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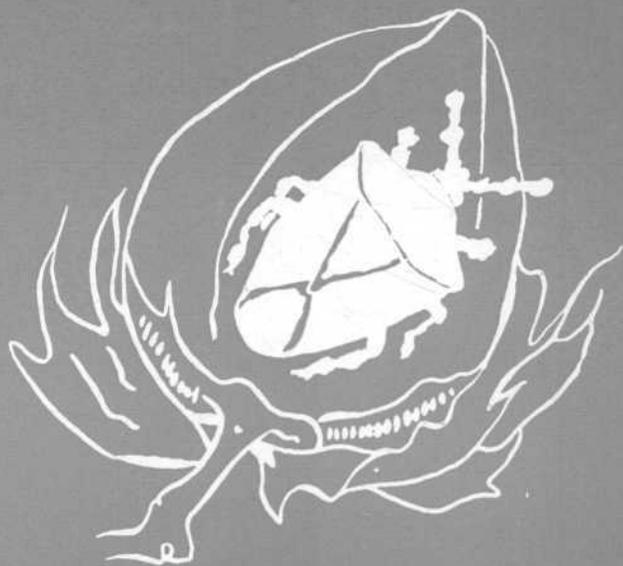
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# COTTON INSECT CONTROL

*In Arizona*

1954



**Circular 179**

# **COTTON INSECT CONTROL**

*In Arizona  
1954*

**By J. N. RONEY, Extension Entomologist**

## **Practice Good Farming !**

- Always prepare a good seed bed.
- Follow good planting practices.
- Use certified seed.
- Treat all seed with a seed disinfectant.
- Follow a good fertilizer program.
- Follow recommended irrigation practices.
- Set up a plan for adequate insect control.

Control of cotton insects by new insecticides is very important, but it alone will not give high yields or good quality. Neither will just following good farming practices. It takes a combination of *good seed, good farming practices*, and proper insect control to get the desired results.

Learn to recognize injurious cotton insects.

Use a bug net (15 inch diameter) at several points in the field to determine if sucking insects are present in harmful numbers. When you are sweeping for the injurious insects, you also may catch many beneficial insects.

Learn to know the beneficial insects. Most of them are predators.

You may catch the big eye bug, the aphis lion, the *Orious*, nabids and assassin bugs that feed on *Lygus*, stink bugs and rapid plant bugs. These also may feed on the eggs and small stages of the cotton bollworm and other worms.

You also may catch the ladybird beetle in both larval and adult stages that feeds on aphids and thrips. Nearly all of these insects feed on aphids. There are other beneficial insects that you may see in field demonstrations.

Start control applications when 10 to 12 injurious sucking insects (*Lygus* and/or superb plant bugs) are found in the bug net after making 100 sweepings over the tops of the cotton plants. These counts should be made at several places in the field. One way is to make 5 counts at five different points in a field. If cotton is rank,

only 25 sweeps may be made at a point. Then base your count on 100 sweepings.

Be certain in counting the insects to consider nymphs (small ones) and adults as the same.

When flea hoppers alone are present, you should have 16 to 20 per 100 sweepings. For stink bugs, if you catch an average of 2 per 100 sweeps at several points start control. All sweepings should be done early in the morning or late evening.

Start control of chewing insects, principally bollworms, when they start appearing in the growing tips of the cotton plant. The eggs are laid on the tender growing tips. From the egg a very small worm hatches. It eats its egg before feeding on the plant, squares and bolls.

Look for these worms on 25 or 50 plants in a row. If you find 2 to 4 small worms in these counts at several points in the field, start dusting or spraying. You cannot control large worms.

Do not dust or spray as a preventative measure or just because your neighbor dusts or sprays. Endeavor to apply insecticides when weather conditions are favorable. Consider other crops and beneficial insects when controlling the injurious insects. Tall rank cotton may require heavier applications than are recommended in this circular.

# Control These Insects

The principal injurious cotton insects of Arizona and controls based on research conducted by Mr. W. A. Stevenson and other workers of the Agricultural Research Service, Entomology Research Branch, USDA, are shown on the following pages.

## BEET ARMYWORM

*(Chewing Insect)*

The beet armyworm may be the first insect to harm your cotton. It feeds on the cotton plant when it is in the seedling stage, and in some instances may partially destroy the crop.

