Kentucky FARM AND HOME Science

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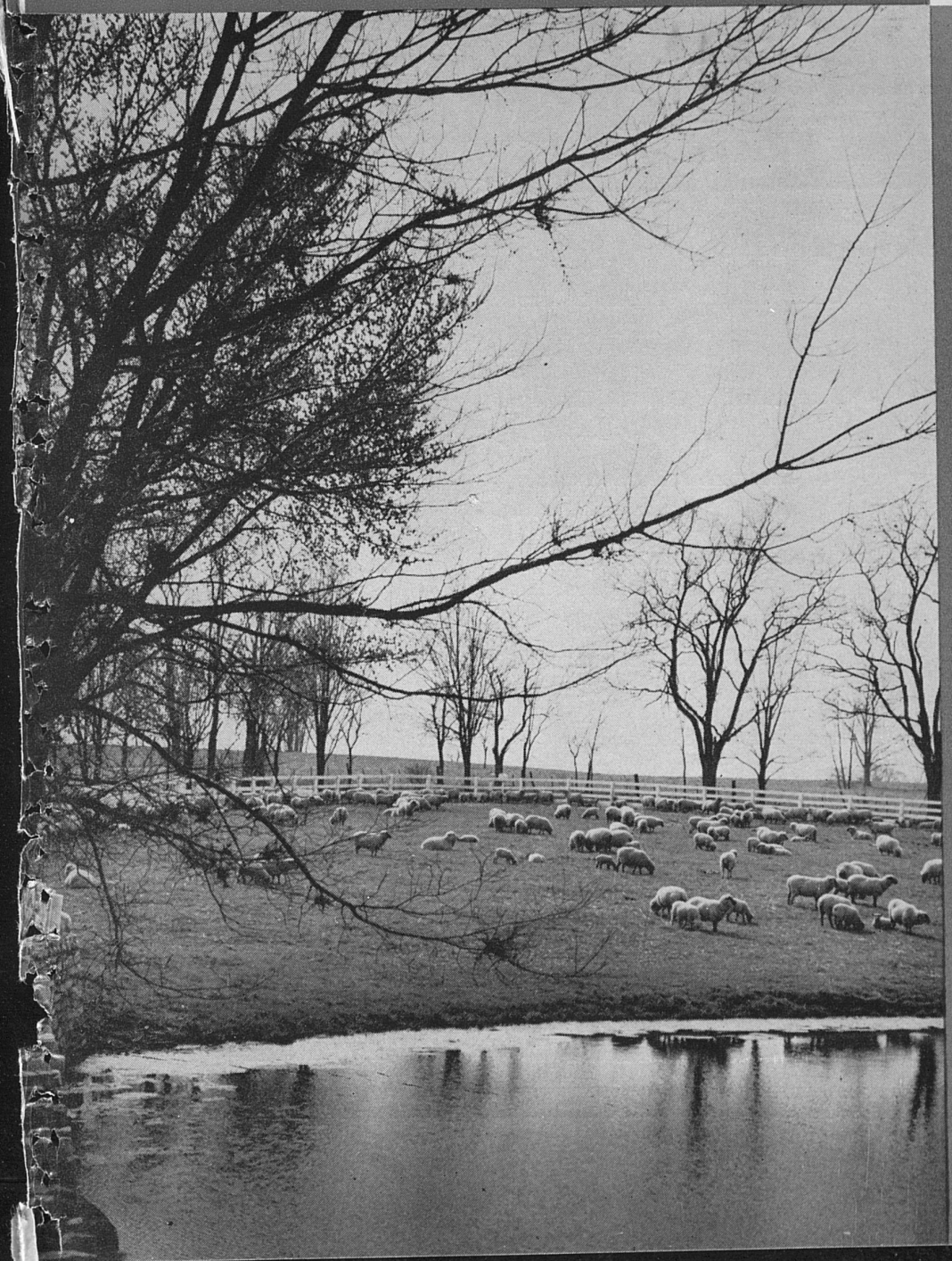

READ—

Kentucky FARM AND HOME Science

Volume 2, Number 2 . . . . . Spring 1957

A report of progress published quarterly by the Kentucky Agricultural Experiment Station, University of Kentucky, Lexington

In This Issue

The Cover

Typical of Kentucky's many fine sheep flocks are these sheep on the Ben Eubank Farm in Fayette County. Photographer Robert May made this picture as the sheep were being assembled for shearing.

HIGH QUALITY PASTURE MAY NULLIFY NEED FOR

Grain Feeding of Dairy Cattle

By D. M. SEATH, D. R. DOWDEN,
JOE RUST, and DON JACOBSON

Experimental trials at Lexington with milking dairy cows on three types of pasture indicate that when the pasture is of high quality grain feeding, regardless of amount, may not be profitable.

The results secured, however, may not apply to every year in Central Kentucky for the reason that abundant rainfall was experienced all during the 1956 growing season when the trials were conducted.

The tests were conducted with dairy cows on three different types of pasture and for each individual pasture there were three levels of grain feeding compared. In one case no grain was fed, in the second 6 pounds was fed per cow daily, and in the third a heavy rate of grain feeding of 12 pounds per day per cow was fed. The measurements of performance were based on milk production, particularly the monthly persistency of this production, and the changes in body weight shown by the cows. The test was conducted for a 16-week period.

