

I. Cotton Production: Insect Control

COTTON INSECTS: OUTLOOK AND RECOMMENDATIONS

J. N. Roney, Extension Entomologist

The early season of 1966 was better than 1965 for cotton seeding. However, cotton was a little slow in getting started. Thrips, black fleahoppers, green fleahoppers, beet armyworms, and lygus were present in large numbers. Many growers who did not use a systemic insecticide in the soil or treat for these insects in the 4- to 6-leaf stage did not set a very good bottom crop.

Lygus populations were the heaviest that I have seen for many years. The populations early ran 15 to 20 lygus per 100 sweeps, then as the season progressed many fields showed 40 to 50 percent of the squares and blooms injured by feeding of lygus. Reduced yields in many fields in the lower elevations were due to lygus as well as some pink bollworms.

The pink bollworm showed up in parts of Maricopa and Pinal Counties earlier than usual in 1966. In fact, in the Mesa and Deer Valley areas, infestations were found in early June. A check showed that most of these fields were in cotton in 1965 and that pink bollworms were there in 1965. The farmer cut the stalks just a short while before planting time. He then furrowed out, pre-irrigated and planted his cotton. These fields became infested early.

It was interesting to note that owners of these fields applied no insecticides. Most of them carried Federal Crop Insurance. These fields became a source of later infestations of other fields in each area. One grower of long-staple cotton in the Mesa area where the pink bollworms were present sprayed four times early and in the so called mid-season. He harvested 2.25 bales of good long-staple cotton.

The first of July, pink bollworms showed up in the Coolidge area of Pinal County and some fields received some injury. One grower who used 7 applications of insecticide starting when the plants were in the 4-leaf stage was able to harvest 1908 pounds of lint with very little pink-bollworm damage. Pink bollworms were all around him and did appear in late September on some of his top crop. It was interesting to note that he harvested over 1100 pounds of lint cotton on August 26, 1966. The cost of insecticide and application was \$37 per acre. Delta Pine and Land Company applied 13 applications of insecticide starting in the 4-leaf stage. They harvested nearly four bales per acre.

The pink bollworms also showed up in September in Graham and Yuma Counties. The infestations in Graham County were only in a few fields with only light infestations with the exception of one field of long-staple cotton that was a late-maturing variety. In Yuma County, heavy infestations showed up in the Yuma area and in Parker, and damage to the top crop was light to severe. In the Roll-Wellton area, the damage was light.

The Extension Entomologist's annual report of 1965 stated that all farmers should cut their stalks and plow under the debris as soon as possible after harvest. Also suggested was rotation by planting fields of 1965 cotton to small

grains. Over 10,000 acres of 1965 cotton in Maricopa County and several thousand acres in Pinal County never had the stalks cut nor the fields plowed. There is a law requiring that this be done, but it was not enforced. The results were that these non-tilled fields of 1965 were a source of infestations for 1966.

We hear reports of great losses in Arizona from pink bollworm in 1966. We had losses, but we do not know how to determine if they were from pink bollworms alone. Many growers did a good job of farming the entire year and protected their crop from the insects. They made top yields of 3 to 4.5 bales per acre. Lygus populations in 1966 were the highest in several years and for a period of several months where the lygus were not controlled, they helped reduce yields.

We have the pink bollworm in Graham, Maricopa, Pinal and Yuma Counties in alarming numbers especially in the latter three counties. The new circular "Control the Pink Bollworm Now," suggests harvesting as soon as possible, cutting stalks as soon as possible, plowing the debris under as soon as possible. Irrigation of the fields not rotated might help. The Salt River Water Users made free water available in December 1966. Rotation to small grains, alfalfa, or safflower is suggested.

What does it look like as of December 31, 1966? The Extension Entomologist, County Agent in Charge Robertson and Assistant Agent Stedman of Pinal County have checked many fields in their county during October, November, and December. It appears that 70 percent are rotating. The others with few exceptions had harvested, cut their stalks and plowed. Examinations of these fields showed a very low percent of infested bolls and practically no worms in the areas of the fields we examined.

In Maricopa County, County Agent Farr and the Extension Entomologist checked many fields where stalks were cut and plowed. We found good coverage with plowing. We found very few worms in bolls in plowed or disked fields. We found worms in fields where stalks had been cut but not plowed. The worms were, in most cases, in green bolls or very small hard bolls.

In Yuma County, Assistant Agent Howell and the Extension Entomologist checked several fields on December 29 and we found no worms in disked or plowed fields. It was also difficult to find worms even in green bolls where cotton was still standing.

What does it look like for 1967? It is hard to say. Observations though would seem to indicate that if farmers cut stalks, plow land, and rotate there will not be much of a carry-over of worms. In other words, just good farming practices should keep the infestation way down in 1967. If farmers wish to make a good crop in 1967 they should prepare a good seed bed, fertilize, plant as soon as soil is right for planting; protect the plant from thrips, lygus, black and green fleahoppers and beet armyworms early if present; and start the plant to fruiting early and prepare to harvest their crop early. Good growers did this in 1966.

Control of lygus during the season is a must. If bollworms, not pink bollworms, show up, control them. We can still make high yields in Arizona with good farming. We have suggested and recommended destruction of stalks

and debris for several years. We have suggested lygus control or protection of the plant from lygus early but only the good farmers have done this. In spite of the pink bollworm, growers who protected the plants in pink-bollworm areas made from 3.2 to 4.5 bales per acre.

Yes, we can and will continue to grow top quality and yields of cotton in Arizona in spite of the injurious insects.

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"OPERATION EARLY" PROPOSED FOR PINK BOLLWORM CONTROL

C. R. Farr, Agricultural Extension Agent, Maricopa County

Plans for cultural control of the pink bollworm must be made early so that various conditions can be controlled. It is possible to select conditions and practices that reduce the hazards of production.

A pamphlet entitled "OPERATION EARLY" was distributed by the Maricopa County Extension Office in October 1966 suggesting a management program. This program was designed to eliminate late bolls of poor quality and to reduce soil abuse. Cultural control of pink bollworms fits well in this program.

OPERATION EARLY proposed the following:

1. Plan early for systems, conditions, and methods.
2. Mature an early crop, harvest early and completely.
3. Destroy stalks and cotton trash early as possible.
4. Plow 12 or more inches deep to bury bolls and trash.
5. Irrigate twice at 7- to 10-day intervals or rotate to winter crop.
6. Plant cotton in selected soil situations which favor early plant development and maximum early fruiting.
7. Plant as far away from 1966 infestations as possible.
8. Protect the early plant from disease and insect injury.
9. Control plant type to obtain maximum boll sets during June and July.
10. Mature the early crop and harvest early.
11. Pick, shred, and plow early.

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A SUMMARY OF COTTON INSECT POPULATIONS - 1966

Dale Fullerton, Survey Entomologist

The cotton insect situation was highlighted by a population explosion of the pink bollworm, Pectinophora gossypiella, in most cotton-growing areas of the state. The heaviest populations occurred in Maricopa and Pinal Counties