# Kentucky FARM AND HOME Science

Issued quarterly by the Kentucky Agricultural Experiment Station

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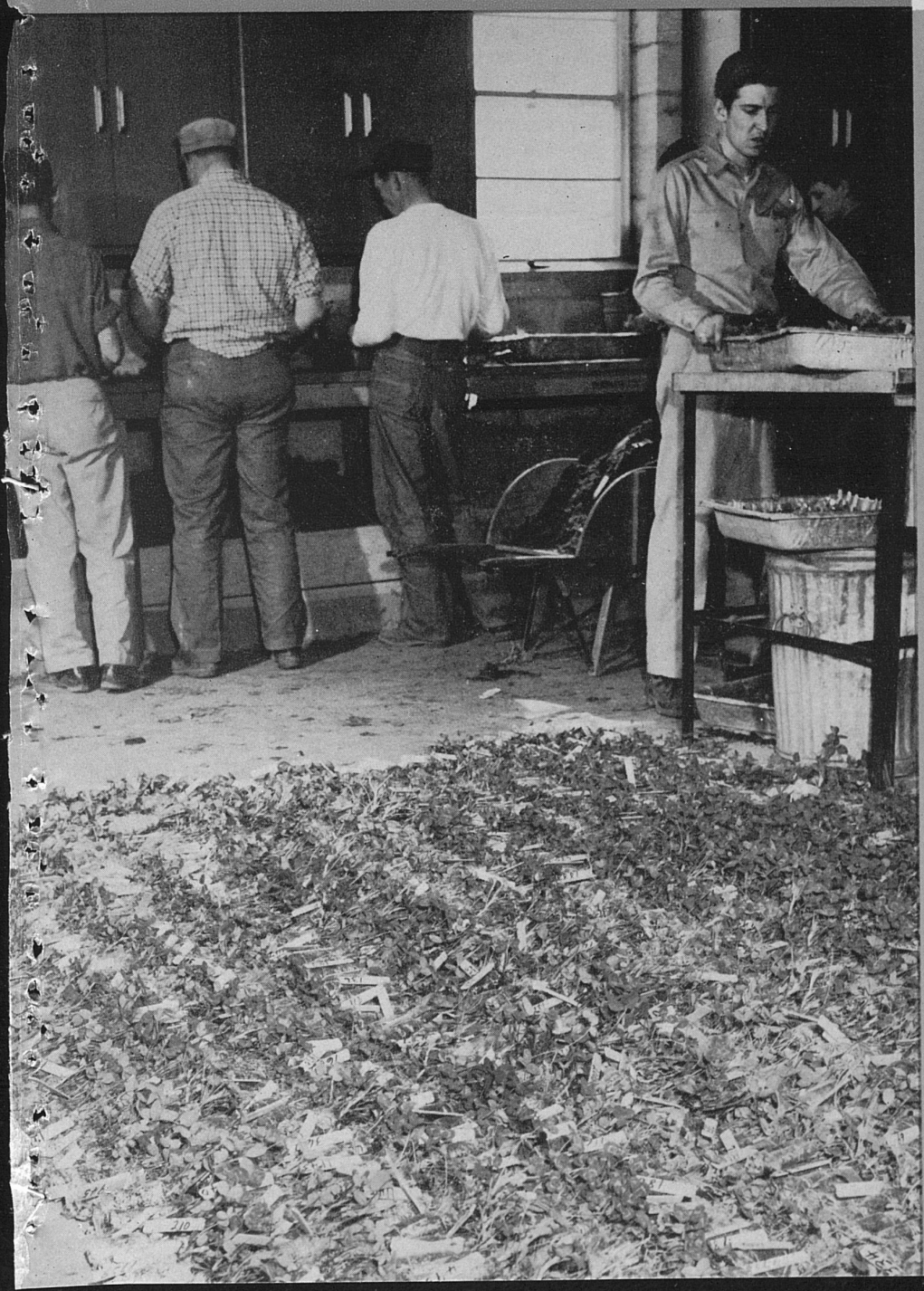

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# Kentucky FARM AND HOME Science

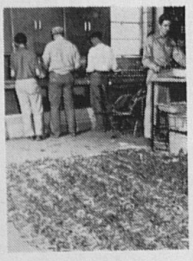
Volume 2, Number 2 . . . . . Spring 1956

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




## *In This Issue*





## *The Cover*

As Agronomy Department workers prepared Kenland red clover plants for shipment to California they covered the work room floor with thousands of small plastic-wrapped bundles. For details, see "Airlift 1956: 10,000 Kenland Red Clover Plants Flown to California" on pages 6-7 of this issue.

