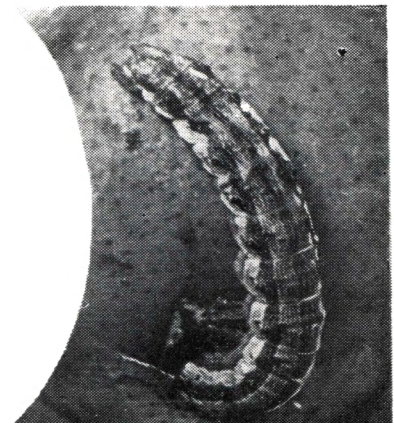
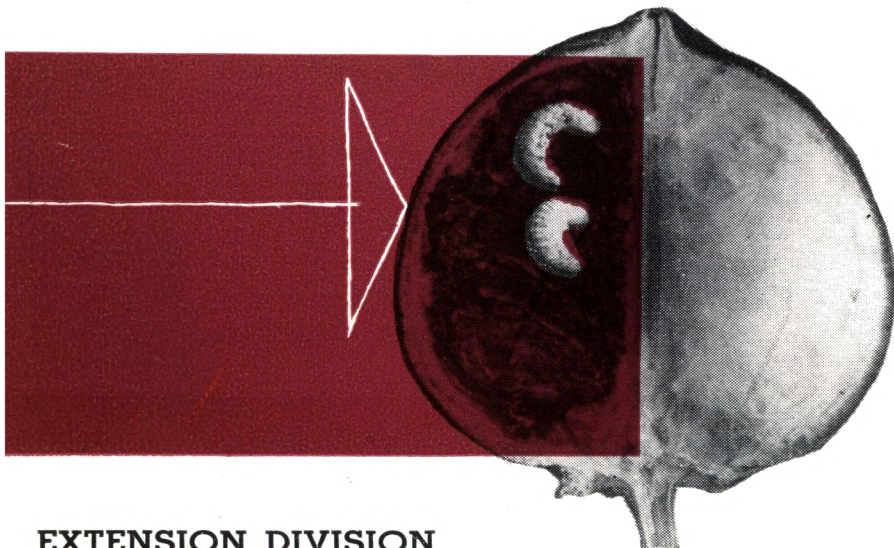
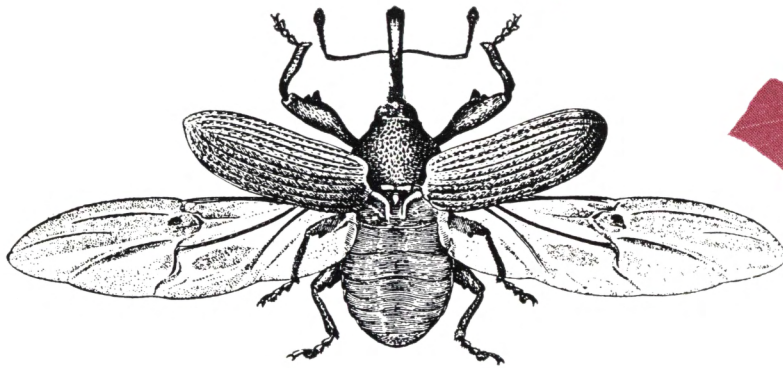
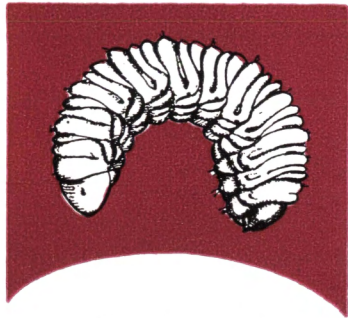


Cotton Insect

control



EXTENSION DIVISION

Oklahoma A & M College
Shawnee Brown, Director
Stillwater, Oklahoma.

CIR 499

1953

Recommendations

CONTROLLING COTTON INSECTS

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Cotton insect control recommendations have changed more since World War II than they did in twenty or twenty-five years preceding it. Changes were brought about by the introduction of the new organic insecticides such as DDT, benzene hexachloride, toxaphene, aldrin, dieldrin, heptachlor, and mixtures of these. Some of these insecticides will control one cotton insect pest but not another.

All organic insecticides often cause a red spider mite infestation to develop unless the dust contains at least 40 percent sulfur.

The following dusting materials or combinations of dusting materials have given good cotton insect control in Oklahoma during recent years:

BENZENE HEXACHLORIDE (3% gamma isomer), 5% DDT and 40% SULFUR MIXTURE

For Boll Weevil Control

Apply at the rate of 10 pounds per acre when the square infestation is 10 percent or above, or as indicated under paragraph "How and When to Dust Cotton."

