Better Crops

WITH PLANT FOOD

March-April, 1964

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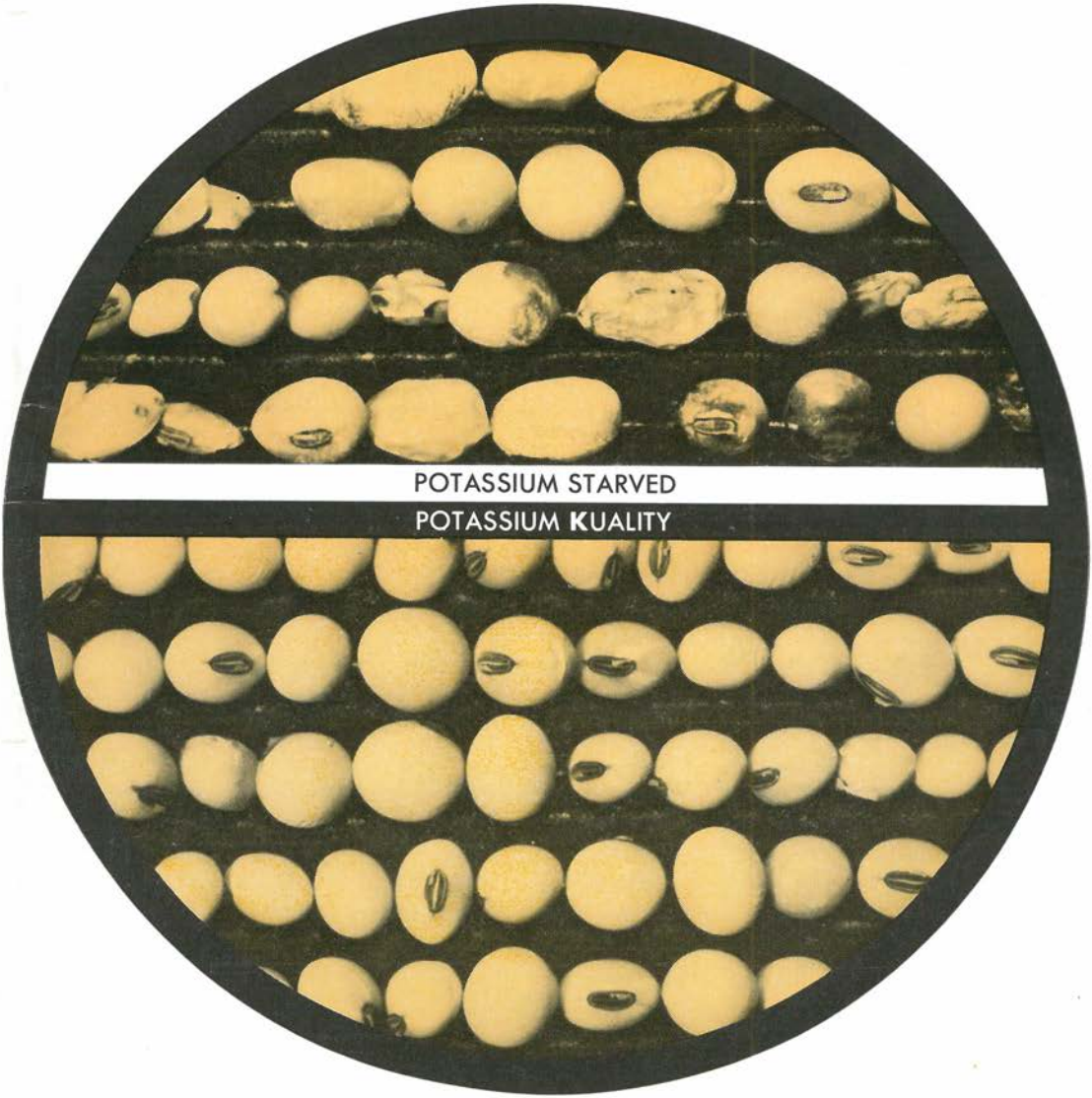

NEW SOYBEAN WALL CHART

SEE PAGE 8

Better Crops
WITH PLANT FOOD

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

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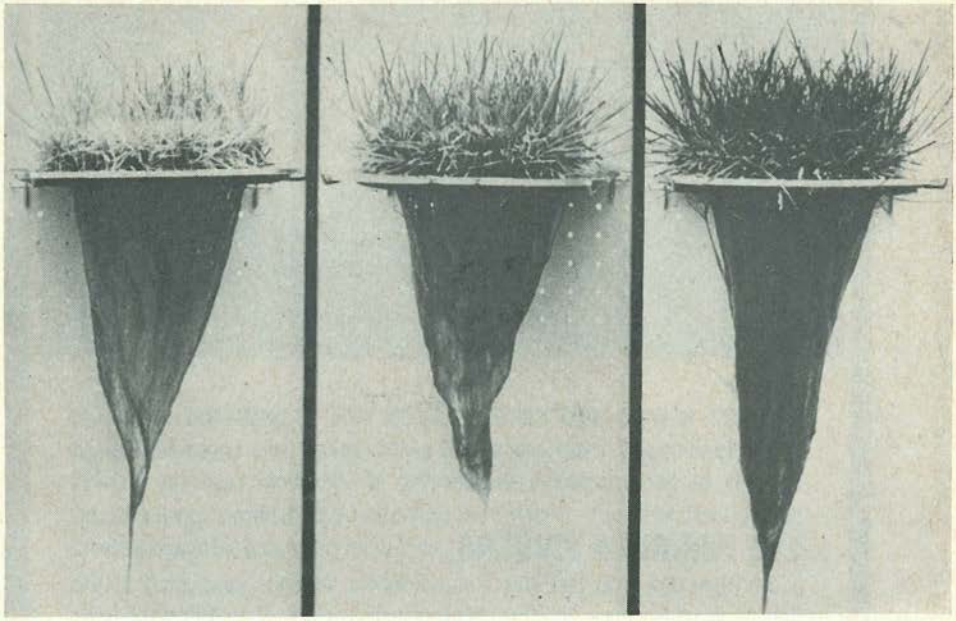
CONTENTS

ON THE COVER

. . . you may lose hundreds of dollars from *hidden hunger* before quality differences like this show up in your soybeans. Poor quality beans, as shown above, only appear from stunted, late maturing K-starved plants.

FIGURE 1—TURF AND ROOT GROWTH DURING HOT WEATHER



HIGH N-P LOW K	HIGH N-P-K	HIGH K LOW N-P
Severe injury during hot weather	Reduction in injury but not highest quality	Best growth and quality

Potassium Helps Bluegrass Face HOT Summer

Weeds often take over a weakened turf when midsummer temperatures climb to the upper 80's and 90's.

Hot weather reduces growth rates of bluegrasses. Because of this, grasses cannot compete with more aggressive weeds. Even where lawns are properly watered, high temperatures may cause turf stands to thin.

BUILD TURF VIGOR

Fertilization influences vigor and competitive nature of lawn grasses. During cool weather, nitrogen benefits growth the most.

But when weather gets hot, nitrogen levels should be lowered and potassium levels increased in the soil. Too much nitrogen is harmful, particularly where potassium is deficient.

RESEARCH MAPS THE WAY

Turf was produced in solution culture to study the effect of nitrogen, phosphorus, and potassium on Kentucky bluegrass growth during hot weather. Foliar and root response were constantly watched during the treatment period.

Treatments consisted of two levels each of N, P, and K in all combinations:

High level of these three nutrients was within the range required for good turfgrass development, as were other essential elements.

Low level was designed to be below this range.

Foliar symptoms of nutrient deficiency did not appear at any time during the experiment—only growth rate differences.

Treatments were started in early April on four-month-old turf. Greenhouse temperatures ran in the upper 70's and low 80's during this period. Temperatures rose gradually during May, finally reaching 110 to 120°F on bright June days.

By ELIOT C. ROBERTS AND HAROLD M. PELLETT
DEPARTMENT OF HORTICULTURE
IOWA STATE UNIVERSITY

Turf was clipped regularly at a 1½ inch lawn height.

The following observations made during these studies may help you produce a better lawn in summer:

1 Low Nitrogen-Phosphorus, High Potassium

During hot weather, low nitrogen-phosphorus, high potassium treatment produced best quality turf (Figure 1). Bluegrass treated this way was more dense, had better color, superior vigor. This treatment also produced greatest root development before hot weather.

2 With High Nitrogen-Phosphorus, Keep Potassium High

When turf was treated with high nitrogen-phosphorus levels, high temperature injury was greater with low potassium than with high potassium (Figure 1).

In neither case was density, vigor, and color as good as for the low nitrogen-phosphorus, high potassium treated bluegrass.

3 Nitrogen Effect Varies with Temperature

High nitrogen levels increased growth of foliage when temperatures were cool as in May (Figure 2). But, when it got hot as in late June and July, more clippings were obtained from low nitrogen treatments. Nitrogen had more influence on growth than either phosphorus or potassium and because of this, its rate and time of application are most important.

4 High Phosphorus Reduces Foliage Growth

Unlike nitrogen, high phosphorus reduced the amount of clippings during both cool and warm weather (Figure 3). As temperatures increased, differences in clipping

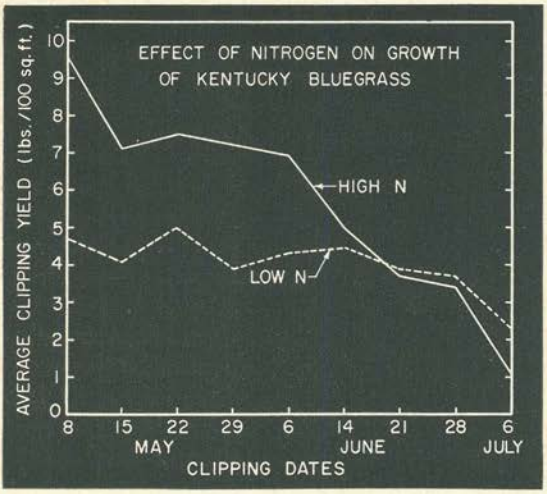


FIGURE 2

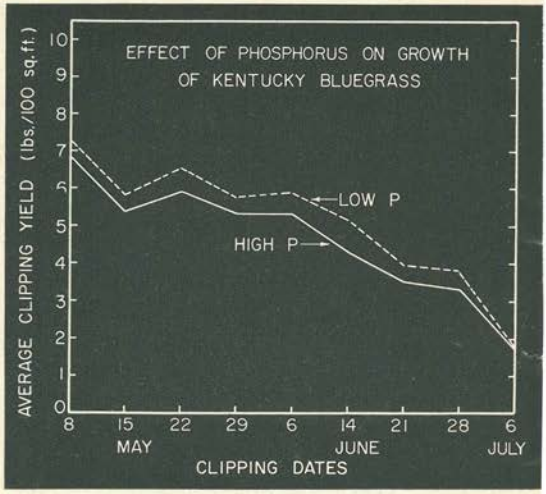


FIGURE 3

yields due to phosphorus levels became less.

5 Potassium Increases Foliage Growth

Potassium increased yields of clippings throughout the experiment (Figure 4). As temperatures increased, differences between high and low potassium treatments decreased.

6 Clippings Less Succulent Under Low Nitrogen

Low nitrogen treatments increased the percentage dry weight of clippings (Table 1). This low N-treated foliage was more "hardened off" and resistant to injury from high temperatures, presumably from changes in the function of cells and the accumulation of carbohydrates, energy supplying food sources, and other organic substances.

High potassium levels decreased the percentage dry weight of clippings slightly but increased turf resistance to high temperature injury. This effect must come from plant processes different from those influencing low nitrogen response.

High phosphorus levels, like high nitrogen, decreased the percentage dry weight of clippings. (Turf injury was greatest and percentage dry weights lowest from high nitrogen-high phosphorus combined.) During hot weather, high phosphorus seems to affect turf much like high nitrogen.

7 Warm Temperatures Tend to Increase Clippings

Regardless of fertilizer treatment, percentage dry weight of clippings increased with increasing temperature (Table 1). When foliage production rate declines in hot weather, the grass is conditioning itself for unfavorable environment. When nitrogen and phosphorus were high and potassium low, this natural conditioning did not permit complete turf survival.

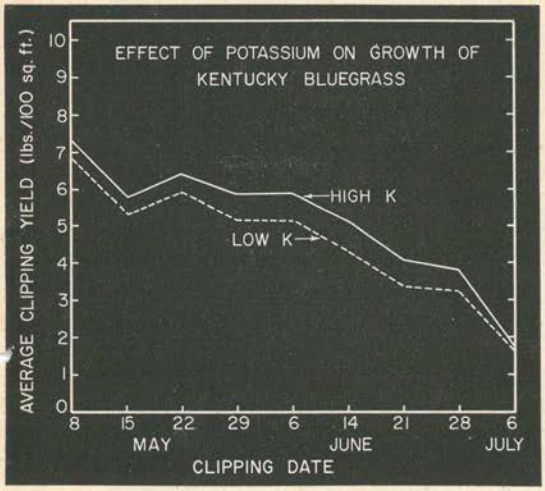


FIGURE 4

8 How Treatment and Temperature influenced . . .

. . . Nitrogen Uptake

Grass grown on low nitrogen contained about 1.0% less nitrogen (in clippings) than grass under high nitrogen (Figure 5). In neither treatment was the turf considered nitrogen deficient. The high nitrogen treatment caused luxury nitrogen consumption that proved harmful under high temperatures.