It is not injurious every year, as parasites usually keep it under control. Some seasons late infestations injure squares.

### Control

A dust mixture of 5 percent DDT and a high percentage of 325-mesh conditioned sulphur will give good control when applied at the rate of 15 pounds per acre. If a spray is used, be certain to apply  $\frac{3}{4}$  of a pound of technical DDT per acre.

One pound of toxaphene per acre in sulphur dust or spray is an alternate material to use.

Late season infestations often cause serious injury to squares and blooms, and 20 pounds or more of insecticides may be necessary.

## DARKLING BEETLES AND CUTWORMS

*(Chewing Insects)*

Darkling beetles and cutworms are minor pests. However, some

seasons they may be very injurious especially following alfalfa or in light rich soils. Control is with poison baits, dusts, or irrigations for long periods after sprouting time.

### Control

Use 10 percent DDT or 10 percent toxaphene and a high percentage of 325-mesh conditioned sulphur mixture applied at rate of 15 pounds per acre by ground machinery for good control.

An alternate material is an apple-peel bait applied at the rate of 10 pounds per acre between the rows. (Apple-peel bait is dried apple peel impregnated with sodium fluosilicate.)

## LYGUS BUGS

## STINK BUGS

## SUPERB PLANT BUGS

## COTTON FLEA HOPPERS

*(Sucking Insects)*

Lygus bugs, stink bugs, superb plant bugs, and cotton flea hoppers are the most important sucking insects of cotton. They feed on squares or bolls of the cotton plant. Stink bugs cause more injury to cotton bolls and stain the lint.

### Control

Use 10 percent DDT and a high percentage of 325-mesh conditioned dusting sulphur applied at the rate of 20 pounds per acre to control all of the sucking and chewing insects, except the stink bugs, spider mites and salt marsh caterpillars.

Research work shows also that 20 percent toxaphene and a high

percentage of 325-mesh conditioned sulphur also is effective when applied at the rate of 20 pounds per acre per application.

Sprays are equally as effective as dusts. Be certain the same amount of technical material is used per acre.

Use 4 to 5 gallons of spray material per acre per application. Extremely rank cotton may require a higher gallonage per acre.

A 2 percent gamma isomer benzene hexachloride, 5 percent DDT, and a high percentage of 325-mesh conditioned sulphur will give the best control of stink bugs when applied at the rate of 20 pounds per acre per application. If a spray is used, be certain to apply not less than four-tenths of a pound of gamma isomer benzene hexachloride per acre.

An alternate dust is 15 percent toxaphene and 5 percent DDT and a high percentage of 325-mesh conditioned sulphur applied at the rate of 20 pounds per acre. If liquids are used, an alternate may be 2 pounds of toxaphene, 1 pound DDT emulsion in 4 to 5 gallons of water per acre.

Dieldrin in a 2½ percent dust with sulphur when applied at 20 pounds per acre will give control. Also a 20 percent toxaphene and sulphur dust applied at the same rate will give control.

Injury by superb plant bug is found primarily in the Safford Valley.

## **BOLLWORMS**

*(Chewing Insect)*

The bollworm feeds on squares, blooms and bolls of the cotton plant. It must be controlled when

it first appears in the tops of the cotton plant.

### **Control**

Use 10 percent DDT and a high percentage of 325-mesh conditioned sulphur at the rate of 20 pounds per acre per application.

An alternate dust of 20 percent toxaphene and a high percentage of 325-mesh conditioned sulphur will give control at a slower rate when applied at 20 pounds per acre per application.

Sprays may be used if the same amount of technical DDT or toxaphene per acre is used as with dust. The sprays must be applied at the correct time or when the worms first hatch. Otherwise very poor results will be secured.

## **THRIPS**

*(Rasping and Piercing Mouth Parts)*

Thrips cause serious injury to young seedling cotton plants. Not all fields are infested, but when thrips are present they can cause serious injury to the plants.

### **Control**

A profitable increase of seed cotton per acre has resulted from an application of 10 percent toxaphene dust at the rate of 10 pounds per acre with a ground duster. The dust was applied when the cotton plant was in the 4 to 6 leaf stage of growth.

A spray mixed so as to deposit 1 pound of technical toxaphene or ½ pound of DDT per acre is also effective. A 5 percent DDT dust applied at the rate of 10 pounds per acre has given good results. Also, 2 ounces of dieldrin in 2 gallons of water, or 2½ percent dieldrin dust will give good control,

when applied at 10 pounds per acre.