Irrigation as a means of overcoming the ill effects of drouth periods has been practised for several years in Kentucky. The development of centrifugal pumps, lightweight portable pipe with automatic couplers, and rotary sprinklers has made possible the successful irrigation of rolling land.

## MANY FACTORS REQUIRE STUDY IN MAKING

# Profitable Irrigation Investment

By JOHN C. REDMAN

The principles involved in making a decision to invest in irrigation are no different from those used in deciding on how much fertilizer to use on what crops, or how much and what combination of feed to give a dairy cow. The prospect for profitable investment depends on a very careful observation and analysis of all related factors as to the need for a system. Some of the questions which must be answered include: (1) Is irrigation the best available use of capital? (2) Will the benefits from irrigation exceed the costs? (3) Are there any other methods for counteracting the effects of a drouth?

Farmers who are limited in capital should use it on various alternatives in such a way that net farm returns will be greatest. Some who have highly developed farms may find irrigation the most productive investment, while others, particularly those farmers on relatively unimproved farms, may find a number of alternatives more profitable, such as more fertilizer, improved seed, more productive livestock, etc.

### Uncertain Rainfall Distribution

For some farmers, benefits from irrigation may be only a reduction in the variation of yield due to drouths, while for others the benefits may include an increase in yield over that from a normal rainfall. Much of the benefit from reducing variation in yield is subjective in nature as the farmer may not feel that he is in position, owing to fixed obligations, to risk possible reduction in income. The decision in this case depends upon the ability and willingness of the farmer to risk the uncertain rainfall distribution and its effect on his income.

To seek an increase in yield over that from a normal rainfall involves a good knowledge of the response to water as well as a knowledge of fertility and other factors influencing plant growth. Experimental data are somewhat lacking to guide these decisions, but many farmers have an idea of what they could produce with adequate water. These benefits must be worth the cost of obtaining them.

### Costs of Irrigation

Costs may arise from having made the investment or from earnings foregone from other possible uses for the money involved. Monetary outlays depend on several factors, such as: (1) cost of establishing a dependable source of water, (2) size and design of system, (3) acreage and crop to be irrigated, and (4) operational costs. About 40 to 50 percent of the investment can be saved if water can be obtained legally from streams. In 1954 a system capable of applying a total of 240 acre-inches of water on 60 acres at one inch per acre setting, with an investment of $2,814 for equipment and $2,000 for reservoir, cost $1.97 per acre-inch for overhead, $2.50 per acre-inch for operating costs, or a total of $4.47 per acre-inch.

The alternatives to irrigation in handling the ill effects of a drouth are often overlooked. To reduce

*(Continued on page 11)*

# Where and How Farm People Get New Ideas

**Friends, neighbors, relatives and radio ranked highest as information sources by 393 outer bluegrass region farmers contacted in survey**

By JAMES N. YOUNG and A. LEE COLEMAN

Where and how farm people get new ideas has long concerned those interested in the spread of new discoveries and techniques in agriculture. That new ideas are being rapidly and effectively spread among our farming population is evidenced by the fact that during the past few years American farmers produced about 75 percent more food and fiber annually than in the years around 1910. This increase has been accomplished despite a large reduction in the number of people working on farms.

### Many Sources of Information

The number of farmers who are completely unaware of improved farming methods is probably small since, unlike their grandfathers, farmers today have access to farm news and advice from a vast number of magazines, newspapers, farm bulletins, and radio and television programs. In addition to these sources, farming information is also provided by many state and federal agencies which are generally located within easy reach of the farmer.

The Department of Rural Sociology is attempting to discover the sources of information used by farmers in obtaining their knowledge concerning new practices. All the farm operators in 13 neighborhoods of a selected county were interviewed. The study was concentrated in a single county so that all of the farm operators would have been "exposed" to the same agricultural agencies, programs and agency representatives, as these frequently vary among different counties. The county selected is located in the Outer Bluegrass Region and has a relatively prosperous tobacco-livestock agriculture.

Of the 393 farmers included in the survey more of them reported receiving farm information from "friends, neighbors, and relatives" and from the radio than from any other sources. Nine out of every ten farmers indicated that they had derived at least some information from each of these sources during the 2-year period preceding the study. Other sources of farm information, in order of the number of times they were mentioned, were as follows: farm magazines, circular letters, newspapers, agricultural advisers, farm bulletins, attending farm meetings, and from dealers and salesmen.

More than 7 out of 10 farmers reported that they received some information from the county agent or through his office. The fact that the county agent was named far more often than any other professional person in agriculture may, in part, be attributed to the very nature of the county agent's work, for while other professional agricultural persons generally have one or more specialized functions, the county agent is, in large measure, responsible for the dissemination of new agricultural techniques.