Clippings produced under high temperatures contained about 1.0% less nitrogen than clippings under cool temperatures (Figure 5). As temperatures increased, the "safe" nitrogen level in leaf tissue was around half the content under cool temperatures and high rates.

. . . Phosphorus Uptake

Grass grown under low phosphorus treatments contained less phosphorus (Figure 5) than high P treatment. In neither treatment was the turf considered deficient.

Clippings produced under high temperatures contained less phosphorus than clippings produced under cool temperatures (Figure 5). As with nitrogen, the "safe" phosphorus level in leaf tissue during hot weather was about half the content accumulated under cool temperatures and high rates.

. . . Potassium Uptake

Differences in potassium uptake from high and low treatments were small (Figure 5)—but apparently enough to prevent considerable injury from high temperatures. Potassium was readily absorbed from solutions, even when present in small amounts. But higher levels resulted in slightly higher potassium accumulation.

Clippings produced under high temperatures contained just over half the potassium accumulated under cool temperatures (Figure 5). We do not know how much potassium might be increased in leaf tissue with further benefit to the turf.

TABLE 1—PERCENTAGE DRY WEIGHT OF KENTUCKY BLUEGRASS CLIPPINGS

Temperature	High N-P		Low N-P	
	High K	Low K	High K	Low K
	%	%	%	%
Cool	18.7	19.4	21.5	21.7
Warm	23.8	25.1	26.6	27.1

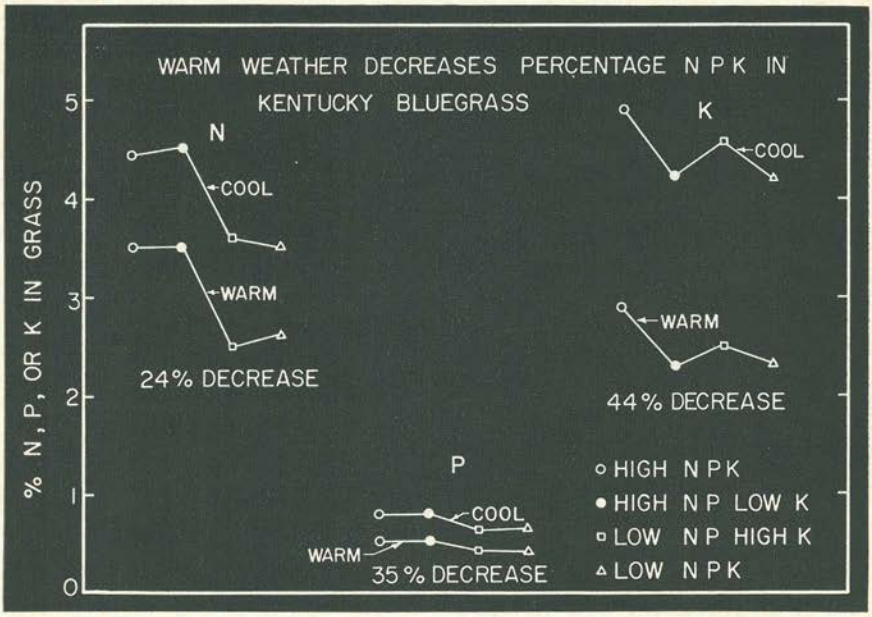


FIGURE 5

SOILS INFLUENCE NUTRIENT AVAILABILITY

These studies show that when nutrient availability is controlled and moisture not limiting, potassium is important for reducing high temperature injury to bluegrass turf. To augment this, nitrogen levels should be kept lower during hot weather. It will pay you to consider certain facts when fertilizing your lawn. For example . . .

N—Some turf managers make heavier nitrogen applications in the spring—when response is most needed—and by the time hot weather stress arrives, available nitrogen is relatively low.

Others use soluble nitrogen forms in early spring, then use only slowly available sources during late spring and summer.

P—Even though this research showed increased uptake of phosphorus from solution and less growth with higher amounts, high phosphorus should not be harmful under many soil conditions. But it is generally recognized that excess phosphorus is applied to many lawns.

Many Experiment Stations recommend and most companies produce special low phosphorus fertilizers for turf.

K—These data show it is wise to use fertilizers containing ample potassium to maintain a readily available source of this nutrient.

On soils naturally low in potassium, a 3-1-2 ratio of nutrients may serve well. Many turf specialists recommend 4-1-2 or 3-1-2 ratio fertilizers for repeated use under these conditions. On irrigated lawns

and golf greens extra potassium is especially needed to offset leaching, fixation, and plant adsorption.

Make sure your lawn is fertilized properly—to be made ready for a hot summer ahead.

THE END

MUCH GREATER PROFIT!

FROM **PROPER** FERTILIZATION ON **LESS** ACREAGE

A recent comparison of fertilizer programs on 17 Iowa farms again indicates that fertilizing corn is highly profitable—and at rates of application that are far above average.

In Iowa, not much more than half of the corn acreage is fertilized, yet all but one of these 17 growers used some fertilizer. Average amount of plant food they applied was 56 pounds N, 38 pounds P_2O_5, and 21 pounds K_2O.

On part of their acreage, each of these farmers applied a higher rate of application. The average was 100 pounds N, 58 pounds P_2O_5, and 43 pounds K_2O. The average investment was $11.32 per acre for the average rate of fertilization, and $20.53 for the higher rate.

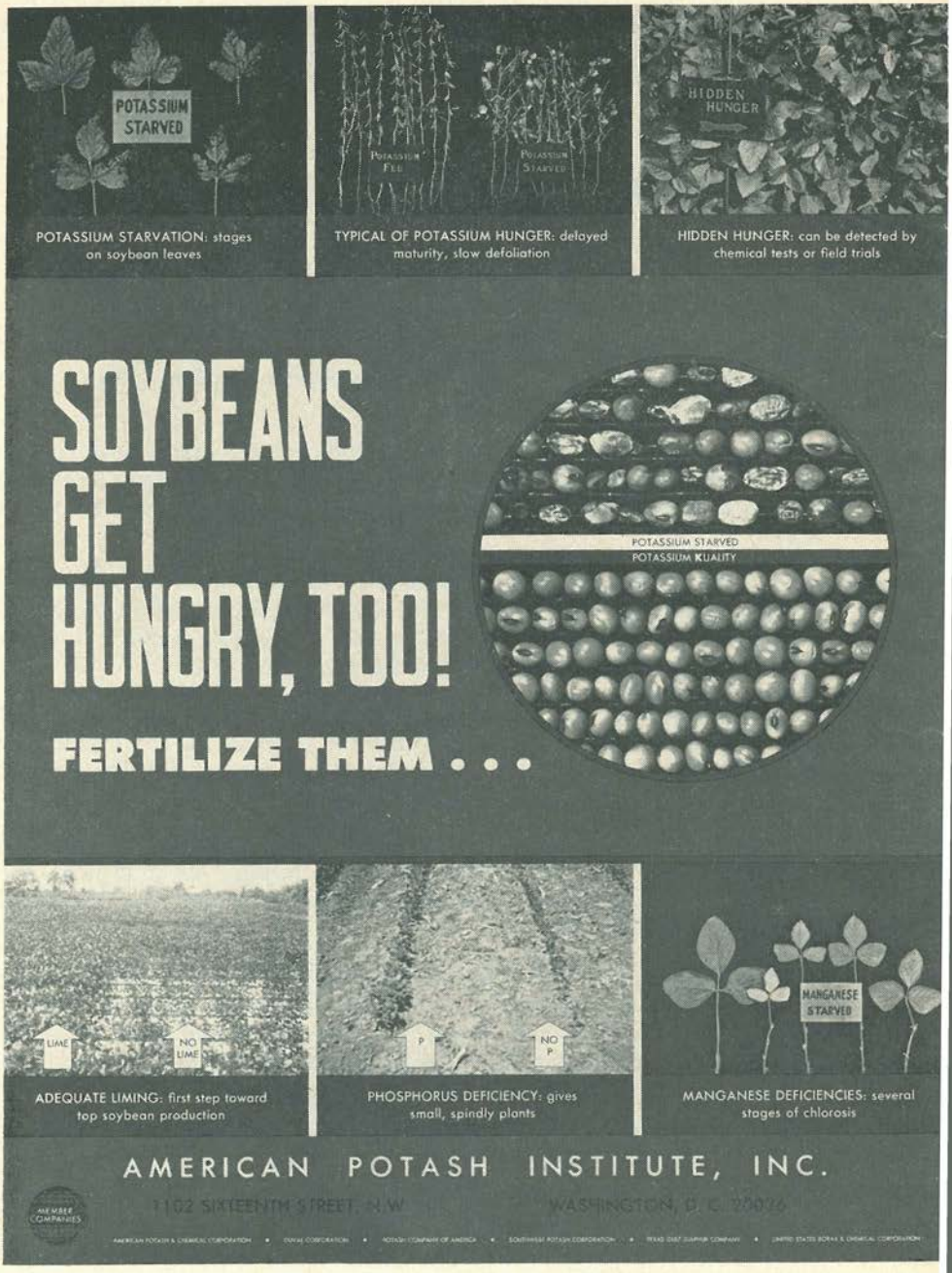
Average yield of the 17 growers for their regular programs was 102 bushels per acre, about 34% more than the average for the entire state. However, the average yield under the higher rate of fertility was 121 bushels per acre—63% greater than the state average.

Based on nutrient uptake of 160-60-120 pounds of plant food for 100 bushels of corn, the 19 extra bushels would require 30-11-23 pounds of N, P_2O_5, and K_2O. Efficiency of use at these high rates was 69% for N, 57% P_2O_5, and 100% K_2O.

For an added investment of $9.21, the high fertility programs returned an additional *net profit of $11.67 an acre.* This is a return of $2.27 for each $1 invested over and above the grower's normal program—proof that you can get a high rate of return from fertilizer even at rates of application that are considerably above average.

The cost of the 19 bonus bushels was 48.5¢ per bushel—well below the average figures reported by Iowa State University, which range from 73¢ to $1.02 per bushel, depending upon soil type and management skill. This points out that extra bushels produced by proper fertilization are likely to return you a much greater profit than trying to farm a greater acreage without fertilizer.

Successful Farming



A BLACK & WHITE **MINIATURE** VERSION OF NEW SOYBEAN WALL CHART NOW AVAILABLE IN **FULL COLOR** (16" x 21" SIZE) FOR PERMANENT WALL DISPLAY

AS A CROP WITH A BIG FUTURE

New Wall Chart Displays SOYBEAN Needs

Soybeans, the crop with a growing future, can get hungry, too.

This is clearly shown by the full-color wall chart just issued by the American Potash Institute, which has featured similar charts on corn, legumes, cotton, and plant food removal for many years.

The new 16 x 21-inch soybean chart is specifically designed for use on the walls of offices, warehouses, stores, classrooms, and other public places that feature educational messages. The coupon below indicates distribution policy.

Featuring 7 natural color pictures, the chart takes the viewer through various stages of soybean needs:

1—The need for adequate liming, as the first step toward top soybean production.

2—The results of phosphorus hunger—small, spindly plants contrasting sharply with well fed plants.

3—The clear-cut signs of manganese hunger, showing several stages of chlorosis on soybean leaves.

4—The graphic stages of potassium starvation on soybean leaves, step-by-step to badly starved leaf.

5—The signs of delayed maturity and slow defoliation as typical of potassium-starved soybeans.

6—A warning against the danger of hidden hunger in soybeans.

7—And the striking difference between potassium starved and potassium quality beans, the end product each farmer seeks.

Metal strips support the chart, top and bottom, with a metal eyelet at top for easy hanging on any wall. For display use, order the chart below.

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BY W. W. WOODHOUSE, JR. N.C. STATE COLLEGE

(*Better Crops* will feature a second article by Dr. Woodhouse on nitrogen fertilization in a later issue.)

