Gibberellin Tested on Grapes

specific responses to sprays shown in fruit set, berry size, and elongation of cluster parts in experiments during 1957

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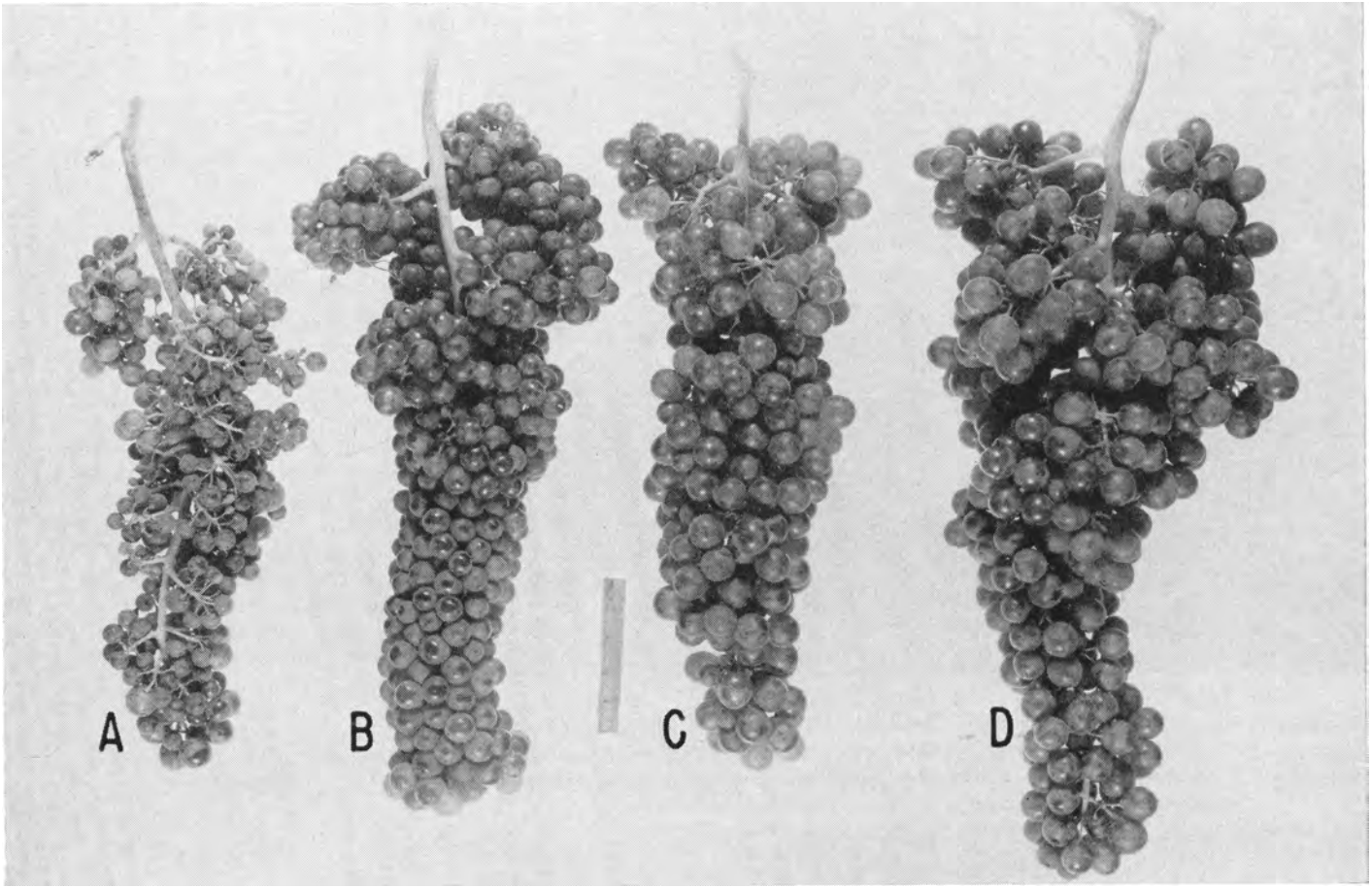

Black Corinth grapes at harvest. Control—*A*; girdled but unsprayed—*B*; sprayed with gibberellin at 5 ppm—*C*; and with gibberellin at 20 ppm—D.

