

I. COTTON PRODUCTION: Insects

COOPERATIVE ECONOMIC COTTON INSECT REPORT

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COTTON

- \*1. Beet armyworm (Spodoptera exigua)  
Especially active on young plants during May at following: Severe at Yuma County - 6 to 12 larvae per plant; Heavy - Cochise and Graham Counties. Up to three treatments applied to control; Moderate - Maricopa and Pinal Counties.
- \*2. Black fleahopper (Spanogonicus albofaciatus)  
Moderate to heavy numbers present from May through July in all cotton growing counties.
3. Boll weevil (Anthonomus spp.)  
Survey and trapping found very few weevils. Only one recovered at Pinal County. And mixed population, with majority native species, trapped in Pima County.
- \*4. Bollworm (Heliothis zea)  
Populations were low during entire season throughout state. Light July through October. Most larvae killed by spray applications used in Pink bollworm programs, implemented by majority of growers.
- \*5. Cabbage looper (Trichoplusia ni)  
Main problem in most cotton fields from May through mid-October. Special treatments required despite regular spray programs for Pink bollworm.
6. Carmine spider mite (Tetranychus cinnabarinus)  
Light at Cochise County in mid-June.
- \*7. Cotton aphid (Aphis gossypii)  
Light numbers appeared in early April on newly emerged seedlings at Maricopa County. Moderate to heavy on young plants from mid-April through mid-May at Cochise, Graham, Maricopa, Pima and Pinal Counties. Light scattered populations present from July through September on young tip growth at Cochise and Graham Counties.
8. Cotton fleahopper (Psallus seriatus)  
One field at Casa Grande heavily infested in mid-June. Pinal County.
9. Cotton leaf perforator (Bucculatrix thurberiella)  
Major problem in August and September in all cotton-growing areas. Heaviest damage at Maricopa, Pinal and Yuma Counties. Many growers had difficulty in controlling or started controls too late.
10. Cutworms (Feltia spp.)  
In early May at Yuma County a few fields treated with either baits or sprays. Plants moderately damaged in mid-May at Safford, Graham County.

11. Darkling ground beetle (Blapstinus spp.)  
Adults numerous in many fields at Maricopa, Pima and Pinal Counties during April and May.
12. False chinch bugs (Nysius spp.)  
Migrations heavy from desert areas in mid-May and June into cotton fields at Cochise, Maricopa, Pima and Pinal Counties.
13. Omnivorous leaf roller (Platynota stultana)  
Infestation of first instar larvae present on 20-acre field of young cotton at Sun City in mid-April. Maricopa County.
- \*14. Lygus (Lygus spp.)  
Moderate to heavy numbers June through mid-July in all cotton counties. Mid-July through August counts high in untreated fields.
15. Painted lady butterfly (Vanessa cardui)  
Larvae moving from wild Malva into cotton in Maricopa and Pinal Counties in mid-April.
16. Pink bollworm (Pectinophora gossypiella)  
Thousands of acres of cotton remained unpicked at end of cotton plow-up date, January 15, and a 15-day extension was granted to growers. Rains necessitated the extension. Only a few thousand acres of cotton stalks remained to be plowed up early February, but rain again hampered plow-up in mid-February. In early March some fields remained unplowed and live larvae were found inside the seed in bolls of cotton remaining on the soil's surface at Tolleson, Maricopa County. Many fields lightly disced and plants remained firmly rooted in soil. By end of March adults started emerging from experimental cages at Mesa, Maricopa County. By April 5, 1968 adults were emerging from experimental cages at Safford, Graham County. By late April moths were emerging from cages at Graham, Maricopa and Yuma Counties. In early May moth emergence increased from cages at Mesa and then started tapering off toward mid-May. Heavy emergence reported from cages at Yuma in late May, but light from cages at Safford and Mesa. First larvae found in Gadsden area, Yuma County, May 11, 1968 in three fields with rosetted blooms. Spray program immediately started in Gadsden area. A 20% mature boll infestation found south of Wellton, Yuma County, in a volunteer cotton field not being farmed. Action taken by State Entomologist. A graph of moth emergence for the month of May from experimental cages at Yuma showed a peak on the 17th through 20th of May with a decline toward the end of May. This coincides fairly well with the blooming period in Yuma Valley with the exception of late cotton. In early June first generation larvae found in stub cotton amongst safflower in Guadalupe area, Maricopa County. First larvae being found in flowers and bolls from Gadsden to Texas Hill area in Yuma County. Treatments applied to some fields. In early July larvae being found in all fields with blooms at Safford. From one to six applications of insecticide made by farmers at Yuma. Larvae being found from Gadsden to Parker at Yuma County. Very few larvae being found in rosetted blooms at Maricopa, Pinal and Pima Counties. In mid-July light numbers of larvae found in short staple cotton blooms