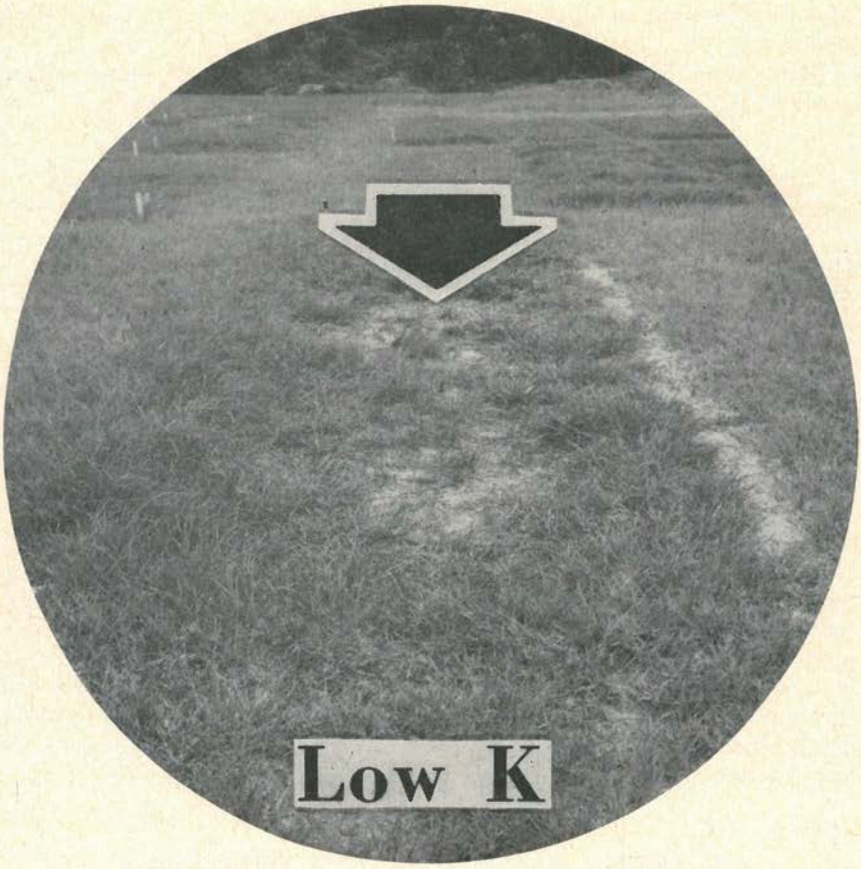
Forages NEED

LIME · PHOSPHATE · POTASH

Forage legumes need lime, phosphate, and potash to grow efficiently. While this is generally recognized, insufficient supplies of one or more of these elements is still probably the most frequent cause of poor legume production on North Carolina farms.

Just as important is the need of grasses for all of these elements. Grasses are known to be responsive to nitrogen but there is a strong tendency to overlook their needs for other elements—resulting in lowered efficiency of the N applied.

Scientific tests show the role of lime, phosphate, and potash in forage production: on legumes, grasses, or mixtures of the two. Let's look at these roles:



. . . To help prevent thinning stands like this **K-HUNGRY GRASS** that decreases yields and quality of the forage.

LIME

On Legumes . . .

. . . the highest lime demand is with alfalfa, followed by the white clovers (including Ladino), and the lespedezas.

Lime, which supplies calcium and magnesium, reduces soil acidity: a change that aids the availability of other elements and the legume's nitrogen-fixing process.

Calcium hunger signs probably never show in the field, though such symptoms have been defined in greenhouse experiments. Lumping cal-

cium, magnesium, acidity, and inoculation together, we speak of a "lime deficiency."

Magnesium hunger does appear in the field in both legumes and grasses, but rarely where soil is limed to the "legume level."

TABLE 1—LIME ON PURE LADINO—GEORGEVILLE SILT LOAM

Lime at Planting	Yield 1957 6th Harvest Year	pH Spring 1957	% in Plant 1957 CaO	% in Plant 1957 MgO
None	1795	5.3	1.97	.67
1 ton	2988	5.8	——	——
2 tons	3653	6.5	1.95	.78
4 tons	4080	7.0	——	——
8 tons	4120	7.4	——	——

PURE LADINO stands responded to lime on a Piedmont soil (Table 1). Optimum lime rate was around 2-3 tons with pH. 6.5. (Unusually dry weather during 3 of the 6 years of the experiment may have slightly reduced the lime needs.) Liming—which increased the plant's magnesium content but not its calcium—was essential to anything like normal growth during this period. In the 8-ton treatment, nearly all the applied limestone above 4 tons was still in the soil unreacted after the experiment. This helps answer why overliming seldom occurs under sod conditions: excess limestone simply does not decompose.

TABLE 2. ALFALFA—NORFOLK SANDY LOAM

Lime applied at planting 1955	1959 Yield	1959 pH	1959 % CaO in plants	1959 % MgO in plants
None	667	5.7	1.07	.35
2 tons	5070	6.1	1.33	.59
4 tons	5932	6.4	1.36	.60
8 tons	6429	6.7	1.43	.61

TABLE 3. LIME ON PURE ALFALFA

Lime Applied at Planting Fall 1955	Yield 1959	pH
500 lbs.	379	5.8
500 lbs. + Molybdenum	3863	5.6
2 tons	7109	6.4

ALFALFA YIELDS—as well as the plant's calcium and magnesium content—climbed with liming on an upper Coastal Plain soil and a Piedmont soil (Tables 2 & 3). Molybdenum used with a low lime treatment helped but did not approach adequate lime: apparently a normal situation on these soils.

TABLE 4. SERICEA LESPEDEZA—EUSTIS SAND

Lime applied at planting	Yield lbs/A 1955–60	pH 1960	in plant 1960 CaO%	in plant 1960 MgO%
0	1789	5.4	0.63	0.30
1 ton	2971	5.8	0.78	0.38
3 tons	3116	6.5	0.89	0.52

SERICEA LESPEDEZA responded to lime, but the level required was not as high as with this "acid tolerant" legume grown on a sandy soil. On grasses . . .

. . . lime needs may show up slowly, but grasses can benefit from lime.

Until recently most forage grasses in this area were grown with a legume. Meeting the legume's lime needs also took care of the grass. But with pure grass stands, we must remember lime.

TABLE 5. LIME ON TALL FESCUE—GEORGEVILLE SILT LOAM

Applied annually N	P	K	Lime at Planting	Yield 7th Harvest Year	1956–62 Av.	1962 pH
200	100	200	0	5010	5024	5.1
"	"	"	2½ ton+½ ton annual	5962	5414	7.0
400	100	200	" " " " "	7114	7818	6.1

TALL FESCUE responded to lime, though the need for lime showed up late in the experiment (Table 5). The tip-off: sharp drop in pH under the 400 lb. nitrogen rate.

TABLE 6. TIME TREND ON LIME RESPONSE, COASTAL BERMUDA—EUSTIS SAND

* Treatment	1955	1956	1957	1958	1959	1960	1961	1962	% in plant 1962 CaO	% in plant 1962 MgO	1962 pH
0 Lime	5564	6242	8309	8432	7307	6487	7175	4462	.48	.17	4.7
Lime (2 tons in 8yrs.)	7669	6577	9252	7953	8853	8008	9030	10503	.55	.35	5.2

* 200 lbs. N, 100 P_2O_5, 200 K_2O annually.

Coastal Bermuda responded to lime (Table 6), though "lime deficiency" developed very slowly. When it finally became acute, magnesium hunger was probably a major effect. Note the low MgO content of the unlimed grass—resulting stand thinning in streaks and spots with yellow to whitish leaves developing during summer.

PHOSPHATE

On Legumes . . .

. . . phosphorus needs are high for young growing plants.

It prevents spindly plants, retarded growth. Phosphorus deficient leaves may turn dark to bluish green, plants may be late blooming and maturing.

TABLE 7. GEORGEVILLE SILT LOAM—PURE LADINO

P_2O_5 Appl.		Yield			% P_2O_5 in
At Plant	Annually	1951–57	1951	1957	Plant 1957
None	—	954	161	394	.50
100	—	1795	1621	460	.56
400	—	3826	3707	2460	.75
200	50	3970	2539	3653	.92

LADINO'S NEED for P, uncomplicated by a grass, is shown in Table 7:
First year—heavy phosphate (400 lbs. P_2O_5) superior.
Sixth year—less P at planting plus annual topdressing superior to all the P at planting. Two treatments about equaled each other for 6 years.
First year lesson—pays to build up P on P-deficient soils.
Last year lesson—annual topdressings pay off.

On Grasses . . .

. . . phosphorus hunger will show up in distinctive signs.

With young grasses in cool weather, watch for a dark green color with stems and lower leaves showing a reddish or purplish cast.

Older stands may thin out with enlarged individual plants and leaves. Older fescue leaves curl upward and become blunt at the tip like the bow of a boat.

TABLE 8. TALL FESCUE—GEORGEVILLE SILT LOAM

P_2O_5 Appl.	Yield 7th Harvest Year	% P_2O_5 in plant 7th Harvest Year
None	3108	.35
100 lbs. at planting	3711	.34
25 annually	5355	.57
50 annually	5747	.77
100 annually	5972	.93

Note 200 lbs. N annually and adequate K and L applied.

TALL FESCUE'S NEED for P for *good production* (Table 8) is not too different from legumes—though this grass is a strong feeder that can extract nutrients from a big volume of soil, and can subsist at a lower P & N level than the clovers.

TABLE 9. COASTAL BERMUDA—EUSTIS SAND

P_2O_5 Applied*	Yield 8th Harvest Year	% P_2O_5 in plant
None	4263	.32
33 annually	8189	.39
100 annually	10,503	.57

* 200 lbs. N annually, K and L adequate.

COASTAL BERMUDAGRASS, a deep-rooter (8 ft. on this site) with high production potential, removes large quantities of nutrients from a big volume of soil and depletes P supply (Table 9). Results: declining yields and plant composition.

POTASH

On Legumes . . .

. . . potash hunger signs are fairly easy to recognize.

Watch for irregular yellow mottling or specks around leaflet edges. These chlorotic spots soon merge to form a yellow border around the leaf tip and along the sides, but not at the base. Clover may fade out of the mixtures without symptoms becoming clear-cut.

TABLE 10. LADINO CLOVER—GEORGEVILLE SILT LOAM

K_2O Appl. Ann.	Yield		K_2O in Plant	K in Soil
	1957	1951–57	1957	me./100 grams 1957
0	2447	2945	1.26	.07
100	3460	4054	——	.13
100 split	3748	3788	1.98	.08
200	3653	4047	2.87	.11
400	3581	4027	2.76	.12

PURE LADINO responded to potash (Table 10), though low yields, partly from dry weather, did not drain too heavily on potash supply, and so the 100 lb. K_2O rate was probably adequate.

Splitting annual potash applications ½ spring-½ summer versus all in spring gave typical results: theoretically better, but sometimes not by enough to make it worthwhile.

TABLE 11. K AND K FIXATION WITH ALFALFA—LLOYD CLAY LOAM

Tr. No.	K_2O At Pl. 1956	1st Spring 1957	1958–59	Yield 1959	Yield 1956–59	K_2O in Pl. 1959
1	0	0	0	299	3336	1.63
2	100	0	100	4716	5224	2.52
3	100	100	100	6940	6258	2.17
4	100	0	200	7109	6144	2.96

ALFALFA GROWTH was affected by potash fixation (Table 11), emphasizing three points:

1—That *too little* of the 100 lbs. K_2O applied at planting (Treatment 2) remained *available* for full alfalfa establishment.

2—That 200 lbs. applied annually after the first spring (Treatment 4) enabled the plants to catch up—while only 100 lbs. annually (Treatment 3) produced ½ ton less hay, with a ton difference in the fourth season.

3—That additional potash the first spring is wise on soils of questionable potash level.

On Grasses . . .

. . . potash hunger shows certain signs.

In the large grasses, such as corn and millet, the leaf tips and margins appear scorched and discolored.

In the smaller grasses, thinning of stands may be the first symptom as these plants become susceptible to leaf diseases and winter injury. Blades may become short and narrow.

TABLE 12. TALL FESCUE—GEORGEVILLE SILT LOAM

Lbs. Applied		Yield	
K_2O	N	7th Harvest Year	% K_2O in plant
None	200	2425	0.92
50	200	4826	2.22
100	200	5395	2.85
200	200	5648	4.27
50	400	4156	1.56
100	400	5264	1.83
200	400	7114	2.80
400	400	8896	4.38

TALL FESCUE evidently has a higher critical K level than is generally assumed—probably about the same as for Ladino Clover (Table 12). Much of the yield depression on K-deficient plots was due to thinning of stands. Potash applications must be adjusted for nitrogen and production levels.

TABLE 13. COASTAL BERMUDA—EUSTIS SAND

K_2O Applied Annually	N applied	Yield 8th Harvest Year	% K_2O in plant 8th Year
None	200	778	0.78
50 lbs.	200	8687	1.33
100 lbs.	200	9293	2.04
200 lbs.	200	10,503	2.78
200 lbs.	400	11,588	2.49

COASTAL BERMUDA has a lower critical level for K than tall fescue (Table 13), but can remove large amounts of K because of Coastal's high production potential. On this very low-K soil, deficiency became acute earlier than expected in many soils—though many soils growing Coastal are quite similar to this. With adequate P and L on all plots, stand loss was severe on the no-K treatment but not apparent on other K levels. This shows (again) the absolute need for adjusting other nutrients to N and production levels on pure grass stands.

THE END

POTASH

puts new life into vineyards

. . . increasing berry weight 10%
cluster weight 24%
yield 31%

Good response to potash fertilization has shown up in several Thompson vineyards in Fresno County, according to Farm Advisor Pete Christensen.

Nutritional surveys in the county had brought several areas of potash deficiency to the attention of local farm advisors. Test plots were set out in several spots, starting in 1959. One of the 1962 tests showed particularly favorable results.