Mature vines of seedless Black Corinth, Thompson Seedless, and seeded Zinfandel grape varieties were used in tests with gibberellin at Davis during 1957.

For the tests, the number of berry clusters on the Thompson Seedless vines was reduced to about 20 per vine—one day before treatment—and those clusters were berry-thinned. The Black Corinth and the Zinfandel varieties were not thinned.

Treatment

The gibberellin—as potassium salt of gibberellic acid—contained about 80% active ingredient. With Dreft as the wetting agent, sprays were applied by 1-quart or 3-gallon hand sprayers. Both clusters and foliage were heavily sprayed.

Average weight per berry, percentage of total soluble solids, and percentage of acid were determined at harvest.

Black Corinth

Girdling has long been used to induce fruit set in Black Corinth, but in recent years that practice has been largely replaced by spraying with the plant growth regulator—4-CPA—4-C—4-chlorophenoxyacetic acid.

A spray experiment on Black Corinth showed that gibberellin also results in an excellent fruit set. Two groups of ungirdled vines were treated on May 31, about three days after bloom; one group was sprayed with gibberellin at 5 ppm—

Data at Harvest—September 23—for Zinfandel Clusters

Treatment, concentration gibberellin ppm	Length cluster cm	Length peduncle cm	Length basal lateral cm	Length pedicel mm	Av. wt./ cluster gm	Av. wt./ berry gm	Total soluble solids %	Acid %
0	16.6	0.9	10.6	6.3	385	2.16	21.0	0.66
1	18.2	1.2	12.6	..	418	2.00	22.0	0.69
10	20.8	1.6	14.4	8.9	335	1.64	21.0	0.64
100	25.5	2.4	15.2	12.2	188	..	22.3	0.59
1,000	..	3.0	..	16.1	9	..	..	..

parts per million—the other group at 20 ppm—four vines per treatment. Another group of vines was ungirdled and unsprayed, and a fourth girdled but not sprayed. At harvest—August 23—an excellent set of berries, much larger than those of the controls, was produced by the vines sprayed with the compound at 5 ppm. The largest berries and clusters resulted from gibberellin at 20 ppm. The percentage of total soluble solids of fruit from sprayed vines was lower than that of girdled fruit, probably because of the larger crop on sprayed vines.

Thompson Seedless

Girdling is generally used in California to produce large berries of Thompson Seedless for table use, although 4-CPA has also been used on a limited scale for the same purpose. On June 11, after berry set, ungirdled Thompson Seedless vines were sprayed with gibberellin at 5, 20, and 50 ppm, four vines per treatment. One group of vines was ungirdled and unsprayed, and another group was trunk-girdled but unsprayed. Fruit was harvested on August 26. Clus-

