

INVESTIGATIONS ON CULTURAL CONTROL OF THE PINK BOLLWORM

T. F. Watson
K. K. Barnes
D. G. Fullerton
M. L. Lindsey
R. Reeder

Objectives:

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

Summary of Progress:

The influence of plowdown date on spring moth emergence has been studied for two years at Mesa, Arizona. The data have shown that each delay in plowdown results in greater spring moth emergence.

A similar study was initiated at Yuma, Arizona in the fall of 1969. Four plowdown dates, performed at monthly intervals after the initial plowdown on October 9 comprised the main treatment in this experiment. Results differed from past experiments in that no significant differences were obtained relative to moth emergence among the four plowdown dates. A possible explanation for this may involve the condition of the cotton throughout this period. At the outset of the experiment the cotton was mature and conditions were unfavorable for continued pink bollworm reproduction in this field.

Previous research has shown that subsequent operations following an initial plowdown appears to further reduce the amount of spring moth emergence. Tests at both Yuma and Mesa confirmed these previous findings, that is, with each spring operation, such as furrowing-out, furrowing-out followed by a pre-plant irrigation, and the aforementioned practices plus the planting operation, successive reductions in spring moth emergence occurred.

An experiment was conducted at Yuma to compare minimum tillage practices in combination with two levels of irrigation and two levels of residue. Where new beds were formed or where the old bed was reformed moth emergence was significantly less than where the old bed was left undisturbed. The forming of new beds resulted in the least amount of moth emergence. Irrigation water applied to any of the tillage treatments resulted in significantly less moth emergence than where plots were not irrigated. Additionally, the removal of plant residue significantly reduced moth emergence.

Several tillage practices were compared at Mesa for pink bollworm control. The practice of shred, disk and plow was more effective in reducing moth emergence than the following: shred, undercut; shred, undercut and chisel-list; or, rototill.

An experiment was conducted at Safford, Arizona to provide varying degrees of winter exposure to the pink bollworm. Three periods during the winter - December 22, February 4 and March 16 - were selected for performing the various practices. Two of the six treatments had no tillage operation performed during

the midwinter period (Feb. 4) and these two treatments yielded by far the greatest moth emergence.

Various flaming tests were conducted to determine the feasibility of destroying pink bollworm larvae on or in the soil. In general, where residue was removed prior to the flaming treatments no significant reduction in moth emergence was achieved by flaming the soil. However, reductions in moth emergence were obtained where the residue was left on the plots. This indicates that sufficient heat was generated to kill those larvae in the surface trash but due to the insulating property of the soil had little effect on those larvae located below the soil surface.