SJVAR&EC
Report 1 - 1976

# EFFECTS OF PRE-BLOOM AND BLOOM TREATMENTS OF GIBBERELLIN ON CHENIN BLANC VARIETY GRAPES

Fred Jensen, Extension Viticulturist, SJVAR&EC, Parlier
Fred Swanson, Farm Advisor, Fresno County
George Leavitt, Farm Advisor, Madera County
Harry Andris, Staff Research Associate, SJVAR&EC, Parlier

## Summary

Gibberellin sprays were applied in the pre-bloom and bloom stages in single and double applications with a total concentration of 10 ppm. Although not conclusive, single pre-bloom gibberellin sprays applied when the average shoot length ranged from 8 to 10 inches, and the basal clusters averaged 2 to 2 1/2 inches, appeared the most effective in reducing the amount of fruit with rot. Soluble solids were increased with most treatments in one trial and tended to be higher in the other although not significant.

---

Pre-bloom gibberellin treatments are currently used to reduce bunch rot in Chenin blanc. Label directions call for application when the shoots are about 15-20 inches long, and the clusters are 3-4 inches in length but may range from 2-5 inches. Some growers believe that better results are obtained from earlier treatment. Since bunch rot is such a serious problem with Chenin blanc, two trials were established to determine the effects of gibberellin applied from a shoot length of 8 inches and on into bloom, and from double applications.

## Methods

1. Design - Randomized complete block with 8 replications of each treatment, single vines serving as replicates.

2. Vines were sprayed with dilute sprays to cover the foliage and fruit. The amount per vine varied from 1/4 to 1/2 gallon depending upon the amount of growth. No adjuvants were added.

3. At harvest, vines were handled as follows:

   A. Madera Co. - Fruit was separated into either sound fruit or fruit with rot, and each portion weighed.

   B. Fresno Co. - Fruit was separated into four catagories on the basis of visual estimate of percentage of berries on each cluster with rot. The number of clusters in each catagory were counted and then weighed.

   C. Samples for soluble solids and total acidity were taken from 20 clusters per vine, each cluster portion containing about 40 berries. Berry size in the Fresno County vineyard was determined on a 50 berry subsample.

Results

1. Madera County Trial - The vineyard was little affected with bunch rot; the rot that was evident was about 95 percent caused by Botrytis and the remainder summer bunch rot. Although the average of all the vines harvested would give a yield of 8.5 tons per acre, individual vines varied from 14 to 76 pounds. This variation plus the low amount of rot resulted in little difference between treatments.

Treatment 3, made at 8 inch shoot length, yielded more sound fruit than no treatment. The double treatment, 14 inch shoot length plus bloom, yielded less total fruit than no treatment. All soluble solids tended to be higher in the GA treatment than no treatment.

2. Fresno County Trial - This vineyard was fairly severely affected with typical summer bunch rot. Vines were quite uniform with a yield of about 10 1/2 tons per acre based on average yields of vines in the trial.

The gibberellin applications appeared to slightly accelerate bloom as shown in Table 2 on May 14 but this tendency had been overcome by May 16.

The harvest results, Table 3, show that treatments at 8 and 10 inch shoot lengths reduced the numbers of clusters with rot and the yield of fruit with rot as compared to no treatment, although total yield was not affected. A double treatment, 12 inch shoot length plus bloom, also reduced the number of clusters with rot but also reduced total yield.

Soluble solids tended to be higher with all gibberellin treatments but only the 19 inch shoot length treatment significantly so.

A more detailed summary of the results are presented in Table 4, along with a calculation of cluster weight. In general, the gibberellin treatments reduced the number of clusters with rot and the yield of fruit per vine in the 51-90 percent rot catagory, and showed a similar tendency in the 11-50 percent catagory.

The calculated average cluster weights are quite interesting in that they apparently show that the clusters which rot the most severely are the larger ones. The average clusters weights are:

| Percent rot | Pounds |
|---|---|
| 0-10 | .44 |
| 11-50 | .59 |
| 51-90 | .55 |
| 91-100 | .42 |

Discussion

The two trials do not give any conclusive evidence as to timing of gibberellin on Chenin blanc. However, it appeared that treatment when the shoot length was either at 8 or 10 inches was slightly superior to other single pre-bloom treatments. Double treatments, or a treatment in bloom were less satisfactory. The double treatment, pre-bloom plus bloom, decreased total yields in both trials.