According to Christensen, about five pounds of potash per vine was applied on a vineyard near Herndon, in late February of last year. This was a four year old Thompson vineyard, first year bearing.

The area had been scraped before the vines were planted. The vineyard showed definite visual symptoms of deficiency. By midsummer, differences began to show up between the plots to which potash had been added and the untreated test plots.

The untreated checks showed leaf fading, burning and some leaf shedding. Fruit developed poorly, with small clusters and undersized berries. Some clusters dried up. The treated areas showed a few similar symptoms, but the vines loaded much better and the fruit was larger and showed a better appearance.

On the treated portion, calculated yields totaled 16,969 pounds per acre. This is compared to a

APPLE TREES SHRINKING

. . . FOR MORE POSSIBLE YIELDS PER ACRE
. . . LOWER PRUNING COSTS

Scientists are "shrinking" the size of apple trees.

The results might make it possible for growers to "squeeze" more trees into their orchards to increase yield per acre. But one of the biggest benefits could be reduction in pruning costs, according to Prof. Louis J. Edgerton, pomologist at the N.Y. State College of Agriculture, Cornell University. In terms of labor, it is estimated that the

TABLE I. RESULTS OF POTASH FERTILIZER TRIALS IN THOMPSON VINEYARD, FRESNO COUNTY

	Avg. Berry Wt. grams	Avg. Cluster Wt. pounds	Avg. Yield lb. per vine
Trial Average			
Check	1.24	.63	23.82
Test Plot	1.38	.86	34.63
Treatment Difference			
Test plot over check	.14	.21	10.81
Per Cent Increase			
Test plot over check	10%	24%	31%

yield of 11,672 pounds from the untreated area.

Table I shows the results of the test on yield, berry weight, and average cluster weight. Christensen points out that the potash deficiency wasn't entirely corrected the first year. Further applications of potash this season should show even better results.

The number of acres of vineyard suffering from potassium deficiency in Fresno County doesn't appear large, according to Christensen. However, where visual deficiencies show up, treatment with potash will probably be profitable.

In vineyards where the symptoms show up as early as late May and persist throughout the season, you are likely to get a good response from potash application. Potassium deficiency is more apt to show up in areas where the ground has been scraped before vines were planted.

Other problem areas may be where there is a lack of available soil moisture, overcropping, or where water stands for long intervals after irrigation.

Under the most favorable conditions, potash fertilization can be very profitable, according to Christensen. On the Herndon test plot, fertilizer cost $79.89 per acre. There was a net gain of $89.81 per acre, for a net profit of $9.29. This doesn't take into account the carryover effect on future yields.

CALIFORNIA FARMER

---

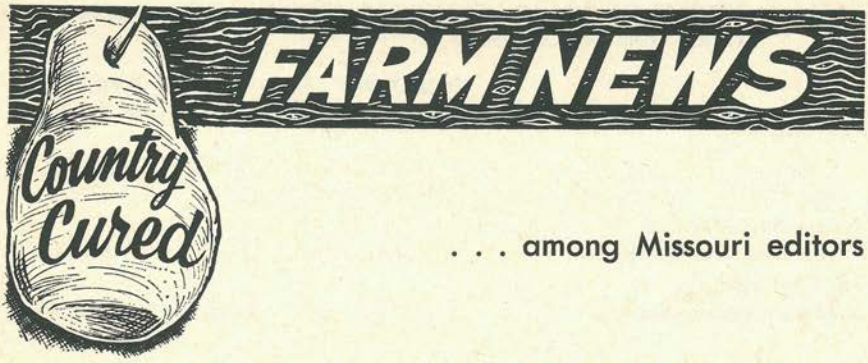
time spent pruning makes up about half the man-hours spent in growing apples today.

In addition, spraying and harvesting costs would drop, the Cornell pomologist points out.

The prospects for these and other benefits are bright because of a new growth-retarding compound being used in experiments at Cornell. Edgerton calls the preliminary results "outstanding." More tests are necessary, however, including experiments using it in combination with other compounds, and on trees of different ages. Also, evaluation of related chemicals is planned.

The retarder, known as B995, is simply sprayed on a tree. It slows growth without any apparent ill

To Page 41



. . . among Missouri editors

Building LOCALIZED Diet

Have you ever opened your local newspaper to a "farm story" about cotton production when the nearest cotton crop is on the other side of your state or a couple of states away?

This has happened in Missouri—and probably in every other major farm state.

The problem?

"Too many editors lean on the *Washington handout*," Missouri University associate agricultural editor, Clyde Duncan, explains.

He should know. The 61-year-old writer-editor has been the route: rural newspaper reporter, United Press night bureau manager, advertising copy writer, farm editor of a major Midwest daily, author of two agricultural books, and now a Missouri University editor and associate professor.

"Too often, farm editors ignore news in their own backyard, running canned releases without any local angle," the veteran writer contends. "Reader interest is zero. The editor does his readers a disservice. The space wasted on cotton (for that area) could be used for a local story of far greater interest *and application* to his readers."

This problem plagues rural newspapers—there simply isn't enough reporting of localized farm news. Why? Largely because most editors of smalltown newspapers are not farmers, are not familiar with new farming developments.

One Missouri editor told Duncan, "We have a good agricultural community, but I don't know what the devil a good farm story is. I've lived in a city all my life."

LIKE A RED-HEADED STEPCHILD

Bill Bray, general manager of the Missouri Press Association, described the problem this way:

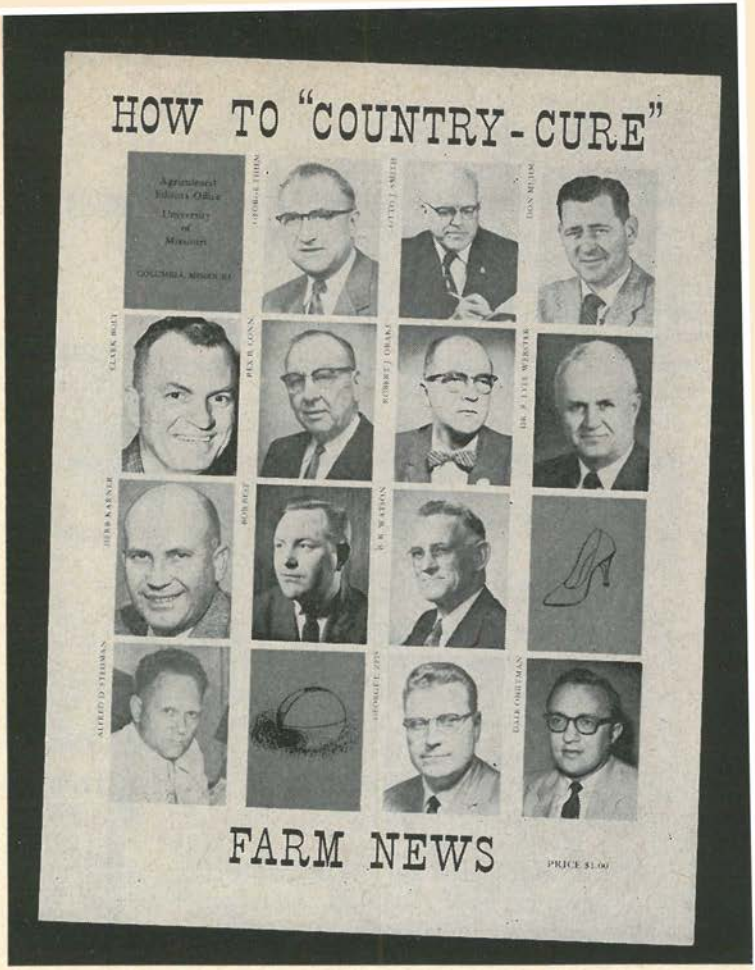
"I had my own weekly newspaper, *Odessa (Mo.) Odessan.* If you are not a farmer, you are afraid of the farm news story. You're afraid you'll make a comment that might make you look silly and thus lose the confidence of your rural readers.

March-April 1964

By
RICHARD
CRUM

UNIVERSITY
OF
MISSOURI

PROGRAM'S "RECIPE" BOOK



. . . Features 13 top farm writers—including a Pulitzer Prize winner—whose combined experience represents an estimated 200 years of farm reporting.

"A few editors are farmers—but very few. It's hard to be both an editor and a farmer. Farming has become more scientific. Editors have enough trouble keeping up with paper and ink, without trying to keep up with fertilizers, not to mention all the other practices demanded by good farming. Someone has to help or the farm story goes the way of the red-headed stepchild—*neglect.*"

Back in 1961, Clyde Duncan kept thinking about this neglect. How to remedy it. How to stimulate more home-grown farm news in country daily and weekly newspapers—local stories that lead to better farm practices and a better economy for everyone.

To those who know, there's nothing like country-cured ham to whet a dull appetite. Why not country-cured news to whet local reader interest long dulled by canned releases from distant word merchants?

But how? Create incentive: through a program for recognizing local farm editors and reporters. Give tangible guidance: through a workbook followed by periodic newsletters that give editors useful

A judging committee—3 professional journalists —choose the winners annually between the mid-March deadline and the early May COUNTRY-CURED BREAKFAST. Below right center journalists Ned Etheridge (left) and Orrine Gregory of the University's Agricultural Editors office work with Editor Richard Collins of the Missouri Farmer on this job.

BEST FARM Page . . . FARM New

hints on covering their local farm front.

AN IDEA WITHOUT FUNDS . . .

When Duncan submitted his idea for a "COUNTRY-CURED FARM NEWS PROGRAM" to Missouri's Agricultural Dean, it was enthusiastically approved by the School of Agriculture—but funds to set up the program were not available.

So, the former United Press bureau chief, grown white haired from pressures only a working newsman knows, set out to finance the project privately when Missouri's Soil Fertility Council got wind of his idea.

. . . MEETS A COUNCIL IN SEARCH OF AN IDEA

The Council—a joint college-industrial group promoting better plant nutrition through proper fertilizer and lime usage—was searching for a program that would cross-pollinate the rural community in an exchange of ideas for better farming. The Council Board called on Duncan, led by its president that year, George Wickstrom of the American Potash Institute.

"What's this I hear about a farm news program of yours?" Wickstrom asked Duncan. The energetic Wickstrom didn't have to add another word to his question. Duncan cut loose.

A week later Duncan received a **To Page 26**

...s Story . . . FARM Feature . . . FARM Column . . . FARM Picture

FARM IN COUNTY GROWS UP

Oliver Family Expands Modern Cattle Farm

A farming revolution on a Cape County homestead rich in family history has brought about the overthrow of conventional agrarian practices in favor of large-scale and specialized beef production.

The wholesale changes have occurred in the past two years on the Oliver farm between Neelys Landing and Fruitland where the very face of the land has been altered for the new operation.

Vast tracts of timber have been cut to make way for the vital pastures; a highly mechanized automatic feeding system was established and an elaborate watering system was developed.

More land was bought or leased to bring the current acreage for the operation to 3,800.

But if the farm which has belonged to the Oliver family longer than Missouri has belonged to the Union is taking on a new life, it is keeping the same family name.

TEXAS OWNER

The present owner, Donald M. Oliver, a Midland, Tex. geologist and oilman, intends that it stay that way.

The farm originally was homesteaded in 1819 by ... Sr. On whose ... document... Ameri...

When the cattle are fattened—a group goes out about every 30 days — the selling is done directly to slaughter houses, not to terminal markets.

Mr. Oliver and Mr. Howard do not say exactly where the marketing is done for competitive reasons.

At the feed lot, the old and the new blend in harmony.

Virtually within the shadows of each other are the century-plus old barn and the historic old Oliver house on the one hand, and a mechanized feed processing plant and heated water tanks on the other.

The feed lot is a network of pens and fences enclosing the cattle and various feeding devices. It is divided to keep the younger stock and the "senior class" apart.

Among the feeding devices are the silage pit—an open concrete structure with a sort of walk-in feature for the steers; a bunker—a long trough from which cattle from either side of the lot can feed; and automatic feeders which shut off the flow of feed at a prescribed po... The bunk... by auger ... a large ... ture equipped ... ing machin... rescribed ... trate.

Assembly Line Cattle Production

These are just a few of the beef cattle turned out over a ...

... is grown on the farm. About 150 acres of corn was produced there last year.

One point that Mr. Oliver is quick to stress is that he is not in the livestock breeding business and doesn't share the breeders' ...ural prejudice for any particular variety of cattle.

"...e just try to get the best ... breeds," he explained.

...t of their calves are Kan... Texas-bred and are pur... personally by Mr. Oliver, ...ther or Mr. Howard.

... Howard characterized the ... business as "a fast ... place for amateurs," ... there are a few ... trade.

... calves arrive at their ... acres of ... cue, tim...

Much of this grows where timber stood just a couple of years ago as an extensive clearing operation on the Oliver farm came with the cattle business.

About 350 acres of trees were cut by commercial timber interests who wanted the wood.

"We were just interested in getting rid of the timber as fast as we could," Mr. Oliver said.

The clearing was one of the top orders of business when general farming was abandoned in favor of beef production.

