

Fertilizing Preceding Crop

The statement is sometimes made that the grower should fertilize his previous crop heavier and not fertilize soybeans. This is good but how about the grower who has not done this, is ready to plant soybeans, but his field is low in fertility? He of course should fertilize his soybeans.

For the grower who is planning ahead it is most profitable to plan a fertility program for the rotation which will boost soybean yields along with all crops in the rotation.

There are many places to apply fertilizer in a rotation (Figure 2). If only small amounts of fertilizers are required, then row fertilizer placed two inches to the side and somewhat below the seed would be preferred. When large applications are required, some broadcast treatments ahead of planting are logical.

Soybeans can use residual fertility provided enough is applied on previous crops. However, there will be little residual for soybeans if only 30 to 40 lbs. P_2O_5 and K_2O are applied on corn before soybeans.

Check Lime Level *First*

Soybeans can fix most of their nitrogen from the air. This is done by nodule bacteria attached to the roots. These bacteria work best in a soil limed to around pH 6.5. In addition, lime supplies calcium and magnesium for plant growth and does many other jobs in the soil.

If a soil is acid, best returns cannot

TABLE 2. YIELD RESPONSES FROM POTASH APPLIED IN 1957[2]

Pounds per acre of K_2O disked in	Yield Response to Fertilizer Applied in 1957		
	1957 (direct) bu/A	1958 (residual) bu/A	Total 2-yr. response bu/A
50	1.7	1.6	3.3
100	3.5	3.7	7.2
150	3.3	4.1	7.4
200	4.3	5.9	10.2
250	3.8	5.3	9.1

[2] Yield of check plot was 35.5 and 22.6 bushels in 1957 and 1958 respectively.

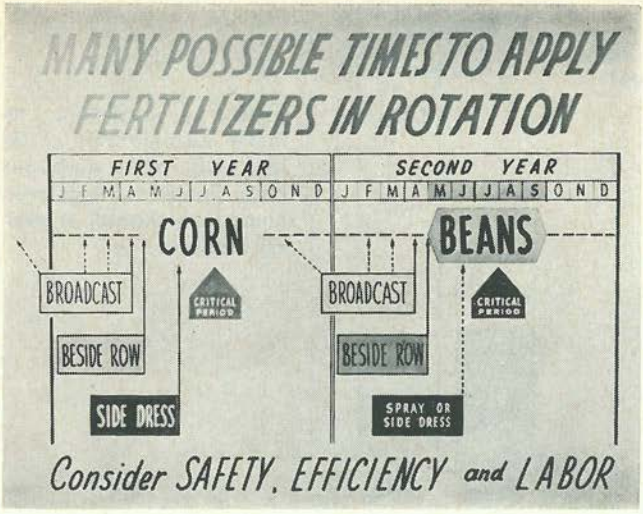


Figure 2—There are many possible times to apply fertilizer in a corn-soybean rotation. If large amounts are applied on the corn, correspondingly lower amounts are needed on the soybeans. With low rates on the corn, fertilizer must be applied for the soybeans if the soil is low in fertility.

be obtained from application of P and K. Below is an example on an acid soil low in K (40 lbs. P_2O_5 applied per acre). There was little response from K, even on a deficient soil, until lime needs were met.

Hence, the pH is the first thing to check in a soybean production program. Get a soil test and follow the recommendations.

Acid soils are becoming more and more prevalent. *In the Midwest in 1960 lime use was the lowest of any year since 1943.*

Manganese deficiency may show on soybeans grown on soils above pH 7.0 or sometimes down to pH 6.3 on poorly drained soils high in organic matter. It can be remedied by 10 lbs. of manganese sulfate as a spray or 25 lbs. in the fertilizer.