### Variation Among Neighborhoods

The findings that have been discussed so far might give the impression that there is a great deal of uniformity throughout the county in terms of information sources. Actually, the variation among the 13 neighborhoods indicates the contrary. For example, in one neighborhood only 1 farmer in 10 said that he had read a farm bulletin during the 2 years prior to the study. At the opposite extreme, in another neighborhood, 9 out of 10 farmers had read one or more bulletins. Also, the proportion of farmers reporting that they had received help from the county agent varied from 40 percent in one neighborhood to 100 percent in another. The farmers indicating some help from the Soil Conservation Service ranged from less than 10 percent in one neighborhood to 75 percent in another. The data further revealed that while 50 percent of the farm operators in one neighborhood read farm magazines, 97 percent of the farmers in another neighborhood reported information from this source.

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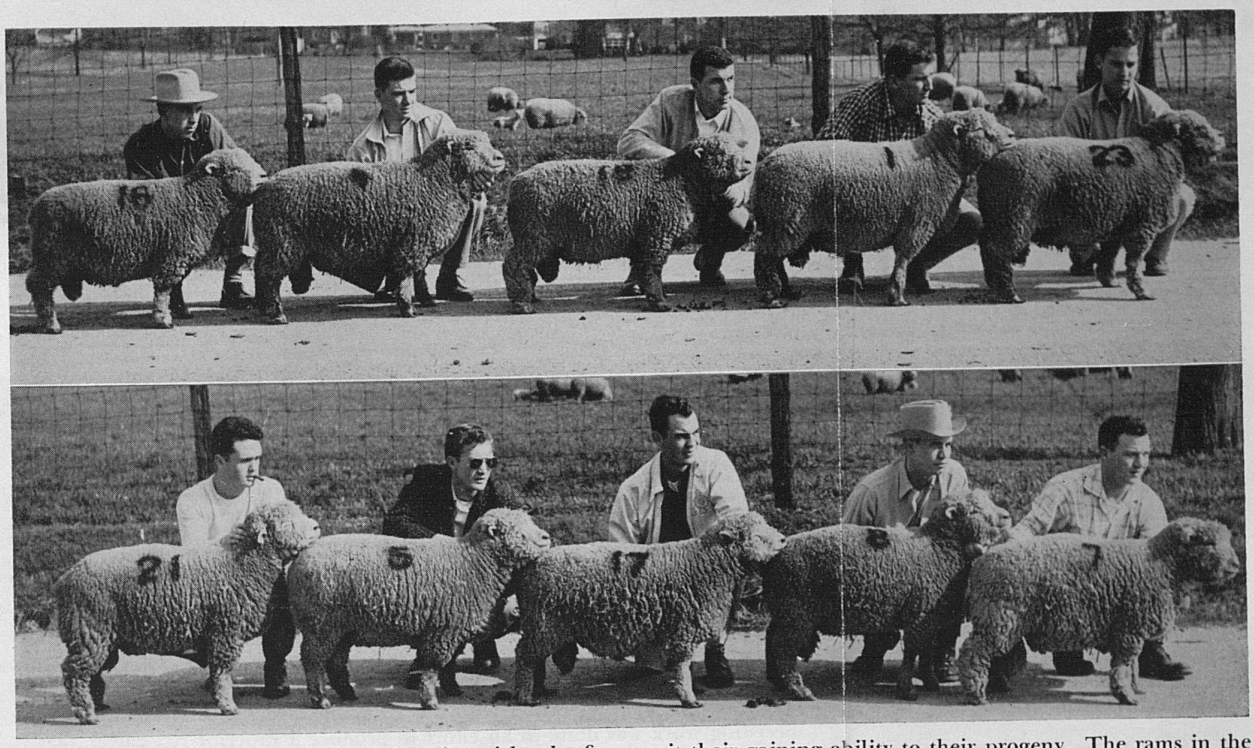


In the ram-testing research reported in this article, the five rams shown in the top row were the high-gainers, with an average daily gain of 0.39 pound. They will be used on 125 crossbred western ewes to determine if they can transmit their gaining ability to their progeny. The rams in the bottom row were the low-gainers (0.23 pound). They will be used on a similar group of 125 ewes for comparison.

# Ram Testing Research Project Started

By PATCH G. WOOLFOLK

Large, fast-gaining rams capable of siring the high quality spring lambs Kentucky is noted for are in strong demand by farmers. Rams of this type are thought to be more capable of settling the large western ewes that have been used by Kentucky farmers for a number of years. Furthermore, lambs sired by fast-gaining rams should theoretically be faster gaining and more efficient gainers than those sired by slow-gaining rams.

