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CONTROL INSECTS AND INCREASE COTTON INCOME

Cotton insects reduced the value of the Southwest's 1949 cotton crop by an estimated \$70,000,000. Thrips, flea hoppers, and aphids sapped the vigor of young cotton plants early in the season, while boll weevils, bollworms, and other insects joined the attack as the season progressed. In local areas throughout the Southwest, these pests almost completely destroyed the cotton crop, and individual farmers saw their work and money spent in making a crop go for naught as insects literally ate up their cotton. According to estimates, nearly 60 per cent of the Southwest's 1949 cotton crop received no treatment for insect control. Moreover, many farmers who attempted to control insects poisoned only for boll weevils and were unaware of the tiny thrips, aphids, and fleahoppers that attacked their cotton even before the first blooms appeared and reduced materially the potential income from the crop.

The loss might have been much greater had it not been for the effective cotton insect-control program designed by entomologists and chemists, promoted by agricultural specialists, and carried out by many cotton farmers. In Texas the 1949 insect-control program—called the best in history and supported by a state-wide cotton committee and integrated with the 7-step cotton program—is estimated to have saved Texas farmers millions of dollars. Approximately 50,000,000 pounds of insecticides were applied on more than 4,000,000 acres.

Cotton insect control is no longer an experiment. True, many improvements are needed and many problems are yet unsolved, but the dollar and cents value of following an insect-control program in the production of cotton is well established. Figures 1 and 2 present graphic evidence of this fact.



Figure 1.—This field received early season insecticide applications on May 31 and June 8 and late-season applications on July 18 and 23. It was ready for picking by August 15. Yield per acre was 594 pounds of lint.



Figure 2.—Field of untreated cotton showing severe insect damage, mostly from boll weevils. Yield per acre was 178 pounds of lint.

Note: Both fields had been defoliated to facilitate harvesting.

Throughout the Southwest, experimental data, community-wide control programs, and the experience of individual farmers testify to the effectiveness of the new insecticides and improved methods of application. Much progress has been made in carrying this program to individual farms, but the job is far from complete, as indicated by the statement above that nearly 60 per cent of the cotton grown in 1949 received no treatment for control of insects.

Effective cotton insect control is of special importance in 1950, inasmuch as acreage allotments will reduce cotton acreage on most farms, and, unless per acre yields can be maintained at a high level, many farmers face the possibility of a greatly reduced cotton income. Controlling insects is of paramount importance in an effort to obtain highest possible per acre yields. Adverse weather may hamper the campaign against insects—as illustrated in many areas of the Cotton Belt in 1949, but the alternative to a control program is risk of total loss of the crop, with the subsequent loss of income. Moreover, if recommendations of agricultural experiment stations and insecticide manufacturers are followed, the program for controlling cotton insects is generally very effective.

In community-wide tests, following the recommended control program has resulted in increases of more than 200 pounds of lint per acre. A survey of records kept by several Texas farmers shows that average cotton yields were increased from 90 pounds of lint per acre in 1945 to as high as 600 pounds of lint per acre in 1949. Specialists working with these farmers testify that a major factor in this increase was that they followed the recommendations of their state experiment station in controlling cotton insects.

The importance of controlling insects in 1950 is further emphasized by the fact that numbers of insects, especially boll weevils, may be unusually high in 1950. Infestation counts during the 1949 season showed that the boll weevil population increased steadily from a relatively low level in the spring to a very high level by late fall. Frequent rains and the bumper crop in most parts of the

Southwest delayed harvest and prevented early destruction and plowing under of cotton stalks, thus leaving ample hibernation quarters for boll weevils. Furthermore, as a result of the ample moisture, cotton plants continued to grow during the fall months, providing adequate feed for the weevils, so that a "large crop" of well-fed weevils went into winter hibernation in condition to withstand considerable adverse weather. Unless severe winter weather occurs before spring, there will be millions of boll weevils ready to destroy the 1950 crop. Early season poisoning can be an important factor in killing these early broods of weevils and reducing materially the potential damage of the pests later in the season. Permitted to reproduce unchecked, they could multiply into such size as to menace the entire cotton crop.

How to Control Cotton Insects

Community action is most desirable. Insects are no respecters of fences or property lines. One unpoisoned cotton field in a community can produce enough insects to threaten all of the neighboring fields. Therefore, to be most effective, the insect-control program should be organized on a community-wide basis, with every farmer participating. Most Texas counties have a committee—frequently called the 7-Step Cotton Committee and usually organized by the county agent—for planning and executing such a program. This committee should co-ordinate the efforts of farmers, ginners, insecticide and machinery dealers, bankers, businessmen, vocational agricultural teachers, and other agricultural leaders in a cotton insect-control program that will cover every cotton patch in the county. By surveying the kind and type of equipment available in the county for applying poisons, by estimating the kind and quantities of insecticides needed for the season, by determining the best time to apply early season control in that county, by co-ordinating weekly infestation counts, and by making latest information on control measures available to the press and radio, as well as through personal contacts and community meetings, this committee can give the program maximum effectiveness. Technical in-

formation is available from agricultural experiment stations, and special help can be obtained from cotton specialists of the Agricultural Extension Service, as well as from persons employed by insecticide and machinery manufacturers. But the ultimate success of the program and the degree to which insects are controlled and income to the community from the sale of cotton and cottonseed maintained rest with the agricultural leaders, businessmen, and farmers in each community.