WATER SUPPLIED

Another was the establishment of an adequate water supply system, since Mr. Oliver was willing to leave the supply ponds or creeks.

This involved drilling d...

... Oliver, now owns it. ...iver has expressed the ...he farm remain in the ...ily and the conversion ... the large-scale cattle ... was seen as a way to ...

THE OPERATION

...terprise — with its nurs... prodding of more than ...d of beef toward develop... the bookkeeping, watching ...arkets and making certain ...ull use of the extensive fa... are being made — looks a lot of work and responsi...y for a young man of 21. ...ut Cowder Oliver summed up ... outlook in three words: "I ... it."

The operation wasn't quite the ...me, but John Oliver Sr. and ...one who came in between prob...

FARM NEWS

Country Cured

Farm Calendar

June 5 to 9—State 4-H Club Week at the University of Missouri.

June 7, Thursday—State Extension Service meeting to discuss the proposed turkey marketing order at the City Hall, Monett.

June 12, Tuesday—Practice judging, demonstration and modeling day for Newton County 4-H members in the Farmers' room in the Newton County Courthouse, 8:30 a. m.

June 14, Thursday—Newton County 4-H Livestock Judging starts at the Rouis Wade farm at 9:30 a. m.

June 14 and 15—Production Credit Short Course in the Memorial Students Union, University of Missouri 10:30 a. m.

June 14, Thursday—Joint Civic Club barbecue at the Kermit Lewis farm, 7 p. m.

June 15, Friday—Newton County Dairy Day and Agricultural Centennial programs.

June 18 to 23—Voting in the referendum concerning the proposed Federal Turkey Marketing Order at the ASCS offices.

July 19, Thursday—Missouri Livestock association annual meeting at the Holiday Inn in Columbia.

July 22 to 28—National Farm Safety Week.

August 5 to 7—Missouri ... Water Conse...

...ding Six Months In Europe

...E Delegate Tells ... Host German Family

... for his trip are provided by Missouri 4-H Club members, businesses, individuals, and foundations through the National 4-H Club Foundation in Washington, D. C.

IFYE is a People-to-People program devoted to creating understanding between rural people of the free world. It involves two-way exchanges in which rural youth of other countries live and work with host farm families in the United States and rural youth from the United States live and work with host farm families abroad.

BY ROBERT McGILL

In Germany, a knife and a fork laid parallel on a plate means you've finished eating, but cross them in a wide angle and you've signaled you want more to eat.

Although in many ways German food differs from what we eat in the U. S., in one important way it is quite similar. It is almost always good.

A set German breakfast table looks different than a U. S. breakfast table. There is no cereal, toast, fried eggs, or bacon and usually there is not even a plate to eat from. But don't let this fool you, a German breakfast is good.

Instead of plates, we eat from small boards about a half inch thick and four by eight inches wide. But this is a... cause the main br... in Germany is ...

...News Story

...tional Ag... ...ens Monday ... Air Base

...t Missouri Cotton Growers Launch Plan ...e Their Product More Competitive

... was presented by National Cotton Council field service representatives Clifton Kirkpatrick, C. E. McDaniel, and Robert E. Price.

They pointed out that if cotton simply maintains its present share of the growing fiber market, expansion in total consumption would permit a 20-million-bale market for American cotton in seven or eight years.

To do this, however, growers must narrow the present research and promotion gap between cotton and its competitors. Synthetic manufacturers now spend $80 million a year for research. Cotton, from all public and private sources, spends only $19 million. Cotton also suffers a 15 to 1 deficit in promotion, it was explained.

Outlined were research opportunities of direct benefit to growers. Most are fundamental research projects in critical areas such as eliminating boll shed, hand labor, and cotton diseases. Also cited was a hard-hitting research program to create consumer demand for cotton products.

A spot check prior to the meeting showed growers realize the pressing need to help themselves and that the Institute provides a means of doing this.

Jack Hutchison of Caruthersville, vice chairman of the steering committee, said: "This program offers an ideal opportunity to paddle our own canoe. It is the first approach I know of that gives farmers a chance to compete with synthetics in an organized front."

He said he especially likes the fact that every dollar will go for research and promotion, funds contributed will draw matching funds, the Institute does not duplicate the function of any other organization, and trustees will be elected in proportion to funds contributed in a state or area.

"We're in the cotton business to create jobs and make a living," pointed out Dearmont Oliver of East Prairie. "I think we should be in favor of this plan. We need to tell people in the cities about cotton products."

Another East Prairie farmer, Sam Jones, stated, "We're in trouble and have been for years. Our big trouble is the synthetics and their millions to spend."

W. C. Bryant, East Prairie, pointed out he had given the plan a lot of thought and is definitely for it. "I don't know of any other industry that doesn't spend over a dollar out of every $150 of its gross for research and promotion."

At Essex, J. P. Ross said, "If producers do not get busy and promote the use of cotton, we'll soon be out of business. Here in the Bootheel, research and promotion will mean more acres and profits for producers."

Tom Allen of Sikeston stated he was very strongly in favor of the program. "The promotion of cotton is vitally important. The people I've talked to all agree this is one of the most important things we have to do."

"I think we have to do more research and advertising to keep the market we've got and maybe pick up some," stated Paul Crouthers of Lilbourn.

Cecil Campbell of Kennett stated, "I'm thoroughly convinced we need research and promotion. Seems to me we now have an opportunity to help ourselves and we should take advantage of it."

Another Kennett grower, Cliff Talbert, pointed out American cotton is sick. "A sick man isn't going to get well by himself. We've got to give him some medicine."

Vernon Wright, who is associated with his brother in cotton, stated they have discussed the plan seriously a number of times. "We feel the cotton producer had better wake up. Otherwise, his acreage is going to be cut instead of increased."

Kenneth Berry, Holland, said he feels fundamental research by the Institute can help solve big problems in growing cotton. "One is the wilt problem. It's attacking us pretty heavily already this year. There are a lot of things research can do for us."

TOM BAKER

...onday, July 23

The Risco R-2 School will open ... 1962-63 school year Monday, ...y 23, according to an announcement made this week by A. L. ...tes, superintendent. Bates said ... a full staff of qualified teachers has been employed.

...ollment for all classes will be ...ay, July 23, beginning at 8:30 ... After the enrollment has been ...leted, the school buses will re... the students to their homes. A ...ers meeting will be held in the ...noon.

...ool buses will travel the same ..., using the same time schedule ...st year. Adjustments will be ... in the routes if necessary.

...w Juvenile Officer ...pointed For County

...cuit Judge Arthur U. Goodman Jr., of Kennett today announced the appointment of Ralph Lloyd ... Juvenile Officer for the 35th ...ial Circuit, which is composed ... Dunklin and Stoddard Counties. ...yd is a native of Kennett and ...formerly engaged in engineering and survey work in Dunklin ...ty. For the past several years ...as been employed as Child ... Worker in the Masonic Children's Home at LaGrange, Illinois. ...yd will officially begin his ... on July 24, succeeding Bill ...lister, who has accepted employment as Midwestern Sales Representative for the Fisher Price Toy ...facturing Co., of Buffalo, ... York.

...lden Lions Club ...talls New Officers

...ly elected officers of the Malden Lions Club were installed in ...mal ceremonies held Tuesday ... at the Lions Club. Ray J. Mo... served as the installing officer. ...n Black was installed as president of the club for 1962-63. He ...eds Rex West.

...er officers taking office were: ...ice-President, H. P. Prentice; ...Vice-President, J. D. Byrum; ...

Teachers Staff Is Complete For Risco School District

A. L. Bates, superintendent of Risco public schools, announced this week that a full staff of qualified teachers has been employed for the coming year. The Risco schools will open their school year on July 23.

The Risco school faculty is composed of:

Junior High and High School

A. L. Bates, Superintendent

Don J. Brewer, principal; Mrs. Doris Blough, Jr. H. S. Math.; Ralph Blough, H.S. Science; Mrs. Reta Butler, H. S. Soc. Studies and Math. Mrs. Madean Dubus, English and Commercial; James DuBus, Jr. H. S. Soc. Studies; Billy Frazier, Jr. H. S. Science; Robert Gray, elementary and H. S. Music; William E. Gordon, H. S. Soc. Studies and Math.; Miss Betty Greer, Commercial; Robert Harris, Voc. Ag.; Roy Hen, P.E. and H. S. Athletics; Mrs. Martha Hunter, Home Ec.; Mrs. Joy Lansum, Elementary and H. S. Art and Spanish; Mrs. Vallie Patterson, Jr. H. S. English; Benny Pulliam, Guidance and H. S. Soc. Studies; William Shoat, elementary and Jr. H. S. p.e.; and Mrs. Marie Weston, H. S. English.

Elementary School

Clyde Brown, Principal

Special Education — Mrs. Goldie ...

Meeting To Discuss Vegetable Growing Set For 7 p.m. Monday

Division of Commerce Director To Speak; Area Farmers Invited

Four meetings to discuss a proposed survey on the feasibility of large scale vegetable growing in Southeast Missouri will be held Monday and Tuesday, July 16 and 17.

The meetings are scheduled at Malden, Caruthersville and Senath on July 16 and at Sikeston on July 17, Dr. Marvin C. Dobbs of Kennett, director of the University Extension Center, reports.

Lawrence A. Schneider, new director of the Missouri Division of Commerce and Industrial Development, will visit the "Bootheel" on July 16 and 17. The purpose of the visit will be to get acquainted with residents and study area facilities.

The new director, along with J. Carl Anderson of Gideon and other staff members, will inspect facilities at Malden Air Base and will be guests at a Chamber of Commerce and Malden Development Corporation dinner at 7 p. m. at the Lions Den.

All farmers and landowners in the area interested in attending this meeting on vegetable growing are invited. They should notify the Chamber of Commerce office in Malden so that sufficient food may ... ministration will be asked to share the cost which is estimated at $20,000 to $25,000.

At a recent meeting in Gideon, J. C. Anderson, a member of the commission of the Missouri Commerce and Industry Division declared that now would be a good time for the area to break away from its economic dependence on cotton, soybeans and wheat.

Anderson cited several advantages of the area including fertile soil, a long growing season, flat land that can be leveled at a relatively low cost for surface irrigation, adequate water for irrigation and a central location in relation to markets.

Clyde Cunningham, extension economist in marketing at the University of Missouri, pointed out to the group that a potential processor would be interested in the quality and quantity of vegetables in the area and would want to have confidence that he would get them.

Cunningham also emphasized that vegetable production would not compete with cotton production.

Attitude Changed

Bratton Wallace, director of the Marketing Division, State Depart...

. . . JUNIOR-Written Story . . . COUNTY AGENT Story

$500 check from the Soil Fertility Council to kick off his project. Today, 107 newspaper editors—nearly one-third of Missouri's papers—participate in the program.

All Missouri newspapers are invited to participate. Membership is free. Participating editors receive "pep talk" bulletins every two or three months: tips on how to improve farm pages, encouragement for good local coverage. They also receive a stereotype mat of a country-cured ham hanging from a smokehouse rafter, a symbol they can use to identify their paper with this state-wide movement to strengthen local farm news.

Once a year all member papers submit their best local farm news coverage to the Ag Editor's Office at the University for judging under seven categories:

1. Best all-around farm page.
2. Best written local farm news story.
3. Best written local farm feature.
4. Best written local farm column.
5. Best local farm picture.
6. Best farm story written by a junior, such as a 4-H Club member.
7. Best written local farm story developed by a county agent.

The winners are recognized at a COUNTRY-CURED BREAKFAST on the last day of Journalism Week at the University in Columbia. The awards—relatively token but meaningful under keen competition—are framed certificates and gold tie clasps fashioned as a country ham.

The one cash award—of $100—is reserved for the county agent writing the best local farm story. The object: to help make county

THE COUNCIL'S BOARD OF DIRECTORS are, seated, left to right: N. A. McDonald, Missouri Limestone Producers Association; Secretary-Treasurer T. D. Dunscombe, Missouri Farmers Association; Vice-president W. J. Stuart, Darling and Company; 1964 President Paul Marshal, W. R. Grace and Company; Retiring President James A. Hart, Spencer Chemical Company.

Standing left to right: John Miller, Consumers Cooperative Association; Joe Heimes, Spencer Chemical Company; Walter Sanborn, California Chemical Company; Arlan Woltemath, Ashcraft-Wilkinson Company; Homer Parman, Top Crop Inc.; and Russell Gibbs, International Minerals Company.

Directors not pictured are W. H. Cover, Armour and Company, and W. J. McBride, Swift & Company.