Apply at 5-day intervals when air is calm until weevils are under control.

If washed off in 24 hours repeat application.

For Bollworm Control

Apply at the rate of 20 pounds per acre when the bollworms make their first appearance, and if possible before they have entered the cotton bolls.



FIG. 1—Adult Weevil Attacking Square

For Cotton Aphid, Cotton Fleahopper, Plant Bug and Leafworm Control

When the fields are treated with the above mixture for either boll weevil or bollworm control the above insects will also be controlled.

Do not mix this 3-5-40 combination with calcium arsenate, lime or other alkaline materials because the chemical reaction may cause them to be less effective. However, there is a lime-free calcium arsenate mixture that can be mixed with either of the above insecticides.

Dust When The Air Is Calm

CAUTION: Benzene hexachloride formulations should not be used where potatoes, peanuts or other root crops will follow cotton the next year for often an objectionable taste is given these crops.

DDT

For Bollworm Control Only

Use a 10 percent dust and apply at the rate of 10 to 15 pounds per acre.

Apply when worms are small and before they enter the bolls.
DUST WHEN THE AIR IS CALM.

Two or more applications may be required for control.

DDT may cause heavy aphid infestation.

Do not mix DDT with common calcium arsenate, or other alkaline materials.

TOXAPHENE

For Boll Weevil Control

Use a 20 percent dust plus 40 percent sulfur or a 20 percent dust without sulfur and apply at the rate of 10 to 15 pounds per acre.

Apply at 5-day intervals when the square infestation is 10 percent or above.

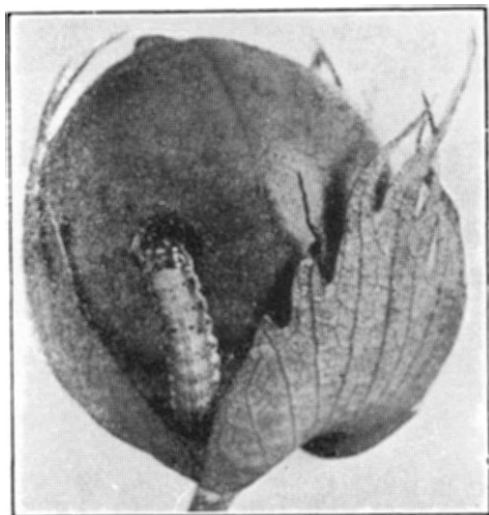


FIG. 2—Large Bollworm attacking boll.

If washed off in 24 hours repeat application.

DUST WHEN THE AIR IS CALM.

For Bollworm Control

Use a 20 percent dust plus 40 percent sulfur or a 20 percent dust without sulfur and apply at the rate of 20 pounds per acre.

Apply when the worms first make their appearance and before they enter the bolls.

For Leafworm, Cotton Fleahopper, Aphid, and Plant Bug Control

Use a 20 percent dust plus 40 percent sulfur and apply at the rate of 10 pounds per acre.

One application is usually sufficient.

LIME FREE CALCIUM ARSENATE PLUS 1% PARATHION PLUS 5% DDT

For Boll Weevil, Bollworm, Leafworm, Aphid, and Mite Control

Use 10 pounds per acre at 5-day intervals until insects are controlled. See insecticide chart on when to begin dusting.

Dust any time day or night when the air is calm.

OTHER DUST COMBINATIONS

1.2% Aldrin plus 5% DDT

1.5% Dieldrin plus 5% DDT

10% Chlordane plus 5% DDT

These dust formulations gave good control in 1951 — but have not been proven effective under conditions existing in 1950.

See chart for timing and amount to use.

CAUTION: Chlordane and Dieldrin DDT should always be used with Aldrin, to prevent a bollworm build up.