Group action is most effective, but if no community plan is in operation, farmers should follow an intensive insect-control program on their own farms, based on the recommendations of their state experiment station. In both the group program and on individual farms it is vital that recommendations of specialists and of insecticide manufacturers be followed carefully. If the recommendations call for two applications of a specific poison 7 days apart, two applications should be made 7 days apart—not three applications at 10-day intervals or two applications at 5-day intervals—nor should another insecticide be substituted for the one recommended. Effective control of insects does not permit the variation in control measures that may be allowed or even be desirable with certain cultural practices. Timeliness is essential for adequate control. Local adjustments may be necessary in the timetable of application, and in many instances the time of application is dependent upon local infestation. Furthermore, most recommendations suggest more than one kind of poison. But outside of the variations given in the recommendations, no changes should be made. Improper use of poisons, may do more harm than good, and failure to follow directions has been a frequent cause of ineffective insect control and has resulted in a waste of poison and of the farmer's money.

Early Season Control

"Kill 'em before they get started!" is an appropriate slogan for the early season control program, because this practice is an effective way to strike a blow against insects before they have a chance to cause excessive damage to the cotton plants.

Early season control refers to the application of insecticides on the young cotton plants prior to the appearance of the first blooms. Under this program, the first poison application is made about the time that chopping and plowing are completed, and one or two additional applications are made at 7-day intervals. Poisoning is discontinued not later than the appearance of the first blooms, and no further applications are made, unless "counts" of insects in the cotton field reach certain levels. (These levels are given in each state's recommendations.)

The importance of controlling insects early in the season is emphasized by the fact that thrips, aphids, and flea hoppers may start feeding on cotton plants almost as soon as the first leaves appear. They sap the strength of the young cotton seedlings, retarding growth during the favorable spring growing season, thus preventing the development of a vigorous, healthy plant, capable of setting and carrying a heavy crop of bolls. The damage caused by these insects—so tiny that they frequently go unnoticed—often lowers the potential yield even before the first blooms appear. In experiments in Wharton County, Texas, fields given early season treatment averaged more than twice as many blooms per acre as untreated fields. Cotton plants receiving early season treatment also held their squares and reached full maturity 3 weeks earlier than the untreated plants. In both 1948 and 1949 tests, cotton given early season insect-control treatment outyielded untreated fields by 50 to 100 percent. In the 1949 experiments, it is estimated that the \$4 to \$6 per acre cost of the early season treatment doubled the returns per acre.

Usually, midseason applications of poison are unnecessary for boll weevil control, if the early season program is carried out according to recommendations and on a community-wide basis. Thorough applications of poison early in the season kill the first broods of weevils as they come to the cotton fields after emerging from winter hibernation and tend to prevent these early broods from reproducing and building up a large population, which would threaten the crop later in the season. If early season control is not applied on a

community-wide basis or if the job is not thorough, boll weevils may migrate into the treated cotton fields from untreated areas, requiring mid- or late-season poisoning.

Mid- and Late-Season Control

Applications of poison after the first blooms appear should be avoided whenever possible, and the time of such applications, if necessary, should be determined by an accurate check of the degree of infestation in the cotton field. In other words, if no insects appear, no poisoning is recommended. But if the degree of infestation reaches a certain stage, poison should be applied immediately and continued until the insects are brought under control. The exact amount of infestation that warrants poisoning and the kind and amounts of insecticides are given in the various state cotton insect-control guides.

The fact that midseason applications of poison are determined by the degree of infestation emphasizes the importance of accurate insect counts at weekly intervals throughout the season. It is essential that every cotton farmer be able to recognize the insects that may attack his cotton crop, so that he may make weekly counts of his own fields to determine whether or not poisoning is needed. "Know your enemies" is sound advice in any battle, and certainly the cotton farmer who cannot identify the common cotton insects that may attack his crop has two strikes against him in the battle for control of the pests. Color photographs of the more common insects found in the Southwest, together with their life history, have been published by several magazines and can be obtained this year by writing to The Hercules Powder Co., 1210 Gulf States Building, Dallas, Texas.

The Use of Sprays

Sprays, which are generally as effective as dusts in controlling cotton insects, are included for the first time this year in the recommendations of several states. New and improved insecticides and power machinery have made it possible to develop suitable spray materials and machinery for applying them to cotton. While the use of sprays is included in some recommendations this year, they should

be used with caution and directions followed carefully.

The chief advantage of sprays is that they can be applied under a wide range of weather conditions, even when a moderate wind is blowing. This is of special interest to farmers who are sometimes forced to wait several days before wind conditions will permit any dusting. By the time weather conditions are suitable, insects may have inflicted considerable damage, and the job of controlling them greatly aggravated. Cost of spraying compares favorably with that of dusting. In fact, since the sprayer can be attached to the tractor without removing the cultivator and spraying continued throughout the day, cultivation and spraying can be done simultaneously, thus effecting considerable saving in labor and tractor costs.

Several precautions should be observed by any farmer who plans to use spray materials for controlling cotton insects.

1. He should make certain that he has equipment that will handle the sprays satisfactorily. A sprayer that is entirely suitable for applying other insecticides or weed killers may be unsatisfactory for applying insecticides to cotton.

2. He should make certain that he has, or will have available, an adequate supply of a spray that has been formulated and tested under conditions similar to those in his community.

3. He should work closely with an insecticide or machinery manufacturer who is familiar with all of the problems involved in the use of spray material for cotton.

Farmers who already have dusting equipment probably should continue to use dusts, in view of the cost of shifting to spray equipment and the fact that many problems associated with their use are as yet unsolved. On the other hand, farmers contemplating the purchase of new equipment for applying poison to cotton should give careful consideration to the advantages of sprays.

Copies of state recommendations for 1950 cotton insect control can be obtained from the Agricultural Extension Service of each state.