

Pink Bollworm Overwintering Studies

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Studies of pink bollworm overwintering survival based on post harvest cotton trash samples, and spring infestation potentials based on pheromone trap catches revealed tremendous differences between 1980 and 1981.

An early hard freeze on 5 consecutive nights from November 20 through November 24, 1979 occurred throughout Pinal, Pima, Cochise, and Graham Counties. This freeze resulted in pink bollworm mortality of 86% in Pinal County, and 90% in Pima and Graham Counties. Night temperatures in the remainder of cotton growing areas of Arizona were not as cold, nor did a hard freeze occur for more than 1 or 2 nights during this same period in these areas. Trash samples taken in late January from Yuma and the Parker - Blythe areas showed the difference well, and pink bollworm mortality was only 22%. Fortunately, overwintering pink bollworm populations were generally low in these warmer areas, and 1980 resulted in populations that were below average based on pheromone trap catches and cotton infestation records throughout Arizona.

Overwintering conditions for pink bollworm were very different during the 1980-81 winter, when no early hard freezes occurred, and most areas of Arizona set records for the warmest winter ever. These mild conditions were reflected in low winter mortality (10-20%) and high spring emergence survival based on trash samples and subsequent pheromone trap catches of emerging moths. The high winter survival of pink bollworms and the earliness of the 1981 cotton season, resulted in much higher populations throughout Arizona for 1981.

These studies show that Arizona winters are highly variable relative to pink bollworm survival, and that data from winter sampling of pink bollworm populations can be very useful in identifying early season pink bollworm problem potentials in Arizona.

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Disruption of Pink Bollworm Pheromone Communication by Pheromone Composition Imbalance

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Seven compounds including the 4 geometrical isomers of 7,11-hexadecadienyl acetate, hexalure, gossyplure, and Z-7-hexadecenyl alcohol, were tested in a wind tunnel for communication disruptant activity against the pink bollworm *Pectinophora gossypiella* (Saunders). Gossyplure and its 2 individual component isomers, Z,Z- and Z,E-7,11-hexadecadienyl acetate, significantly reduced male catches in a gossyplure baited trap suspended upwind behind an array of septa treated with 1.0 mg of the materials. In subsequent tests, all three materials were ca. equally effective in reducing trap catch by 96-98% in 15.5 X 15.5 m field plots treated with rubber septa containing 1 mg/septum of the materials (289 septa/plot, rate of 12,486 septa containing 12.5 g of material/ha). Mating of clipped wing virgin laboratory females in mini-mating tables within the plots was similarly reduced by 93-97% by the 3 materials. Our observations of males in the wind tunnel and field plots indicated that in the gossyplure permeated atmosphere males expended their efforts finding septa (confusion). However, males subjected to either of the individual isomers of gossyplure did not search out treated septa and appeared to be inactive. We attribute the latter result to a perceived imbalance in the ambient ratio of pheromone components due to the release of only 1 component. The disruption of communication by ratio imbalance of multicomponent pheromones is widely documented for other Lepidoptera and appears to be a potential alternative to gossyplure in pheromone control programs for the pink bollworm.