

## Implementation

### MANAGEMENT OF THE OBLIQUEBANDED LEAFROLLER AND ORGANOPHOSPHATE INSECTICIDE RESISTANCE WITH SOFT PESTICIDES IN NEW YORK APPLE ORCHARDS

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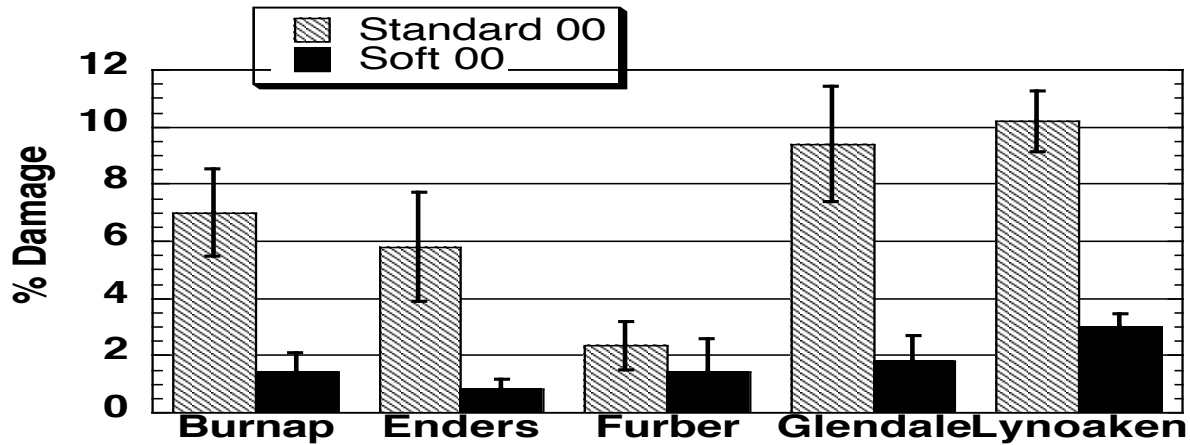
The 2000 growing season marks the completion of the second year of a proposed three-year research project with the following objectives: 1) to determine if populations and fruit damage from OBLR will decline in commercial orchards treated with soft pesticides for several consecutive seasons because of the effects of natural enemies (parasitoids and predators); 2) to determine if resistance levels of OBLR to organophosphates and other classes of conventional pesticides will decline during 2-3 growing seasons in plots set up in commercial apple orchards treated entirely with soft pesticides. Plots, ranging in size from 4-30 acres, were set up initially in 1999 in 5 commercial orchards in Wayne and Orleans Co. and in a research orchard at Geneva. A grower's standard plot of similar apple cultivars and tree training systems, which was treated with a normal, organophosphate-based insecticide program, was used as a comparison for the "soft" insecticide plots on each farm. Colonies were collected from 4 of the 5 commercial orchards during early spring prior to the beginning of the first and second season of the project and laboratory bioassays were conducted to compare the susceptibility of each population to two organophosphates commonly used in NY orchards, Guthion and Lorsban. Treatments of soft pesticides were continued in the research plots during the second year of the program (2000) throughout the season.

The susceptibility of overwintering OBLR larvae to Guthion and Lorsban was compared in laboratory bioassays in the initial year of the project (1999) and the second year of the study (2000). The resistance ratios for Guthion were lower in both the soft pesticide blocks and in the standard commercial orchard during the 2000 growing season than in 1999, but the resistance ratios for Lorsban in the commercial orchard and soft pesticide blocks did not change greatly from the 1999 to the 2000 growing season. These results suggest that organophosphate resistance is fairly stable in populations of OBLR in NY apple orchards, and multiple seasons of reduced selection pressure may be necessary before resistance levels substantially decline.

The total amount of OBLR damage was considerably lower in all of the soft pesticide blocks than in the standard comparison plots during the 2000 growing season (Fig. 1). The average total damage at the end of the season was less than 2.0% in most of the "soft insecticide" blocks. The overall percentages of clean fruit in the "soft insecticide" blocks were similar at harvest to those in the comparison blocks (Fig. 2). However, plum curculio damage was observed in several "soft" blocks, particularly near the borders next to woods. The general level of curculio damage in these "soft" programs was higher at the end of the 2000 season than in the

initial year of the trial. No damage from internal lepidoptera or apple maggot was observed in either the standard or “soft” plots. Populations of foliar pests such as mites, aphids, leafhoppers, and spotted tentiform leafminers were low throughout the season in the “soft” blocks.

**Fig. 1.** Comparison of total OBLR damage in standard and “soft insecticide” plots during the 2000 growing season.



**Fig. 2.** Comparison of percentages of clean fruit in standard and “soft insecticide” plots during the 2000 growing season.