In a test to study these concepts, 25 Southdown ram lambs were purchased by Mr. Herschel Weil, farmer and stockman of Lexington, and put on a feeding test at the Kentucky Agricultural Experiment Station to determine their ability to make rapid gains. The rams were group fed for 154 days on a ration of alfalfa hay and shelled yellow corn. Salt and bonemeal were given free choice. Average daily feed consumption for the trial was 1.68 pounds of hay and 1.29 pounds of corn per lamb. At the conclusion of the trial, the lambs were consuming a ration of 1.67 pounds of hay and 1.42 pounds of corn.

Average daily gains ranged from 0.22 to 0.42 pound, revealing a rather wide variation in the ability of the rams to make rapid gains. Five different purebred Southdown flocks were represented in the group, and it was interesting to note that rams from any one of these flocks varied considerably in their rate of gain. Gains for the flock group having the best overall average ranged from 0.32 to 0.42 pound, while those from the flock having the lowest average ranged from 0.22 to 0.31 pound. Since the heritability of gaining ability is thought to be rather high, these data indicate that improvement in this respect is possible within any one of the flocks represented in the test.

*(Continued on page 11)*

**Kentucky plant breeders seek to save time in building up seed supplies of legume by**

# Airlift 1956: 10,000 Kenland Red Clover Plants Flown to California

A one-acre field on a ranch near Patterson, California, is playing an important role in a research project which concerns Kentucky agriculture.

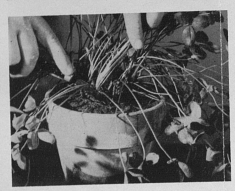
In that sunny, irrigated field, comparatively free from weeds, are now growing some 10,000 Kenland red clover plants which were flown overnight from the Kentucky Agricultural Experiment Station at Lexington. If all goes well, these plants will produce 600 to 700 pounds of seed this year, which will hasten the time when more farmers can obtain seed of this superior clover. The work being done is expected to save at least six years in building up seed stocks.

As shown on the opposite page, the plants used in this project were propagated from cuttings from selected "mother" plants rather than from seed.

Kenland is an improved red clover variety, developed by the Kentucky Station in cooperation with the U. S. Department of Agriculture. In tests over several years, Kenland has produced from 15 to 25 percent more hay per acre and has had better stands in the third year than any other variety tested.

This project is being carried on cooperatively by the Kentucky Station with the U. S. Department of Agriculture and the California Agricultural Experiment Station. In charge of the work in Kentucky is Dr. Norman L. Taylor, of the Department of Agronomy.

*(Photographs of scenes in California were furnished by Dr. C. S. Garrison, USDA.)*



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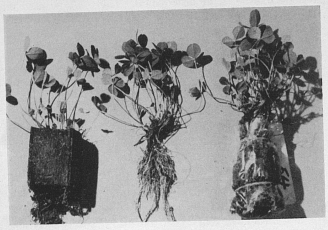
(above) Kentucky's all-out effort to step up the production of Kenland red clover seed supplies got its start in this plastic greenhouse at the Experiment Station. This picture shows Dr. Norman L. Taylor, of the Department of Agronomy, checking "mother" plants of Kenland clover (in pots) and getting ready to transfer cuttings to the metal flats. The "mother" plants are 3-year-old, virus-free, and anthracnose-resistant selections from the variety Kenland, which was released several years ago by the Kentucky Agricultural Experiment Station in cooperation with the U. S. Department of Agriculture. The breeding work was done in an effort to produce a superior red clover variety adapted to Kentucky soils and climate.

↑
(above) From each of 500 especially selected Kenland red clover "mother" plants, Experiment Station workers made 20 cuttings last October. All plants were eliminated which showed signs of virus infection or which reacted to inoculations of southern anthracnose. This picture shows how the cuttings were made.

(right) Steps in preparing the red clover plants for shipment. On the left are shown the cuttings as they grew in a mixture of peat moss, soil and sand. In the center are some washed plants, ready for packaging. On the right is a packaged group of five plants, with their roots protected by wet sphagnum moss, wrapped in polyethylene plastic, and labeled as to the plot number in which they are to be transplanted in California. →



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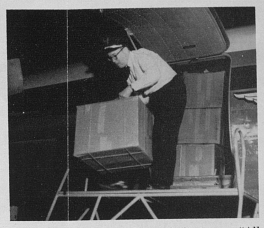
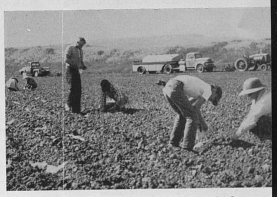
(left) After the plants were packaged and labeled, they were sorted as to plot number and carefully packed in these shipping cases. (The picture on the cover of this issue of Kentucky Farm and Home Science shows a portion of the 10,000 plants after they were packaged and labeled, and before they were checked and packed for shipment.) From the Experiment Station greenhouse the cases of red clover plants were rushed to the Lexington air port for night shipment to California. Dr. C. S. Garrison, of the U. S. Department of Agriculture, cooperating in the project, accompanied the shipment.