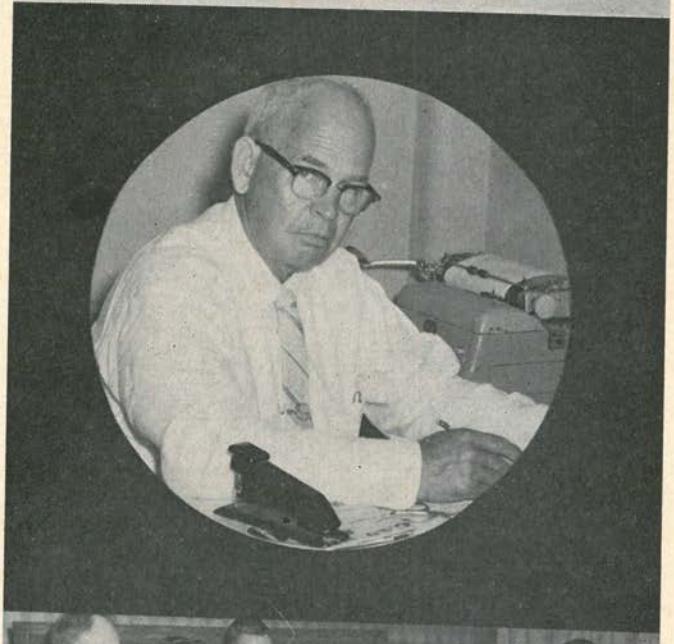
COUNTRY CURED WINNERS (left to right) for 1963 were Allen Black, editor *Malden Press-Merit*, Best Local Farm News Story; Don Gordon, reporter for *Cape Girardeau Southeast Missourian*, Best Farm Feature Story; Jim Whitfield, Henry County extension director, Best Farm Column, in the *Windsor Review;* Robert McGill, senior at Missouri University, Best Story Written by a Junior; Dick Brady, editor of *Monett Times*, who published McGill's stories about the International Farm Youth Exchange program in Germany; Howard Bush, representing Tom Hanger, farm editor of the *Neosho Daily News* who tied with *Cape Girardeau Southeast Missourian's* Don Gordon for Best Farm Feature Story; Mike Hood, Missouri University senior, Best Farm Picture, in *Columbia Missourian;* and Don Kirkpatrick, advertising manager, *Windsor Review*, who saw that Jim Whitfield's prize winning column was published

THE SPONSORS

. . . Soil Fertility and Plant Nutrition Council of Missouri.

THE CREATOR

. . . Veteran newsman, Clyde Duncan.



. . Representing newspapers rom various parts of the tate

THE WINNERS

selfish endeavor—not a publicity stunt. Its purpose today—as in the beginning more than 10 years ago—is to support research and education for better soil fertility practices. Improving farm news seemed a natural way to spread good education.

"This has been our aim—to promote agriculture with no strings attached," says Paul Marshal, 1964 Council president from W. R. Grace Company.

Newsman Bill Bray agrees with Marshal: "They seek no publicity. The Council's support of our Country-Cured Farm News Program is a genuine effort for more and better farming practices."

The program's success for Missouri or any other state depends on the enthusiasm of the editors involved, Duncan says, especially those organizing the project.

He should know. Most Council members and Missouri newsmen are quick to say Duncan's own enthusiasm has made Missouri's "COUNTRY-CURED FARM NEWS PROGRAM" the popular movement it is today.

The results seem appropriate for a man who has hauled so many different writing loads for so many years—in his sixth decade to bring his experience into Dick Lee's Ag Editors shop at Missouri and sell some of the nation's top agricultural journalists on the need for improving local farm news.

Upon such teamwork is true progress built.

ORDER SOYBEAN CHART

PAGE 9

HIGHER PLANT POPULATIONS

Indiana's 1963 Five-Acre Corn Growing contestants who pushed their yields past 200 bushels per acre used more fertilizer, higher plant populations, more narrow rows and less tillage than entrants with lower yields.

Three hundred contestants were divided into three groups of 100 each so their practices could be compared with their yield success. The high group was 100 who produced more than 200 bushels an acre, the average group produced 155 to 157 bushels per acre, and the low group produced less than 115 bushels.

Dr. Marvin L. Swearingin, Purdue University extension agronomist, reports that the high group planted an average of 20,140 seeds per acre, the average group planted 18,140 seeds and the low group planted 16,400. Rows 38 inches wide or less were used by 55 per cent of the high group, 45 per cent of the average group and 29 per cent of the low group.

MORE FERTILIZER

Average total nitrogen in pounds per acre was 120 for the high group, 93 for the average group and 67 for the low group. Similar comparisons, from high to low group, for phosphate were 91, 64 and 54 pounds per acre and for potash were 104, 79 and 60 pounds per acre.

Swearingin said more members of the high group planted before May 10, more used one or no trips after plowing to prepare a seedbed and more used pre-emergence herbicides and fewer cultivations to control weeds. More than 90 per cent of the high group applied starter fertilizer with side band applicators.

KEYS TO CORN CHAMPIONS

. . . FROM LAFAYETTE, IND. *NEWS & OBSERVER*

These tabulations are to be considered only as a summary of practices used and not a statistical analysis from which cause and effect conclusions may be drawn. The summary does indicate certain trends in practices used by entrants when grouped according to yield.

It should be remembered when considering such practices as seeding rate and row width that a higher percentage of the low yielding group is located in Northern Indiana and on sandy loam or lighter soils.

MORE NARROW ROWS

LESS TILLAGE

CULTURAL PRACTICES USED IN 5-ACRE CORN CONTEST—1963 SUMMARY

(100 samples each from low, average, and high yield groups)

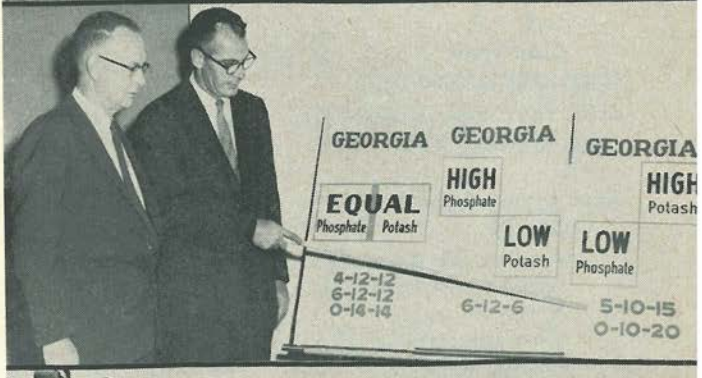
	Below 115 bu/A	155 to 157 bu/A	Above 200 bu/A	Above 200 bu/A 1962
DISTRIBUTION OF SAMPLES				
Northern Ind.	46	31	7	
North Central Ind.	20	34	37	
South Central Ind.	24	24	35	
Southern Ind.	10	11	21	
SOIL TYPE (%)				
Loam or heavier	61	60	87	
Sandy loam or lighter	26	14	9	
N/A*	13	26	4	
PRECEDING CROP (%)				
Continuous row crop	20	21	24	16
Followed legume	33	36	37	53
PLOWED (%)				
Fall	7	8	15	
Spring	93	92	85	
SEEDBED—NO. OF TRIPS (%)				
0 (Plow & plant)	4	3	7	6
1	13	11	21	
2	42	44	34	
3 or more	41	42	38	
PLANTING DATE (%)				
Before May 10	20	32	35	35
May 11–20	37	45	39	56
After May 20	32	15	21	9
N/A	11	8	5	—
ROW WIDTH (%)				
39–40″	66	45	41	42
37–38″	24	39	36	45
35–36″	5	5	13	10
34″ & below	0	1	6	3
N/A	5	10	4	—
SEEDING RATE (%)				
Above 22,000	3	11	27	
20,100–22,000	5	16	28	
18,100–20,000	16	21	26	
16,100–18,000	22	25	14	
14,100–16,000	24	25	4	
14,000 or below	18	1	0	
N/A	12	1	1	
Average seed rate/A.	16,400ppa	18,140ppa	20,140ppa	20,135ppa

*N/A—no answer.

	Below 115 bu/A	155 to 157 bu/A	Above 200 bu/A	Above 200 bu/A 1962
HYBRIDS USED				
Total number	62	55	43	42
Companies represented	33	29	22	18
Used SX or modified SX (%)	23	28	25	26
Used mixed hybrids (%)	7	7	9	—
N/A (%)	4	2	2	—
CULTIVATION (%)				
None	2	4	1	3
Cultivated once	26	37	42	39
Cultivated twice	54	54	54	56
Cultivated 3 or more	14	5	4	1
Rotary hoed at least once	52	69	47	60
HERBICIDES USED (%)				
Preemergence	17	24	38	60
Post emergence	32	45	35	
% of users indicating good results	73	81	89	
INSECTICIDES USED (%)				
Soil	0	3	8	8
Corn borer	3	2	6	8
USED IRRIGATION (%)	0	2	1	1
SOIL TEST AVAILABLE (%)	22	29	33	43
USED MANURE PAST 2 YRS (%)	36	42	35	43
FERTILIZER WITH PLANTER				
Applied side band (%)	58	74	85	95
Applied split boot (%)	31	15	9	5
N/A	11	11	6	—
Used row fertilizer (%)	92	97	98	100
No K_2O in row (%)	11	20	11	15
Average lbs./A				
N	14 lbs.	15 lbs.	16 lbs.	15 lbs.
* P_2O_5	44 lbs.	53 lbs.	59 lbs.	54 lbs.
K_2O	33 lbs.	31 lbs.	36 lbs.	36 lbs.
FERTILIZER BROADCAST OR SIDE DRESSED				
N–% using	65	84	90	85
–Ave lbs/A	52 lbs.	77 lbs.	104 lbs.	96 lbs.
P_2O_5–% using	20	22	43	23
–Ave lbs/A	10 lbs.	11 lbs.	32 lbs.	20 lbs.
K_2O–% using	34	50	57	49
–Ave lbs/A	26 lbs.	48 lbs.	69 lbs.	56 lbs.
AVERAGE TOTAL FERTILIZER				
N–lbs/A	67	93	120	111
P_2O_5–lbs/A	54	64	91	74
K_2O–lbs/A	60	79	104	92
USED MICRONUTRIENTS (%)	0	0	5	5

Where official agriculture and industry . . .

. . . are selling efficient soil fertility



. . . for higher yields per acre.

THROUGH GEORGIA'S FAMED EXTENSION AGRONOMY INTENSIFIED PROGRAMS . . .

YIELDS AND INCOME CLIMB WHEN FARMERS FOLLOW SCIENCE

By P. J. Bergeaux & J. R. Johnson
University of Georgia

Although Georgia farmers applied the first commercial fertilizer used in the United States—Peruvian guano on Hancock County cotton in 1845—soil test summaries over a century later showed their soils still acid, still low in nutrient elements.

FERTILITY STATUS OF GEORGIA SOILS—1957 [1]

Area	Percent Soils below pH 6.0
South Georgia	70%
North Georgia	63%

Area	% Low and Medium in Phosphorus	% Low and Medium in Potassium
South Georgia	73%	93%
North Georgia	72%	78%

[1] Compiled from Georgia Soil Test Summaries.

These findings gave birth to Georgia's now well known Soil Fertility Program in 1957. The need was clear that year:

1 LOW ANALYSIS FERTILIZERS in wide use—over 268,000 tons of

non-recommended grades (25% of the tonnage sold) plus 50% of the nitrogen consisting of 16 and 20 percent sources of nitrogen.

2 LIME NEEDS extensive—about 70% of the state's soil. Where farmers should be using about 1,500,000 tons annually, they were using only 328,077 tons.

3 FAR LESS FERTILIZER USE THAN RECOMMENDED on major crops. . . .

AVERAGE FERTILIZER USE PER ACRE

(1957 Survey of 6 Pilot Counties)

Crop	Average Yields/A	Fertilizer Use–lbs/A N	P_2O_5	K_2O	Recommended–lbs/A N	P_2O_5	K_2O
Corn.....	33 bu.	44	36	37	100	50	70
Cotton.....	395 lbs. lint	48	54	69	80	60	80

. . . in a state where almost half the farmers surveyed did not know what the numerals in 4-12-12 fertilizer analysis meant.

4 CROP YIELDS far below economic production levels:

CROP	Per Acre Yields
Cotton.....	333 lbs. lint
Corn.....	26 bu.
Oats.....	28 bu.
Tobacco.....	1289 lbs.
Hay.....	96 tons
Peanuts.....	910 lbs.

5 TOTAL FARM INCOME only $663,000,000 from marketing farm products—in contrast to $950,000,000 in 1963.

A PROGRAM TO MEET THE NEED

How Georgia's Soil Fertility program was born to meet these needs has been widely reported in this magazine and elsewhere. We need not repeat the details here. It has been a story of teamwork: between fertilizer industry agronomists, college Extension agronomists, official county workers, and business and civic leaders made interested in the program by the potential income increases from higher crop yields. The object: to stimulate more and more farmers to adopt soil testing habits and to follow the recommendations from those tests.

It began in six pilot counties, expanding by 20-25 counties each year until 154 counties will complete the Soil Fertility phase of the Extension Agronomy program this year.

Out of the Soil Fertility Program grew follow-up crop campaigns in this sequence of programs:

MASTER CORN—to do something about those low corn yields.
BIG M PASTURE—to promote more and higher quality grass.
PROFIT PICKING COTTON—to raise too-low yields.
BONUS SEED—to bring in the latest varieties and hybrids.
CLEAN ACRES—to eradicate "Willie Weed."
GOLDEN PEANUT—to do for peanuts what the other Intensified Extension Agronomy Programs had done for corn, pastures, cotton, etc.