Summary of Performance

While the cows were grazing a permanent pasture consisting of Kentucky bluegrass and white clover the monthly persistency of milk production averaged 86.6 percent for cows with no grain, 86.4 percent for those receiving a moderate amount (6 pounds of grain daily), and 92.6 percent for those heavily fed on grain (12 pound daily). In the same order, body weight gains for the summer averaged 2, 68 and 57 pounds per cow. On an improved pasture consisting of orchard grass and Ladino clover the persistency of milk production was 95.6, 91.7 and 96.4 percent for the same levels of grain feeding. Accordingly, body weight gains were 18.5, 81.5 and 83 pounds per cow. Cows grazing on an improved pasture of orchard grass and Ladino clover, along with a supplemental pasture of Sudan grass, had an average persistency without grain of 94.3 percent, with moderate grain 92.2 percent and on the heavy grain level 86.2 percent. Body weight changes were +33, −3.5, and +111.5 pounds per cow respectively for the three groups.

A summary of performance on all three types of pastures showed average monthly persistency values of 90.8 percent without grain, 89.1 percent with moderate grain, and 92.0 percent for the heavy grain feeding program. These differences do not show a significant difference and would not make it profitable to feed grain to cows grazing pastures such as those used in the experiment.

Forage Dry Matter Intake

A check on the forage dry matter intake for 1000-pound body weight of cows grazing these pastures gives some clue why grain feeding did not greatly increase milk production. The daily averages in this connection were 31.8 pounds of dry matter consumed from pasture when no grain was fed, 28 pounds on the moderate grain feeding program and 24.3 pounds per cow per day when 12 pounds of grain was being fed to the cows. The total dry matter intake per 1,000 pounds body weight would be 31.8 pounds of dry matter per cow per day for those without grain, 33.1 for those that had 6 pounds grain per day, and 33.7 pounds of dry matter per cow for those being fed the 12 pounds of grain. These dry matter intake data show only small differences although it should be recognized that the dry matter from the grain would contain more energy than would the dry matter from the pasture. This may account for the fact that body weight gains were heavier for those receiving the grain.

Bromegrass Valuable in Dry Years

Results from the 1956 experiment are somewhat in line with those previously secured at Lexington from tests conducted by the Dairy Section when cows were grazing excellent pasture. Even during dry years, such as the three-year period 1951 through 1953, it was found that bromegrass, when properly fertilized, resulted in cows being able to have a persistency of approximately 90 percent without any grain being fed. Likewise, a persistency of 87.3 percent was secured without grain when cows were grazing good bluegrass pasture. During this same period, how-

(Continued on Page 12)

Symptoms indicate that some of the state's soils may lack one of the "minor" elements needed for plant growth, causing

Zinc-deficient Corn in Kentucky

By H. F. MASSEY

Zinc, one of the minor elements, is not generally considered to be a necessary fertilizer in Kentucky. However, it appears that we may have to consider zinc fertilization for best production of corn on some fields.

What is the Problem?

A number of corn fields have been observed in Kentucky over the past several years in which the corn, or a part of it, was apparently zinc-deficient. The affected plants usually showed a yellow streaking when 8 to 10 inches tall. Later, the leaf tips and margins became purple and, if the corn was severely affected, a broad white stripe developed down each side of the leaf. The corn was usually stunted, and the pith often showed dark brown or purple discoloration at the lower nodes. If the corn was very severely affected, it usually remained stunted or died, but if the deficiency symptoms were not severe, the plants often recovered and made satisfactory yields.

Despite the fact that the problem does not affect a great number of farmers and does not cause great loss to those affected, it seems wise to study zinc deficiency in corn in some detail. It is logical to assume that the zinc deficiency will probably become more prevalent with time. Also, despite the fact that the affected corn usually recovers, the poor growth early in the season is a source of worry to the farmer.

A number of other things can cause corn to have symptoms similar to those of zinc deficiency. Root aphids and also some bacterial diseases can cause such symptoms. Some corn plants from numerous locations over the state, showing the above-described condition, were found to be suffering from aphids and bacterial diseases. However, other plants were apparently not affected by either of those causes.

How Can Deficiency Be Diagnosed?

Analysis of the plant is often helpful in diagnosing a deficiency. Plants showing the symptoms stated above were usually found to have a lower concentration of zinc than healthy plants. However, severely deficient plants sometimes contained a higher concentration of zinc than non-deficient plants. Plants showing only mild deficiency symptoms usually had the lowest concentration of zinc.

The best method of determining whether plants are actually zinc-deficient is to determine whether other plants grown on the same soil respond to zinc fertilization. Several experiments were put out in the field and in the greenhouse. Corn grown on soils from fields where severe zinc deficiency had been observed usually responded to zinc treatment. It seems quite certain that there are some soils in Kentucky deficient in zinc for corn production, but we cannot yet say that all corn showing the above-described symptoms is zinc-deficient.

