

# Walnut Aphid Investigations

evaluation of new and old aphicides object of experiments conducted in northern California test plots in 1958 season

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**OMPA** was the most outstanding aphicide in studies at Linden, Walnut Creek and San Jose that included preliminary experiments with Phosdrin, Dicapton, Bayer 25141, Phosphamidon and Dibrom.

In the experimental plots at Linden OMPA—in dosages ranging from 0.5 to 1.0 pound per acre—resulted in outstanding control of the aphid for the entire season. Systox gave satisfactory results, and of the new materials, Trithion and ethion performed in a satisfactory manner. The control obtained with Guthion was less impressive and more work must be done with this insecticide before its potential as an aphicide can be fully determined. The failure of parathion to control the aphid as in past seasons probably indicates that a strain of walnut aphid resistant to this insecticide has developed. Malathion gave better control than did parathion but resistance to this material by the aphid can be expected. BHC followed by Systox, as in previous years, proved to be a most promising treatment. Results with Phosdrin, Dicapton, Bayer 25141, Phosphamidon and Dibrom warrant further study.

At Walnut Creek, the plots treated with ethion and Guthion received a BHC treatment with an April spray directed against walnut blight. BHC was not included in the blight spray applied to the Trithion and OMPA plots because they had been treated with OMPA during the preceding season and no early increase in the aphid population was expected. OMPA at 0.8 pound per acre resulted in excellent control, and that obtained with two applications of Trithion was good. Guthion resulted in promising results, and the ethion treatment, applied when needed, following the early BHC application afforded good protection.

In the San Jose studies OMPA—at 1.1 pounds per acre—gave good control throughout the season. Ethion and Trithion resulted in very satisfactory suppression. Guthion approached the effectiveness of ethion and Trithion, but Sevin failed to give highly satisfactory control.

OMPA—the most outstanding aphicide for walnut aphid control—is registered by the United States Department of Agriculture for use on walnuts and a

tolerance of 0.75 ppm—parts per million—has been established by the Food and Drug Administration. The amount of OMPA that can be applied per season is 1.0 pound of actual per acre and the latest date that it may be applied is when the average cross-sectional diameter of the developing nut reaches  $\frac{1}{2}$ ".

Satisfactory control of the walnut aphid with OMPA is dependent upon a number of factors which include timing and thoroughness of application. Good control has resulted from treatment applied any time during the period beginning when the developing nuts are in the feather stage and extending until the average cross-sectional diameter reaches  $\frac{3}{8}$ "– $\frac{1}{2}$ ". Disappointing control has occurred when treatment was applied after the foliage had hardened. OMPA is not readily absorbed by old foliage and may be washed off by rain. Apparently OMPA exerts a beneficial hormone-like action—beyond the control of the walnut aphid—and the response appears to be most pronounced when the aphicide is applied before the foliage is fully expanded.

Thorough coverage is needed despite the fact that OMPA is a systemic insecticide. If the tops of trees are missed, the aphid population will develop in those areas to such a level the trees will drip with honeydew.

The amount of OMPA needed ranges from 0.5 to 1.0 pound of actual ingredient per acre. Where the walnut aphid has shown resistance to phosphate insecticides for some years—as in the San Jose area—OMPA should be used at the 1.0 pound rate. Elsewhere, a dosage of 0.75 to 1.0 pound should give adequate control.

OMPA has a suppressive action against some species of spider mites and at rates of 0.75 pound or more it tends to check damage caused by the false spider mite. However, OMPA has some unfavorable influence because its use tends to induce an increase in Calico scale and European red mite populations.

Walnut aphid resistance to parathion and malathion—first found in the San Jose area—has appeared at Linden. Once resistance becomes firmly established, increasing the dosage of these insecticides gives little relief and some other aphicide must be used. Dropping parathion

and malathion for aphid control from the summer program may cause them to be missed because these aphicides have resulted in a marked suppressing action on soft scales.

BHC for early season aphid control followed by Systox or another aphicide, when needed, is a program promising considerable merit. Systox treatments continue to give good aphid control but are likely to result in an induced increase in the soft scale population, particularly when it is used in a program with DDT.

Trithion, a registered product at one pound per acre has resulted in good control of the walnut aphid, and exerts a controlling influence against spider mites and soft scales. When used in combination with DDT, it appears to improve the control of the codling moth.

Ethion, 25% wettable powder, at 8.0 pounds per acre, has given good control of the walnut aphid. It appears to be effective against spider mites, including the false spider mite. Summer applications also show promise in controlling soft scales, and probably aid in the control of the codling moth.

Guthion 25% wettable powder, at 6.0 pounds per acre, in two applications resulted in excellent control of the codling moth but against the walnut aphid it exhibited somewhat variable control, which ranged from fair to good. Further evaluation of this material as an aphicide is needed.

Sevin in two applications of 8.0 pounds of 50% wettable powder—against codling moth—exhibited some control of the walnut aphid. Additional work is needed before the effectiveness of Sevin against the walnut aphid can be fully ascertained.

Phosdrin, at 0.5 pound actual material per acre, looked promising against the walnut aphid. Other materials that warrant further investigation include Dicapton, Bayer 25141, Dibrom and Phosphamidon.

Winter treatments with parathion—or parathion and oil—to control soft scales are effective in killing overwintering eggs of the walnut aphid as does Trithion when used in winter control programs.

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