Advice to Grower

1. *Get a soil test and follow recommendations.*
2. *Many times there is not time to get a soil test. In this case—*
   a. *Check with the county leadership for advice*
   b. *Study the soil test summaries for the area*
   c. *Check with successful growers*
3. *Place fertilizer at planting in a band about two inches to the side and somewhat below the seed. If such equipment is not available advise plowing down the fertilizer.*
4. *Start planning for next year. Most soybeans are grown in rotation with corn. Fertilize the corn heavily with N, P and K and get an adequate stand. The residual fertilizer and the heavy crop residues will pay off on soybeans next year.*
5. *Fertilizer and lime aren't the only factors to watch. Inoculate and keep down the weeds. Narrow rows, 21-28 inches, will increase yields 10-15 percent.*
6. *If the grower is hesitant help him him to put out a strip through his field using all the best practices.* Seeing is believing. **THE END**

	YIELD OF SOYBEANS		
	12 lbs. K_2O bu/A	120 lbs. K_2O bu/A	Increase from K_2O bu/A
NO LIME	16	18	2
LIME	22	33	11

Forests Decay, Harvests Perish . . .

ATTRACTED by the bland softness of an afternoon in winter, I rode southward through a dense forest.

The ground was sodden with the ooze of melting snow. The dripping trees were as motionless as granite. The last year's leaves, tenacious lingerers, loath to leave the scene of their brief bravery, adhered to the gray boughs like fragile bronze.

There were no visible indications of life, but the broad, wintry landscape was flooded with that indescribable splendour that never was on sea or shore—a purple and silken softness, that half veiled, half disclosed the alien horizon, the vast curves of the remote river, the transient architecture of the clouds, and filled the responsive soul with a vague tumult of emotions, pensive and pathetic, in which regret and hope contended for mastery.

A sudden descent into the sheltered valley revealed an unexpected crescent of dazzling verdure, glittering like a meadow in early spring. It was Bluegrass, unknown in Eden, the final triumph of nature, reserved to compensate her favorite offspring in our new paradise for the loss of the old.

Next in importance to the divine profusion of water, light and air, those three great physical facts which render existence possible, may be reckoned the universal beneficence of grass.

Exaggerated by tropical heats and vapors to the gigantic cane congested with its saccharine secretion, or dwarfed by polar rigors to the fibrous hair of northern solitudes, and embracing between these extremes the maize with its resolute pennons, the rice plant of southern swamps, the wheat, rye, barley, oats and other cereals, no less than the humbler verdure of hillside pasture and prairie, grass is the most widely distributed of all vegetable beings.

It is at once the type of our life and the emblem of our mortality.

Lying in the sunshine among the buttercups and dandelions of May, scarcely higher in intelligence than the minute tenants of that mimic wilderness, our earliest recollections are of grass. And when the fitful fever is ended, and the foolish wrangle of the market and forum is closed, grass heals over the scar which our descent into the bosom of the earth has made; the carpet of the infant becomes the blanket of the dead.

"All flesh is grass," said the prophet. "My days are as the grass," sighed the troubled patriarch. And the pensive Nebuchadnezzar, in his penitential mood, exceeded even these, and did eat grass like an ox.

Grass is the forgiveness of nature

. . . BUT ALL FLESH IS GRASS

EULOGY BY HON. JOHN JAMES INGALLS, SENATOR FROM KANSAS, 1872-1891.

—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten.

Streets abandoned by traffic become grass-grown like rural lanes.

Forests decay, harvests perish, flowers vanish, but grass is immortal.

Beleaguered by the sullen hosts of winter, grass withdraws into the impregnable fortress of its subterranean vitality, and emerges upon the first solicitation of spring.

Sown by the winds, by wandering birds, propagated by the subtle horticulture of the elements which are its ministers and servants, it softens the rude outline of the world. Its tenacious fibres hold the earth in its place,

SPOKEN IN CONGRESS BY AN ELOQUENT MIDWEST SENATOR

. . . Flowers Vanish

and prevent its soluble components from washing into the wasting sea.

It invades the solitude of deserts, climbs the inaccessible slopes and forbidding pinnacles of mountains, modifies climates, and determines the history, character, and destiny of nations.