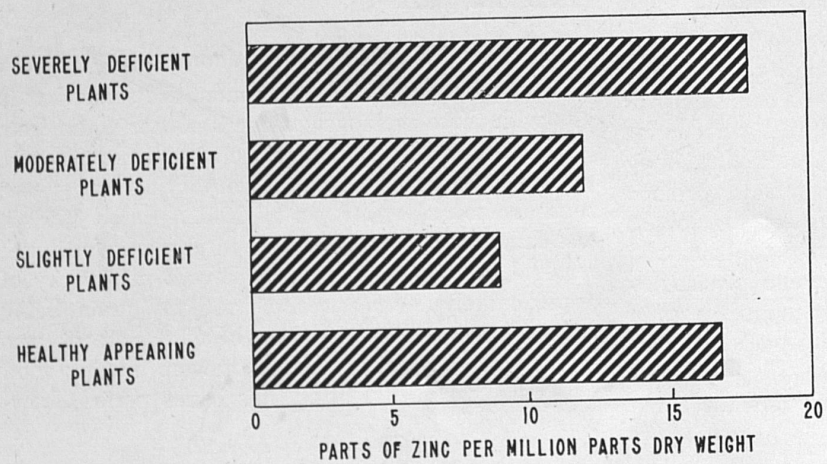

Fig. 1.— Zinc concentration in 6-week-old corn plants having varying degrees of zinc deficiency.

How Can Zinc Deficiency Be Corrected?

Zinc deficiency can be corrected by fertilizing the soil with zinc. However, the placement of the zinc appears to be very important. Zinc which is merely broadcast on the soil or mixed in the soil may be fixed so rapidly that it becomes unavailable to the plant. The experimental work to date has not shown which is the best method of applying zinc, but it appears that about 20 pounds per acre of zinc sulfate, applied in a band an inch or so below the seed, gives good control. However, it is very difficult to apply this small amount of fertilizer in a band below the seed with present equipment and it is costly to have it mixed with the fertilizer.

Another way of applying the zinc to the corn is to treat the seed. In greenhouse work, a coating of zinc oxide on the seed supplied the plant with sufficient zinc for normal growth in a zinc-deficient soil. If it works satisfactorily in field experiments, this method will provide an economical procedure for correcting zinc deficiency.

What Must Still Be Done?

To date we have determined that some zinc-deficient corn occurs in Kentucky and we know reasonably well how to determine whether soil is likely to be deficient in zinc for corn. We still have not determined the best method of applying zinc to correct zinc deficiency. Work is being planned for this coming year which will determine the best method of applying zinc as a fertilizer or as a coating on the seed. Another thing which must be determined is how much of the corn in Kentucky is affected with the problem. To determine the extent of this difficulty, a number of small experiments are planned for localities where zinc deficiency is suspected.

These experiments should enable us to determine the extent of the deficiency in Kentucky and the best way to correct the deficiency where it exists.

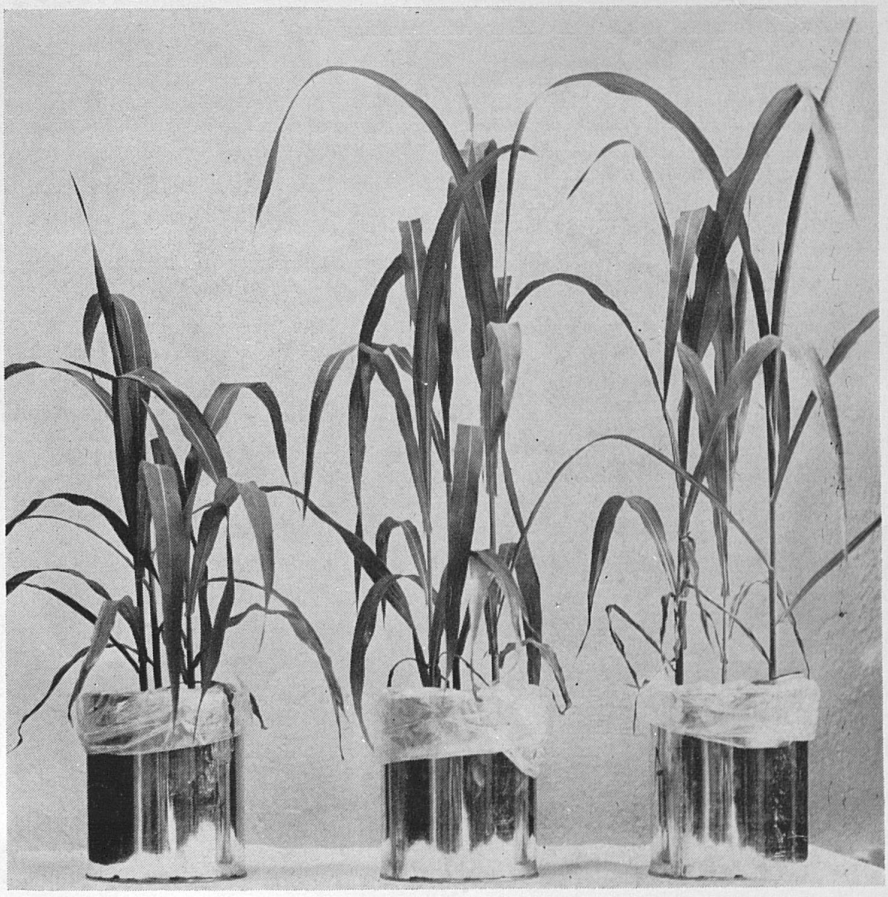

Fig. 2.— Corn plants in these pots shows the response to two methods of zinc treatment. The plants in the pot on the left received no zinc. Those in the center pot were given zinc sulfate at the rate of 20 pounds per acre. The material was mixed in the soil under the corn. In the pot on the right, the seed was coated with zinc oxide. The last-mentioned treatment has not been checked by field experiments.