But what about the Soil Fertility Program—the tremendous increase in soil samples? Did farmers follow soil test lime and fertilizer recommendation?

Out of nearly 900 farmers replying to a random survey from 45 different counties, 68% said they followed the lime recommendations, 65% followed or used more fertilizer than recommended.

And these farmers realized more income after adjustments for extra lime, fertilizer, and harvesting costs:

LIME

CROP	YIELDS/A SOIL TEST RECC. used less	followed	UNIT	ADDITIONAL INCOME/A [1] THROUGH FOLLOWING SOIL TEST RECOMMENDATIONS
Cotton	442	492	lbs. lint	$11.00
Peanuts	1276	1400	lbs.	$ 8.50

FERTILIZER

Cotton	371	534	lbs. lint	$39.50
Pastures	2.6	4.1	tons hay	$15.10
Corn	44	59	bushels	$10.05
Peanuts	1342	1406	lbs.	$ 3.40

[1] Average per acre income above that of farmers who used less lime and fertilizer than recommended. Extra lime, fertilizer and harvesting costs deducted.

As expected, most farmers followed or used more fertilizer than recommended on the major cash crops—tobacco, cotton, peanuts—but less than recommended on corn and pastures, the two crops covering the majority of cultivated acres. This indicates the fertilizer potential in Georgia.

EFFECT ON THE STATE'S ECONOMY

How are these programs affecting Georgia's farm economy? Soil fertility is only one factor influencing farm income—true—but the changes in lime-fertilizer usage, per acre yields, and farm income between 1957 and '62 tell a graphic story even this early in a long-range program.

1 Soil Samples Soar

About 22,000 soils samples were tested in 1957, the year before the Program was launched. The samples nearly doubled the first year—39,000 in 1958—reached a peak of 53,000 in 1959, and currently average 45,000 samples per year.

2 Fertilizer Usage Shifts Gears

. . . to high-K fertilizers

Fertilizer tonnage climbed 17 percent, despite cultivated acreage cuts from various government programs. And plant nutrients jumped a whopping 58 percent, reflecting the Program's emphasis on higher analysis fertilizer—especially those high in potassium.

MIXED FERTILIZER

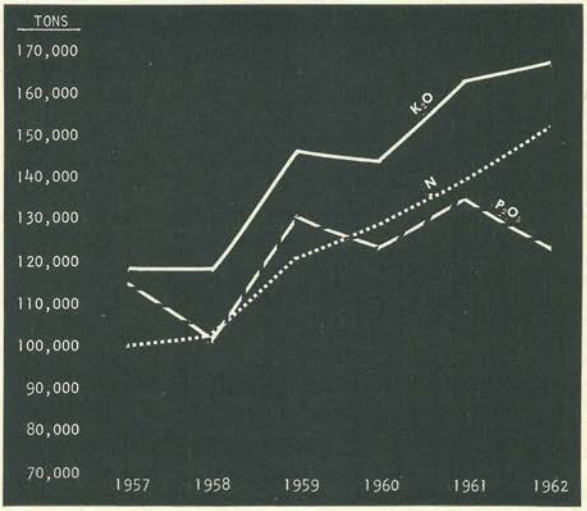
Year	Tonnage	% Increase
1957.....	1,291,442	
1962.....	1,512,965	17

Plant Nutrients

	(N, P_2O_5, K_2O)	
1957.....	340,721	
1962.....	536,923	58

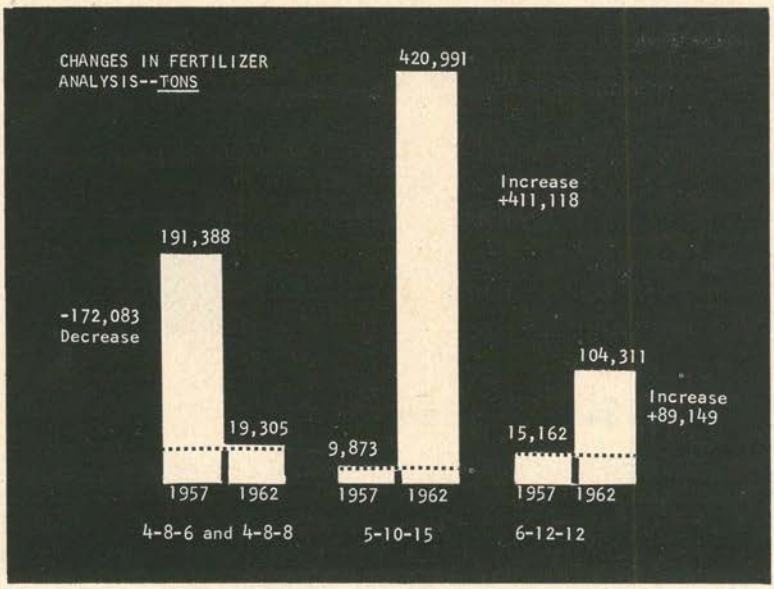
Average Plant Nutrient Content

Year	Plant Nutrient Content %
1957.....	25.99
1962.....	29.60



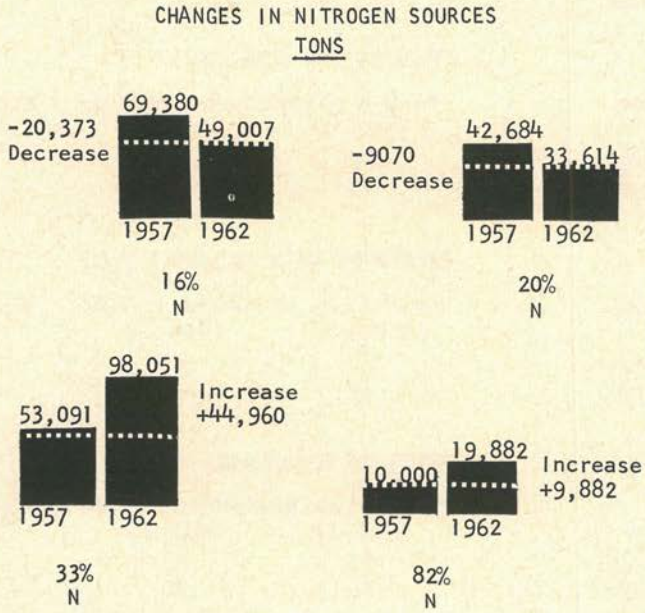
The striking potassium and nitrogen progress came from increased usage of high potash fertilizers and more nitrogen.

High potash fertilizers—such as 5-10-15—were emphasized because earlier soil test summaries showed the majority of Georgia's soils lower in potassium than in phosphorus.



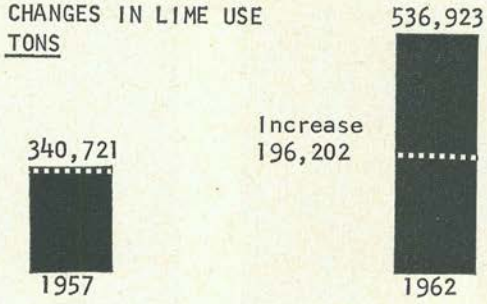
. . . to high-N materials

The Soil Fertility Program stimulated much wider usage of recommended grades and high analysis nitrogen materials:



3 Lime Usage Climbs

Although lime usage increased 58%, the gap between current use and need (1,500,000 tons) is still great:



4 Soil Fertility Status Barely Shifts

Before 1957, soil test summaries showed most Georgia's soils either low or medium in available P_2O_5 and K_2O—and also acid. By 1962, potassium and pH levels showed little change—North Georgia soils slightly less acid, South Georgia practically no change—but phosphorus soil levels significantly up in both areas, especially the South.

Why didn't soil potassium increase and acidity decrease with increased usage of high-K fertilizers and lime? Removal by higher crop yields and acid residue from increased use of ammonia type nitrogen help answer this question.

CHANGES IN SOIL pH

Area	Percent of Soils below pH 6.0		Change
	1955–57	1960–62	%
South Georgia	70	68	– 2
North Georgia	63	53	–10

CHANGES IN AVAILABLE P_2O_5

Area	Percent Low or Medium in P_2O_5		Change
	1955–57	1960–62	%
South Georgia	73	35	–38
North Georgia	72	49	–23

CHANGES IN AVAILABLE K_2O

Area	Percent Low or Medium in K_2O		Change
	1955–57	1960–62	%
South Georgia	93	92	– 1
North Georgia	78	70	– 8

5 Yields and Income Climb Together

The payoff? It comes through income from crop yields. Both yields and income have climbed steadily during the Extension Agronomy Intensified Programs:

CHANGES IN PER ACRE YIELDS AND INCOME
1957 and 1963

CROP		Per Acre Yields 1957	1963	Increased Income 1963 over 1957
Corn	–bu.	26	43	$ 25,166,000
Wheat	–bu.	17.5	28	410,000
Oats	–bu.	28.5	36	3,659,000
Soybeans	–bu.	14	16.5	970,000
Cotton	–lbs. lint	333	454	40,978,000
Peanuts		910	1500	33,985,000
Tobacco		1295	2003	36,912,000
			Total	$134,762,000

Total farm income climbed to nearly $950,000,000 in 1963—a new high and sharp contrast to the $663,000,000 of 1957. The increase? Nearly $290,000,000!

Georgia's Soil Fertility Program was only one shoulder behind this big push. But no one driving along its lush green pastures or plump-eared cornfields or thick white cotton rows can doubt what soil fertility management had to do with this picture. THE END

Shrinking Trees
From Page 21

effects on foliage. "You can almost see the terminal growth slow down," says Edgerton, "yet the leaves grow to full size, are green and well developed."

While it appears that trees remain perfectly normal and well formed (other than remaining small), extensive tests are planned to analyze fruit development. The exact amount or concentration of spray and the proper times of application must be determined so that development of apples is not retarded, explains Edgerton.

Another possible benefit from the spray is the likelihood that it will bring trees into bearing at a younger age. Here again, additional tests are needed, according to Edgerton.

The pomologist stresses the point that these new findings do not replace the use of root stocks which produce dwarf trees—a means of reducing tree size that has prompted interest among growers in recent years. "We might call the new method a supplementary means, for which we will find many uses," he says.

CORNELL NEWS

Via fertility know-how

Steps Toward Tobacco PROFITS

C. O. McKee
O. E. Street
J. H. Hoyert

. . . In Maryland Extension Fact Sheet 111

You're fertilizer-conscious by necessity. You know you need fertilizer for a profitable tobacco crop. Even so, questions pop up:

"How much fertilizer?"

"What analysis is best?"

"What's the best way to apply it —and when?"

Once you've got the answers to these questions, you still need to know how many plants per acre are best for your particular soil.

We realize that there is generally a desirable combination of fertilizer and planting practices for any individual farm condition. By the same token there are general

EFFECT OF FERTILIZER RATES AND PLANT POPULATIONS ON TOBACCO ACRE VALUES*

Pounds of 4–8–12	Plants Per Acre 4900	7200	8700
		Results	
750	$519	$510	$472
1500	$577	$639	$606
2000	$649	$726	$709

* 3-yr. avg. University of Maryland Agricultural Experiment Station.

BROADCAST vs. BAND FERTILIZER APPLICATIONS ON TOBACCO*

Method of application	Value per acre
Broadcast	$607
Bands	$681

* 3-yr. avg., University of Maryland Agricultural Experiment Station.

EFFECT OF THICKNESS OF STAND ON TOBACCO VALUES*

Plants per acre	5,000	7,200 to 7,500	8,700 or more
		Value per acre	
	$553	$615	$598

* 5-yr. avg., University of Maryland Agricultural Experiment Station.

recommendations for planting rate and fertilizing practices that have a very wide range of adaptation over much of the major tobacco-producing area in Southern Maryland.

Research was conducted at the University of Maryland Tobacco Experimental Farm, investigating the relationship of fertilizer rate and method of application with plant spacing. This test was located on a sandy loam soil typical of much of the tobacco-producing area.

A 40-inch row width was used in this test, with plants spaced to give a comparison of 4,900, 7,200 and 8,700 plants per acre.

Rates of fertilizer tested were 750, 1500 and 2000 pounds of 4-8-12 per acre.

We could also compare the broadcast method of fertilizer application with the band and side-dress methods.

This test showed that fertilizer rate was the most important factor. At all plant populations, the

value of the tobacco increased as the fertilizer rate was increased.

The 7200-plant population level was superior to the 8700 level at all fertilizer rates. This indicates that on this soil there is no advantage to the high plant population rate. The 7200-plant population was also superior to the 4900 level at the 1500- and 2000-pound fertilizer rate, but not at the 750 pound rate. Therefore, low fertilizer rates will support only a low number of plants, but at higher fertilizer rates, more gross return will be obtained by increasing the plant population.

Other research with rates of nitrogen, phosphate and potash has given still further information on the amounts of these plant foods necessary to promote desirable growth of tobacco.

RECOMMENDATIONS FOR FERTILIZATION

Factors to consider in determining the amount of fertilizer to be used revolve around the needs of the plant. Plants obtain plant food from the soil. The soil provides it from its "stored" quantity plus the fertilizer added.

