

# Walnut Aphid Study

## shows systox promising material for conditions in northern California

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A single application of systox was sufficient to control the walnut aphid for the entire season in an experimental orchard at Linden.

The studies were conducted on the Payne variety of English walnut. The aphid population of the orchard had increased to an average of 52.2 aphids per leaflet by codling moth spray time.

On May 10, several aphicides were combined with the codling moth spray in air carrier and conventional sprayer applications. The air carrier applications were made at the rate of 200 gallons of water per acre and the conventional rig applications at the rate of 1,000 gallons per acre. Only 25% wettable parathion and 6% gamma isomer B.H.C. were used in both types of applications. The parathion when applied with the conventional rig was used at the rate of 1½ pounds per acre, and at one pound per acre when applied by the air carrier sprayer. The B.H.C. was applied at the rate of nine pounds per acre with the conventional sprayer and at seven pounds with the air carrier sprayer. Although larger amounts of material were used with the conventional sprayer, the control was not as good as that obtained with the air carrier sprayer.

Besides parathion and B.H.C., the following aphicides were applied with the air carrier sprayer—equipped with a

volute and having an air capacity of at least 40,000 cubic feet per minute: 25% malathion wettable powder at the rate of two pounds per acre; 25% E.P.N. 300 wettable powder at one pound per acre; systox at 0.62 pounds, 1.25 pounds, and 2.50 pounds of actual ingredient per acre, and 14% nicotine dry concentrate at seven pounds per acre.

Malathion gave the poorest control even though it was used at twice the dosage of parathion. Outstanding results were obtained with systox at all three concentrations at which it was used. The 14% nicotine dry concentrate resulted in very good control, but the systox treatments—just north of the nicotine plots—may have exerted a favorable influence. All aphicides applied with the air carrier sprayer—except malathion—resulted in excellent control through June 30. On this date the entire orchard was retreated with the exception of the systox plots where the aphid was still unable to establish colonies, particularly on the older foliage. B.H.C. was not included in the June 30 application because investigations have shown that if used more than once or later than in the codling moth spray it is apt to result in an off-flavor in the harvested nuts.

All aphicides applied on June 30—by air carrier sprayer without a volute at approximately 55 gallons per acre—resulted in satisfactory control although malathion both as a 25% wettable powder at 2.2 pounds per acre or as an emulsion of 0.55 pounds of actual per acre was hardly as effective as 25% wettable parathion at 1.1 pounds per acre or as emulsion of 0.27 pounds of actual per acre; 25% wettable E.P.N. 300 at 3.3 pounds per acre and 14% nicotine dry concentrate at 7.7 pounds per acre. None of these aphicides equaled systox despite the fact that there had been but a single application of the latter.

With the systox treatments there was no marked increase in the aphid population until the crop was nearly ready for harvest. The increase late in the season was in proportion to the amount of active material applied. Although aphids could not live on the old foliage until late in the season, migrating adults were able to establish colonies to varying degrees on new foliage by early summer. This condition was first observed on June 24. As

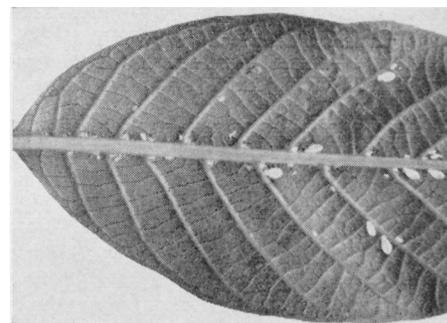
the season advanced aphid activity on new growth became more apparent.

The 2.5 pounds dosage of systox per acre resulted in what appeared to be serious injury to the foliage on the north side of the trees. The injured leaves lacked substance and were chlorotic between the veins superficially resembling symptoms of zinc deficiency. The injury could be distinguished in the 1.25 pound dosage, and could barely be detected in the 0.62 pound treatment.

Despite the leaf injury, the quality of nuts from the systox treatments was uniformly good.

In a comparison of samples from the north and south sides of the trees, the best quality nuts came from the north half of the trees where the leaf injury had occurred.

Excellent nut quality was also obtained from the parathion and nicotine treat-



Aphids on walnut leaf.

ments, although the percentage of light meats in the parathion treatment was less than that found in the plots receiving systox.

Lowest quality of nuts occurred in the malathion treatments which may have been due to poorer control of aphids, or to the presence of spider mites because it was only in the malathion treatments that spider mites increased to a possible destructive level.

Taste tests failed to indicate any off flavor in nuts treated with malathion or systox. Residue analyses are to be made, although a residue problem is hardly to be expected.

Some limited applications of 25% wettable parathion were made by plane. In two cases excellent control was obtained with 1½ pounds of 25% wettable powder applied in 15 gallons of water per acre.

Although systox appears to be a most promising material in walnut aphid and spider mite control, it has not as yet been released for use on walnuts and additional investigational work is needed.

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Systox injury to walnuts. Left, normal leaf, right, an injured leaf.