Although the gibberellin treatment reduces set and probably yield in the absence of rot, the reduction in rot secured with gibberellin and the higher soluble solids secured from the use of gibberellin compensate so that total yield are similar whether gibberellin is used or not. Gibberellin improves the quality of the fruit in reducing rot and in increasing soluble solids.

The potential effects of gibberellin on crop yields will be evaluated with flower cluster counts made in April of 1977.

Table 1

Madera County - Chenin blanc

Effect of pre-bloom and bloom applications of gibberellin on bunch rot and maturity of Chenin blanc. Harvested Sept. 9.

| Date treated | GA conc. ppm | Shoot length inches | Basal cluster length at bloom stage inches | Yield per vine, pounds | | | Soluble solids °Brix | Total acidity |
|---|---|---|---|---|---|---|---|---|
| | | | | Sound fruit | Fruit with rot | Total fruit | | |
| 1. - | 0 | - | - | 36.0ab | 6.2a | 42.2ab | 20.6a | .80a |
| 2. Apr. 23 | 10 | 8 | 2 | 46.4 c | 3.2a | 49.6a | 22.3 bc | .78a |
| 3. Apr. 26 | 10 | 10 | 2 1/2 | 37.6 bc | 2.8a | 40.3abc | 22.7 bc | .78a |
| 4. Apr. 28 | 10 | 12 | 3 | 39.9 bc | 2.6a | 42.5ab | 23.4 c | .75a |
| 5. Apr. 30 | 10 | 14 | 3 1/2 | 35.1ab | 3.1a | 38.2 bc | 21.9 b | .76a |
| 6. May 3 | 10 | 16 | 4 | 36.6abc | 3.5a | 40.1abc | 21.8 b | .76a |
| 7. Apr. 28 | 5 | 12 | 3 | 36.1ab | 5.2a | 41.3abc | 22.1 bc | .82a |
| May 3 | 5 | 16 | 4 | | | | | |
| 8. Apr. 30 | 5 | 14 | 3 1/2 | 26.9a | 4.3a | 31.2 c | 23.1 bc | .76a |
| May 13 | 5 | - | 50% bloom | | | | | |
| 9. May 13 | 10 | - | 50% bloom | 32.5ab | 4.9a | 37.3 bc | 22.6 bc | .76a |

Table 2

Fresno County - Chenin blanc

Bloom percentages on two dates as affected by gibberellin application.

| Treatment | Bloom percentage | |
|---|---|---|
| | May 14 | May 16 |
| 1. Check | 38a | 81ab |
| 2. 8" shoot length | 56abc | 84a |
| 3. 10" shoot length | 54abc | 86a |
| 4. 12" shoot length | 52abc | 85a |
| 5. 14" shoot length | 59abc | 83a |
| 6. 15 1/2" shoot length | 60 bc | 88a |
| 7. 19" shoot length | 71 c | 87a |
| 8. 10" + 14" shoot length | 55abc | 84a |
| 9. 12" + bloom | 55abc | 88a |
| 10. Bloom | 44ab | 76 b |

Table 3

Fresno County - Chenin blanc

Effect of pre-bloom and bloom application of gibberellin on bunch rot and maturity of Chenin blanc. Harvested Sept. 14 & 15.