Soil Test. The first step in determining your fertilizer needs is a soil test. This is a measure of the "stored" quantity of phosphate (P_2O_5), potash (K_2O) and magnesium (MgO) in your soil. A soil test further indicates the relative acidity (pH) of your soil.

You can get a soil test and recommendations for tobacco fertilizer from the Soil Testing Laboratory of the University of Maryland, Agronomy Department. See your Extension Agent for further information on how to have your soil tested.

Phosphorus and Potash

It is desirable to have available to the plant as a workable minimum 200 pounds per acre of phosphate and 300 pounds per acre of potash. These minimal plant requirements are met by the "stored" quantity in the soil plus the recommended fertilizer application.

Nitrogen

The nitrogen level changes rapidly in the soil with temperature, moisture, etc. Therefore, it is very difficult to make specific nitrogen recommendations for crops based on the soil test. General nitrogen recommendations range from 60 to 90 pounds per acre. The method for supplying nitrogen will depend upon the level of phosphate and potash in the soil.

If your soil test indicates low levels of phosphate and potash, all the nitrogen will be supplied in a mixed goods (example 4-8-12) tobacco fertilizer. However, if your soil test shows relatively high levels of phosphate and potash, then only part of the nitrogen should be supplied in a mixed fertilizer goods and the remainder in straight goods (example, ammonium nitrate).

General fertilizer recommendations, where no soil test information is available will be about 1,500 pounds of 4-8-12 per acre.

Fertilizer ratios found to be best for Maryland soils are 1-2-3, example 4-8-12, 5-10-15, 7-14-21: and 1-2-4, example 4-8-16. These ratios are for broadcast, band, and sidedress applications. A 1-0-3 ratio (8-0-24) is also available and recommended primarily for sidedressing.

HOW FERTILIZER SHOULD BE APPLIED

Band. Research work at the University of Maryland Tobacco Experimental Farm indicates that there is an advantage from banding fertilizer for tobacco. Where 1,500 pounds of 4-8-12 was applied by both the band and broadcast method, there was a $74 increase in acre value in favor of the band method. The bands of fertilizer should be placed about 4 inches to the sides of the plant and about 3 to 4 inches deep. Transplanters with very satisfactory banding attachments are commercially available.

Broadcast. Broadcasting of fertilizer is the most popular method of fertilizer application for tobacco in Maryland. This method is fast and is normally done immediately prior to transplanting.

Sidedressing. Sidedressing of fertilizer is a necessity on many sandy soils. It is also a very effective method of counteracting the excessive leaching of nitrogen caused by heavy early rains on any soil. In some years there are heavy rains in early to middle June which will cause excessive leaching of fertilizer. Sidedressing additional fertilizer after such rains will give excellent results.

In 1955 there were 2.66 inches of rain between the 8th and 11th of June, at the University of Maryland Tobacco Research Farm. Where 1,500 pounds of 4-8-12 fertilizer was applied in bands before the rain, total return from the tobacco was $557 per acre.

However, where the 1,500 pound application was split, 750 pounds banded at transplanting before the rain and 750 pounds sidedressed after the rain, the per acre return was $666, or $109 more per acre, as a result of sidedressing.

Fertilizer to be sidedressed normally should be applied within 21 days after transplanting to get best results.

HOW MANY PLANTS PER ACRE?

Your Tobacco Experimental Farm tests have shown the number of plants set per acre affects returns considerably.

Setting 7,200 to 7,500 plants per acre gave the highest return—$62 an acre more than 5,000 plants per acre, and $17 an acre more than 8,700 or more plants per acre. Recommendations for the number of plants to set per acre depend on the type of soil, level of fertility and the availability of irrigation. Sandy, droughty or infertile soils can't support as many plants as loamy, more fertile soils.

Lighter, sandy soils: 6,000 to 6,500 plants per acre have given best results.

Medium soils: 6,500 to 7,200 plants per acre are advisable. These medium textured soils make up most of Maryland tobacco acreage.

Stronger, heavier soils: 7,200 to 8,000 plants per acre will pay off, because these soils have better moisture-holding ability.

SUMMARY

1. Test—don't guess! See your Extension Agent about a free soil test for the most economical and profitable fertilizer recommendations.

2. Fertilizer recommendations.

Nitrogen ranges from 60 to 90 pounds per acre depending on your desired level of production, soil texture and past crop history. Phosphorus, potash, lime and magnesium recommendations are based on the soil test.

3. Ways to apply fertilizer. Broadcasting fertilizer is often more convenient from a labor standpoint.

Row placement of fertilizer in bands is a more efficient way to use fertilizer, although it requires special equipment. If you use row placement, you can increase the effectiveness of fertilizer.

4. Sidedressing. This is a necessity on many sandy soils and will greatly improve production after early leaching rains on almost all soils.

5. Number of plants set per acre depends on the type of soil:

Light, sandy soils: 6,000 to 6,500 plants per acre.

Medium textured soils: 6,500 to 7,200 plants per acre.

Heavier soils: 7,200 to 8,000 plants per acre.

THE END

NO LONGER FOR DREAMERS

For the first time University of Delaware agronomists have been able to produce more than 200 bushels of corn per acre—on research plots at the University's Georgetown Substation.

Average production in the state is 65 bushels per acre.

Working on the project were Dr. William Mitchell, extension agronomist, Ed Wisk, crops research associate, and Ed Ralph, associate county agent in Sussex county.

Mitchell said they established a project that they hoped would raise the sights of Delaware corn producers above the traditional 100 bushel mark.

100 FAIRLY COMMON TODAY

"Fifteen years ago the average Delaware corn yield was about 30 bushels," Mitchell explained. "Hundred bushel yields were for dreamers and fellows like us. They were grown on a few research plots around the country, and from this we started making recommendations to farmers that would enable them to duplicate this success. Today one hundred bushel corn is fairly common in Delaware."

Mitchell felt the 100 bushel demonstration plots had served their purpose on the University farm.

"If we were going to stay ahead of the pack we had to know how to grow 200 bushels of corn per acre," he concluded.

Although results of the work from a scientific point of view aren't 100% conclusive, the production factors are sound and success speaks for itself.

Some of the plots went as high as 225 bushels, Mitchell reported. The average of both hybrids used under

. . . AS DELAWARE HITS 200-BUSHEL MARK

the best conditions of the experiment was 188.4 bushels.

WHAT DID IT TAKE?

What did it take to get this? Mitchell lists several points he is sure of and a few others that need a little more investigation.

1 It takes an outstanding hybrid. There are many varieties on the market, he says, but only a few have the potential for a top yield.

2 You can't expect large yields unless you plant large amounts of seed. He tested plant populations of 12,000, 15,000 and 18,000. The 18,000 population gave the highest yields.

3 The high yielding plots had two tons of ground limestone and one ton of 10-10-10 fertilizer disced into the soil and plowed down to a depth of 12 inches.

4 All plots received a pre-emergence treatment of Atrazine to control weeds, eliminating the need for cultivation.

MOISTURE: A BIG FACTOR

Mitchell counts moisture as one of the big factors and one that is the most difficult to control. The test plots received almost 20 inches rainfall during the growing season.

He figures this is about the right amount: "It takes a half million gallons of water to grow a top yield. That is about 20 inches of rainfall."

Most farmers will say nothing can be done about moisture other than irrigation. Mitchell disagrees. The amount of water stored in the soil at planting time is extremely important and farmers can do something about it.

"Once the moisture is in the soil," he explains, "the trick is to save it for the corn. Early plowing will prevent cover crops and other vegetation from using up this store of moisture."

Can the results of this research be duplicated on a larger scale and in other locations throughout the state? Mitchell said, "Ten years ago people were asking the same question about the 100 bushel yields we were getting on our research plots. I think we've proven it can be done. We find more and more people getting the confidence to try, and following the practices that make such yields possible."

NO CEILING TOMORROW

The results of this year's work will need to be re-proven and Mitchell wants to know the answers to some questions that are still up in the air. But since the break-through has been made, he feels it is just a matter of time before the results will be duplicated by Delaware farmers.

Mitchell doesn't see any limit to corn yield maximums in the near future.

"We will have to grow corn at an economical level in the years ahead or switch to some other crop," he concluded. "Right now it takes 60 bushel per acre to break even. Maybe in a few more years the break-even point will be 150 or even 200 bushels. We're not growing corn just to be growing it —we want to be able to show farmers how to produce corn at an economical level."

Delaware News

High Fallout in Milk Traced to Poorly Fertilized Pastures

Studies by the St. Louis County Health Department have disclosed that milk from poorly fertilized pastures contains more radioactive strontium and iodine than milk from well-managed farms.

This unexpected finding could lead to a new countermeasure for reducing the fallout in milk. By proper fertilization of pastures, the amount of fallout entering milk could be substantially reduced.

The disclosure also answers the persistent puzzle of why St. Louis seemed to be a radioactive hot spot, with radioactivity levels in milk generally higher than other parts of the nation.

Actually, St. Louis was not a hot spot by the fallout experts' use of the term. It was just that the milk samples being measured for strontium 90 content were coming largely from poorly managed farms.

Ever since the Public Health Service started surveying the radioactive levels in milk in 1957, St. Louis milk has generally had a higher strontium 90 concentration than other major cities.

Because of this, the St. Louis County Health Department, with the support of the Public Health Service, began a study in 1959 to determine the relationship between the fallout level and farming practices.

The results were described to a Joint Congressional Atomic Energy subcommittee by C. Howe Eller,

Yield Key: Fertilizer PLACEMENT

. . . CAUSING 40% DIFFERENCE IN STAND . . . 27% DIFFERENCE IN YIELD

In VPI tests, when fertilizer was placed in contact with corn seed, yields were only 61 bushels per acre, agronomist George Hawkins reports.

When the same amount of fertilizer was placed in a band to one side of the row so it was not in contact with the seed, yields increased to 88 bushels per acre.

Lower yields were due mainly to lower stands. Contact placement resulted in only a 43 percent stand, but putting the fertilizer to one side resulted in 82 percent of a perfect stand.

The question is often asked: "Should I put all the fertilizer in a band near the seed, broadcast all of it, or broadcast part and put part in a band in the row?" Research shows that highest yields are ob-

commissioner of health in St. Louis County.

Briefly, the findings were that milk from marginally managed dairy farms, where the land is poor and the crop management inadequate, tended to contain relatively high levels of strontium 90 and iodine 131, the radioactive materials in fallout that pose the greatest health hazard.

In contrast, Dr. Eller reported, milk from well-managed farms, where the land was scientifically fertilized, tended to contain relatively lower concentrations of the radioactive substances.

Now that the discovery has been made, the reasons for the disparity seem quite obvious. The disparity results from the effects of fertilization in promoting the growth of pasture foliage.

In well-fertilized pastures, the forage plants grow more rapidly and larger than on unfertilized land. Thus, even though equal amounts of fallout come down on the fertilized and unfertilized pastures, the fallout is more dilute on the larger mass of plants growing on the fertilized land.

Therefore, the cows that consume the fertilized forage take in less fallout and thus pass less along into their milk.

As Dr. Eller pointed out, the discovery offers "a practical partial countermeasure" against fallout contamination of milk. In an experiment on "a marginal dairy farm," he said, it was found that the concentrations of both strontium 90 and iodine 131 in milk could be reduced 50 per cent or more "through optimal fertilization of the land."

THE NEW YORK TIMES

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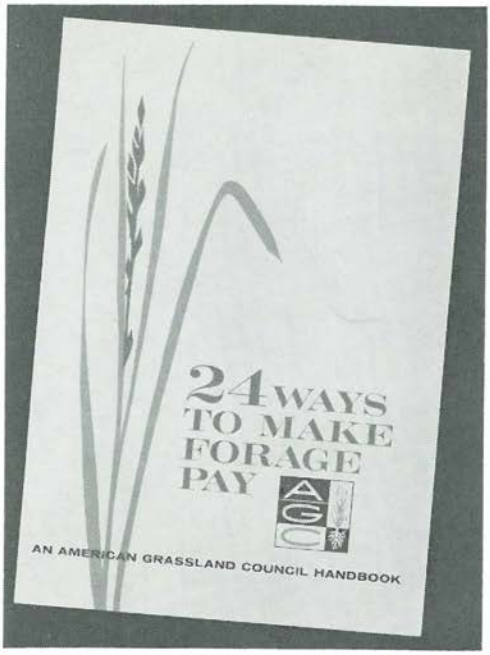
tained when the fertilizer application is split between a broadcast application and a row application.

In addition to slightly higher yields, there are certain advantages in placing part of the fertilizer in a band near the row, says Hawkins. One is the more rapid growth of corn plants during the early part of the growing season. If cultivation is used for weed and grass control, having a larger corn plant at that time can make cultivation easier and may result in better weed control.

If only one method of application is to be used and rather high rates of fertilizer are to be applied, research indicates that broadcasting the entire amount is better than applying it all in the row.

Says Hawkins, "When applying fertilizer for corn, remember *not* to place it in contact with the seed. In deciding whether to broadcast part or apply part in the row or broadcast all, the advantages of split application must be weighed against the extra time and effort involved."

VPI NEWS



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