INVESTIGATIONS ON CULTURAL CONTROL OF THE PINK BOLLWORM

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Objectives

To investigate physical, mechanical, and cultural methods as possible control measures for the pink bollworm.

Summary of Progress

A field experiment was conducted at Yuma, Arizona to determine the effects of crop termination dates, level of pink bollworm control, and defoliation and harvesting practices on yields, quality of cotton, and overwintering populations of pink bollworm. The experiment had four crop termination treatments as follows: last irrigations July 15, July 29, August 16 and September 3, respectively. Within each crop termination treatment there were three levels of pink bollworm control as follows: untreated check; complete boll protection, with treatments starting at first boll formation; and treatments starting at 15% boll infestation. Additionally, the effects of three defoliating and harvesting practices were determined on each pink bollworm treatment.

The influence of production practices on overwintering populations of pink bollworms will be determined by placing pink bollworm moth emergence cages on each plot to determine moth emergence from the various treatments. Therefore, this experiment will not be completed until mid-summer of 1972.

Results indicate that three population levels of pink bollworm were maintained as planned. However, the treatment aimed at complete boll protection was not as successful as desired, probably the result of intense population pressure from nearby check plots. The seasonal mean infestation levels for the check, complete boll protection, and 15% infestation treatments were 59.4%, 10.9%, and 16.1%, respectively.

The number of insecticide applications differed greatly, depending on insecticide schedule followed and date of last irrigation. The maximum number of applications made for pink bollworm control was 21 in the complete boll protection treatment of the September 3 irrigation termination date; the minimum number was six in the 15% infestation treatment of the first termination date, July 15.

An evaluation of each plot prior to harvest indicated that there were fewer open bolls damaged by pink bollworms and fewer rotted bolls in each of the "complete boll protection" plots than in either of the other two treatments. The 15% infestation treatment was intermediate and the check showed the highest level of damaged and rotted bolls. There appeared to be no correlation, however, between irrigation termination dates, and damaged and rotted bolls.

Yield data showed clearly that the first irrigation termination treatment (July 15) was too early since it was significantly lower than the other three.

Although the last three irrigation treatments were statistically the same, the highest yielding treatment was the one receiving the last irrigation on July 29. This indicates that it may not be necessary to extend the growing season for maximum yields.

From the standpoint of pink bollworm control, highest yields were obtained where complete boll protection was provided, followed by the 15% infestation treatment and then the untreated check which had the lowest yields. When considering all irrigation treatments each of the above insect control treatments was significantly different from the others. However, in each of the last three irrigation treatments (July 29, August 16, and September 3) the complete boll protection and 15% treatments were statistically the same and both were significantly better than the check.

When quality data have been obtained from each of the treatments in this experiment it will be possible to evaluate treatments in terms of most economic yields rather than maximum yields. These data coupled with moth emergence records from the various treatments should provide information relative to most optimum long-range production practices.

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ENVIRONMENTAL IMPROVEMENT THROUGH BIOLOGICAL CONTROL AND PEST MANAGEMENT

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Objectives

To develop a pest management program to prevent lygus damage in cotton.

Summary of Progress

Research has continued along two lines relative to lygus populations and associated problems in cotton. First, the strip-planting of alfalfa in cotton and strip-cutting of alfalfa were further tested as means of maintaining the cotton free of lygus (or at sub-economic levels). Second, seasonal population trends of certain predators were estimated to determine the potential of these predators against other pests if chemical control of lygus were unnecessary.

Strip-cutting alfalfa:

Population trends of Lygus spp. and seven common insect predator groups were studied in strip-cut alfalfa at Safford, Arizona. Adults of Lygus spp. and Orius spp. consistently migrated back and forth to the half-grown alfalfa as the full-grown alfalfa was cut during the entire season, but adults of Nabis, Collops; Geocoris, Chrysopa, reduviids and coccinellids did not consistently exhibit this type of migration.

Nymphs of Lygus and Orius did not migrate to the half-grown alfalfa when the mature alfalfa was cut, resulting in high nymphal mortality in the cut areas. Possible migration of nymphs and larvae of other predator species occurred but was inconsistent.