

Chemical Control/New Products

Results from the First Year of an Apple Orchard Ecology Study

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This study is part of a series of agchemical product experiments conducted throughout the country in a non-traditional format. The emphasis is examining medium-term changes in both pest and beneficial fauna under different management regimes based on selective or conventional products. The current study examines the effects of Aphistar vs Provado (both aphicides) compared to an untreated control. The treatments are applied to replicated large blocks, and seasonal counts of pests and natural enemies are taken. The study is planned to be continued for 3 years.

Materials and Methods

A 2nd leaf 'Golden Delicious' apple block with crabapple pollinizers was selected in the spring of 1996. A 5-acre section was divided into 9 plots in a 3 x 3 (RCB) arrangement, with each plot ca. 0.55 acres. The block was under codling moth mating disruption. Within each plot, 20 trees were tagged, and samples of all pests and natural enemies were taken from these trees. A 2-row and 5-tree buffer was observed between the nearest tagged tree and the plot border. Most tree fruit nests and NEs were counted, including green apple aphid and NEs, rosy apple aphid colonies, leafroller larvae and shelters, leafroller parasitoids (reared from field-collected larvae), white apple leafhopper (1st and 2nd generation), western tentiform leafminer (population and parasitism), phytophagous and predatory mites, codling moth (10X lure), obliquebanded and pandemis adult moths in pheromone traps, fruit damage by codling moth (after 1st generation) and damage by all pests (harvest). Fruit were also graded on the AWETA packing line for numbers and weights. Treatments were applied on 16 July and 20 August 1996 with an airblast sprayer calibrated to deliver 60 gpa. Other than mating disruption, no other insecticides were used.

Results and Discussion

Aphid populations were moderate during June and started to build during early July (Fig. 1). The first aphicide treatments provided adequate suppression, with no statistical difference between the 2 aphicides, both of which were better than the untreated control. By mid-August, aphid populations had declined in all treatments, and no differences among treatments (including the control) occurred just before or after treatment. Leafhopper and mite populations were low throughout the season; leafminer populations were moderate (data not shown). Leafrollers were the most numerous and damaging direct pest, as indicated by larval populations and fruit damage at harvest (Fig. 2). Codling moth damage was minimal (<3.5%) considering no broad-spectrum pesticides were applied. Aphid damage (honeydew/sooty mold) was also moderate (<2.5% overall), with no difference among treatments. Bitter pit was a severe problem,

and rot was extensive, usually associated with leafroller damage.

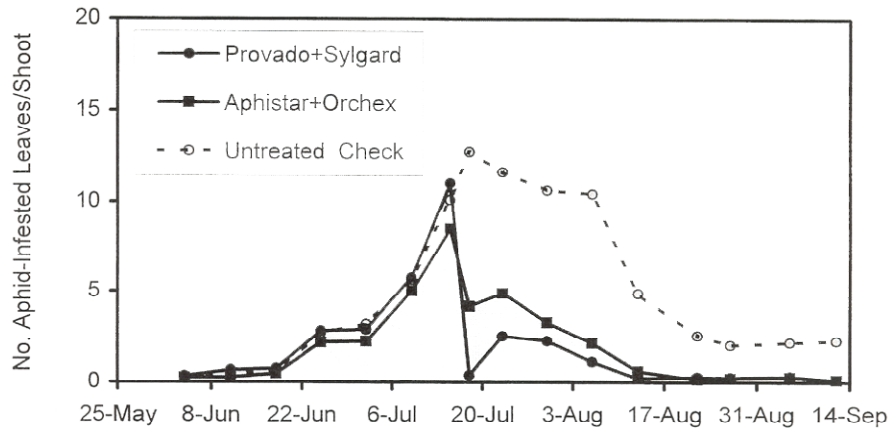


Figure 1. Seasonal apple aphid populations, 1996.

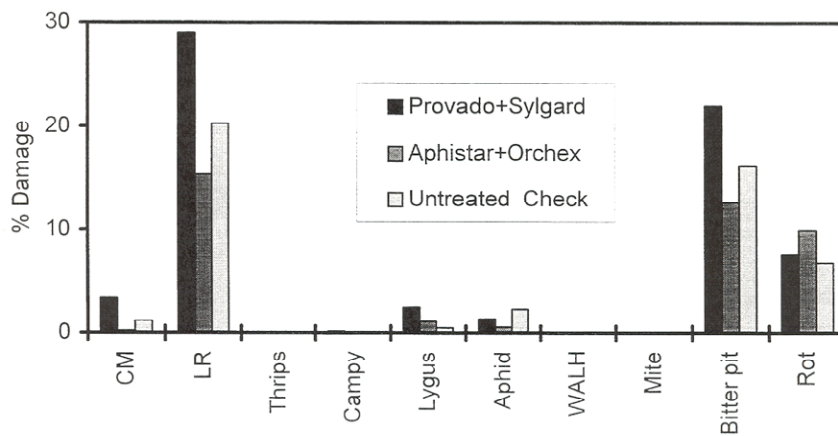


Figure 2. Fruit damage by various pests, Soaring Eagle, 1996.