Unobtrusive and patient, grass has immortal vigor and aggression. Banished from the thoroughfare and the field, it bides its time to return, and when vigilance is relaxed, or the dynasty has perished, it silently resumes the throne from which it has been expelled, but which it never abdicates.

Grass bears no blazonry or bloom to charm the senses with fragrance or splendour, but its homely hue is more enchanting than the lily or the rose. It yields no fruit in earth or air, and yet *should its harvest fail for a single year, famine would depopulate the world.*

One grass differs from another grass in glory. One is vulgar and another patrician. Some varieties are useful. Some are beautiful. Others combine utility and ornament. The sour, reedy herbage of swamps is base-born. Timothy is a valuable servant. Redtop and clover are a degree higher in the social scale.

But the king of them all, with genuine blood royal, is Bluegrass. Why it is called blue, save that it is most vividly and intensively green, is inexplicable; but had its unknown priest baptized it with all the hues of the prism, he would not have changed its hereditary title to imperial superiority over all its humbler kin.

Men were wholly rooted in the soil. The character of nations, like that of forests, tubers, and grains, is entirely determined by the climate and soil in which they germinate. The direct agency upon which all nations depend is food.

Temperature, humidity, soil, sunlight, electricity, vital force, express themselves primarily in vegetable existence that furnishes the basis of that animal life which yields sustenance to the human race.

What a man, a community, a nation can do, think, suffer, imagine or achieve depends upon what we eat.

Breeder's Gazette

Winter Meeting

AIDS

See Pages 10-23

To Monticello

MR. TOMATO MARCHES ON

With the boss—a well-deserved "Oscar" proudly shown.

WITH "advanced" education and degrees and all the accompanying "dignities" being what they are today, it is not unrealistic to believe that some modern farm boy with a freshly acquired Ph.D. under his hat might be amazed at the antics of a fellow-Purdue-graduate running the Rooster Crowing Contest at the Indiana State Fair.

And if he were to rush back to Lafayette to ask how Purdue could afford such an "undignified image" at a state-wide event, the chances are high that Indiana Agricultural Extension Director, L. E. Hoffman, would say, "Young man, at Purdue there are two institutions—Purdue and Roscoe Fraser. And when Roscoe crows, the *people* know he crows for them."

I do not mean to imply here that there are not *many* "dedicated institutions" within the halls of Purdue and the boundaries of Indiana—but the old-line Extension drumbeater, Roscoe Fraser, happens to stand out at this hour because of his retirement in July after three decades of carrying horticultural science to Hoosier farmers in a form they could *understand and use.*

To an old-line Extension man . . .

An "Oscar" Comes Home

How well they could use it was revealed by an honor the Indiana Canners Association recently extended Fraser. They gave him an "Oscar" on which was inscribed a new name for his retirement: "Mr. Tomato." It was signed simply, "From a grateful industry for long years of service."

Trying to pin down the most important contribution Roscoe Fraser has made to agriculture is a tough job.

The moment you get his pioneer work on muck crop development and commercial tomato production squared away, horticultural youth programs pop up. While looking into his seed

With a queen—a vegetable shopping tour happily shared.

With a champ—some valuable tips willingly given.

. . . sharing his honors with Indiana Extension Director L. E. Hoffman, touring a vegetable market with Tomato Queen Sandy Karn, advising 4-H Winner Charles Silverthorn can never become "routine"—because enthusiasm for each new day floods his being as fully as the air he breathes and the story he carries down the farthest row. Through such humans has Extension truly extended the miracles of modern farming.

improvement work, personal contributions to Purdue's Agricultural Alumni Association pop up.

And right behind them arise various vegetable contest projects, ranging from 400-bu. potato clubs to 1,000-bu. onion clubs—with a ton-litter hog club thrown in for good measure.

So, the young Ph.D. with "disturbed dignities" might well call Roscoe Fraser "at least a specialist." The official title, I believe, is Extension Vegetable Crops Specialist. But any honest look at the man's record will compel you to call him a "generalist" —too!

