Migrating Aphids on Walnuts

reinfestation of aphid-free orchards a constant threat from infested orchards on windward side

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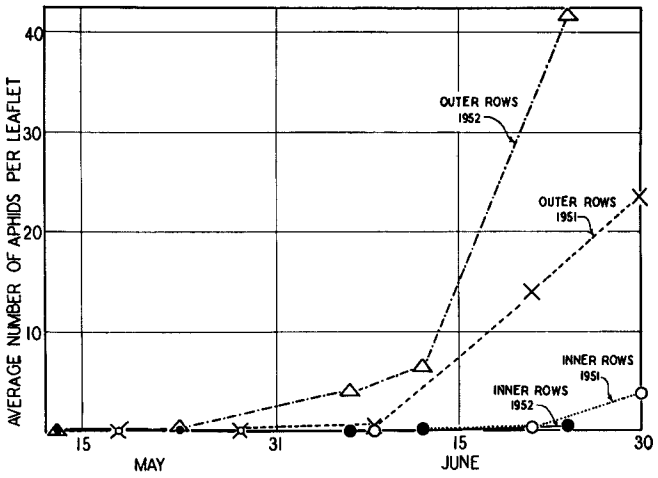
A single treatment—with one of the several available insecticides—could control aphids on walnuts for an entire season if migrating aphids could be kept from the orchard.

When a walnut grove without efficient aphid control is on the windward side of an aphid-free orchard, it furnishes a constant supply of winged aphids which migrate to and reinfest the clean orchard.

The reinfestation of an experimental orchard in 1951 and 1952 was studied carefully. The outer five to 10 rows in both years became heavily infested in from four to five weeks after treatment, while the trees deeper in the orchard remained almost free of aphids. The increase of aphids toward the center of the orchard was much delayed but there is little question that the rise in population was a result of migratory aphids.

The problem of reinfestation by migrating aphids could be minimized if the growers in a given area would apply effective treatments in a well coordinated program.



Influence of migrating aphids on the pattern of reinfestation in the experimental orchard at Linden.

Treatments for aphid control must be applied correctly because the newer aphicides adversely affect the natural enemies of the aphid. Investigations have shown that when their natural enemies are killed the aphid population is likely to reach a more destructive level than had no artificial control been applied. The aphid population will double about every three days which means that if it is reduced by treatment to an average of one aphid per leaflet, the population will increase—in the absence of natural enemies—to 32 aphids in 15 days and to 64 aphids in 18 days.

In 1952, experiments were conducted with a systemic insecticide — O,O-diethyl-S-(beta-mercaptoethyl) ethyl phosphate —which proved to be very effective against migrating aphids. The treatments were applied on May 10th and it was not until several months later that aphids were able to establish colonies on the old foliage. A single experimental treatment remained effective for the entire season, but this systemic insecticide has not yet been released for general use on walnuts. However, extensive studies during the coming year may result in sufficient information to permit the release of this new insecticide for commercial use in walnut orchards during the year 1954.

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COTTON

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used. Nitrogen supplied as urea and calcium nitrate were poorer than the nitrogen-phosphate combination and the best nitrogen source. Treble superphosphate was somewhat better than the unfertilized but was considerably poorer than some nitrogen or nitrogen-phosphate sources. There were no real differences in the phosphate materials tested.

Nitrogen sources compared on Panoche loam which supplied 100 pounds actual nitrogen per acre increased seed cotton yields as much as 96.8%. No real differences were found to exist between the nitrogen or nitrogen-phosphate sources compared on this loam soil. Phosphate materials applied at 100 pounds an acre, a rate higher than economically recommended, uniformly reduced seed cotton yields about 8% but did not differ in themselves.

Under conditions of these tests, where fertilizer sources supply equal amounts of the fertilizer elements, only small differences exist in cotton producing efficiency. Nitrate and ammoniacal-nitrogen are used equally effectively by cotton plants.

On light textured or sandy soils some nitrate-nitrogen may be lost through leaching action. In these circumstances ammoniacal-nitrogen sources tend to perform better than nitrate sources and the nonproteid source such as urea.

Phosphates

Phosphate sources which were supplied at the rate of 100 pounds available phosphate an acre did not materially differ in crop producing efficiency. Phosphate materials used without adequate nitrogen may not benefit cotton yields and may in some cases reduce yields.

Nitrogen fertilization has an important effect in economic production of continuous cotton in California. In some areas, phosphorus may increase yields, but must be supplemented with nitrogen for maximum effect.

Small yield differences exist between nitrogen sources on soils which do not rapidly lose nitrate-nitrogen through leaching action. Ammoniacal nitrogen tends to perform better on light textured soils. In areas where the efficiency of fertilizer sources are equal, the grower should select the material with the lowest unit cost of plant food.

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