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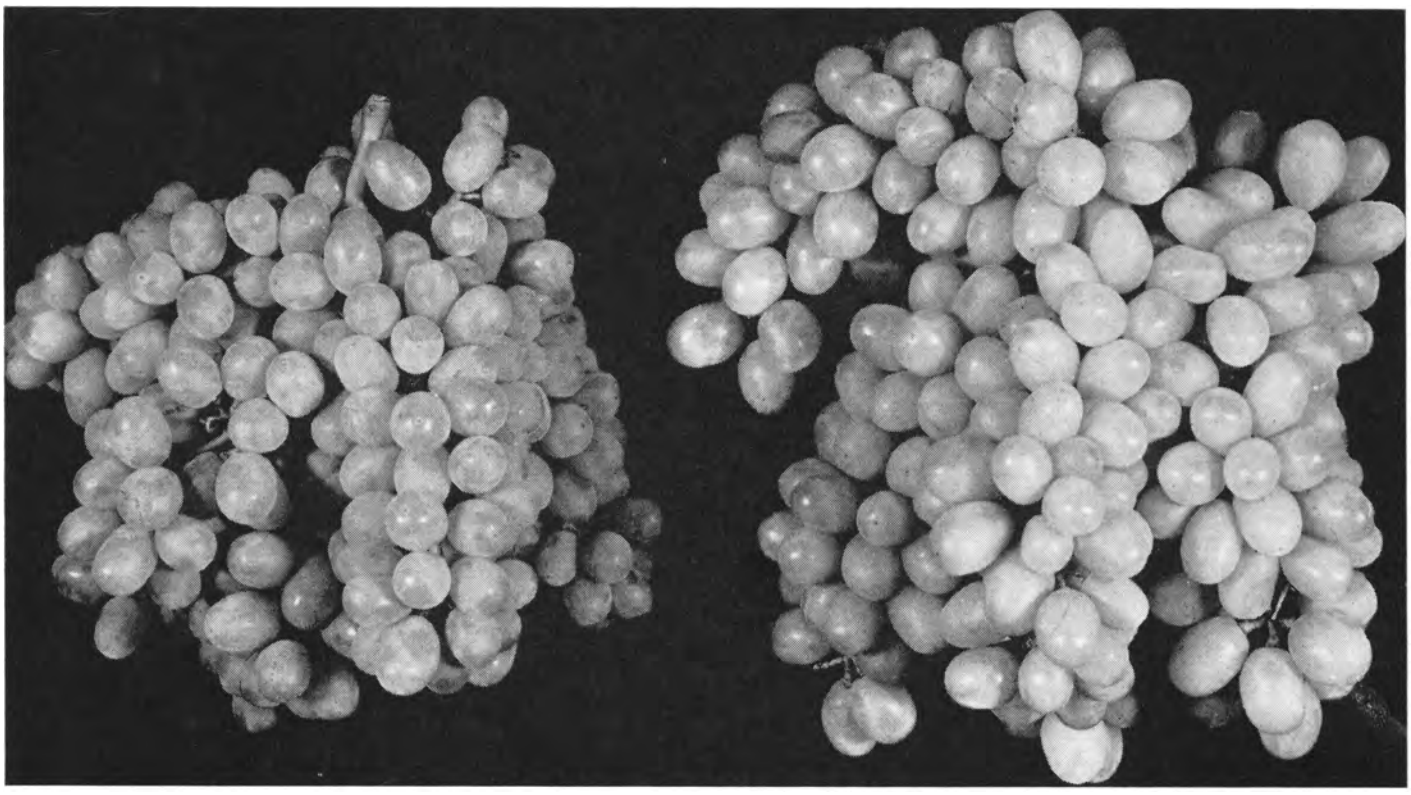
Thompson Seedless grapes at harvest sprayed with gibberellin. Above—*left*, 0 ppm; *right*—5 ppm. Below—*left*, 20 ppm; *right*, 50 ppm.



This may be due to the fact that magnesium levels are low, as are sodium. There is a tendency for a reciprocal relationship between these two elements and potassium. At Davis, for example, the magnesium content has been found to be 2–3 times as high as in the Kern County experimental plots, and the potassium content is much lower.

The leaf analyses provided an obvious explanation of the failure of the trees to respond to nitrogen. The analyses also pointed up the difficulty of getting absorption of phosphorus and potassium—even with heavy applications on a light soil—and emphasized the importance of time of sampling in the interpretation of leaf analyses.

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ters and berries of vines sprayed with the gibberellin at 5 ppm were larger than those of unsprayed and ungirdled vines, but smaller than those of the unsprayed but girdled vines. Very large clusters and berries resulted from treatment with the compound at 20 ppm and 50 ppm. The percentage of total soluble solids was lowest and the percentage of acid highest in the fruit sprayed with the compound at 50 ppm.

Zinfandel

Grape varieties with compact clusters are undesirable because rot is likely to develop in them. If the cluster parts could be lengthened, such clusters would be loosened and the tendency to rot reduced. Shoots of Zinfandel, a variety with very compact clusters, were sprayed with gibberellin at 0, 1, 10, 100, or 1,000 ppm on April 7 when the shoots were 2″–3″ long. Canes were removed and fruit harvested on September 23. The shoots and their internodes were elongated in proportion to the concentration of compound used. When measured on July 15, the shoots sprayed with the compound at 1,000 ppm were twice as long as the untreated shoots.