Lexington Airport. Time—8:47 p.m. "All aboard for California!"



(above) Crews setting the Kenland red clover cuttings in rows on the Albert Bevis ranch near Patterson, California. Behind them are a water tank truck and a planter which put water in the rows before the plants were set. In the background are the hills of the Coastal Range.

(below) As the setting of plants progressed, water from the Delta-Mendota irrigation canal was turned in.

**Has the farmer learned too well the science of production? Or,**

# More About Our Farm Surpluses

By H. R. JENSEN

Requests by administrators of our agricultural program for downward adjustments in agricultural price supports and production makes one further item clear to individual farmers and that is: our program administrators have decided that our accumulated agricultural stocks are too large. The farmer may conclude, therefore, that he has learned too well the arts and skills of production, that he should quit trying to increase his per acre or per animal yields of crops and livestock. Let us examine this conclusion first purely in terms of dollars and cents, and then in terms of other considerations.

### Monetary Considerations

First, there are those farmers who are severely limited on capital. For this reason their most important consideration is to plan so they won't go broke. Therefore, the income they can make in the coming year is more important to them than what they can average over the next 2, 5 or 10 years. They will plan their production to get as much income in the coming year as possible even though such a plan may mean a lower average income over the next 5 or 10 years. They will take prices as given, whether or not these are determined entirely in the free market or partly in the free market and partly by the agricultural program. It will pay them to increase yields per acre or per animal as long as the added returns are greater than the added costs.

But, since we are now discussing farmers who are severely limited on capital, these farmers will make more money if they do not push per acre or per animal yields to the point where the last dollar or the last day of labor just pays for itself. To get the most money from their limited capital in the *coming year* they will want to (1) select those crops and livestock which can be expected to give the highest returns per dollar invested (to the extent these choices are consistent with their ability to stand the risks), (2) push production in any one enterprise only as long as it is expected to pay more here than in any other enterprise, and (3) produce these quantities by using the methods within their means which will give lowest costs.

From a dollar-and-cents standpoint these farmers have no other choice. These farmers individually simply cannot afford to consider how their joint actions may affect the country's total production and the prices farmers will receive for their products 5 to 10 years hence. Their most important concern is to plan their production and take the action necessary to assure staying in business now. Such action may mean staying outside the program or joining the program but not complying with its intent, or joining the program and complying with its intent. Whatever action is taken with respect to the program must be evaluated in terms of the three points outlined above.

Then there are those farmers who are not so severely limited in respect to capital. For this reason, they can afford to plan for a period longer than the year ahead. Their most important concern is not one of making as much money as they can in the coming year. Their greatest concern is to choose the production plans which they expect to yield the highest average income over, say, the next 5 to 10 years. Such planning may not give the highest possible incomes in the next year or two, but it is expected to yield the highest average income over the next 5 to 10 years.

To get this highest average income, farmers in this group, like the ones in the previous group, will want to (1) select those crops and livestock which can be expected to give the highest returns per unit of resource invested, (2) push production in any one enterprise only as long as it returns more here than in any other enterprise and (3) produce these quantities with the least cost methods. However, as com-

**AN INCONSISTENCY—?**

**In last fall's issue of Kentucky Farm and Home Science appeared an article entitled "Excess Farm Production—How Much." The authors outlined a number of factors to consider in evaluating the size of our agricultural stocks. In discussions on farm adjustments it is often suggested that the farmer increase his per-acre or per-animal yields. In the farmer's mind such a suggestion may appear inconsistent when he views the nation's surplus agricultural stocks. In the current article, the author attempts to appraise whether or not there is an inconsistency.**

pared with the output of the farmers in the previous group, the combination of products produced may differ as may the methods of production. Too, since farmers in this group have more capital, it will pay them to push production farther in all enterprises. The action that a farmer in this group will take with respect to the production control program again must be evaluated on the basis of the three points outlined above. But these points are considered in the framework of a longer time span. Hence, a farmer in this group is concerned about how the joint action of farmers affect the country's total agricultural production and the prices farmers can expect to receive for their products over the next 5 or 10 years.

