

## RESEARCH ON THE BOLL WEEVIL

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### Ecological Studies

Dissection of adult weevils caught in pheromone traps throughout the winter of 1982-83 indicated that the female was in a reproductive state until near the end of December. Thereafter, trapped females were in a non-reproductive state and in poor physiological condition.

In late winter and early spring, adult weevils were found feeding on buds of globe mallow. Laboratory studies were conducted to determine the ability of the boll weevil to survive on globe mallow. With a water source only, survival was only about two weeks. However, when weevils were provided with either seedling cotton or globe mallow, adult longevity was extended to 8-10 weeks, with neither food source showing an advantage. Although globe mallow appears to be significant as a food source for adult survival, no reproduction has been detected on this host.

A laboratory study was conducted with newly-emerged adult weevils to determine the effect on longevity when fed either cotton squares or bolls. Survival was as long as 5 months on both types of food.

### Life-History Studies

Developmental time of the boll weevil was studied under both constant and fluctuating temperature conditions in the laboratory. Constant temperatures were 68°, 77°, 86° and 95°F, and fluctuating temperature conditions were 70-95°F and 77-102°F. Shortest developmental times from egg to adult occurred at temperatures of 86° and 95°F; the time required was 17 days. Adults survived for several months with females ovipositing 2-5 eggs per day throughout their life span.

### Cultural Control

Weevil-infested bolls were collected and utilized at Tucson to determine the effects of various simulated cultural practices on overwinter survival and adult emergence. Bolls were buried at depths of three or six inches, placed on the ground surface, or held 18 inches above ground, simulating bolls retained on the plant. No emergence occurred from either of the treatments where bolls were buried; nor was there any survival in these treatments. Of the two remaining treatments, greater survival and emergence occurred where bolls were held 18 inches above ground. Peak emergence periods occurred soon after a rainfall, probably indicating the softening effects of rainfall on the bolls.

### **Chemical Control**

Susceptibility of the boll weevil in Arizona to various insecticides was determined in both laboratory and field studies.

Laboratory studies: Response of the boll weevil to 15 different organophosphate and pyrethroid insecticides was determined using the topical application method. Results with the organophosphates -- such as Guthion<sup>R</sup> and methyl parathion -- indicated a similar response by the weevil as others have reported with the boll weevil in the South. Some of the pyrethroids provided a quick "knockdown" of the weevil but with delayed mortality.

Field studies: A large-scale field study was conducted at Texas Hills Farms to determine the effect of "pin-head" square treatments on subsequent population build-up. Results were inconclusive due to the low populations initially, and to the erratic occurrence of localized populations across the test site. Two important conclusions emerged: 1) low, early-season populations are extremely difficult to detect; and, 2) three early-season applications appeared to have little, if any, detrimental effect on beneficial insects. Treatments in this experiment were Temik<sup>R</sup> (side-dressed), Guthion, Imidan<sup>R</sup>, Dimilin<sup>R</sup>, and untreated checks.

A mid-to late-season experiment on boll weevil control was conducted at Roll, AZ. Good control was achieved with Guthion, methyl parathion -- EPN, Penncap<sup>R</sup> - M, and Ammo<sup>R</sup>. Applications were made at 3-4 day intervals using a high-clearance ground sprayer.

### **1983 PRE-SEASON TRAP CATCH OF BOLL WEEVIL (Coleoptera: Curculionidae) IN WESTERN ARIZONA INCLUDING A COMPARISON WITH THE 1982 CATCH**

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#### **Summary**

An adult boll weevil (Anthonomus grandis complex) trapping network was organized in the major cotton producing areas of western Arizona for the first four months of 1982 and 1983. The results for each year are summarized as the mean number of adult boll weevils caught per grandlure baited trap and adjusted for the number of days each trap was in operation. Where possible,