

ORGANIC APHID CONTROL

by Paul Vossen and Lucia Varela

With the success in controlling codling moth in organic orchards using pheromone confusion products along with the elimination of conventional insecticides, aphids, normally a secondary pest, can become a major pest of apples. The primary aphid affecting apples on the North Coast is rosy apple aphid (*Dysophis plantaginea*) which causes leaf curling, fruit deformation, fruit stunting and honeydew/sooty mold residues. If left uncontrolled, rosy apple aphids can damage up to 50% of the fruit on the tree and reduce tree growth when high populations persist.

The aphids' life cycle includes survival on plantain as a secondary host in mid-summer and fall. However, they overwinter on apple trees as black shiny oval eggs and hatch in the spring coinciding with the apples' foliage development. Traditional organic control measures include the eradication of plantain from the orchard, dormant oil sprays to control overwintering eggs, and spring foliar sprays applied at the beginning of aphid colony development prior to leaf curling and continued as live colonies persist.

Eradicating the alternate host, plantain, has not proven to be a practical preventative measure because we have observed severe rosy apple aphid infestations in orchards where we could not find a single plantain plant. The source of plantain is most likely outside the infested orchard.

A dormant oil spray and four foliar organic pesticides (Stylect oil, Pyrellin, M-pede, and Neemix) were tested in two different experiments in 1995. The first trial, called the Sullivan orchard, was set up as a split plot design where half of the trees were treated with dormant oil and the other half were not. Both halves were later sprayed in the spring with the foliar materials and various combinations of those same materials.

The sprays were applied with a hand-gun type sprayer at 250 psi with six replications on the Gravenstien variety. In the Sullivan orchard, the dormant oil applications were applied on March 17th, 10 days after green tip, as a "delayed" dormant treatment. The spring foliar treatments were applied three times at approximately 10 day intervals beginning April 24th when aphid damage first appeared..

The second trial on Golden Delicious called the Bloomfield orchard was too wet to apply a dormant application but the foliar materials were applied in two replications by the grower on two acre sized plots with a speed sprayer. Three applications were made starting with the appearance of the first aphid damage on April 27; again six days later, and lastly two weeks later based on the persistence of live aphid colonies. The orchard had such poor fruit set due to heavy spring rains that fruit could not be evaluated, but shoots were.

RESULTS and DISCUSSION

In the Sullivan orchard, the most obvious positive treatment was the application of dormant oil. When applied alone or when followed by most other spring applied materials, dormant oil significantly helped control aphid damage. Other materials that significantly reduced fruit damage (stunting and malformation) were stylet oil & Neemix (tank mix), Neemix & Pyrellin (tank mix), Pyrellin, all applied after the earlier dormant oil application. Stylet oil & Neemix (tank mix) applied as a spring application without a previous dormant oil application also performed significantly better than the non-sprayed control trees.

In reducing shoot damage stylet oil, stylet oil following dormant oil, stylet oil & Neemix (tank mix), and stylet oil & Neemix (tank mix) following the dormant oil application were all significant improvements over the other materials and the untreated control. Stylet oil seemed to be the best spring applied material in reducing aphid damage on shoots and the number of live colonies of aphids especially when combined with Neemix. (See Table I, Sullivan orchard)

The Bloomfield orchard had damage levels that were greater than the Sullivan orchard with 50% of the untreated trees' shoots affected by aphid colonies. There was a good deal of variability within each of the treated blocks so no significant differences between materials was noted. The trend, however, indicates reduced shoot damage with the M-pede & Neemix (tank mix) treatment. Stylet oil did not perform as well in this experiment, most likely due to its requirement for application under high pressure to get a smaller particle size and improved coverage. (See Table II, Bloomfield orchard)

Rosy apple aphid can be difficult to control even with conventional insecticides because of the protection offered to colonies inside curled leaves. Organic growers will need to time pesticide applications earlier and more frequently before the aphid colonies become too protected inside curled leaves and inaccessible to the organic materials. With good coverage, timing, and by using the right materials, however, aphids can be controlled organically.

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