In some areas where sprays are used, mites have become a problem. However, this may not develop every time. Start control measures when 2 or 3 thrips are found on the small plants. It is generally too late to receive maximum benefit from controls if the leaves are curling.

All materials should be applied with ground equipment, and liquids work the best. More than one application may be necessary.

### APHIDS

*(Sucking Insect)*

Aphids sometimes cause serious injury to cotton in all stages of growth. The worst injury is caused by their presence on plants when cotton bolls are open. The "honeydew" that they excrete injures the quality of the lint.

#### Control

Benzene hexachloride at the rate of  $\frac{1}{2}$  pound of the gamma isomer per acre gives a "knock-out" of the aphids. One percent parathion dust applied at 20 to 25 pounds per acre is also effective. Follow directions when using.

Demeton (formerly known as Systox) 2 to 4 ounces per acre in 5 gallons of water has been very effective.

### SEED CORN MAGGOTS

The seed corn maggot sometimes injures cotton in the seedling stage.

#### Control

Research workers have found 2.66 ounces of 75 percent lindane

per 100 pounds of seed to be very effective when thoroughly mixed. Or you may use 4 ounces of actual chlordane to 100 pounds of seed.

Another control is 2 ounces of dieldrin to 100 pounds of seed mixed in a slurry treatment. Best results are secured when this is mixed with a fungicide. Treat only a short time before planting.

## COTTON

### LEAF PERFORATORS

*(Chewing Insect)*

The cotton leaf perforator is on the increase in the cotton growing areas of the state. It causes injury to stub rather early and to planted cotton in mid to late season. Due to its habits of feeding only short periods, it is difficult to control.

#### Control

Best results are secured with 20 to 25 pounds of 15 percent toxaphene, 5 percent DDT and a high percentage of dusting sulphur. Endrin spray may be used at the rate of two tenths to four tenths of a pound per acre in 3 to 4 gallons of water.

### SPIDER MITES

Several species of spider mites (not true insects) may appear in cotton fields in great numbers during 1954.

#### Control

In most cases, an application of 30 to 40 pounds of 325-mesh conditioned sulphur should give good control.

There may be some species that show a resistance to sulphur. Those species showing sulphur resistance may be dusted with 3 per-

cent aramite dust. Or spray with 1 pint of 25 percent aramite in 3 to 5 gallons of water per acre.

Demeton spray at the rate of 3 to 4 ounces in 5 gallons of water per acre has also been very effective.

### **SALT MARSH CATERPILLARS**

*(Chewing Insect)*

The salt marsh caterpillar, also known as "woolly worm," may cause some injury to cotton.

#### **Control**

All stages of this worm may be controlled with a dust mixture of 15 percent toxaphene, 5 percent DDT and a high percentage of 325-mesh conditioned sulphur. Apply at the rate of 20 to 25 pounds per acre per application.

A mixture of 1 pound of technical DDT and 3 pounds of technical toxaphene in an emulsion form in 5 gallons of water is effective. Late season infestations may need more materials than recommended above.

### **LEAF ROLLERS**

A leaf roller has been causing some injury in some parts of the state.

#### **Control**

Early in the season either a 10 percent DDT (or a 15 percent toxaphene, 5 percent DDT) and a high percentage of 325-mesh conditioned sulphur will give control. Either dust should be applied at 20 pounds per acre.

The leaf roller is difficult to control.

### **WHITE FLIES**

The white fly adults and nymphs caused considerable alarm in 1952 and 1953.

#### **Control**

A combination dust of 2 percent gamma isomer benzene hexachloride and 5 percent DDT and sulphur dust looks promising.

If white flies are causing injury, 2 percent parathion at intervals of 3 to 4 days may clean them up with several applications. Generally these flies do not do too much damage.

### **CABBAGE LOOPERS**

The cabbage looper caused considerable injury during 1953.

#### **Control**

DDT dust failed to get control. Research workers found a dust mixture of 15 percent toxaphene, 5 percent DDT and high percentage of sulphur to be very effective.

A bacterial disease also gives excellent control when present. This is a disease of the insect that will kill the worm very quickly.

