EVALUATION OF PIRATE AGAINST BEET ARMYWORM AND CABBAGE LOOPER IN COTTON

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Abstract

PIRATE® was evaluated for effectiveness against substantial levels of beet armyworm and cabbage looper populations in commercially grown cotton fields in San Angelo, Texas in 1995. During an eight-day post application evaluation period, Pirate significantly reduced the populations in small, medium and large sized beet armyworm larvae and cabbage looper.

Introduction

The beet armyworm, *Spodoptera exigua* Hübner (BAW),and cabbage looper, *Trichoplusia ni* (CL), reached unusually high levels in many of the cotton growing areas in Texas in 1995. Registered insecticides failed to provide adequate control of both BAW and CL larvae forcing some growers to abandon their crop. The BAW has long been considered to be an occasional pest on cotton. Outbreaks experienced in Mississippi in 1993 (Layton, 1994), far West Texas in 1994, and in South Texas, the Coastal Bend and West Texas on seedling cotton in 1995 (Huffman et al., 1995) have raised concerns relative to the importance of having efficacious materials readily available.

PIRATE® is an insecticide-miticide that has shown effectiveness in controlling beet armyworm, fall armyworm and loopers across the southeast and the mid-south cotton belt (Wiley et al., 1995). The purpose of this study is to evaluate the effectiveness of PIRATE® in controlling the BAW and CL under high levels of infestation.

Materials and Methods

A 40-acre cotton field in San Angelo, Texas, was divided into six contiguous plots of approximately 6.5 acres each. The cotton was planted on June 5 with HS200 variety and was commercially farmed under dryland conditions. Pirate was applied at a rate of 0.21 lb/ac on August 17 against a well-established population of beet armyworms and cabbage loopers (primarily beet armyworms). Insecticide was applied by ground with a broadcast sprayer calibrated to deliver 10.0 gallons of total spray through #8 cone nozzles. One half gallon of non-ionic surfactant was added to the tank to buffer the water. Efficacy against BAW and CL was measured by sampling the larval population. A total of five samples was taken from each plot using a 14 x 20 x 5½ in. plastic pan. The first sampling point was 50 feet from the edge of the field, with subsequent samples taken 25 feet apart, moving lengthwise through the plot. With the pan near the plant terminal, each sample was taken by tapping the upper half of the plant three times in rapid succession with a 15 x 1 x ½ inch wooden stick using, as much as possible, the same force to dislodge the larvae into the plastic pan. All larvae collected from 10 alternating plants (one sample) were placed in a plastic bag, noted with the date, sampling point and taken to the laboratory. When the samples were examined, species were separated and BAW larvae were classified by size---small (< 0.25 in.), medium (0.25-0.5 in.) and large (> 0.5 in.)---and recorded. Bollworm and budworm larvae were not sufficient in number to analyze. A pre-treatment sample was taken just prior to the application of Pirate. Post application sampling occurred every 24 hours thereafter for the duration of the study.

All statistical analyses were carried out using "ANOVA" and "RANGE" tests, MSTAT-C statistical software programs (Michigan State University, Copyright 1988).

Results

Results are presented in graphic form:

The overall mean number of small BAW larvae per pan in the Pirate treated plots was significantly less than the untreated. During the eight-day post treatment evaluation period, the Pirate treated plots had significantly fewer small larvae for at least four days as compared to the untreated plots. (Figure 1)

The Pirate-treated plots had significantly less medium sized BAW larvae for seven of the eight days post application evaluation period. (Figure 2)

The mean number of the large sized BAW larvae in the treated plots was numerically less during the entire post treatment evaluation period, and significantly less for four of the eight days. (Figure 3)

In the Pirate treated plots there were significantly fewer CL larvae for seven of the eight days post application evaluation period. (Figure 4)

These results indicate that Pirate can provide an effective control for both the beet armyworm and cabbage looper under unusually high levels of infestation.

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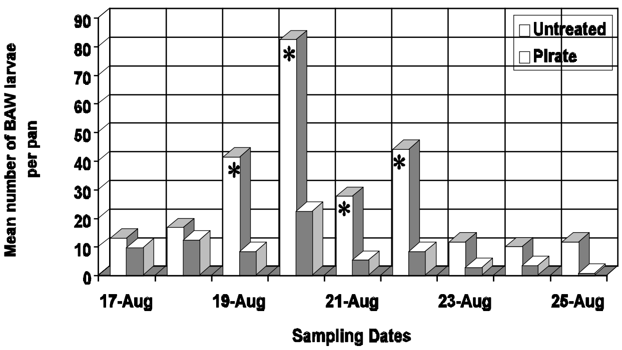
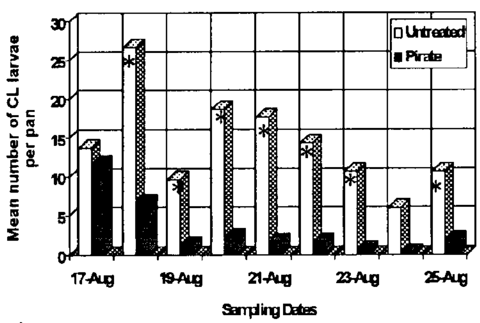


* denotes significantly more larvae than the treated plots within the same sampling date (LSD=18.322).

Figure 1. Mean number of small beet armyworm larvae per pan, San Angelo, Texas 1995.



* denotes significantly more larvae than the treated plots within the same sampling date (LSD=5.643).

Figure 2: Mean number of medium beet armyworm larvae per pan,San Angelo, Texas, 1995.

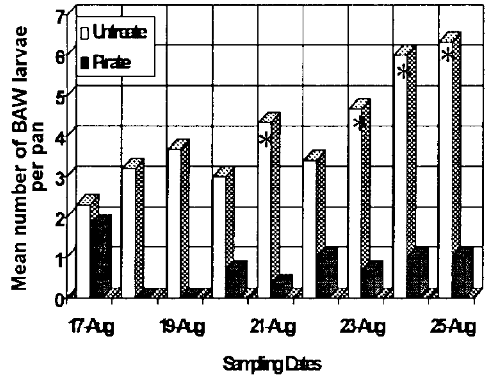


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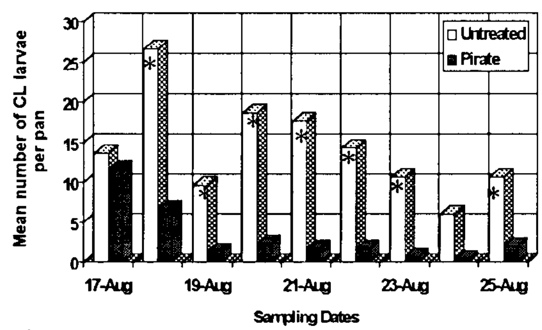
Figure 3: Mean number of large beet armyworm larvae per pan, San Angelo, Texas, 1995.



* denotes significantly more larvae than the treated plots within the same sampling date (LSD=5.643).

Figure 4: Mean number of cabbage looper larvae per pan, San Angelo, Texas, 1995.