Two "Generalists" From Monticello

And perhaps aptly so, since he first saw life in Monticello (Indiana)—a name well-known in the state where I live, because of a man who lived on a hill he named Monticello and wrote strong words about human freedom with one hand and equally strong words about the values of diversified farming and engineering with the other hand.

Although Thomas Jefferson was one

MR. TOMATO MARCHES ON . . .

of the world's most useful "generalists," this mention in no way means to compare Farmer Fraser with Farmer Jefferson—except to assure any academists acutely afflicted with "background consciousness" that there are such creatures as "generalists," men who know much about many things.

I get the impression that Roscoe Fraser is such a man. I get that impression from this incident:

When the Purdue Agricultural Alumni Association awarded Fraser its coveted Certificate of Distinction this year, there naturally appeared a brief biographical summary on him. I have no idea who molded the 9 or 10 sentences together—but I have a solid suspicion of the ultimate source of his facts, whether the alumni writer secured them directly or indirectly.

After explaining that Fraser had been a vo-ag teacher, county agent, and World War I buck sergeant before becoming a Purdue specialist—and listing his muck crop, commercial tomato, seed improvement, youth program, and alumni work—the data unfolded equal space to these five achievements:

1. Second only to Governor Schricker in crowning tomato queens and kissing junior vegetable growers.
2. Creator of the potato to spudnik.
3. Rooster crower organizer.
4. Salesman of hot dogs and apples at Purdue athletic events.
5. Encourager of long morning-glory vines.

Although they call him "Mr. Tomato," it takes more than a mere horticultural specialist—indeed, a first-class generalist—to kiss vegetable queens and to sell hot dogs *successfully*. Roscoe Fraser has done both with aplomb, I understand.

These conclusions can be reached about Indiana's "Mr. Tomato" because he is obviously a man with a

WHY CHAMPS ARE CHAMPS

. . . in tomato growing

By
Roscoe Fraser
Monticello, Indiana

WHAT makes a champion canning tomato grower in a state like Indiana?

Perhaps I have been in this work long enough now to suggest at least three traits a champ must have: (1) Plenty of personal initiative, (2) solid knowledge of his soil and crop, and (3) a ready willingness to adopt the best-proved practices.

The best way to explain why champs are champs is to show what Indiana's three leading canning tomato growers of 1961 did to win the title, the reserve title, and the 4-H title.

Champ Royer's Approach

David E. Royer of Rossville won the Championship by producing 21.17 tons of tomatoes per acre on 12.4 acres. They graded 81% U. S. No. 1's with only 1.6% culls. He did it through the following practices:

1. By plowing his field of light clay loam 8 to 10 inches deep in mid-May, discing, spring tooth harrowing, and cultipacking.

2. By setting Georgia certified Urbana and Campbell Soup 135 plants 28 inches apart with 40 inches between rows at 5,600 plants per acre rate—first during May 18-22, but after the May 27 frost about half the field

David Royer, right, won the 1961 Indiana State Canning Tomato Championship and Stanley Smith, with his father-in-law, took the reserve Champion Honors. Pictured two pages back is the Indiana 4-H Canning Club Champion, Charles Silverthorn. Why these champs are champs is told here by Mr. Tomato himself, retired Purdue Horticulturist Roscoe Fraser.

again on June 2.

3. By spreading on his field (which had been in clover pasture in 1960 and in oats the year before) 122 lbs. of 46% superphosphate and 480 lbs. of 60% potash per acre and plowing down.

4. By applying 300 lbs. 12-12-12 per acre in the row and using 20 lbs. of 10-52-27 starter solution per acre.

5. By cultivating three times and spraying six times with Manzate.

Royer's tomatoes were harvested in late summer and delivered to the California Packing Company at Frankfort, Indiana.

Reserve Champ Smith's Approach

Stanley Smith (along with his father-in-law, Omer Conn) of Peru won the Reserve Championship by producing 24.97 tons of tomatoes per acre on 16.7 acres. The tomatoes graded

. . . MR. TOMATO MARCHES ON

ready sense of humor—*and* a sense of humanity known probably by more people than that of any other Purdue staff member.