at Goodyear, Tempe and Mesa. Many fields being treated in Maricopa County. Ten percent of fields in Yuma County infested. In late July buildup occurring in both treated and untreated fields at Yuma. In early August, Cochise and Greenlee Counties were still free from Pink bollworm larvae. Graham County started first aerial insecticide application under County Pest Control District. Five applications were applied at seven-day intervals. Maricopa County next to Yuma County with infestations, except Maricopa's infestations widely scattered and generally in areas with a past history of heavy damage. Few larvae being found in Pinal and Pima Counties. By mid-August majority of growers applying controls in Maricopa and Pinal Counties. Control programs continue in Yuma and Graham Counties. Infestations lighter from Colorado River east at Yuma County. In late August larvae being found in a few fields at Pinal County. Lint cleaners yielding very few larvae at Yuma County indicating early infestations were low on first set cotton. In early September adult flights heavy along Colorado River, Yuma County. In mid-September few larvae being found in cotton gin lint cleaners at Yuma, with the exception of Texas Hill area. Treatments ended at Graham County and populations building up northeast of Solomonville. One field found infested at San Simon, Cochise County. Situation in Maricopa, Pima and Pinal Counties excellent. By late September larvae counts increasing where control programs ended. During October light scattered infestations, but not too much of a problem as majority of growers harvesting cotton. Many growers unable to pick as trailer shortage acute and gin yards crowded with loaded cotton trailers. During December about 85 percent of cotton harvested. Majority of carry-over into January was scrapping. The Arizona Crop and Livestock Reporting Service forecast for the 1968 cotton crop follows: The all cotton yield at a record high 1,151 pounds per harvested acre compared with 887 pounds last year and the five-year average yield of 1,051 pounds. The total value of cotton and cottonseed for the 1968 crop, based on December 1 estimates, is placed at \$112 million compared with \$78 million last year and the five-year average of \$132 million.

- .7. Salt-marsh caterpillar (Estigmene acrea)  
Light numbers of larvae present during late September and all of October in Graham and Maricopa Counties.
18. Say stink bug (Chlorochroa sayi)  
Moderate during last half of July at Cochise and Graham Counties.
19. Spider mites (Tetranychus spp.)  
Buildup occurred in some fields at Maricopa, Pinal and Yuma Counties during last half of July.
20. Spotted cucumber beetle (Diabrotica undecimpunctata)  
Moderate at Bowie in early August. Cochise County.
21. Variegated cutworms (Peridroma saucia)  
In mid-April causing injury to some fields in Pinal County. Controls were applied.

\*22. Western flower thrips (Frankliniella occidentalis)  
From mid-April to mid-May leaf curl injury occurred on young untreated plants in Graham, Maricopa, Pima, Pinal and Yuma Counties.

23. A Whitefly (Trialeurodes abutilonea)  
Fairly heavy but spotty in some fields during July through September at Cochise, Maricopa and Pima Counties.

\*Indicates insects reported in Cooperative Economic Insect Report Summary of 1968.

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INVESTIGATIONS OF SAMPLING AND STATISTICAL METHODS  
FOR THE ASSESSMENT OF COTTON INSECTS

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Objective

To determine methods to properly assess populations of cotton insects for purposes of biological and chemical control of injurious cotton insects.

Summary of Progress

During 1968 additional data were obtained to determine (1) the distribution of insects on individual plants; (2) the distribution of insects in the fields; (3) the effect of ecological factors on insect distribution; and (4) the proper sampling units for the various tests.

The 1967 data are currently being analyzed and will soon provide an improved method of assessing cotton insects in the field. The 1967 data for distribution of insects in the field have been compiled and will soon be published.

The insects studied include: (1) the bollworm, (2) the pink bollworm, (3) the cabbage looper, (4) the beet armyworm, (5) the salt-marsh caterpillar, (6) the boll weevil, (7) predators, and (8) parasites.

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