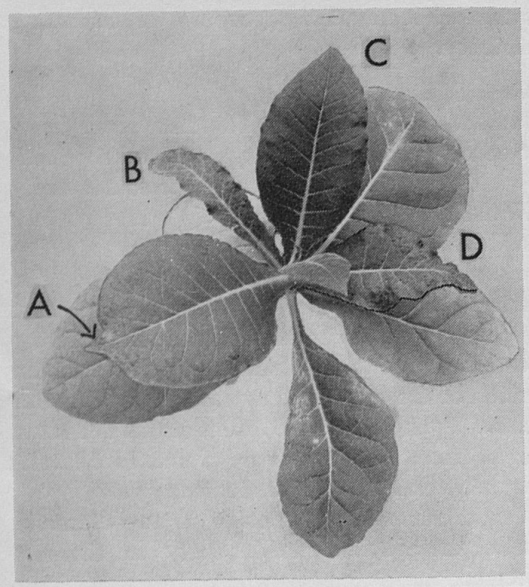

Fig. 1.— A chlordane-treated tobacco plant.

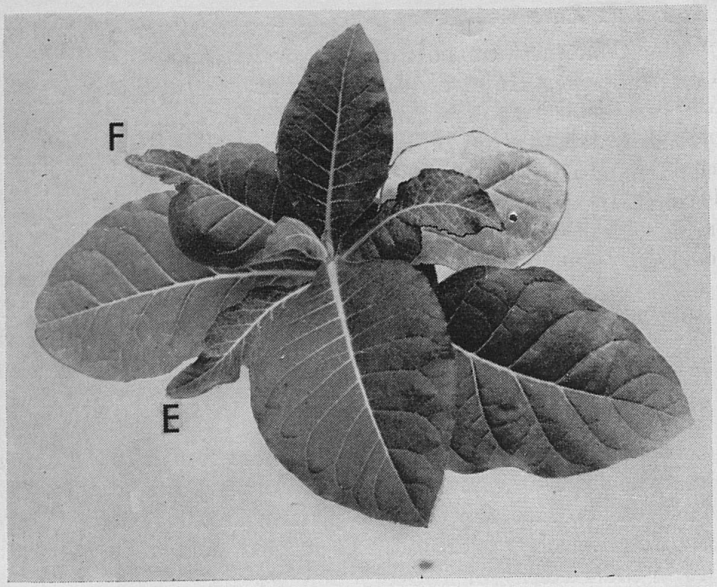

Fig. 2.— Another chlordane-treated tobacco plant.

Figs. 1 and 2.— These two photographs illustrate the distortion in some tobacco leaves caused by dipping the plants in chlordane solution before setting. The leaves which were formed immediately after transplanting were the ones which were affected. Compared with the normal leaf (C), note the strap-like leaves (B and E), and the distorted tips (A, D and F).

Malformed Tobacco Leaves

Laboratory work verifies field observations and seeks to determine the role of two insecticides, chlordane and lindane, in producing abnormal leaves

By RICHARD THURSTON

Malformed tobacco leaves (similar to those being sent to the Experiment Station by farmers and county agents) were noticed in 1954 in experimental field plots of tobacco. These were found in plots where the tobacco roots had been dipped in suspensions of either lindane or chlordane before being transplanted. About 10 percent of the chlordane-treated plants and 35 percent of the lindane-treated plants had malformed leaves about 2 weeks after transplanting. The leaves present at the time of treatment remained perfectly normal in shape. Those formed immediately after transplanting were abnormal, but normal-appearing leaves were eventually produced by all the affected plants. Although the affected plants outgrew the development of malformed leaves, these plants were stunted and did not grow so well as the unaffected plants.

The abnormal leaves observed on lindane-treated plants were narrow and strap-like, but the malformed leaves observed on chlordane-treated plants were normal except at the tips, which were curved sharply inward, forming small, sharp pointed nubs.

Laboratory tests were conducted to verify these field observations and to find out if the insecticide or some material used in formulating the insecticide was causing the leaf malformation. Two emulsion concentrates of both insecticides were formulated in the laboratory from technical chlordane and technical lindane. The leaves and growing buds of Kentucky 35 burley tobacco seedlings were dipped for 10 seconds in diluted water emulsions of these insecticides. Plants were also dipped in the same manner in "blanks" (water emulsions containing all the ingredients except chlordane or lindane).

All of the plants dipped in the emulsions containing lindane or chlordane produced abnormal leaves. Those dipped in the blank emulsions did not produce ab-

normal leaves. The first symptom of injury was a whitish instead of the normal green color of the small newly developing leaves. The leaves that were already developed when the plants were dipped were not affected. Two weeks after treatment abnormally shaped leaves were found in all the treated plants. Most of the abnormal leaves which were first formed on both the lindane- and chlordane-treated plants were narrow and strap-like, but others were narrow at the base of the leaf and the outer half was more nearly normal in appearance.

Bottom Leaves Unaffected

Figures 1 and 2 show typical chlordane-treated plants 3 weeks after treatment, and Figs. 3 and 4 show typical lindane-treated plants. The bottom leaves, which were present when the plants were treated, were unaffected by either the chlordane or the lindane. The first leaves produced after the plants were dipped in chlordane were narrow and strap-like with a granular leaf surface, as illustrated by leaves B (Fig. 1) and E (Fig. 2). Progressively less leaf deformation was evident as successive leaves were formed. Leaf D (Fig. 1) had a narrow tip, but the stem half of the leaf was more nearly normal in size and shape than B or E. The stem half of leaf F (Fig. 2) was quite normal, but the tip was still narrow and strap-like. Leaf A (Fig. 1) resembled the leaf malformation which was first observed in chlordane-treated plants in the field: the leaf was almost completely normal except for the tip which was a sharp-pointed nub in contrast to the tip of a normal leaf such as C (Fig. 1), which was produced immediately after A (Fig. 1).