Who Can Say?

As to his most worthy contribution to agriculture, who can honestly say?

Was it the 25 muck crop shows he promoted during his 29 years on the Purdue staff—or the more recent horticultural television shows he produced?

Was it the unusual tomato displays at the State Fair and his work as horticultural advisor to Indiana's 4-H Clubs—or his service as Assistant Director of the State Fair Boy's Camp?

Was it his foresight in leading the first hybrid corn show at Purdue—or his later work as chairman of the Seed Improvement Committee for 10 years?

Was it his management of the first "Noise, Noodles, and Enthusiasm Dinner" for the Purdue Agricultural Conferences—or his leadership of the Ag Conferences Ag Alumni Dinner for 14 years?

Was it the scores of vegetable judging contests he organized—or his chairmanship of Indiana's branch of the National Junior Vegetable Growers Association for 25 years?

Nothing Too Ridiculous

No activity apparently has been too small—*or too ridiculous*—for him to try to do. In fact, it is an Indiana maxim that Roscoe Fraser "gets the job done when others say it is impossible." While others have often stood back, muttering "I don't know about that," Fraser has been known to have the job "half done."

We could complete this look at Roscoe Fraser's role in agriculture by chronologically (and perhaps lazily) listing his activities from the time he entered the little Monticello High

MR. TOMATO MARCHES ON . . .

School to study vocational agriculture and participate in FFA and 4-H work until the canning industry of Indiana named him "Mr. Tomato" last fall.

Such a chronology would include graduation in agricultural education from Purdue in 1916, then work at Monticello's Hoosier Stock Farm and later at Carpenter and Ross Shorthorns in Ohio, then vo-ag teacher at Monticello High and service in World War I, then County Agent of White County for over 6 years before joining Dr. Hoffer of the Purdue Agricultural Experiment Station in cornstalk testing work, then potash demonstrations for 3 years before joining Purdue's Horticultural Department for the 29-year haul that eventually made him one of the nation's top voices in muck crop and canning crop extension work.

A Personal Risk

But such a chronology doesn't really tell the story—completely. Perhaps an experience he and Leroy Hoffman had in 1935 reveals more of the man than all the personal data sheets we could fill:

At a State Fair barbecue in 1933, Fraser lost money by barbecuing too many sheep and hogs. To meet his deficit, he raised two acres of hybrid single cross corn and realized $256 *profit*.

The experience was deep in his mind as he and Mr. Hoffman started discussing the possibility of forming a Purdue Agricultural Alumni Association. Although their determination was aglow by early 1935, such effort costs money—and 1935 was not 1962! No one of Mr. Fraser's generation needs any further explanation.

Early that year, however, Mr. Fraser and Mr. Hoffman cosigned a note to finance the production of 12 acres of single cross hybrid seed corn. They used the profits from this venture to form the Purdue Agricultural

82.88% U. S. No. 1's. Smith and Conn did it through the following practices:

1. By discing their field six times, since they were handicapped by wet weather.
2. By setting Campbell Soup 146 plants 18 inches apart with 60 inches between rows at 5,200 plants per acre rate—first on May 15 and later on June 2 after the frost wiped out the entire crop.
3. By broadcasting on their field (which had been in corn the year before) 300 lbs. of 60% potash, 150 lbs. of 45% superphosphate, and 100 lbs. of urea on the plowed ground and discing into the soil.
4. By using 25 lbs. of 10-52-17 fertilizer in the setting water, using a half pint per plant.

4-H Champ Silverthorn's Approach

Charles Silverthorn of Frankfort won the 4-H championship by producing 28.9 tons of tomatoes per acre on 11 acres. They graded 85% U. S. No. 1's, 13% No. 2's, and 2% culls. He did it through the following practices:

NEW Z-Z-ZIP IN

BEES are putting new z-z-zip in white clover production for Hayden Shannon of Mountain View, Arkansas, a grade A dairy producer.

