

# *New Dusts For . . .* Cotton Insect Control

F. S. ARANT, Entomologist  
Agricultural Experiment Station

W. A. RUFFIN, Entomologist  
Extension Service

**O**NLY three dusting treatments of the many tested in 1947 were found to be suitable and effective for cotton insect control in Alabama. These are:

Chlorinated camphene, 20 per cent  
Benzene hexachloride-DDT, 3-5 mixture

Calcium arsenate alternated with calcium arsenate-nicotine.

The experiments were conducted by the Alabama Agricultural Experiment Station to find out which of the many new insecticides on the market are best. Reported here are control recommendations based on experimental results.

## INSECTICIDES to USE

**Chlorinated camphene, 20 per cent.** This insecticide was highly effective in the control of boll weevil and bollworm in all experiments. It was not effective in eliminating heavy cotton aphid populations. However, where used throughout the season, there was no build-up in numbers of aphids. In these tests, which were repeated several times, the plots dusted with chlorinated camphene yielded 403 to 827 more pounds of seed cotton per acre than undusted plots.

**BHC-DDT, 3-5 mixture.** This dust, which contains 3 per cent gamma benzene hexachloride and 5 per cent DDT, gave excellent control of all three—boll weevil, bollworm, and cotton aphid. It gave the quickest kill of boll weevil of any of the dusts tried. However, its period of effectiveness was shorter than that of chlorinated camphene or calcium arsenate. In one large experiment, the average gain in seed cotton per acre over no dusting was 496 pounds from the use of BHC-DDT, as compared with gains of 164 pounds from applications of calcium arsenate and 571 pounds from dustings of chlorinated camphene.

BHC-DDT is irritating to the operator of the dusting equipment.

**Calcium arsenate alternated with calcium arsenate-nicotine.** Alternate applications of calcium arsenate and calcium arsenate containing 2 per cent nicotine gave excellent control of boll weevil and cotton aphid. These dusts were not very effective against bollworm, which caused severe damage in 1947. In these tests, dusting with calcium arsenate and nicotine resulted in 338 more pounds of seed cotton per acre than no dusting. On the other hand, calcium arsenate used alone

---

AGRICULTURAL EXPERIMENT STATION  
of the ALABAMA POLYTECHNIC INSTITUTE

M. J. Funchess, Director

Auburn, Alabama

(without nicotine mixture) gave an increase of only 164 pounds of seed cotton per acre over the yield of the undusted plots.

If bollworms become numerous in fields dusted with calcium arsenate-nicotine, it may be necessary to make one or two applications of 10 per cent DDT to kill the worms.

**Price Factor.**—Many growers have asked about the relative value of chlorinated camphene or BHC-DDT dust as compared to calcium arsenate-nicotine mixture. Experimental results to date indicate that the new materials give better control of cotton insects than alternate applications of calcium arsenate and calcium arsenate-nicotine. Therefore, growers can afford to pay as much per pound for chlorinated camphene or BHC-DDT as the current price of calcium arsenate containing 2 per cent nicotine.

## THESE NOT RECOMMENDED

Certain insecticides are not recommended because of unfavorable results obtained from experiments conducted throughout the cotton-growing states. These include:

**Boll weevil spray.** A commercial boll weevil spray sold last year in Alabama was tested in several states. It was found to be of no value in the control of cotton insects.

**Chlordane-DDT, 3-3 mixture.** A mixture containing 3 per cent chlordane and 3 per cent DDT was sold in several states last season. This mixture was tested by State and Federal agencies; it was found to be of little value against boll weevil. Actually its use resulted in an increase in aphid damage to cotton.

**Chlordane.** A dust containing 5 per cent chlordane was tested in Alabama. It did not control boll weevil as well as calcium arsenate, and its use resulted in increased damage from the

bollworm. In experiments elsewhere 10 per cent chlordane showed great promise as a boll weevil insecticide. At this strength it killed adult weevils as well as young grubs in the squares. However, this material is still in the experimental stage, and is not ready for general use on cotton. It is available for those who wish to use it on a trial basis.