The first leaves produced by plants after treatment with lindane were also usually narrow and strap-like, as shown by leaf H (Fig. 4). Later-produced leaves, such as G (Fig. 3) and I (Fig. 4) had a more irregular leaf edge and shape. An abnormally large amount of the leaf surface was composed of the mid-vein, but this was probably the result of a reduction in total leaf surface rather than of an enlargement of the mid-vein. Lobing of leaves, as shown by leaf I (Fig. 4), was common in the later-formed leaves, and this lobing became deeper and more pronounced in leaves formed after these pictures were taken. In these lobed leaves the lateral leaf veins, instead of branching off nearly straight from the main vein, ran parallel to the main

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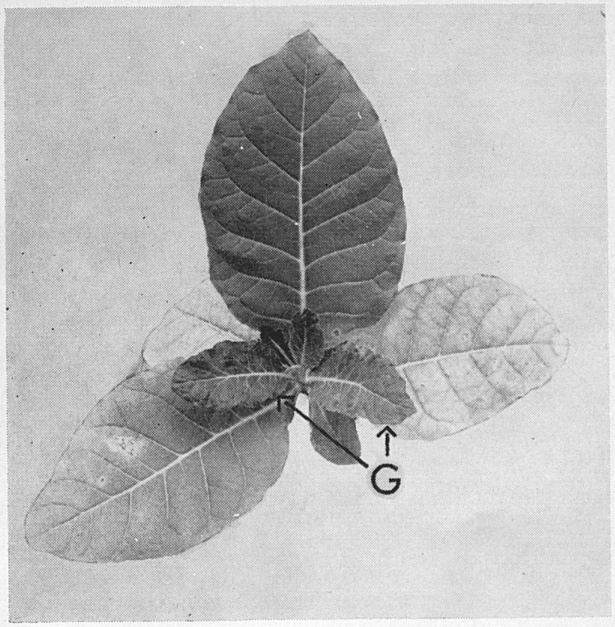

Fig. 3.— A lindane-treated tobacco plant.

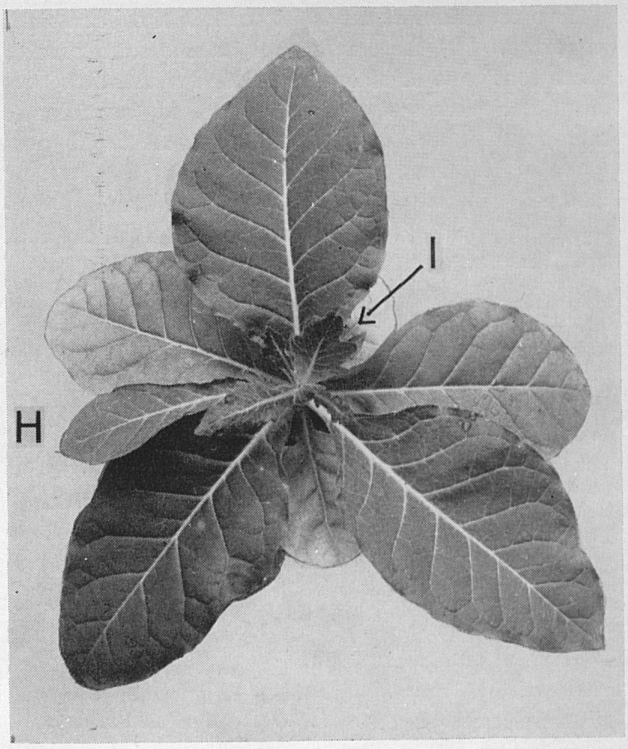

Fig. 4.— Another lindane treated tobacco plant.

Figs. 3 and 4.— Dipping these tobacco plants in a lindane solution before setting caused the plants to produce distorted leaves. Note the crinkled leaves (G), the strap-like leaf (H), and the lobed, oak-like leaf (I).

Effects of Extending OASI Program

Three-county rural survey reveals growing importance of the extension of Old Age and Survivors' Insurance[1]

By JOHN R. CHRISTIANSEN[2]
and C. MILTON COUGHENOUR[3]

The Old-Age and Survivors Insurance program of Social Security is quite new to rural Kentucky, even though in 1950 some farm workers were made eligible for Old-Age and Survivors Insurance, or "OASI" as it has sometimes been called. Beginning January 1, 1955, self-employed farmers and nearly all hired workers were included in this insurance system, and more recently, under the 1956 Amendments, additional provisions affecting farm families were introduced.

Two provisions of the latter amendments seem most important: (1) the counting of income from cash or share rent in total income for Old-Age and Survivors Insurance purposes when the landlord "participates materially" in the management decisions or physical work of farm production, and (2) permitting low income farmers to figure net income as equal to two-thirds of their gross (rather than as half of their gross income as under the 1954 Amendments).