His average herd size is 30 cows and Shannon utilizes 150 acres of permanent pasture in the dairy operation. This pasture includes primarily fescue and ladino clover, though some common Bermuda, hop clover, and lespedeza are included.

Four years ago ladino clover would grow on the Shannon farm but it would soon die out and not re-seed. After applying 1½ tons of limestone

1. By setting Urbana plants 22 inches apart with 48 inches between rows at 5,600 plants per acre rate—on May 15.

2. By plowing under four loads of manure, 500 lbs. of 60% muriate of potash, and 100 lbs. of ammonium nitrate per acre on a field that was in clover in 1960.

3. By applying 500 lbs. of 5-20-20 in the row with the planter at the time the plants were set.

4. By using "Take Hold" 10-52-17 in the setting water at the rate of 20 lbs. per acre.

5. By cultivating the plants 6 times and giving one hand hoeing in mid-July.

6. By giving the field 8 sprayings of Manzate (starting in early July) at intervals of 7 to 10 days—and using aldrin on 6 of the sprays to control fruit flies.

The $3,600 profit young Silverthorn made on his crop is going toward his college education at Purdue University where he will be a sophomore this fall. THE END

WHITE CLOVER

per acre as shown by a soil test, the clover would still fade out after the initial seeding. Shannon then decided to use some bees for pollination purposes. At the present time he has 16 colonies of Italian bees.

"Since the colonies of bees were added, I have clover all over my place," Shannon said. "Before I got the bees, clover growing was almost impossible on my farm, even after proper fertilization practices. In addition to helping my clover, the bees have provided more than enough honey for our family use," Shannon concluded.

Arkansas Extension News

. . . MR. TOMATO MARCHES ON

Alumni Association. Later the same year Mr. Fraser and several associates formed the Purdue Agricultural Alumni Seed Improvement Association, with Fraser heading the Seed Improvement Committee. Their first project was 8 acres of hybrid seed corn.

From this 8-acre beginning, the Ag Alumni Seed Improvement Association has grown into a major supporter of Purdue. For example, since 1945, the Seed Association has invested $500,865 in the Purdue Experiment Station and $120,000 in the Purdue Ag Alumni Association. Since 1952, the Purdue Experiment Station has received $58,000 from a Certified Seed grant collected from the Ag Alumni Association.

Currently the Ag Alumni Seed Improvement Association is valued at more than $1,225,000! And it's not partisan history to conclude that it all began with two men—farming school teachers essentially—risking some of their personal finances on 12 acres of corn in the shank of a great depression.

The Ultimate Picture

Although this experience is a revelation of the man perhaps the ultimate picture is found deep in the heart of a tomato field where Roscoe Fraser can be found on his knees examining a young lad's 4-H crop and encouraging the boy with tips that no academic degrees short of experience can ever bring.

One of the latest beneficiaries of those tips was Charles Silverthorn of Rt. 7, Frankfort—the Indiana 4-H Canning Club Champion who produced 28.9 tons per acre of Urbana tomatoes on 11 acres.

The $3,600 profit he made on the crop is going toward his college education at Purdue University.

In all probability, that $3,600 will

mean more to the memory of Roscoe Fraser than the Seed Association's $1,225,000 purse—as his interests turn to the two farms he operates on muck land (of course) around Monticello, to the little Methodist Sunday School class he has taught for 12 years, and to the barbecues and fish fries that most Hoosiers associate with his name.

I understand that he has participated in the annual Jonah Club Fish Fry since 1935—"a fun club that has avenged Jonah by frying over 400,000 pounds of fish since its organization."

Between that record and the unselfish life he obviously has given the people of Indiana, surely Roscoe Fraser's future is well insured.

—sm

ATTENTION . . . ALFALFA DEHYDRATORS!

EGG-BREAKING processors face a problem arising, strangely enough, from improved methods of egg production. The problem is how to get the dark yellow color back in egg yolks.