The individual farmer is seldom in a position where his action has any significant effect on market supplies and prices. For this reason, the individual farmer in this group may say to himself, "Most other farmers will join the program and comply with its intent, and on this basis my interests are served best by either staying outside the program or joining the program but not complying with its intent"; or he may say to himself, "Most other farmers will join the program but not comply with its intent, so I might as well take similar action to get my share of the market." However, if the majority of farmers reason the same way and act in line with this reasoning, their joint actions do affect market supplies and prices. Present production and stocks, in part, may reflect this type of reasoning. Over time, the degree of financial success of one farmer's plans and actions depends on the actions and plans of other farmers.

### Other Considerations

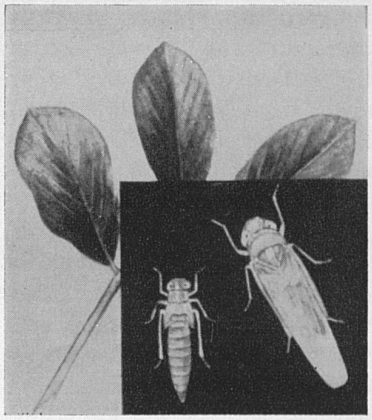
The above-mentioned considerations are purely in terms of dollars and cents. The kind of action a farmer takes with respect to the production control program may involve considerations other than income considerations. For example, a farmer may feel that joining the program and complying completely wits its intent is the "right" thing to do. He may feel it is the "right" thing to do simply because the program is part of national policy and that it is the duty of every person to abide by national policy. Action in line with this feeling may or may not conflict with dollar-and-cents considerations. If it does conflict, no one can resolve the conflict but the farmer himself.

# Value of Specific Insecticide Shown

By KENNETH J. STARKS

With the advent of many new insecticides, it has become increasingly difficult to remember what material to use for the control of a specific insect. Consequently, one is often tempted to use whatever insecticide is available or easily obtainable, without regard to the type of insect pest involved. In such cases, the control results may be disappointing, as indicated below.

During 1955, the second hay crop of alfalfa in a field located on the Experiment Station Farm at Lexington was used for an insecticide experiment. Dieldrin and methoxychlor at the rates of ¼ and 1 pound of actual insecticide per acre, respectively, were applied separately to randomized plots 60 feet wide by 100 feet long. Both insecticides were emulsifiable formulations and were applied with ground spray equipment. Dieldrin was applied on June 28, whereas methoxychlor was used about 3 weeks later on other plots. Data were recorded from insect counts made at intervals with a sweeping net and from yield samples of alfalfa taken on August 2, approximately 5 weeks after the dieldrin treatment and 2 weeks after the methoxychlor spraying.



An alfalfa leaf showing leafhopper injury. Yellowing is typical of this type of injury. The inset shows (left) a nymph or immature potato leafhopper and (right) an adult.

Dieldrin has been proved to be effective for grasshopper control at a dosage even lower than the one used in this test. Methoxychlor is currently one of the materials recommended for the control of potato leafhopper. Both of the above-mentioned insects were

*(Continued on page 12)*

# Fields Show Value of Good Practices

## Effect of lime and fertilizer combinations demonstrated in six Kentucky counties

By EUGENE C. DOLL

The results of the general-fertility rotation experiments which were conducted for many years in several Kentucky counties markedly show the effectiveness of good fertilization and soil management practices in increasing and maintaining crop yields. These experiment fields were located at Berea, Campbellsville, Greenville, Fariston and Mayfield and at the Western Kentucky Substation at Princeton. A three- or four-year rotation of corn, wheat, and either one or two years of a mixed grass-legume hay was followed. These experiments were designed to test the effect of applications of limestone and various fertilizer combinations on the yields of the various crops grown in the rotation.

Applications of ground limestone have resulted in increased yields on most of the upland soils in Kentucky. Yield increases which can be attributed to limestone were obtained for all three crops grown in the rotation (corn, wheat, and hay). However, the most striking effect of limestone is shown by the increased yield and quality of the hay. Furthermore, adequate applications of limestone resulted in more effective utilization of the other fertilizer elements, particularly phosphorus.

These experiments have shown that phosphate fertilization of all of the major upland soils of Kentucky (except for the high-phosphate soils of the Inner Bluegrass Region) is necessary for good crop production. Twenty-five or thirty years ago, phosphorus was generally the most deficient of the three major fertilizer elements (nitrogen, phosphorus, potash). Limestone and phosphate alone, however, are not sufficient to maintain high yields, but must be properly balanced with nitrogen and potash. Nitrogen, phosphorus, and potash may be supplied by crop residues and farm manure as well as through the use of commercial fertilizers. The results obtained at the Greenville Soil Experiment Field given in Table 1 are typical of the data obtained from the soil experiment fields.

