HAVILAND, DAVID R.[1*], LARRY D. GODFREY[1], and TOM BABB[2], [1]Dept of Entomology, University of California Davis, One Shields Avenue, Davis CA 95616 and [2]Spreckels Sugar Company, P.O. Box 2240, Woodland CA 95776. **The establishment of economic injury levels for the beet armyworm, *Spodoptera exigua*, in California sugarbeets.**

## ABSTRACT

In recent years, the beet armyworm, *Spodoptera exigua*, has surpassed aphids as the most economically important insect pest of California sugarbeets. Armyworms are recognized for their ability to reduce seedling stand densities, defoliate leaves, and feed on the beet roots at the soil level which predisposes plants to opportunistic root rot pathogens. Increasing chemical control costs, secondary pest outbreaks, pest resistance, and uncertainties related to FQPA legislation have led to a need for reevaluating current control practices.

This study was initiated to determine the economic injury level for beet armyworm in California sugarbeets. One and a half acres of sugarbeets were grown at the UC Davis plant pathology field station in Davis, California. The field was planted on May 12th and divided into six row plots, each representing two rows for October 2000 harvest, two rows for May 2001 harvest, and the other two acting as borders. Treatments were assigned in a randomized complete block design with four replications.

Armyworm populations for the first field experiment were established naturally. Larval populations were reduced by treatments ranging from 0 to 4 applications of Success[®] at 6oz/acre in the 12 weeks preceding fall harvest. Season-long treatments of 2, 3, and 4 applications provided the best overall armyworm suppression. Highest larval densities varied according to date and application timing. No significant differences were found among single applications made in July, August, and September, or multiple-application treatments. Parameters evaluated included leaf area (104 to 122 cm$^2$), yield (22.6 to 24.0 tons per acre), and sucrose (12.9 to 13.1%). Although economic damage was not incurred, data suggest that no significant losses occur for one time density counts of 7 larvae per 40 sweeps in August, 14 larvae in September, and 9 larvae in October. Also, no significant differences were found for cumulative damages of 3.3 larvae per 40 sweeps over the 11 weeks before fall harvest.

The second field experiment was artificially infested 1, 2, or 3 months before fall harvest with 0, 20, 40, 80, or 120 *S. exigua* eggs per six inches of row. Eclosion (in the absence of predators and parasites) averaged 18.5% (July), 34.0% (August), and 17.8% (September). This is the equivalent of 22.2, 40.8, and 21.4 first instar larvae per plant in the 120-egg treatment. Unfortunately, due to high predation, nearly 100% of 600,000 eggs had been eaten by three days after each inoculation date. The net result was a lack of treatment differences, thus resulting in no significant differences among infestation treatment levels or among infestation dates.