Full Impact of OASI Not Known

Because OASI is so new to farm families, its full impact is not yet known. However, certain implications of its extension to Kentucky farm families are evident from two sources: (1) a recently completed field study concerning OASI in Harrison, Menifee, and Wolfe counties, and (2) observations of Kentucky Extension Service personnel who are particularly concerned with the problems of older farm people.

As to economic aspects, the Kentucky study revealed that a considerable proportion of farm operators and their families were already protected by OASI, and that many of them could expect to receive substantial monthly payments from the program. It was estimated that about 71 percent of the farm operators in Harrison, a Bluegrass county; and 39 percent of those in Menifee and Wolfe, both Mountain counties, had some kind of OASI protection by the beginning of 1957.[4] Furthermore, it was determined that about half of the farm operators who were 65 years of age or older at the beginning of 1957, among the total of 550 operators interviewed in the three counties, would become eligible for monthly retirement payments by that time. These farmers were estimated to be eligible for retirement benefits amounting to an average of $75 per family in the Bluegrass county and slightly less than that in the Mountain counties. The average monthly survivors' payment that would be due operators' families in case of the operator's death was estimated to be $124 and $77 in the Bluegrass and the two Mountain counties, respectively. Such payments, if received, will probably enable numerous farm families to get otherwise unobtainable goods, services, and economic stability.

May Keep Older Farmers on Farm

Kentucky extension personnel report that an increasing proportion of older farmers receiving or planning to receive OASI payments, and having children living in urban areas intend to remain on their farms rather than move into cities to live with their children. Some of the major reasons for this decision appear to be that: OASI benefits are sufficiently large

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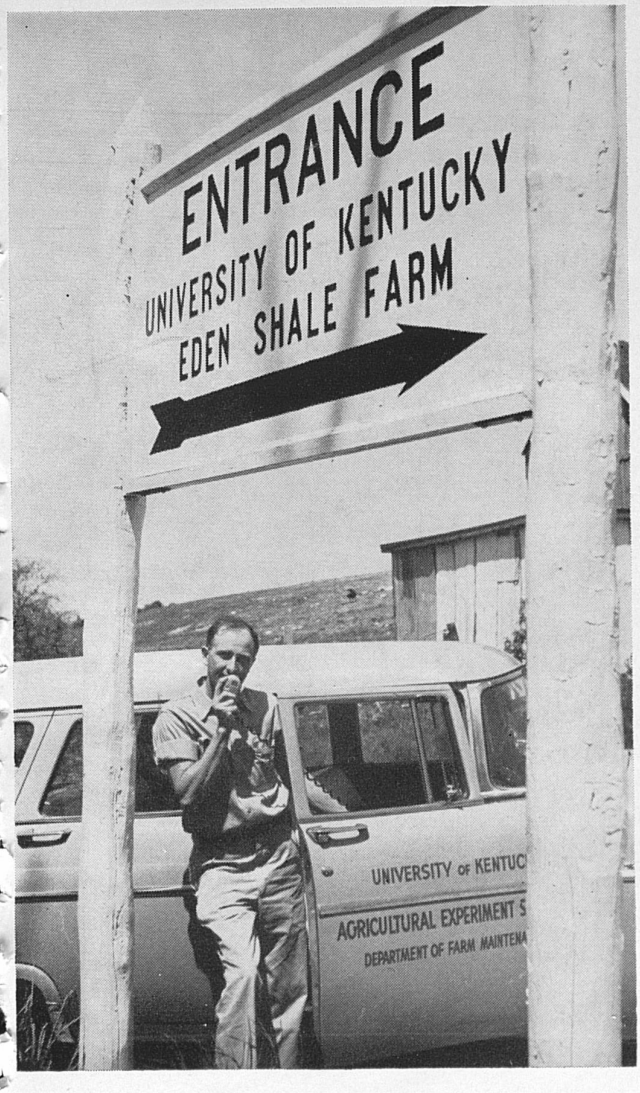
[1] The investigation reported in this article was a cooperative project of the Kentucky Agricultural Experiment Station and the Agricultural Economics Division, Agricultural Marketing Service, USDA.

[2] Farm Population and Rural Life Branch, Agricultural Marketing Service, USDA.

[3] Department of Rural Sociology, Kentucky Agricultural Experiment Station.

[4] These estimates were made prior to the enactment of the 1956 Social Security Amendments. Therefore, some modification of these data might be expected on the basis of this latest revision of the Social Security laws.

(Above) Mrs. Nancy Blankenship, secretary to the superintendent of the University farms, is shown communicating via radio with Superintendent W. L. Mahan (below). The latter has just arrived at the Eden Shale Farm.



Farm Supervision Is Aided By Radio

By JOHN NEWLAND

The University of Kentucky owns or leases more than 3,000 acres of experimental farming land within a 60-mile radius of the campus—land which the farm superintendent can "visit" just by pushing a button.

This feat was made possible through the installation of a $4,200 emergency radio network connecting the Kentucky Agricultural Experiment Station with the outlying farms.

W. L. Mahan, superintendent of farms, said mobile units are located in trucks at the 900-acre Eden Shale farm in Owen County, the 140-acre farm in Woodford County, the 400-acre farm in Mercer County, the 500-acre campus farm, the 1130 Experiment Station farm near Lexington (Coldstream), and in the superintendent's vehicle.

Only the sub-stations at Quicksand (Breathitt County) and Princeton (Caldwell County) are beyond the fringe area.

The base transmitter is in the Experiment Station Building at Lexington.