The data in Table 1 illustrate the differences in yield among plots which received different fertilizer treatments, and the differences have been consistent from year to year. During a long-time experiment, however, the tendency of the yields from plots receiving the same fertilizer and other management treatments to increase or decrease over a period of years is as important as the differences in yield between plots receiving different treatments. An experiment must be conducted for a considerable time before these trends become apparent. At all of the locations in Kentucky where long-time experiments were conducted, the yields from the plots which received complete fertilizer treatments tended to increase from year to year, while those from the plots which received either no fertilizer or an incomplete or unbalanced fertilizer tended to remain more nearly constant or have decreased slightly. Because of the large annual fluctuations in yields, owing mostly to varying weather conditions, it is necessary to calculate the yields from the various plots in terms of linear regressions in order to measure accurately the annual changes in yield resulting from a particular fertilization or other management treatment. Figure 1 illustrates the trends in the yield of ear corn obtained in an experiment conducted

Table 1.— Greenville Soil Experiment Field, 1948-54

| Fertilizer treatment | Corn (bus.) | Wheat (bus.) | Hay (lb.) 1st. year | Hay (lb.) 2nd. year |
|---|---|---|---|---|
| None | 18.0 | 4.6 | 1,550 | 1,950 |
| Phosphorus | 37.6 | 16.5 | 2,450 | 2,800 |
| Phosphorus and potash | 50.8 | 18.1 | 2,530 | 2,800 |
| Nitrogen, phosphorus and potash | 51.4 | 25.5 | 2,700 | 2,800 |
| Limestone, nitrogen, phosphorus and potash | 55.6 | 31.5 | 3,400 | 3,200 |

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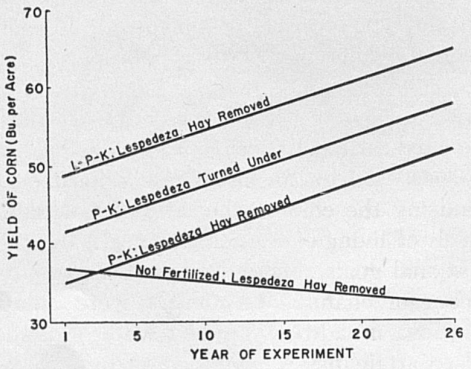


**Fig. 1.—Yield of corn grown in a 3-year rotation in wheat and lespedeza at the Western Kentucky Agricultural Substation, Princeton, over a 26-year period. Fertilizer treatments included combinations of limestone (L), phosphorus (P), and potash (K).**

## Where Farmers Get New Ideas

*(Continued from page 4)*

There were also widespread differences among farmers at various socio-economic levels, as is shown in comparing five size-of-operation groups, ranging from the very small "patch" farms to farms of two-man size and larger. The variation in extent of contact with certain information sources as between the smallest and largest of the five divisions is shown in Table 1.

**Table 1.— Contact with information sources**

| Of all farm operators in each group, percent who: | Smallest farms | Largest farms |
|---|---|---|
| Read farm magazines | 63 | 100 |
| Attended a farm meeting or demonstration | 11 | 81 |
| Talked with a professional agricultural adviser | 21 | 100 |
| Got help or information from county agent | 55 | 100 |
| Got help or information from soil conservation district | 16 | 65 |

Similar differences were apparent when farmers were grouped according to educational levels and by socio-economic status. To some extent the neighborhood variation and the differences on the basis of socio-economic status reflect the same basic factors, since the small, low-income, poorly educated farmers are heavily concentrated in certain neighborhoods.

Since such a high percentage of farmers in the study reported getting farm information from "friends, neighbors and relatives," it might be assumed that this would be practically universal throughout all areas of the county, but the data showed that whereas 100 percent of the farmers in one neighborhood gave this as a source of farm information only 57 percent in another said they had received help through this source. Significant in this connection was the fact that in the neighborhoods where friends, neighbors, and relatives were most often named as a source of information farmers were less likely to report getting information from other sources, particularly from professional sources.

### Conclusions

Increasing the efficiency of agriculture and raising the levels of living of rural people are important state and national goals. The typical Kentucky county has a number of channels or media for spreading farm information, in addition to organized programs designed to attain these objectives. Workers interested in the dissemination of farm practices should be aware that the best means for getting information concerning a new practice across to farmers may differ both as between different neighborhoods and between individual farmers. If, therefore, one is to achieve maximum effectiveness in "selling" a particular idea or technique it is important to know the channels or media which are most important within each segment of the farming population.

