Grape Leafhopper Tests

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GRAPE LEAFHOPPERS pass the winter as winged adults in protected places in the vineyards or nearby. They begin moving to the vines as soon as the young leaves bud out and for a period of three or four weeks thereafter continue to move from their winter quarters to the vines. The adult leafhoppers feed for a number of days on the vine before egg laying which begins about April 20. The first nymphs appear about mid-May in the Lodi-Stockton area. About three weeks or longer are required for first brood nymphs to acquire wings and somewhat less time for the following broods. There are three broods developed during the season. Reproduction takes place on the vine only.

Plots of eight rows (about 2½ acres) each were dusted on May 2, 1947. The vineyard in which the plots were located was near Escalon and the variety was Carignane. A vineyard power duster was used and every middle was traversed. The nozzles of the duster were directed to the crowns of the vines but dust blast did not have sufficient spread to hit the lowest and topmost leaves directly. A dust of 1% parathion and 99% inert material was used and compared with a 5% DDT, 50% sulfur, 45% inert material dust which was in general commercial use. Both dusts were applied at the rate of 20 pounds per acre.

Pretreatment and post-treatment counts of overwintered adults were made on May 1 and May 8 in the following manner. After spreading a dark cloth under the vine to catch the leafhoppers, individual vines were sprayed with a hand-operated fly-spray atomizer containing pyrethrum in oil to inactivate the leafhoppers. The vines were then shaken and the leafhoppers counted. Counts were made under six vines in each plot. On May 30, counts of nymphs were made on basal leaves selected at random. Only one leaf was selected per vine and thirty leaves were examined from each plot. The results are given in table 1.

At the time the dusts were applied the overwintered adults were dying naturally. Thus, the per cent reduction was not entirely due to treatments. Nevertheless, the DDT showed appreciably more control of adults. The greater persistance of DDT was shown by the presence of fewer nymphs on May 30.

TABLE 1—Results of Dusts Applied May 2, 1947, on Control of Grape Leafhopper

Dust treatment (20 lbs. per acre)	Adults per vine		Per cent reduction	Nymphs per leaf May 30
	May 1	May 8		
Parathion 1%	21.7	5.5	76.0	8.4
DDT 5%, sulfur 50%	18.7	0.7	95.2	2.7

TABLE 2—Results of HETP Sprays Applied in August for Control of Grape Leafhopper

Treatment per 100 gallons and date of application	Number of nymphs per leaf		
	August 13	August 14	August 22
Unsprayed	1.7	1.8	3.3
HETP 50%, inert 50%, 1 pt. Aug. 13 and Aug. 20	8.7	0.9	0.2
HETP 50%, inert 50%, 2 pts. Aug. 13 and Aug. 20	6.9	0.0	0.0
HETP 50%, inert 50%, 2 pts. Aug. 13	4.7	0.0	0.9

The results of observations on leafhopper control from HETP sprays applied in the spring were not conclusive because of the low infestations encountered. Since the HETP appeared to be promising for Pacific mite control, a test of this material was made at Davis in August. Each plot consisted of three rows of 45 vines each in an experimental variety vineyard. Sprays were applied using a 50 gallon Bean rig at 250 pounds pressure. The foliage was heavy and thorough spray coverage was difficult. Only leafhopper nymphs were counted from basal leaves selected at random. The spray treatments and the results of the counts are given in table 2.

The interval of seven days between sprays for plots receiving the double application was selected to conform to the interval necessary for Pacific mite control. This interval is too short for best leafhopper control since in August leafhopper eggs require from 12 to 15 days to hatch.

As a result of the sprays the numbers of nymphs were greatly reduced while they were increasing on unsprayed vines. On August 22, the only nymphs that were found had hatched recently. Immediately after spraying it was noted that both adults and all stages of nymphs were killed and could easily be seen on the ground beneath the vines.

From these experiments it would appear that a dust containing 1% parathion did not give sufficient control of the grape leafhopper. If such a dust were to be used to control mites on grapes, then DDT should be added if leafhoppers are to be controlled at the same time. It would appear also, if care is taken to spray thoroughly, that the use of HETP sprays for control of Pacific mite on grapes will probably give adequate control of the grape leafhopper.

enough on the leaves to prevent settling of crawlers. The addition of di 2 ethyl hexyl phthalate increased the efficiency of the parathion perhaps through its solvent action for parathion or by increasing the deposit. Though the results were influenced by the presence of predators, it would appear that parathion applied later in the season after the crawlers had settled controlled those scale which had not reached the "rubber" stage. In this case also the di 2 ethyl hexyl phthalate increased the efficiency of parathion.

In the examination of olive twigs sprayed in November some parathion sprays appeared to have killed black scale in the "rubber" stage. For the control of prerubber stages a DDT-kerosene spray was as effective as any of the parathion sprays when examined in January. The persistance of parathion residue during the winter has not yet been determined, however. It is possible that the final effectiveness of the sprays cannot be determined until spring of 1948.

Parathion appears to be effective against young black scale and, at higher dosages, may even partially control the scale in the "rubber" stage. As a post-harvest spray there is little to recommend the use of parathion over a DDT-kerosene spray. A great deal more must be learned about the use of parathion before it could be recommended.