### **PINK BOLLWORMS**

Farmers in those regions where the pink bollworm has been found should get ready at once to combat this insect.

#### **Control**

If the cotton has been picked it is wise to follow these rules:

1. Endeavor to pick cotton as clean as is possible since the larvae feed in the seed.
2. If cattle or sheep are available the fields may be pastured rather clean as a means of cleaning out all seed cotton.

3. If you do not have livestock to place in the fields, you should start cutting the stalks with a good stalk cutter of the rotary type, as soon as harvesting is completed.

Best results have been secured with a six-blade stalk cutter known as a shredder. This cuts the stalks into small lengths and usually destroys 50 percent of worms in the unpicked bolls.

4. Next, plow your land with a mold-board plow. Best results have been secured when the plow is set for 10 to 12 inches, so that it completely turns over the soil. Repeated tests have proved that worms buried that deep are killed.

Follow this plowing with an irrigation that will wet the soil to a depth of 10 to 12 inches.

5. For insecticidal control, see the weekly cotton insect reports.

## Airplane Application of Insecticides

### FARMERS

Control of insects is big business. Why not treat it in that manner? You are paying the crop dust-er to dust or spray your crop, so why not see that it is done correctly?

Before dusting or spraying, see if it may bother livestock, live-stock crops, and bees. If so, at-tempt to remedy the situation.

1. Furnish competent flagmen in the field.

2. Furnish one person at the airplane loading field.

3. Have pre-arranged signals with airplane and ground crew, and flag the airplane out if the insecticide is not being applied correctly and on correct fields.

Remember you are working for the farmer. The insecticide is his; the crop is his; so make the appli-cation under his direction and not just the way you desire.

1. Have one man to assist the farmers' workers at the loading field.

2. Be sure to know the location of the field and the insecticide you are to apply.

3. Always follow the flagman. Have prearranged signals and if he flags to stop dusting or spray-ing, follow his request. He is pay-ing for the service you are rend-ering.

4. Do not make swaths wider than the power of your plane will give. Usually a swath by a 450 HP motored plane should not be over 50 feet in width for dust and 35 feet in width for sprays.

In many areas, the farmers and applicators sign contracts. Re-mem-ber this is a business propo-sition, so why not follow these procedures.

Applicators and farmers should become familiar with the Arizona Applicators Law.

### AIRPLANE APPLICATORS

Your job is to apply insecticides under best weather conditions. Know the hazards of the insecti-cides you are applying.

# Suggestions

If salt marsh caterpillars should appear in August or September, be sure that you control them with the recommended insecticides at once.

There are many types of ground spray equipment for sale. Be sure to secure one that gives a good coverage of the plant from bottom to top at all times and gives 40 pounds or more of pressure. Never use spray equipment that has been used for applying 2,4-D.

Some crops may be injured by cotton dusts. Never use a dust

containing sulphur adjoining or near cantaloups or similar melons. Honey bees may also be injured by some insecticides, so consider your beekeeper when dusting or spraying. Also be careful when applying around livestock or suburban areas.

Always follow directions when using insecticides. Use only recommended materials at all times.

## Materials Recommended, 1954

### DUSTS

Label	Contents
5 - 60 to 75	5% DDT - 60 to 75% Dusting Sulphur
10 - 50	10% DDT - 50 to 60% Dusting Sulphur
10 - 40	10% Toxaphene - 40% Dusting Sulphur
20 - 40	20% Toxaphene - 40% Dusting Sulphur
2 - 5 - 50	2% Gamma Isomer B. H. C. - 5% DDT - 50% Dusting Sulphur
15 - 5 - 40	15% Toxaphene - 5% DDT - 40% Dusting Sulphur
2.5 - 50	2.5% Dieldrin - 50% Dusting Sulphur
1 or 2	1% Parathion Dust 3% Aramite Dust

### SPRAYS

Name	Pounds Per Acre
Toxaphene	1.0 - 2.5 - 3.0
DDT	0.5 - 1.5
Benzene Hexachloride	0.4 - 0.5 gamma isomer
Dieldrin	.25 to .5
Demeton	2 to 4 ounces

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## **SEE YOUR COUNTY AGENT**

For further information on controlling cotton insects, see the County Agricultural Agent in your county. He can help you with information regarding conditions in your locality.

University of Arizona  
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Chas. U. Pickrell, Director

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