## Profitable Irrigation Investment

*(Continued from page 3)*

variation in farm income or to increase yields, farmers can: (1) maintain flexibility in the farm business so changes can be made without undue costs through changes in livestock program, maintaining a sizeable reserve of feed, emergency crops, or maintaining a cash or credit reserve, (2) operate livestock program below the capacity of the farm to avoid being forced to take drastic action during a possible drouth, (3) substitute more plentiful feeds for the scarce feed, (4) use the natural rainfall more efficiently through building up the water-holding capacity of the soil by adding organic matter, fertilizer, etc., and (5) diversify plant population to provide a more uniform distribution of forage supply throughout the season. All of these alternatives are practiced by farmers and, like irrigation, constitute a cost. It is important that these alternatives be considered particularly when scarce capital has other productive uses.

## Ram Testing Research Project

*(Continued from page 5)*

To further evaluate this method as an aid in selecting commercial rams, the five high-gaining rams and the five low-gaining rams will be bred to comparable groups of 125 crossbred western ewes each to determine if their ability to gain in the feedlot will be transmitted to their progeny and also to observe any differences in their ability to settle ewes. The average daily gains of these two groups of rams were 0.39 and 0.23 pound, respectively. It is possible that a good share of this difference may be observed in the progeny of these two groups.

For the past few years, the trend in Kentucky has been toward the use of larger, fast-gaining rams, and it seems imperative that the purebred breeder take this demand into consideration. This is particularly true for those raising breeds such as the Southdown that are inherently small but possess so many of the quality characteristics desired in spring lambs by the consuming public. If the demands of the commercial breeder are not considered, his only alternative may be to use rams of breeds more closely meeting his requirements.

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TO

## Value of Specific Insecticide

*(Continued from page 9)*

present in damaging numbers in the experimental plots, but the leafhoppers did more obvious injury to the alfalfa during the test.

In Tables 1 and 2 are shown some of the results. Methoxychlor afforded excellent control of potato leafhopper 2 days after being used and continued to hold down the population until the yield samples were taken although this insecticide has relatively short residual properties under field conditions. Methoxychlor gave a 60-percent reduction of grasshoppers 2 days after application when counts from plots sprayed with this material were compared with those from untreated areas. However, grasshoppers taken by sweeping the methoxychlor-treated plots were mostly adults which would indicate that the insecticide gave some control of immature grasshoppers, but many of the more tolerant adults escaped fatal poisoning. There was little control of grasshoppers after 2 weeks in the methoxychlor-treated plots.

**Table 1.— Summary of insect counts taken from plots of alfalfa in an experiment using dieldrin and methoxychlor**

| Insecticide treatment | Insect | Percentage decrease when compared with untreated plots | | |
|---|---|---|---|---|
| | | 2 days | 2 weeks | 3 weeks |
| Methoxychlor | Grasshoppers | 60 | 6 | .... |
| | Potato leafhoppers | 94 | 47 | .... |
| Dieldrin | Grasshoppers | 97 | .... | 72 |
| | Potato leafhoppers | 26 | .... | −12 |

**Table 2.— Summary of yield data from plots of alfalfa in aflalfa in an experiment using dieldrin and methoxychlor**

| Insecticide treatment | Percentage increase in comparison with untreated plots | | | |
|---|---|---|---|---|
| | Green weight | Dry weight | Ratio of leaves to stems | Length of stems |
| Methoxychlor | 27 | 25 | 27 | 13 |
| Dieldrin | 14 | 40 | 19 | 19 |

Dieldrin gave satisfactory control of both adult and immature grasshoppers even 3 weeks after application. However, the potato leafhoppers apparently were little affected in their biotic activities by this chemical. After 3 weeks there were slightly more leafhoppers in dieldrin-treated plots than in the untreated plots.

In comparison with the unprotected controls, plots treated with either insecticide gave samples of alfalfa having appreciably higher green and oven-dry weights. On the average, plants in the chemically treated plots had longer individual stems but, even so, they had a greater proportion of leaves in comparison with stems than the untreated plants. Plants from the dieldrin treatments were taller than those from the methoxychlor-sprayed plots, presumably because of better protection from grasshoppers. However, the leaves on dieldrin-treated plants were noticeably yellowed by potato leafhoppers and some of them were shed. Unfortunately, no plots treated with a combination of methoxychlor and dieldrin were included in the experiment. The results given here perhaps indicate that it can be profitable to control both grasshoppers and potato leafhoppers attacking alfalfa. However, satisfactory control of either pest is obtained only when the proper insecticide is used at a suitable dosage.

## Fields Show Value of Practices

*(Continued from page 10)*

at the Western Kentucky Substation over a period of 26 years.

The information obtained from the long-time rotation experiments have been extremely valuable in formulating fertilizer and soil management recommendations. The necessity of proper fertilization has been clearly shown, and the increased yields from plots which have received the same treatment shows the value of continued fertilization for a period of years. Furthermore, in spite of the fact that the soils at the various locations vary considerably, the results obtained at the different fields are remarkably similar.