South Dakota State College poultry scientists may be able to help solve the problem, so processors can tap the higher prices in market outlets. Premium prices for dark egg yolk products are paid by noodle manufacturers and sponge cake bakers.

Changes in methods of egg production make it more difficult to obtain quantities of dark colored yolks. In the past, hens on free range consumed large amounts of fresh green feed, and farm-run eggs carried a lot of yellow-orange pigment in the yolks.

In quantity, these yolks served as blenders to standardize egg yolk color. Now, more and more hens are kept in confinement on diets which produce uniformly colored yolks, most often much lighter in color than required by processors.

In response to requests for help from processors in the area, State College poultrymen, in two experiments using seven diets, found that a 20 per cent alfalfa meal supplement caused hens to produce eggs with yolks dark enough to satisfy color requirements for special egg-breaking purposes. In the diet, yellow corn was the major energy source.

With the 20 per cent alfalfa meal supplement the diet contained 35.6 milligrams of xanthophyll per pound of diet (98 per cent of the pigment in natural egg yolk comes from xanthophyll compounds).

At least 25 milligrams of xanthophyll from alfalfa meal per pound of diet is required to produce the dark color wanted by processors, according to visual measures for pigmentation and from chemical analyses of yolks, made by the poultry researchers at State College.

For table eggs, probably as little as seven milligrams of xanthophyll per pound of diet would be required to produce the yolk color generally preferred, the poultrymen point out.

In South Dakota, 25 to 40 per cent of the eggs produced are processed in egg-breaking plants; for the United States as a whole, 10 per cent of the total egg production goes to egg breakers.

Standardizing the dark color in egg yolks is an important economic consideration and processors may assume more supervision in egg production, perhaps even to recommending certain feeding practices.

South Dakota Ext. News

After being ordered to explain why he was tardy for school, the mountain boy gave this explanation:

"Ma woke Pa up in the middle of the night because she heard a noise in the hen house. Pa sleeps in the raw, but he grabbed his gun and went outside. He had it pointed toward the hen house waiting for something to happen, when our old hound dog came up behind Pa with his cold nose, and we've been cleaning chickens since 3 o'clock this morning."

The Sunday School teacher gave a long talk on sin, prayer and asking forgiveness by praying. After she had finished talking, she asked little Susie: "Now, Susie, what do we do before we ask the Lord to forgive us?"

"Sin," replied Susie.

"How old are you?"

"I'm five. How old are you?"

"I'm either four or five. I don't know which."

"Do women bother you?"

"No."

"You're four."

The pastor was rejoicing with a little old lady over one of her elderly relatives who had finally joined the church after a lifetime of riotous living.

When she wondered if the oldster's carryings-on would be forgiven, the pastor assured her: "Yes, indeed. The greater the sinner, the greater the saint."

"Oh," she mused wistfully, "I wish I had learned that 40 years ago."

"To what do you attribute your long life? the young reporter asked the 90-year-old man.

"Well, sonny, it's this way. I never waste energy resisting temptation."

A well-known administrator, out for a neighborhood stroll, met the wife of the minister of his church. "We've missed seeing you in church lately," she said politely.

"After all, a man doesn't have to go to church to be a good Christian, does he?" the official hedged.

"No," answered the clergyman's wife, "He doesn't. And a woman doesn't have to be married to be a mother either," she smiled sweetly, "but most people seem to think it's a good idea."

"Pop, what protects a man best from running wild—advice, restrictive laws, or stern council?"

"Poverty, son, poverty."

A writer moved to New England. All he wanted to do was to write, but the neighbors thought the land ought to be used.

"What you goin t' raise?" asked a farm neighbor.

The writer knew that the simple truth, "I want to write," would not do. He remembered that his wife had said something about the city being no place to bring up children.

"I'm going to raise children," he answered.

The farmer spat. He was unimpressed. "Around here we look on that as a side line."

WINTER MEETING AIDS

Special Section—Pages 10-23

Some things basic
Some things new
Using research
As a tool.

For early birds now mapping plans