Mahan and his secretary, Mrs. Nancy Blankenship, operate the Station unit. To do this, they were required by the Federal Communications Commission to obtain a "restricted radio-telephone operator's permit."

The radio is in operation from 8:30 a.m. to 5 p.m. During this time the farm foreman can contact the Experiment Station or other farms within a radius of 20 air miles. Although the foremen do not sign out when they leave their trucks, they report in upon returning, to check for possible messages. Mrs. Blank-

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Study Effects of Pasture Mixtures on Gain and Finish of Beef Steers

Five grasses and legumes being used in experiment being continued at the Woodford Farm

By C. F. BUCK, W. C. TEMPLETON, JR., W. P. GARRIGUS and E. N. FERGUS

An experiment to study the effects of three pasture mixtures on gain and finish of yearling beef steers was initiated at the Woodford Farm in the spring of 1954. Three soil types—Maury, Donerail and Lawrence silt loams—are present and tests indicated great variation in initial fertility.

Ground limestone and 0-10-20 fertilizer containing 40 pounds borax per ton were applied uniformly to the entire area at the initial rates of 2 tons and 1000 pounds per acre, respectively. The old sod consisting principally of orchard grass and lespedeza was plowed, a seedbed was prepared, and the following seedings made at the rates and times indicated.

	Mixture* and Pounds Per Acre	Time Seeded
1.	Kentucky bluegrass, 14	August, 1954
	Adapted white clover, 2	March, 1955
2.	Kentucky bluegrass, 16	September, 1954
	Birdsfoot trefoil, 12	April, 1954
3.	Smooth bromegrass, 12½	September, 1954
	Ladino white clover, 2	March, 1955

* Varieties used were: Kentucky bluegrass, commercial; smooth bromegrass, certified Southland; adapted white clover was from a lot produced in western Kentucky; birdsfoot trefoil, 50-50 mixture of imported French and certified Empire; Ladino clover was certified.

Trefoil Affected by Fungus

During the spring and early summer, 1955, the birdsfoot trefoil made excellent growth and was used for hay or general grazing; however, no yield data were obtained. During late summer much of the trefoil was killed by the fungus *Rhizoctonia solani.* Neither of the other mixtures produced sufficient forage to harvest during 1955. All pastures were clipped to control weeds. No fertilizer was applied during 1955. Experimental grazing began in the spring of 1956. Commercial fertilizer equivalent to 300 pounds per acre of 0-10-20 was broadcast on all pastures during the spring of 1956.

The experiment is of the split-block design, with four replications of each mixture. Two of the four

These steers are typical of those now grazing on three pasture mixtures at the Woodford Farm. The mixture shown is bromegrass-Ladino clover. The picture was taken about the last of June 1956.

replications are continuously grazed while each of the other two is divided into three sub plots and grazed rotationally. Grazing is on a "put and take" basis, with two "tester" steers randomly allotted each pasture. A "reserve" area of each mixture is provided for the grazing of "put and take" steers during the time they are not on experimental pasture. During 1956 the "tester" steers remained on a given pasture the entire season. The "put and take" steers were added to or removed from the experimental pastures as necessary to avoid under- or over-grazing.

Eighty good-to-choice yearling Hereford steers, wintered to gain approximately 1.3 pounds daily, were used in 1956. They had free access to water, shade and mineral feeders which contained salt, ground limestone and steamed bone meal in separate compartments. Bonemeal was consumed in the largest amount and ground limestone in the least.

Steers Weighed Every Two Weeks

The steers were individually weighed at intervals of 14 days at 6:00 a.m. after being without water during the previous night. The weighing and holding facilities were arranged so that all steers could be weighed and returned to their pastures in less than 90 minutes.

Precipitation from April 1 through August 31 was approximately 5.83 inches above normal. There was a deficit of 1.06 and 0.66 inches during September and October, respectively. Despite the lush growth of both white clovers during the first part of the grazing season, only a few cases of mild-to-moderate bloat occurred. There was no indication of bloat in animals on the trefoil mixture. No animals were lost from any cause during the grazing season.

Results obtained during the 1956 grazing season, as measured by the "tester" steers, are summarized in Table 1.

Trefoil Gives Lower Returns

Though the Kentucky bluegrass-white clover mixture was approximately equal to the smooth bromegrass-Ladino clover mixture in terms of average daily gain, production of beef and carrying capacity steers on the latter mixture had higher carcass grades, sold for $3.70 more per hundred pounds and gave $13.22 more returns per acre.

The trefoil content of the Kentucky bluegrass-birdsfoot trefoil pastures was much below optimum because of disease, as pointed out previously. This was clearly reflected in the animal data. This mixture had a lower carrying capacity, gave lower daily gains, and produced approximately 200 pounds less beef per acre than the two other mixtures. Dollar returns per acre of bluegrass-trefoil were approximately half those from the brome-Ladino or bluegrass-white clover mixtures.

As is well known, final conclusions regarding the value of different farm practices cannot be drawn from a single year's data. For that reason and, also, because there was much variation in the botanical composition of each of the mixtures during 1956, these data are definitely preliminary. The experiment is being continued.

Table 1.

