were exposed to blight infection. The inference that the bloom spray was the most beneficial may be because 0.2 inches of rain fell shortly after its application.

Summary

These experiments indicate that both the number and timing of treatments for optimum walnut blight control will vary with the season. In years when there is only a relatively small amount of rainfall during the infection period (as in 1975) few sprays will be needed. But if the rainfall is heavy and prolonged during the infection period (as in 1974) several treatments will be needed. Protective sprays applied at a particular stage of nut development will be helpful in reducing blight infection only if appreciable rainfall follows. However, because it is impossible to predict the weather during the critical period of infection, applications should be applied to cover the major period of susceptibility. On early varieties, a pre-bloom spray should be used to help keep the bacterial inoculum at a minimum before the highly susceptible pistillate flowers are exposed. In addition, a pre-bloom spray might help to eliminate catkin infection and subsequent spread of the disease through infected pollen. A bloom spray should be applied to protect the pistillate flowers. Due to rapid growth of fertilized nuts after pollination a third spray should be applied at post-bloom. If rains threaten, additional sprays would be beneficial as the nuts continue to enlarge, but in most years in the Sacramento Valley this will be unnecessary. The nut enlargement period usually ends around the first of June on early-maturing varieties. Success in control of walnut blight depends on proper timing and thoroughness of coverage. In devising a blight spray schedule remember that copper sprays are only protective agents; their continuous presence on susceptible parts of the plant is absolutely essential during the critical spring period.

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The authors acknowledge the assistance of Mineral Research and Development Corporation, Occidental Chemical Company, and the Chapman Chemical Company in supporting these studies, as well as the cooperation of the following growers: Earl Harris, Herb Carrier, and WALGRO Inc.

Reducing Set in Ruby Seedless Grapes with Gibberellin

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Ruby Seedless is a red seedless variety used as a table grape and for the freezer. The clusters are well filled to compact. In some vineyards, looser clusters would be desirable to reduce bunch rot and to facilitate packing. Gibberellin sprays reduce set in Thompson Seedless and several wine varieties, so trials were established with Ruby Seedless to determine the possible benefits.

In 1973, we sprayed vines at three stages of development: 1) pre-bloom shoots 15 to 18 inches long; 2) bloom, 30 percent caps off; and 3) bloom, 60 percent caps off. The concentrations of gibberellin tested were 2 1/2, 5, and 10 ppm. Although a replicated trial was established for detailed sampling, the effects of the sprays were obvious and precluded the necessity of further evaluation. All of the pre-bloom treatments resulted in straggly clusters and excessive numbers of shot berries. The 5 and 10 ppm concentrations during bloom also produced straggly clusters with shot berries. Only the 2 1/2 ppm concentration approached the desired loosening but even this low dosage appeared to be excessive. The late bloom spray was more favorable than the early bloom spray.

Based on our 1973 experience, we established a trial in 1974 using gibberellin rates of only 1 and 2 ppm to compare to no treatment. Vines were treated only in the late bloom stage on May 17, when 70 percent of the caps had fallen from the flowers. About 150 gallons of spray were applied per acre to insure good coverage of the clusters and leaves. Each treatment was replicated 15 times.

Just before the grower's harvest, we sampled for soluble solids and berry weight determination by taking 50 berries from each replication. The character of the clusters was rated visually by three observers. Clusters in the desired range, well filled to loose, were assigned numbers of 3 and 4. An average cluster index number below 3 was excessively compact, and above 4, excessively straggly.

Our data in the table show that the most favorable results were obtained with a 1 ppm spray. This treatment produced loose clusters without increasing shot berries. This treatment had no effect on the soluble solids or berry weight. Two ppm produced excessively straggly clusters but did not increase the numbers of shot berries.

The low rate of gibberellin treatment required shows that the Ruby Seedless variety is very sensitive to gibberellin. In contrast, Thompson Seedless table grapes require a 10 ppm concentration for berry thinning.

This is a report of work in progress only. The chemicals and uses contained in this article are experimental and should not be considered a recommendation for use.

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EFFECT OF BLOOM-TIME GIBBERELLIN TREATMENT ON RUBY SEEDLESS GRAPES

Treatment gibberellin conc.	Berry weight grams	Soluble solids °Brix	Looseness index†
1. 0 ppm	3.35 a*	15.2 a	2.87 a
2. 1 ppm	3.33 a	15.5 ab	3.80 b
3. 2 ppm	3.42 a	15.7 b	4.43 c

* Mean separation by Duncan's multiple range test, 5% level.

† Favorable range of well-filled to loose clusters in the range of 3 to 4.