Effects of

OIL SPRAYS FOR CONTROLLING PACIFIC MITE ON GRAPEVINES

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Results of test plot research, along with commercial application experience, indicate that the use of oil sprays to control Pacific mite on grapes is promising. However, more information is needed on the causes and conditions resulting in plant injury before the use of oil sprays on grapevines can be recommended.

IN THE EARLY PART of the growing season of 1967, a considerable vineyard acreage was sprayed with oil emulsion for control of Pacific mite. In most cases, the sprays were useful because they delayed the development of the mites. However, the use of oil sprays can cause significant injury to grapevines. Several years ago, when oil sprays were more frequently used to control spider mites on grapevines, they occasionally caused considerable injury, especially when the oil sprays closely followed or closely preceded sulfur dusting.

The present interest in the use of oil sprays on grapevines arises from the fact that, in certain areas of the San Joaquin Valley, Pacific mite has become resistant to all the registered acaricides (with the possible exception of binapacryl [Morocide]). However, the short period of effectiveness of binapacryl makes multiple applications necessary, and only the dust form is registered for use on grapevines. Moreover, in many vineyards in this area, there are only a few of the predaceous mites that might otherwise help control the Pacific mite. To overcome these problems, combinations of acaricides have been used, and two or more applications have been necessary. Such control is costly, however, as compared with the relatively inexpensive oil sprays. Also, resistance to oil has never been reported. Early season is an appropriate time to use oils because the amount of foliage is small and good spray coverage is more easily attainable. The most important factor in effectiveness of oil sprays for mite control is good coverage. An early-season oil spray may delay the development of mites long enough so that only one treatment with a more potent and costly acaricide may be needed.

PACIFIC MITE CONTROL DATA FOR OIL SPRAYS ON THOMPSON SEEDLESS GRAPES IN FRESNO COUNTY TESTS, 1966–1967

Materials per 100 gallons	Date applied	Gallons per acre*	1966 TESTS—Average number of mites and eggs per leaf									
			April 20		June 9		June 16		June 23		June 30	
			Mites	Eggs	Mites	Eggs	Mites	Eggs	Mites	Eggs	Mites	Eggs
Niagara Orchex 696 1 gallon	4–20	487										
	4–29	318	0.3	0.1	0.3	0.7	4.1	6.2	27.9	53.2	107	132
Niagara Orchex 696 1 gallon	4–20	487	0.2	0.1	0.9	3.0	12.3	16.0	65.7	84.6	114	193
Volck Supreme 1 gallon	4–20	394	0.6	0.2	0.3	0.9	3.0	4.0	31.3	53.0	36	100
Untreated			May 27, 1966—12.6 mites and 17.3 eggs per leaf									

Materials per 100 gallons	Date applied	Gallons per acre†	1967 TESTS—Average number of mites and eggs per leaf							
			June 20		June 28		July 5		July 11	
			Mites	Eggs	Mites	Eggs	Mites	Eggs	Mites	Eggs
Mobil 99A, 1 gallon	4–27	230								
	5–8	289	0.0	0.3	0.4	0.4	0.7	0.6	0.7	5.7
Volck Supreme 1 gallon	4–27	218	0.3	0.0	0.7	0.3	3.4	4.0	7.7	17.5
Volck Supreme 1 gallon	4–27‡	207								
	5–8	324	0.1	0.1	0.1	0.5	1.3	2.3	2.8	9.3
Untreated			June 26, 1967—7.9 mites and 10.9 eggs per leaf.							

* Sprayed by hand.
† Sprays applied with an inverted "U" boom.
‡ A light rain was falling when this treatment was applied.

Injury

Vine growth produced under low temperatures early in the season (daily maximum temperature of 80°F or less) appears to be more susceptible to injury related to the stress of heat, sulfur dust, or oil sprays. Injury may be particularly severe at the beginning of sudden high temperatures following an extended cool period. At such times, sulfur dust or oil sprays may scorch the very young leaves, especially if oil sprays are applied in the heat of the day. Oil sprays remove the bloom from the berries, and thus, may make them unmarketable as table grapes. The effect of oil sprays on the processing of raisins or wine is not known.

Tests of oil sprays on Thompson Seedless grapevines in 1966 altered the appearance of the leaves but did not cause marked discoloration or any burning. Sprays were applied with hand-held guns in 1966. Each plot consisted of about 20 vines and each treatment was replicated three times. Fifteen to 20 leaves per plot were examined on each sampling date (see table). The spring of 1966 was warm and thus both grapevines and mites developed early. Shoots were from 14 to 18 inches long when the first spray was applied on April 20. Thus data indicate that the infestation level on untreated leaves (May 27) was not reached on oil-sprayed leaves until at least 20 days later.

