



Correct time of application is important in cotton-insect control.



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## COTTON INSECT CONTROL

### Recent Research Reported

During 1958, a cotton insect research program was begun in Arizona with the close cooperation of entomologists of the University of Arizona Agricultural Experiment Station and the Agricultural Research Service of the United States Department of Agriculture. This program involves field testing of insecticides, largely at the University Cotton Research Center near Phoenix, and more basic studies of cotton insects and their control centered largely at the U.S.D.A. Laboratory at Tucson under the direction of G. T. Bottger. A new research laboratory for this latter work has been completed at Tucson.

The following comments are based on 1958 field research in Maricopa and Pinal counties, under this cooperative program, by personnel located at the Cotton Research Center.

#### Early Treatment Important

Three experiments were conducted in which insecticides were applied at weekly intervals by airplane to 8-acre blocks. Treatments were begun when a low population level of lygus bugs was present. Results showed that injurious insects never built up to highly destructive numbers in treated plots, although slight damage was noticed.

If a grower would use such a program during the latter part of the season, he would be able to control pests before any appreciable damage was done to his cotton. Repeated applications of insecticides reduced the predator populations, but did not eliminate them.

Adequate control of lygus bugs and black fleahoppers is considered the starting point in any good program. These insects feed on small squares, and many

farmers are not aware of the potential damage they cause until large numbers of squares have dropped.

Research work in 1958 showed the desirability of starting insecticide applications when 6 lygus bugs are found per 100 net sweeps. This seems to be a low level for starting insect control treatments, yet a large scale experiment showed an increase of over one-half bale of cotton per acre on the first picking when the lygus bug control was started at a low population level.

Good lygus bug control was obtained with the following dusts, applied at the rate of 30 pounds per acre: 15% toxaphene — 5% DDT — 40% sulphur; 1.5% Endrin — 1.5% methyl parathion; 5% Malathion — 10% DDT — 50% sulphur; 7.5% Sevin — 40% sulphur; 2% Dieldrin — 10% DDT — 40% sulphur; 2% Dieldrin — 10% DDT — 40% sulphur; 2% Endrin — 40% sulphur; 5% Dilan — 40% sulphur.

As a rule cabbage loopers are killed by a virus disease before populations have built up to destructive numbers on cotton. In Maricopa county in 1958, the virus did not control the loopers and many fields were severely defoliated.

The best looper control was obtained with a dust mixture of 1.5% endrin and 1.5% methyl parathion. This did not eliminate the looper population but gave 70% or more kill and prevented serious damage to the cotton leaves.

#### Many Problems in 1958

The salt-marsh caterpillar was a severe problem in 1958. Parathion spray, applied at the rate of 0.5 pound per acre gave excellent control of large and small salt-marsh caterpillars. Sevin and Dylox sprays at the rate of 2 pounds per acre

also gave excellent control of caterpillars in all stages of growth.

Dilan gave good control in 1958, although poor kills were obtained after caterpillars had attained one-third or more of their growth. Even though the kill of larger worms was poor, their feeding was greatly reduced.

Dilan had the most lasting effect of any material tested in 1958. A 7.5% Sevin dust and a mixture of 1.5% Endrin with 1.5% methyl parathion also gave good control of salt-marsh caterpillars.

Control of newly hatched larvae was obtained with a spray of 6 pounds of toxaphene with 3 pounds of DDT per acre. This high dosage did not control the larger caterpillars.

A dust mixture of 15% toxaphene, 5% DDT plus 40% sulphur controlled only half of the infestations.

#### Sprays vs. Dusts

In two 1958 experiments, good commercial control of the cotton leaf perforator was obtained with the following dust formulations, applied at the rate of 30 pounds per acre: 5% Dilan; 5% Sevin; 5% Malathion; 15% Toxaphene — 5% DDT — 40% sulphur.

Previous work has shown that sprays are slightly more effective than dusts controlling cotton leaf perforators. In 1958 salt-marsh caterpillars seldom attacked cotton fields that had been severely injured by the cotton leaf perforator.

During 1957, spider mites on cotton in the Litchfield Park area were difficult to control. Experiments on sugar beets showed that this spider mite is resistant to demeton (Systox) and other organic phosphate materials.

Preliminary 1958 experiments showed that Aramite and Kelthane controlled this spider mite on cotton, but that the control was not as good as that previously obtained with demeton (Systox) before the mite became resistant to it.