The length of cluster parts was increased in proportion to the concentration of the gibberellin used. The compound at 10 ppm resulted in the production of rather loose clusters as a result of the elongation of cluster parts. Very loose clusters resulted from application of the compound at 100 ppm, but there were many shot berries. At 1,000 ppm the clusters were virtually destroyed. In this treatment ovaries still adhered to the greatly elongated pedicels, but the cluster framework was cracked and quite brittle. Above 1 ppm the average weight per cluster and berry usually decreased with increasing concentrations of the compound, probably because the number of small shot berries increased.

There was no definite trend in the percentage of total soluble solids or acid. However, treatments at later dates hastened coloration and maturation.

Data at Harvests for Black Corinth and Thompson Seedless Grapes

Treatment, concentration gibberellin ppm	Av. wt./ cluster gm	Av. wt./ berry gm	Total soluble solids %	Acid %
Black Corinth				
0 not girdled	59.8	0.14	27.7	0.85
5 not girdled	122.0	0.47	23.2	0.85
20 not girdled	215.9	0.65	23.5	0.89
0 girdled	131.7	0.35	24.1	1.02
Thompson Seedless				
0 not girdled	0.66	1.59	22.4	0.79
5 not girdled	0.95	1.91	23.2	0.73
20 not girdled	1.46	2.71	18.9	0.83
50 not girdled	2.15	3.15	17.6	0.94
0 girdled	1.10	2.26	23.0	0.74

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RED MITE

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ated for mite control in an orchard with a history of mite resistance to parathion and malathion. Although the sprays were applied for aphid control, mite counts were taken at intervals throughout the season. All materials were applied with conventional ground equipment and orchard guns, at an average of 350 gallons per acre.

A definite mite resistance to parathion and malathion was observed in past seasons and in 1957 Diazinon did not hold the mites in check. The trees in the test plot showed severe mite injury to the leaves. Thimet, at two dosages, Nialate, and Guthion gave what could be considered commercial control in spite of the phosphate resistance present. However, in the previous season, Thimet gave such good control in this orchard that only a few mites could be found on the treated trees. In the 1957 season, although commercial control was obtained, the plots were close to treatment levels. Guthion and Nialate had not been used previously in this orchard.

Thiodan—the only nonphosphate compound used in these trials—had little or no acaricidal effect.

The results of these tests indicate that even though resistance to one or more phosphate chemicals may be present, it is possible to obtain spider mite control for at least a season or so with other phosphate materials. How long the materials will continue to be effective is a matter of conjecture.

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Gordon Morehead, Sacramento County, Jim DeTar, Solano County, Dick Bethell, El Dorado County, Russell Gripp, Lake County, and Bruce Bearden, Mendocino County; Farm Advisors, University of California, cooperated in trials with Bartlett pears.

PARASITES

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Aphelinus semiflavus adults began to appear commonly in the San Joaquin and Salinas valleys in the fall of 1957. The shiny black aphid mummy is quite distinct, but it is not conspicuous because it is found usually on the under surface of the lower leaves.

In addition to the three imported parasites, over 8,000 individuals of several aphid feeding predators imported from India have been released in northern California. Among these predators are three ladybeetles—*Coccinella septempunctata* Linn.; *Adonia variegata* Goeze; and *Scymnus nubilus* Mulsant. Also from India a green lacewing—*Chrysopa carnes* St.—has been released against the spotted alfalfa aphid. None of these predators had been recovered by November 1957. One of the difficulties in establishing the predators is the effective competition of native natural enemies of the spotted alfalfa aphid in the spring and fall.

Because the three wasp parasites overwintered successfully in the San Joaquin Valley and *Praon* survived the winter as far north as Tehama County, it is expected that they will be widely distributed throughout the state in 1958, and become abundant enough to contribute significantly to the natural control of the spotted alfalfa aphid in northern California as they have done in southern California.

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