In 1967, sprays were applied with an inverted "U" boom. Each plot consisted of 17 vines; 15 leaves were examined per plot on each sampling date (see table).

The spring of 1967 was cool and development of both vines and mites was much later than usual. In 1967, the infestation level on untreated leaves (on June 26) was not reached on oil-sprayed leaves until about 15 days later.

Mildew

Grape foliage and fruit must be protected from infection by the powdery mildew fungus, and oil sprays are being tested to determine how they fit into the program to control this disease. Oil sprays did not control powdery mildew on Thompson Seedless grapevines in tests made in 1967 at the Kearney Horticultural Field Station, although they eradicated infections on the berries where total coverage was obtained. Thorough coverage is difficult to obtain from commercial spray applications, however. Furthermore, the oil sprays did not protect the grapevine foliage from subsequent infection. Sulfur dust protects the grapevines for a period of several days. Combinations of oil and sulfur used in 1967 tests were surprisingly noninjurious to fruit and leaves whether applied together, before, or after each other. Late-season oil applications (just prior to harvest) appeared to discolor the berries. Further research is planned on the problems of compatibility of sulfur and oil as they concern control of Pacific mite and powdery mildew.

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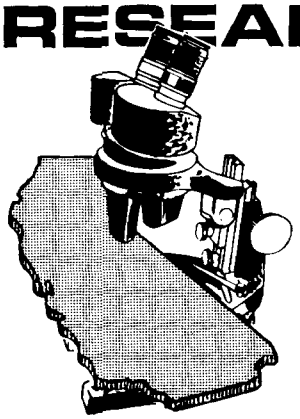
RESEARCH PREVIEWS



A continuing program of research in many aspects of agriculture is carried on at University campuses, field stations, leased areas, and many temporary plots loaned by cooperating landowners throughout the state. Listed below are some of the projects currently under way, but on which no formal progress reports can yet be made.

CANTALOUPE HANDLING

Agricultural economists at Berkeley have begun a study that may aid cantaloupe growers in their harvesting problems (more than one-third of the fruits are now returned to the field because of quality, size, or injury). Different techniques, from field to packinghouse, will be tried and analyzed with a view to improving all phases of the operation.

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STAR THISTLE CONTROL

Biological control specialists at Berkeley hope to get permission to release insects (now held in quarantine) that prey on yellowstar thistle, a common nuisance weed in many rangelands.

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BIO-CONTROL OF NAVEL ORANGEWORM

Entomologists at Berkeley have found a natural parasite of the navel orangeworm in California but feel that not enough of the parasites are available in most orchards to control the orangeworm. In one test orchard, additional parasites were released with a corresponding increase in the mortality of orangeworms.

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UNEXPECTED DIVIDEND

Entomologists working at Los Angeles on methods of controlling household insect pests have developed a chemical which may turn out to be useful as a shampoo ingredient for controlling fungus conditions on pets and human beings. Clinical testing of the material is scheduled.

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BROWN MITE CONTROL

Test plots set up by the Department of Biological Control, U.C., Riverside, indicated promise in the use of lady beetles, *Stethorus picipes*, to control the avocado brown mite, *Oligonychus punicae*. These studies will be continued.

CREATURE COMFORT STUDIES

Shelters against cold, and cooling devices for extreme heat for both beef cattle and swine are being tested from the Sacramento to the Imperial and Coachella valleys in an effort to determine the best environment for weight-production in these animals. The work is a joint effort of agricultural engineers and animal science researchers.

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BETTER AG EDUCATION

Staff members of the Department of Applied Behavioral Sciences, at Davis, are working in conjunction with representatives of the high schools and colleges throughout the state to try to improve the teaching of agricultural subjects by better allocation of functions and responsibilities of the different schools involved.

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LYGUS ON COTTON

Davis and Riverside entomologists, working out of the Cotton Field Station at Shafter, have found that lygus bugs prefer to lodge in alfalfa rather than in cotton. If given a choice, lygus bugs will desert a cotton field for an alfalfa patch planted next to it—a factor worth considering in any pest control program.

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SPIDER MITES ON GRAPES

It is often observed that dusty grape vines have more spider mites. Entomologists at Davis are investigating the fact that amount and size of dust particles on grape leaves may play a major role in the buildup of spider mites.

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SOIL CHANGES STUDIED

Soil scientists of the Kearney Foundation are making detailed studies of the effect that greatly increased applications of nitrogen fertilizers may be having on the soils of the state—aimed at developing ways to use nitrogen more efficiently.