EXTREME CARE SHOULD BE USED IN HANDLING ALL OF THESE MATERIALS

OKLAHOMA COTTON INSECT

Insect and Pc

INSECTICIDES	BOLL WEEVIL	BOLLWORMS	WEBWORMS
DUSTS	For early applications, make first application before squares are large enough to be punctured—Second application seven days after first & third 7 days, later if needed. For mid-season and later, when 10% of squares are punctured repeat every 5 days until controlled.	When eggs and 4-5 small worms per 100 plants—at five day intervals for 3 applications.	When worms appear
3-5-40 3% g BHC 5% DDT 40% Sulfur	10 - 15 lbs.	20 lbs.	10 - 15 lbs.
3-5-0 3% g BHC 5% DDT—No Sulfur	10 - 15 lbs.	20 lbs.	10 - 15 lbs.
3-10-40 3% g BHC 10% DDT 40% Sulfur	10 - 15 lbs.	10 lbs.	10 lbs.
3-10-0 3% g BHC 10% DDT—No Sulfur	10 - 15 lbs.	10 lbs.	10 lbs.
20-40 Dust 20% Toxaphene—40% sulfur	10 - 15 lbs.	20 lbs.	10 lbs.
20-0 Dust 20% Toxaphene—No Sulfur	10 - 15 lbs.	20 lbs.	10 lbs.
Lime free Calcium Arsenate + 1% Parathion + 5% DDT	10 lbs.	10 lbs.	-----
2½% Aldrin + 5% DDT Dust	10 - 15 lbs.*	20 lbs.	-----
1½% Dieldrin + 5% DDT Dust	10 - 15 lbs.*	15 - 20 lbs.	-----
10% Chlordane + 5% DDT Dust	-----	10 lbs.	-----
10% DDT Dust	-----	10 - 15 lbs.	-----
SPRAYS	ACTUAL CHEMICAL	ACTUAL CHEMICAL	ACTUAL CHEMICAL
Toxaphene DDT Spray	1 - 2# Toxaphene .5 - 1# DDT	2# Toxaphene 1# DDT	.75# Toxaphene .375# DDT
Toxaphene Spray	2 to 3#	-----	1#
BHC—DDT Spray	.24 - .36# g BHC .4 - .6# DDT	-----	.24-.36# g BHC .4-.6# DDT
Aldrin—DDT Spray	.25 - .5# Aldrin* .5 - 1# DDT	.5# Aldrin 1# DDT	-----
Dieldrin—DDT Spray	.25 - .5# Dieldrin* .5 - 1# DDT	.4-.5# Dieldrin .8 - 1# DDT	-----
Chlordane—DDT Spray	.8 - 1# Chlordane* .4 - .5# DDT	1# Chlordane .5# DDT	-----
Heptachlor	.5 - 1#	-----	-----
DDT Spray	-----	1 - 1.5#	-----

For thrips control, use any of the above materials (With the exception of calcium arsenate) at
*Did not prove effective under extremely wet condition as existed in 1950.

HOW AND WHEN TO DUST COTTON

Dust insecticides may be applied at any time of the day or night when the air is calm. Dust can be applied with any type of ground equipment such as hand dusters, cultivator attached dusters, cart dusters on which the power is generated by a small motor, and by power take-off dusters. There is a type of duster to meet the needs of the individual farmer. Most of the ground dusting during the past few years has been done by power take-off dusters which dust from 4 to 8 rows at a time.



FIG. 3—Grown Boll Badly Damaged by developing weevils.

that boll weevils, bollworms, leafworms, and thrips can be successfully controlled by spraying as well as by dusting. In these tests, emulsifiable concentrates were used in low gallonage and low pressure sprayers.

The following spray formulations have given good control under Oklahoma conditions:

Toxaphene DDT Spray
Toxaphene Spray
B. H. C.—DDT Spray
Aldrin—DDT Spray

Dieldrin—DDT Spray
Chlordane—DDT Spray
Heptachlor
DDT Spray

See spray chart for timing of sprays and amounts of local chemical to be applied per acre. For effective control, it is necessary to apply the correct amount of actual chemical per acre at the right time.

The amount of diluted spray applied per acre will vary with the kind of sprayer used, the type nozzles used per row, the pressure in the nozzle, and the number of nozzles used per row. The pressure and speed of the tractor also govern the amount used per acre.

If dust is applied by an airplane, the plane must be flown just above the cotton plants and the swaths should not be wider than the wing spread of the plane, which is usually 30 to 40 feet. The farmer should always furnish a spotter for the plane so that the pilot will know just where to make each flight through the field.

Do not permit pilots to dump large quantities of dust on a few rows in the field and make wide swaths, for the control will be very disappointing.

HOW AND WHEN TO SPRAY COTTON

Three years of testing by the Oklahoma Experiment Station have shown

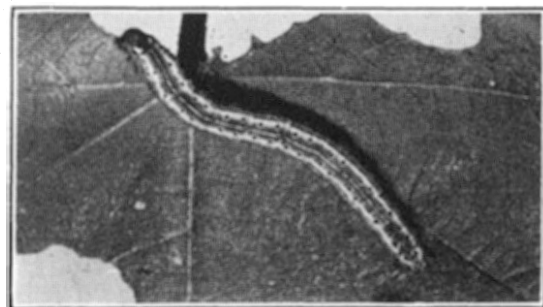


FIG. 4—Full Grown Cotton leafworm.

