Highlights of 1966 Research

Pink Bollworm Moth-Emergence Studies

In moth-emergence studies it was shown from early-collected bolls that not only do high numbers of pink bollworm moths emerge during the late-fall period but also large numbers emerged from both bolls and soil cocoons the following spring.

Estimates of fall pink bollworm moth emergence were made in two fields of cotton, one heavily infested and one with a light infestation. The calculated total emergence was 84,610 and 18,456 per acre, respectively.

The estimated number of adult pink bollworms emerging from short-staple cotton which was defoliated and harvested early was 1210 per acre compared to 7865 moths per acre that emerged from long-staple cotton which was defoliated and harvested late in the fall.

In the spring of 1966, large emergence cages (6' x 6') were placed in 3 fields in Safford. These fields had destructive infestations the previous fall. Due to wet weather the fields were not plowed but were disked. One field was allowed to remain fallow but the other two were listed and pre-irrigated. The cages were placed in the field on April 1 and checked daily for moth emergence. Moth emergence began on April 25 and continued to July 13, and ranged from 3828 moths per acre in one field to a maximum of 12,907 per acre in another.

Pink bollworm infested bolls were placed at various depths in soil to study winter survival. Depth of boll burial ranged from zero (ground surface) to 12 inches. The most effective suppression of spring moth emergence was obtained from the 12" burial-depth (buried on January 12). When bolls were buried at the 12" depth on February 15 however, spring moth emergence increased approximately 5 fold. Planting of barley in cages which had bolls buried 2 and 4 inches reduced the spring emergence approximately 50 percent.

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

R. O. Kuehl, Statistician
R. E. Fye, Entomologist, USDA

Objective:

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

Summary of Progress:

A cooperative agreement allowing $30,000 in funds to cover a period of three years was made between Dr. R. O. Kuehl, Statistician, Agricultural

Experiment Station, University of Arizona, and the Cotton Insects Branch, Entomology Research Division, USDA, to study methods for the proper assessment of cotton insect populations.

Preliminary studies were made in 1966 to determine the proper number of plants to utilize as a sample unit for accurate estimation of cotton-insect populations. Data were taken in an effort to determine the distribution of several cotton insects on individual plants and in entire fields.

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BOLL WEEVIL INVESTIGATIONS

R. E. Fye, Entomologist, USDA
Adair Stoner, Entomologist, USDA

Objective:

To determine the biology and ecology of Anthonomus sp. in Arizona and to utilize this information to improve control measures and to predict the damage potential of the boll weevil in the arid Southwest.

Summary of Progress:

Boll-weevil infestations were generally light in Arizona in 1966 and in many cases were not detected until late season. Areas in Yuma and Pinal Counties, which were heavily infested in 1965 and in which relatively early and thorough stalk destruction and plow up were practiced, suffered little damage by boll weevils in 1966.

Only one infestation near Stanfield, Pinal County, was known to have caused heavy economic damage. In this case, a field heavily infested in 1965 was poorly plowed, and volunteer stub plants survived and flourished in the skip rows and thus provided early season oviposition sites for overwintering weevils. The progeny of these overwintering weevils served as generators of subsequent destructive generations.

Thus 1966 experience indicates the desirability of early effective stalk destruction and plow up.

Strong populations of thurberia weevils were rebuilt from extremely small surviving populations from 1965. Ground squirrel hoarding of the thurberia bolls, and heavy browsing by cattle during extremely dry range conditions in the Santa Rita Mountain foothills had decreased the 1965-1966 overwintering population to 1/50 of the 1964-1965 overwintering populations. During 1966 the populations regained earlier levels. A preliminary study, utilizing plastic spheres, indicated that the water transport of thurberia weevils in the thurberia bolls from the thurberia sites in the foothills to the cotton-growing areas would be hazardous and improbable.