The Grape Mealybug

a dormant season parathion spray reduced infestation to 1% at harvest

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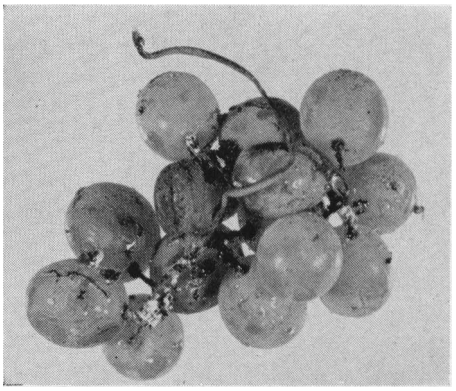

Mealybug and honeydew on grape berries.

Parathion sprays applied to field plots—in Tulare and Fresno counties—during the dormant season controlled grape mealybug in 1953 better than any other material tested, and confirmed results of trials in 1952.

The sprays proved so effective that less than 1% of the fruit was infested at harvest. During the last thirty years many materials and methods were tried for control of the mealybug but no satisfactory treatment was found.

Grape mealybugs cause occasional heavy losses in table grape vineyards. The honeydew they exude makes the grapes sticky and the presence of the whitish waxy mealybugs in the fruit clusters is unsightly. Often the honeydew drips onto the cluster from a mealybug feeding on a petiole or leaf. A black sooty mold usually grows on this honeydew, contributing to the general unattractive appearance. The fruit clusters with a recognizable infestation are either rejected in the field or culled out at the packing house.

The mealybug populations vary considerably from year to year with parasite and predator activity often controlling the infestations. Sometimes, however, natural control fails and a rapid build-up ensues.

In 1953 the mealybug infestation in Tulare County reached its highest peak of the last decade, with about 10% of the table grape acreage sustaining some fruit loss. Several other grape growing areas in the state also report increased infestation.

The grape mealybug control project was started in Fresno County in 1952. Of several treatments tested, a dormant parathion spray produced the best results. For the 1953 season, dormant sprays of parathion and other materials were tried as well as some foliage sprays.

All of the sprays, both dormant and foliage, were applied by hand-held guns operated at pressure of about 350 pounds per square inch. During the dormant period about a gallon and a half of the spray preparation was applied per vine. Such high gallonages are believed necessary for adequate coverage. Even so, examination of the vines immediately after spraying showed large areas of dry bark under the loose outer bark. The sprays were directed against all the old wood, especially the cordons and arms, from both above and below. The mealybugs overwinter beneath the bark as newly hatched larvae. The young larvae remain in clusters either in the cottony material of the previous egg mass, or in close proximity, until late in the dormant season, at which time they migrate toward the bases of the spurs or canes.

The foliage sprays applied during May covered the leaves and canes as well as the arms and spurs. From 5/8 to 3/4 gallon of material was applied per vine. At that time the half-grown mealybugs are found on the arms or spurs, or succulent wood, or out on the young shoots, fruit clusters, petioles and leaves.

The plots were evaluated prior to harvest by counting the number of clusters containing either mealybug, the honeydew exudate, or both. From 200 to 900 clusters were examined in each plot. For dormant spraying, trials were made with parathion, malathion, EPN, lime-sulfur, and sodium arsenite. All gave some degree of control. The parathion sprays gave a higher degree of control than did any of the other materials.

The materials were tested as dormant sprays at the following rates per 100 gallons of water: malathion, one quart of emulsifiable concentrate—four pounds per gallon—EPN, one quart of emulsifiable concentrate—four pounds per gallon—lime-sulfur, two gallons combined with three gallons of dormant oil emulsion. Emulsifiable parathion—four pounds per gallon—was used at four rates, 1/2, 3/4, 1 and 1 1/2 pints per hundred. Increased control was obtained up to one pint per hundred, but no additional benefit was gained using 1 1/2 pints.

A spray of 25% wettable parathion—two pounds per 100 gallons, plus three gallons of dormant oil emulsion—gave good control but was somewhat less effective, and more costly, than one pint of emulsifiable parathion.

The excellent control obtained with the parathion sprays, even with incomplete coverage of the well protected mealybugs in the underlying bark, may have been due to either the fumigating effect of parathion or to the persistent residue of this material in the rough bark.

The addition of two gallons of dormant oil emulsion to the malathion or parathion emulsifiable concentrates did not prove superior to the use of the emulsifiable concentrates alone.

The dormant parathion sprays were applied on dates ranging from late January to the end of March. No great differences in control were apparent within this period. Perhaps the later sprays were slightly better. The young mealybugs migrate toward the spurs near the end of the dormant season and might be expected to be more easily killed in the less protected positions.

The cost of using 600 gallons per acre in the dormant season ranges from $15.00 to $25.00 per acre for labor and materials. One low gallonage dormant parathion spray was applied using a little less than one half gallon per vine. Some benefit was evident but the result was decidedly inferior to the heavier applications. Because one pint of the emulsifiable concentrate was used per 100 gallons of water, the quantity of active material was only one third that used in those trials which produced the best results.

After foliage had developed, single and double sprays of parathion were tested as well as a double malathion spray. The double malathion sprays produced poor control as did the single parathion spray. Double parathion sprays produced good to excellent control. Timing appeared to bear some relationship to the degree of control obtained. An early and late May treatment produced considerably better results than a mid- and late May treatment.

Further trials are scheduled for the 1954 season to investigate more thoroughly the gallonage requirement, the timing of the sprays, and such new materials as may be available.

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