

# Spider Mite on Walnuts

promising results obtained with three miticides tested in control experiments in infested walnut orchard at San Jose

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The most destructive species of spider mites—found in localities where experimental investigations were conducted in 1956—was the European red mite. Infestations of the Pacific spider mite and the two-spotted spider mite were limited and noneconomic.

In the experimental orchard at Linden, damage caused by the European red mite was masked by that done by the false spider mite—*Brevipalpus lewisi* McGregor—whose population reached a level sufficiently high to cause some defoliation before the end of September. Most of the defoliation was limited to the lower parts on the southeast portion of the trees, but where large mite populations were present the damage extended about two thirds up the tree. The injured spots had a scorch-like appearance. Where this situation was found, the false spider mite occurred in swarms and serious defoliation had taken place. It was apparent that the damage done by the false spider mite far exceeded that inflicted by the European red mite.

Spider mites were present in all the areas where experimental studies were conducted. In most of the orchards the populations were adequately checked by natural enemies but—in some cases—the spider mite feeding became noticeable before the pest population was reduced to a nondestructive level.

Chemical control measures directed against spider mites were conducted in an orchard at San Jose, selected because it was subjected—in 1955—to a destructive infestation of the European red mite.

both—was higher in isolated stores than in downtown and neighborhood or secondary districts. In Butte and Fresno counties the proportions of stores carrying these goods were highest in downtown stores.

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Treatments and Average Number of European Red Mites Per Sample of Walnut Leaf<sup>a</sup>

Treatments, amount applied per acre in pounds, and date of application <sup>b</sup>	Average number of mites per leaf sample on:						
	July 16	July 19	July 27	August 2	August 15	August 24	Sept. 3
Check .....	1.63	3.56	12.89	16.95	13.78	29.96	3.56
Kelthane, 18.5% W.P. 8.4 pounds. Applied May 18 <sup>c</sup> (actual per acre 1.55 pounds) ....	0.00	0.13	0.02	0.20	0.45	3.92	0.57
Kelthane, 18.5% W.P. 4.75 pounds. Applied July 27 <sup>d</sup> (actual per acre 0.88 pounds) .....	...	2.37	9.85 <sup>e</sup>	0.17	3.22	0.88	0.61
Kelthane, Emulsion 2 pounds per gal. Applied July 27 <sup>d</sup> (actual per acre 2.3 pounds) .....	1.97	1.84	9.85 <sup>e</sup>	1.27	0.15	0.23	0.87
Trithion, 25% W.P. 11 pounds. Applied July 16 <sup>d</sup> .....	2.16 <sup>f</sup>	0.03	0.12	0.00	0.04	0.07	0.04
Nialate, 25% W.P. 13 pounds. Applied July 16 <sup>f</sup> .....	1.27 <sup>f</sup>	0.24	0.00	0.00	0.00	0.09	0.25

<sup>a</sup> Leaf samples 15 mm in diameter.

<sup>b</sup> All treatments applied with an air carrier sprayer.

<sup>c</sup> Incorporated with the codling moth spray and applied in approximately 190 gallons of water per acre.

<sup>d</sup> Applied in approximately 210 gallons of water per acre.

<sup>e</sup> Applied in approximately 225 gallons of water per acre.

<sup>f</sup> Applied in approximately 260 gallons of water per acre.

<sup>g</sup> Pretreatment count.

Three mite materials—Kelthane, experimental compound R-1303—Trithion—and experimental Niagara-1240—Nialate.

In anticipation of a European red mite outbreak, a Kelthane 18.5% wettable powder was incorporated with the codling moth spray applied on May 18. It was used at the rate of 8.4 pounds per acre and applied in approximately 190 gallons of water per acre with an air carrier sprayer. Other treatments for the control of the European red mite—all applied with an air carrier sprayer—were delayed until the pest population developed to a level where control measures were justified.

In making mite population determinations, next-to-terminal leaflets were picked at random from the south side of the trees, and from areas that showed evidence of mite feeding. On each survey 25 leaflets were collected from no less than five trees in each plot. In making counts, three impressions were made, about equally spaced, along the midrib of each leaflet and—with the exception of the eggs—all stages of the mites within the impressions were counted.

All treatments—as shown in the large table—resulted in satisfactory control. Kelthane had excellent holding power where it was incorporated with the May 16 codling moth spray. The two experimental materials, Trithion and Nialate,

resulted in unusually good control. Both materials—especially 1240—appeared to exhibit considerable ovicidal action and not to be particularly harmful to predatory mites. The dosage of Kelthane wettable powder used for summer control apparently was at the lower limit to insure commercial control.

Result of Crack Test at Harvest

	% sound	% with light colored meats	Weight of meats per 100 nuts in grams
Check .....	90	68	494
Trithion ....	98	85	549

All the treated plots remained in fine condition up and through harvest. In contrast, the trees in the check plots suffered serious defoliation and by harvest the ground beneath them was covered with leaves. A large predator population developed in the check plots, but occurred much too late to save the trees from serious damage. At harvest a crack test was conducted to determine the quality of the crop. The best nuts were obtained from the trees that were protected from the European red mite. The test also indicated that a considerable amount of spider mite damage is needed to produce a noticeable decrease in the quality of the crop.

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