**Boll Weevil Catchers.** Boll weevil catchers were tested last season in several states. Some were found to be effective in collecting weevils and other insects on small cotton. However, the number of beneficial insects collected usually far exceeded the harmful forms. The use of boll weevil catchers did not eliminate the need for dusting later in the season; neither did the use of these machines materially increase the yield of cotton.

## WHEN to DUST COTTON

Ordinarily cotton in Alabama does not require dusting early in the season—before the plants are fruiting freely. Boll weevils emerging from hibernation in the spring and early summer live for only a short period. If insecticides are applied at this time, the only weevils killed are those that would die without poisoning. Usually other insect pests are not numerous enough to warrant dusting early in the season.

Results of experiments conducted by the Alabama Station in 1947 indicate that early dusting of cotton with the new recommended insecticides may not only be unnecessary but actually harmful unless continued through the season until the bolls mature. Where three early dustings were made at 5-day intervals, beginning when the cotton began squaring, less cotton was produced in each of four fields than where no dust was applied. On the other hand, profitable increase in yield resulted when dusting was delayed and five applications were made during the

time the cotton crop was being set and matured.

The most profitable control of cotton insects results from dusting while the cotton plants are setting and maturing the crop. After the plants are fruiting freely, squares should be examined for boll weevil punctures. When 20 or more are punctured out of each 100 examined, it is time to begin dusting. Three applications of dust should be made at 5-day intervals. One week following the third dusting, the cotton should be examined again. If weevils are swarming or the number of squares punctured exceeds 20 in 100 examined, two to three additional dustings should be made at 5-day intervals. If there is no evidence of insect damage, no dust should be applied. However, additional frequent inspections should be made until the bolls are mature. If insect damage or swarming of weevils occurs at any time before the bolls are mature, the cotton should be dusted at 5-day intervals until the insects are under control. Very late dustings are often the most profitable of all. It is a grave error to stop dusting several weeks before the bolls are mature on the assumption that there will be no further insect damage.

## AMOUNT of DUST NEEDED

If dusting has not been started too early, 6 to 7 applications of dust should be enough for the season. The average rate per application is 10 pounds per acre for chlorinated camphene and BHC-DDT, and 8 pounds for calcium arsenate and calcium arsenate-nicotine. Each grower should stock in advance 60 pounds of dust for each acre of cotton. If calcium arsenate is to be used, one-half of the dust (30 pounds for each acre) should contain nicotine.

The amount of dust needed may be increased by frequent rainfall or heavy insect damage. If an application of calcium arsenate is washed off within 24 hours, the dusting should be re-

peated. Results to date indicate that applications of BHC-DDT or chlorinated camphene need not be repeated if the insecticide remains on the cotton 12 to 15 hours without rain. The BHC-DDT mixture kills many weevils within 4 to 6 hours after dusting.

## HOW to APPLY the DUST

The insecticides may be applied with ground machinery or by airplane. Ground machinery (hand-operated, mule-drawn, or tractor equipment) should have a distributor over each row covered. The dust should be blown through the foliage in a thin cloud that completely envelops the plants. The air should be relatively calm when dust is applied.

Where tractor dusters are used, care must be taken late in the season to prevent damage to the cotton by the machinery. The speed of the tractor should be reduced and guards should be provided to prevent the wheels crushing bolls on the ground. A large sweep placed just above the surface of the ground and in front of each wheel will lift boll-laden branches out of the path of the wheels. Sheet metal guards may also be used.

## PRECAUTIONS

Cotton dusts are poisons and should be treated as such. They should not be dusted on pastures or on maturing food and feed crops. The odor of benzene hexachloride may persist in the soil for a long time. Until more information is available, the dust should not be applied in fields where soil crops, such as potatoes, are to be grown the following season.

Any dust left over at the end of the season should be stored in the original container and in a dry place inaccessible to livestock. Empty containers should not be left where livestock can lick them.

Prolonged breathing of dusts should be avoided.

SECOND PRINTING, APRIL 1940.