Factor	Kentucky bluegrass-white clover	Kentucky bluegrass-birdsfoot trefoil	Smooth bromegrass-Ladino clover
Initial wt. of steers, lb*	681	724	689
Final wt. lb	1037	977	1038
Av. Daily Gain, lb	1.80	1.35	1.75
Beef/acre, lb	472	282	492
Steer days/acre	265	226	275
Av. No. Steers/acre	1.34	1.20	1.40
Dressing percentage	57.75	56.83	58.60
Price/lb carcass	$29.75	$29.00	$33.45
Dollars of Beef/acre	$81.22	$46.46	$94.44
Average carcass grade	Standard	Standard	Good

* Grazing of mixture 1 and 3 was started April 19, 1956. Mixture 2 had not made sufficient growth for grazing until May 1, 1956. Initial weight of the steers on mixture 2 was, therefore, somewhat higher.

What Happened to the Clover Clones?

The 1956 Spring issue of the Kentucky Farm and Home Science carried an article on the air shipment of Kenland red clover clones from Kentucky to California. Here is what happened to the clones:

The feasibility of producing breeder seed of Kenland red clover on clones established as spaced plants in California and Kentucky was investigated in 1956. Five hundred third-year clones were vegetatively increased in a plastic greenhouse to 20 plants each and shipped to California for transplanting, March 28 to 31. A duplicate planting was established in Kentucky, May 29 to 31. Only a small amount of seed was harvested from the Kentucky planting, but approximately 5 bushels of cleaned seed were harvested from the California planting, showing that seed production on clonal material is possible, at least in California. The percent stand remaining in California on Jan. 15, 1957 was 23.9 and in Kentucky on Dec. 3, 1956 was 41.8. This difference may have been due in part to the high seed yields produced in California, which is known to weaken red clover plants. The clones surviving at the two locations were not the same, but some evidence existed that clones possessing tolerance to virus diseases tended to persist longer in both locations.

This experiment was continued in 1957 by establishing three small plantings in Western United States and one in Kentucky to determine if there is a location where clones can be maintained and at the same time produce high seed yields. (Norman L. Taylor)

Farm Supervision Aided by Radio

(Continued from Page 9)

enship keeps a log of station operating hours—an FCC requirement.

Although the radio system has been in operation only a short time, the results support the overall purpose of the communications medium—better farm management.

The more noticeable results are that it saves travel time; expedites the shipment of equipment and supplies; brings management in a closer contact with the experimental activities; provides first-hand reports of weather and ground conditions, and speeds up action in case disease epidemics or similar emergencies occur on one of the farms.

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University of Kentucky
Lexington, Ky.

Frank J. Welch
Director

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Grain Feeding of Dairy Cattle

(Continued from Page 3)

ever, a no-grain-fed group on orchard grass averaged 83.3 percent and those on Ky. 31 fescue 75.6 percent. In the latter two cases it appears that these grasses by themselves were not able to stimulate milk production properly without supplemental feeding. In each case, data from pasture tests where Ladino clover was mixed with these grasses indicated that more satisfactory results were secured.

Experiments at Lexington where alfalfa hay has been used as a supplement to summer pasture have given results in line with those reported above for grain feeding on pasture. It was found that the feeding of alfalfa hay to cows on good pasture did not result in appreciable increases in milk production. The practice was unprofitable as long as the pasture remained reasonably good. It appears that any supplement, whether grain or hay, should be used only when the pasture is considered inadequate. Later tests may indicate, however, that cows producing at very high levels of milk production will give a profitable response to moderate grain and/or hay feeding even when grazing high quality pasture.

Malformed Tobacco Leaves

(Continued from Page 7)

vein for some distance and then branched off in an irregular course toward the leaf margin.

The lindane-treated plants were very stunted, and numerous suckers were formed. The chlordane-treated plants were only slightly stunted, and no suckers were formed. Lindane was found to have a much greater effect on the plant than chlordane at the same concentration, and normal leaves were not produced on lindane-treated plants until 3 weeks after normal leaves were produced by chlordane-treated plants.

How either lindane or chlordane affects the plant so that these abnormal looking leaves are produced is not known. Work is being done to determine if these insecticides act only externally on the growing tobacco bud or if the insecticide enters and affects some internal plant system. In these tests the buds of tobacco seedlings are cut out so that two-stalked plants will be formed. One of the two growing buds is then treated and the other left untreated. Preliminary results indicate that the lindane or chlordane treatment is not affecting the untreated bud.

Effects of Extending OASI

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to allow them to live independently; some farm income can be earned by remaining, in addition to receiving OASI payments; and the additional income available through OASI allows them to live relatively comfortably, where they wish. Other older farmers already receiving or expecting to receive retirement benefits soon are manifesting less resistance to turning over the operation of their farms to younger relatives who desire to live in rural areas and operate the farms. Moreover, younger farmers confronted with the opportunity of taking over older relatives' farms at an earlier date than previously expected are seemingly more inclined to remain on farms. Also, the added security provided by OASI to their families is proving to be an inducement to some young people to look more favorably upon farming as a livelihood.

Some Kentucky Extension Service personnel have also noted that, generally, Old-Age and Survivors Insurance appears to be one of the most beneficial programs that has yet been extended to farmers, particularly those in low-income areas. Its influence, apparently, will be felt not only by farmers, but also by other rural and even urban dwellers in these areas. The increased number of OASI payments to rural residents will likely increase the demands for goods and services including rural health services and facilities. Furthermore, this increased income to farmers may indirectly provide money for such community and area cooperative improvement endeavors as in building schools and roads, and in obtaining electrification.