Insect Investigations

Pre-Cotton Season Trap Catch of Boll Weevil For Three Consecutive Years in Western Arizona

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Summary

In August, 1981 cotton producers in the Texas Hill area of Yuma County reported boll weevil (BW) infestations in planted cotton for the first time since 1966. In 1982 a pre-season trapping network was organized in western Arizona to provide cotton production personnel with knowledge of the geographic range and size of the BW population before control measures would have to be initiated to protect that season's crop. The traps were monitored on a weekly basis by state regulatory personnel and volunteer crop consultants. This network was intensified in 1983 and continued in 1984. The results indicate the BW made the greatest advances in western Arizona between 1982 and 1983. In 1982, BW were caught in 43% of the trapping sectors and in 1983 and 1984, 96% of the sectors. The size of the BW population, as measured by the mean number of BW caught per trap per day, increased between 1982 and 1983 from 1 to 291 times depending on trap sector. Due to the high quality cultural and insecticidal control that took place throughout most of western Arizona at the end of the 1983 season, the initial 1984 population in the region was approximately 2/3 the size of the 1983 population, though the change in local populations between 1983 and 1984 varied from -32X to +11X depending on trapping sector.

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In late 1981 the boll weevil (Anthonomus grandis) made its most recent advance into Yuma County, Arizona. The westward migration of the pest was monitored and reported by researchers investigating the production of soca or stub cotton in Maricopa County.

At the suggestion of grower advisory groups, a pheromone trapping network was established prior to the 1982 season in the major cotton producing areas of the three counties of western Arizona. After verifying the presence of the boll weevil (BW) in Yuma and La Paz counties during 1982, the network was again coordinated in 1983 and 1984. No BW were trapped in Mohave County, hence, there will be no further reference to that county.

The pre-season trapping networks, which operated from January 1 to April 30 of each year, were designed to create awareness and active interest among cotton producers and their crop consultants who, for the most part, were facing the BW for the first time in their careers. They were designed to monitor BW movement throughout the major cotton producing regions of western Arizona, and estimate relative population sizes among the various trapping sectors of those regions. And finally, they were to be used in the development of a historical data base which would permit comparisons and current year predictions based on previous year's information - before the first management tactic had to be initiated by the grower.
Materials and Methods

During the week of January 1, private traps were placed by volunteers at pre-determined locations among state-run traps so that the desired density of one trap per square mile was reached. Every week thereafter, until April 30, all traps were checked and the number of weevils trapped, recorded.

Pheromone lures were replaced in the private traps every four weeks. All trappers were contacted monthly for the report of the weekly results of the previous month. This information was summarized for each trapping sector as the average number of BW caught per trap per day and mailed in a monthly newsletter to the agricultural public.

At the end of each trapping season, a final summary was prepared for distribution. It displayed the results on area maps as well as in graphic form.

More detailed discussions of the methods and materials used, as well as an explanation for the geographical subdivision into trapping sectors, is provided in two previous articles by Borth (Cotton: A College of Agriculture Report, Series P-61, February 1984 and Series P-59, February 1983).

Results and Discussion

The monthly newsletters and final summaries of 1982, 1983, and 1984 (which provide more detail than is presented here) are on file in the office of the Yuma County Cooperative Extension Service, 1047 Fourth Avenue, Yuma, Arizona 85364.

Figure 1 is a graphical representation of the trapping results obtained from the Gila River Valley of Yuma County. Each trapping sector is a five mile section of the Gila River Valley that runs from Texas Hill in the east to the city of Yuma in the west. The height of each bar represents the mean number of BW caught per trap per day for all traps in the sector and is adjusted for the number of days each trap was in operation.

The diamonds, representing the 1982 catch, are hardly noticeable. Only in the eastern region from Avenue 35E to Avenue 55E were BW caught. However, by 1983, they built into a very large population that was centered around Texas Hill, but extended 55 miles west into Yuma. In 1984, the center of population shifted approximately 30 miles to the west. It was encouraging that the total number of BW caught in this region was less in 1984 than in 1983, particularly in the Avenue 50E - Avenue 55E trapping sector. This indirectly shows the value of the intensive, high quality cultural and insecticidal BW management that took place in this area at the end of the 1983 season.

The carry-over population into 1984 was large enough, however, to do considerable damage to the 1984 crop, especially in the Avenue 10E to Avenue 30E sectors, where growers acquired minimal experience controlling BW in 1983.

The Yuma Valley and Yuma Mesa area is oriented in a north-south direction and the five mile trapping sectors of Figure 2 run from the north end of the
Figure 1. 1982–1984 pre-season boll weevil trap catch for the January–April period. Wellton-Mohawk Irrigation District, Yuma County, Arizona.

Figure 2. 1982–1984 pre-season boll weevil trap catch for the January–April period. Yuma Valley and Yuma Mesa, Yuma County, Arizona.
valley, south to the Mexican border. The scale for the Yuma Valley portion of this figure is 100 times smaller than that used in Figure 1. Even though the size of this population is not as large as in the Gila River Valley, the pattern that is emerging is worth noting. In 1982, no BW were trapped in the Yuma Valley. In 1983, a small number were trapped and in 1984 the increase ranged from 4 to 11 times, depending on trapping sector.

The break in the graph represents the difference in Valley traps and Mesa traps. It also indirectly reflects the differences in farming practices and attitudes by some of the growers. It is quite possible that the small number of BW trapped on the Mesa in 1982 were the predecessors of the much larger population caught in 1983, especially in the sector that borders Mexico. Pressure from state regulatory officials concerning cultural practices in 1982 and 1983, contributed to the reduction of the 1984 population, considerably so in the southernmost sector.

The major cotton producing region in La Paz County is in the Parker Valley, which lies in a north-south direction along the Colorado River. In Figure 3, the trapping sectors are five mile increments and run from the city of Parker in the north to the south end of the valley, near the town of Ehrenberg. As seen in the previous figures, the 1982 trap catch in this area could almost be called negligible - except that it represented the predecessors of the much larger population of 1983 which extended throughout the valley and was heaviest in the northern half of the valley. The four fold increase in population size in the Indian School to Scott Road sector that occurred between 1983 and 1984 gave the cotton producers there the distinction of facing the heaviest BW pressure in the state of Arizona in 1984.

![Graph](image-url)

**Figure 3.** 1982–1984 pre-season boll weevil trap catch for the January–April period. Parker Valley, La Paz County, Arizona.