

populations of ground mealy bugs before applications of any treatments. Samples were taken at a one foot depth and a two foot depth using a 4" diameter soil auger.

Treatment applications were as follows:

- 1) Provado 1.6F – a synthetic product similar to nicotine (32 oz/acre, applied with 2 litres of water per tree)
- 2) Enzone-33.5 gal/acre applied with 4 acre inches of water
- 3) Mycotrol- a fungi, *Beauvaria bassiana*, 2 qts./acre
- 4) Sulfur- ground elemental sulfur applied at a rate of 2,000 lbs./acre
- 5) Solarization- using black polyethylene plastic (4 mil.)
- 6) Calcium Nitrate- (7-0-0 + 11% Ca) applied at 130 gal/acre or 110 lbs. N/acre
- 7) Solarization + Enzone-(33.5 gal Enzone + 4 acre inches of water + polyethylene)
- 8) Untreated Control

Post treatment soil samples were taken using the aforementioned procedures three weeks after treatment applications. Five trees with the rating of "2" were also sampled at this time.

Results and Conclusions

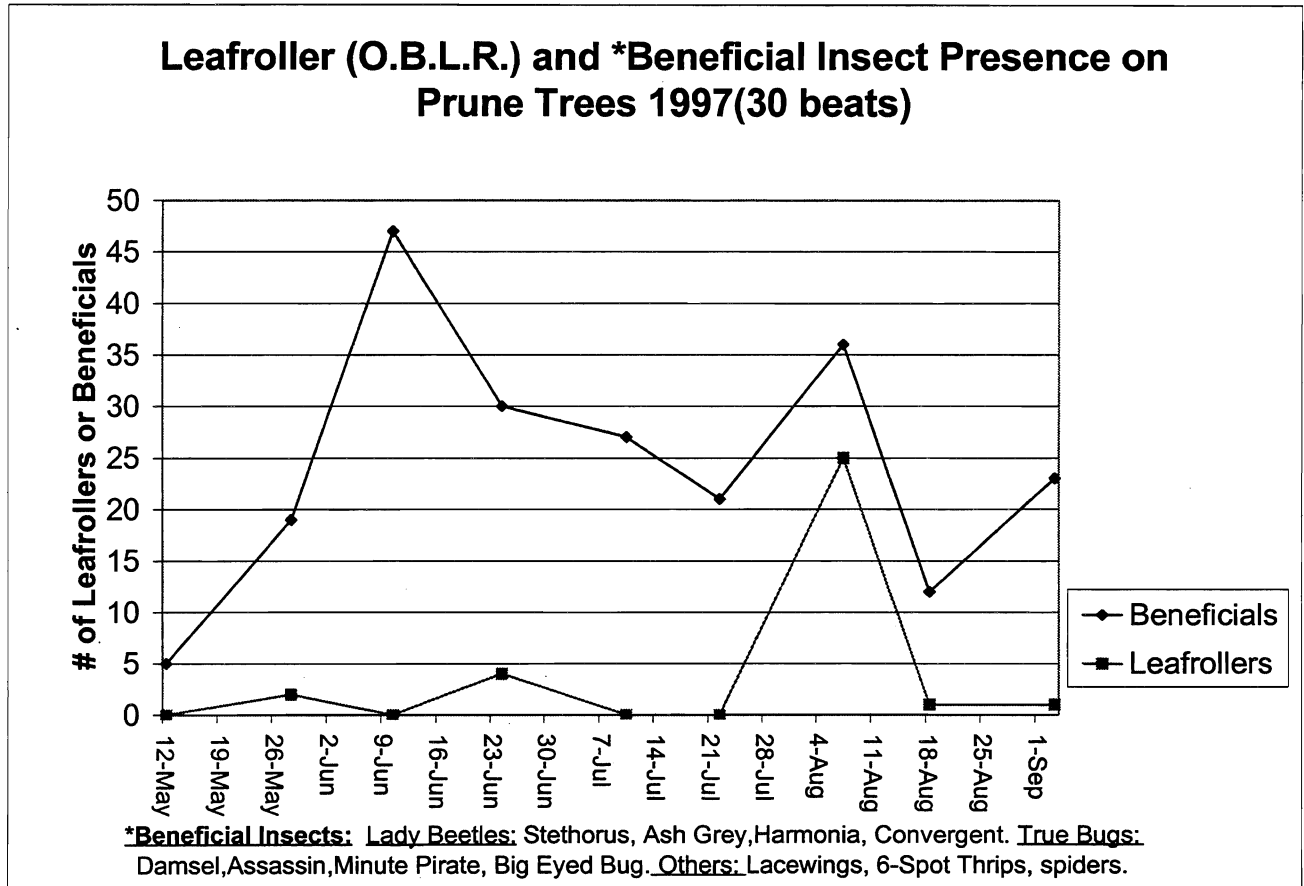
Due to the large volume of soil samples taken (170 separate samples), screening and evaluation is still being performed. Additional samples will be taken in the spring of 1998. This study examines materials with a variety of toxicity and modes of action for the control of ground mealy bug. Success or failure of the treatments will be evaluated using ground mealy bug population counts from the samples taken 3 weeks post treatment and samples taken this Spring (1998). These will be compared to the baseline population counts taken before application of the treatments. Treatments will also be ranked for tree vigor in spring 1998. A numerical reduction in ground mealy bug populations will not be the sole measure of success or failure of the treatments. Suppression of ground mealy bugs and increased tree vigor is the goal.

Beneficial and Phytophagous Insect Monitoring

Bill Olson, Nadeem Shawareb, and Carolyn Pickel

The "beat tray" technique was used to demonstrate monitoring for beneficial insects such as lady beetles (stethorus, ash gray, convergent, and harmonia), true bugs (damsel, assassin, minute pirate, and big eyed bugs), as well as lacewings, spiders, and six-spotted thrips. This technique was also used to monitor for the presence of leafroller larvae throughout the growing season. Pheromone traps often catch more than one species of leafroller. This makes it difficult for growers to identify the type of leafroller causing damage in their orchard. The beat tray technique helped to identify Oblique Banded

Leafroller as the type of leafroller present in this orchard. The use of beat tray monitoring will assist in accurate identification of the pest and assist in determination of correct treatment timing.



Fertilizer Recommendations Based on Soil, Tissue, and Water Analysis

Bill Olson and Nadeem Shawareb

Soil, tissue, and water nutrient analyses are being used to help growers “fine tune” fertilization programs on a site by site basis. One ESPS cooperator was able to reduce annual nitrogen applications by 50 pounds of N/acre. Adequate nitrogen levels were indicated in both soil and leaf samples. Analysis of well water samples indicated that the irrigation water contained 9.52 ppm NO₃-N. This indicates that the orchard would receive 50 lbs. of N/acre per year by applying 2 acre feet of irrigation water. Leaf analysis showed all nutrient level to be adequate except zinc. A foliar application of zinc sulfate was recommended to correct zinc deficiency.