One nozzle per row is sufficient in small cotton before it starts to set squares. Use two nozzles per row on medium sized cotton up to 18 inches tall. Use three nozzles per row in tall, rank cotton. When using one nozzle, set it 6 or 8 inches above the tops of the plants so that the spray will completely envelop the plants. When using two nozzles per row set them so as to direct two cones of spray towards the sides of the plants. When using three nozzles per row on larger plants, have the third nozzle set so as to direct a cone of spray downward to cover the tops of the plants. Widen the angle of the two lateral nozzles so as to obtain as much plant coverage as possible.

Nozzles such as used in spraying orchards are not recommended because they use too much spray.

Some difficulties may be experienced in spraying rank cotton where it laps across the rows and the foliage and limbs come in contact with the spray nozzles. See spray chart for timing sprays, and amount to use per acre.

CAUTION: 2-4-D is very toxic to the cotton plant and no ground sprayer or airplane that has been used in applying 2-4-D should be used in the cotton field.

HOW TO DETERMINE WHEN TO BEGIN TREATMENT

For Pre-Square Treatment

Examine all plants on 100 linear feet of row.

The row should be selected near the center of the field and plants examined at three points in the row.

These points should be near each end of the field and in the middle.

When one or more weevils are found in this space, pre-square applications should be applied.



FIG. 6—Egg puncture in a square. Note the raised wart-like area where the egg was inserted.

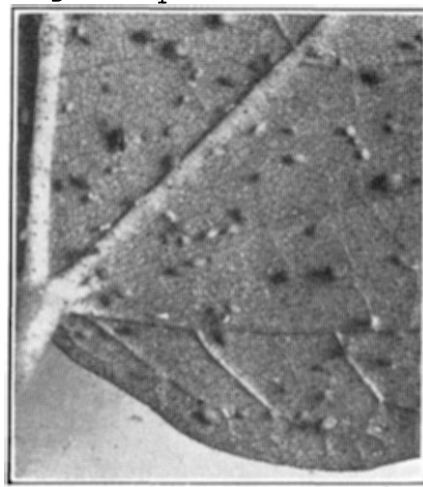


FIG. 5—Aphids on cotton leaf

For Square Protection

To determine the number of punctured squares, walk diagonally across the center of the field, picking 100 squares as you walk. These squares should be half grown or larger and an equal number should be picked from the top, middle and lower branches of the plants. After picking 100 squares, examine them for weevil injury. Record both egg punctures and feeding punctures as damaged squares. The number of squares damaged will give you the percentage of infestation when

100 squares are examined at each point. When 10 squares out of each 100 are punctured, treatment should begin and continue at 5-day intervals until infestation is reduced below 10 percent.

On upland cotton in central eastern Oklahoma it is recommended that cotton receive two early applications of an approved insecticide to kill the over-wintering weevils. This practice is also effective on any early planted cotton where boll weevils are found at the rate of more than one weevil per 100 feet of linear row. When possible 30 days should elapse between the time of the last early application of the insecticide and the time the bollworms normally make their appearance. The reason for this is that the organic insecticides kill many of their natural enemies. By allowing a period of 30 days between the last early treatment and the time that the bollworm usually appears, the natural enemies of the bollworm will build up and help in controlling them. Early applications are also effective in controlling thrips and webworms that might be present in addition to over-wintering boll weevils.

Where the rate of application varies, for instance, from one pound to one and one-half pounds, the lesser amounts are for small cotton and when insects are not very numerous. The larger amounts are for larger cotton and when insects are numerous.

THE PINK BOLLWORM SITUATION

More pink bollworms were found in Oklahoma by the operators of the gin trash machines in the fall of 1952 than ever before. This is the first time that live worms were found in large numbers. This pest was found in six additional counties which brings the total counties now infested up to twenty. The counties in which the largest number was found were Comanche and Cotton. The counties in which the pink bollworm has now been found are: Stephens, Jefferson, Cotton, Caddo, Kiowa, Tillman, Jackson, Harmon, Greer, Beckham, Washita, Comanche, McClain, Grady, Custer, Canadian, Cleveland, Love, Garvin, and Hughes.

So far, no pink bollworms have been detected in any of the fields of growing cotton, and it is hoped that they never will become numerous enough to require the use of insecticides for their control. Farmers are urged to cooperate in carrying out the quarantine regulations. No cotton seed should be shipped out of the quarantine areas into pink bollworm-free areas.