| Date treated | GA conc. ppm | Shoot length inches | Basal cluster length inches | Clusters per vine | | | Yield per vine, pounds | | | Soluble solids °Brix | Total acidity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sound fruit 1/ | Fruit with rot 1/ | Total fruit | Sound fruit 1/ | Fruit with rot 1/ | Total fruit | | |
| 1. - | 10 | - | - | 70a | 46a | 116a | 27.8ab | 23.7a | 51.5a | 17.8a | 1.06a |
| 2. Apr. 22 | 10 | 8 | 2 | 75a | 22 c | 96a | 38.5 b | 12.5 b | 51.0a | 18.4abc | .97a |
| 3. Apr. 24 | 10 | 10 | 2 1/2 | 81a | 23 c | 104a | 39.4 b | 14.1 b | 53.6a | 19.1abcd | .92a |
| 4. Apr. 26 | 10 | 12 | 3 | 73a | 26 c | 99a | 32.5ab | 15.5ab | 48.1a | 19.0abcd | .92a |
| 5. Apr. 28 | 10 | 14 | 3 1/4 | 78a | 29 c | 106a | 33.5ab | 20.2ab | 53.7a | 18.2ab | .98a |
| 6. Apr. 30 | 10 | 15 1/2 | 3 1/2 | 67a | 26 c | 93a | 31.1ab | 17.9ab | 49.0a | 18.4abc | .95a |
| 7. May 3 | 10 | 19 | 4 | 66a | 28 c | 94a | 25.3a | 14.4 b | 39.7ab | 20.1 d | .92a |
| 8. Apr. 24 | 5 | 10 | 2 1/2 | 71a | 32 bc | 103a | 33.2ab | 14.8 b | 48.0a | 18.2ab | .98a |
| Apr. 28 | 5 | 14 | 3 1/4 | | | | | | | | |
| 9. Apr. 26 | 5 | 12 | 3 | 61a | 22 c | 84a | 22.6a | 11.5 b | 34.2 b | 19.6 bcd | .96a |
| May 14 | 5 | - | 55% bloom | | | | | | | | |
| 10. May 14 | 10 | - | 44% bloom | 66a | 41ab | 106a | 25.1a | 19.8ab | 44.8ab | 19.7 cd | .92a |

1/ Sound fruit contained 0 to 10% of berries affected with rot, and fruit with rot contained 11% or more of the berries affected with rot.

Table 4

Fresno County - Chenin blanc

Number of clusters, yield, and cluster weight in each rot catagory.

| | Cluster per vine | | | | | Yield per vine, pounds | | | | | Cluster weight, pounds | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent berries with rot | | | | | Percent berries with rot | | | | | Percent berries with rot | | | | |
| Treatment | 0-10 | 11-50 | 51-90 | 91-100 | Total | 0-10 | 11-50 | 51-90 | 91-100 | Total | 0-10 | 11-50 | 51-90 | 91-100 | Average |
| 1 | 70a | 30a | 13.0a | 3.6 a | 116a | 27.8ab | 16.2a | 6.7a | .86a | 51.5a | .40 | .55 | .53 | .24 | .44 |
| 2 | 75a | 16 b | 4.2 b | .88abc | 96a | 38.5 b | 10.2a | 2.2 b | .21a | 51.0a | .51 | .62 | .51 | .24 | .53 |
| 3 | 81a | 20ab | 2.8 b | .12 c | 104a | 39.4 b | 12.6a | 1.5 b | .06a | 53.6a | .49 | .64 | .52 | .48 | .52 |
| 4 | 73a | 23ab | 3.0 b | .25 c | 99a | 32.5ab | 13.5a | 2.1 b | .10a | 48.1a | .45 | .58 | .69 | .41 | .49 |
| 5 | 78a | 23ab | 4.4 b | 1.1 abc | 106a | 33.5ab | 15.2a | 3.6 b | 1.3 a | 53.7a | .43 | .66 | .83 | 1.18 | .51 |
| 6 | 67a | 22ab | 4.0 b | .62 bc | 93a | 31.1ab | 14.2a | 3.1 b | .66a | 49.0a | .47 | .65 | .77 | 1.05 | .53 |
| 7 | 66a | 20ab | 5.0 b | 3.1 abc | 94a | 25.3a | 11.3a | 2.5 b | .62a | 39.7ab | .39 | .56 | .50 | .20 | .42 |
| 8 | 71a | 25ab | 5.5 b | 1.4 abc | 103a | 33.2ab | 12.4a | 2.2 b | .28a | 48.0a | .47 | .50 | .39 | .20 | .47 |
| 9 | 61a | 17 b | 4.1 b | 1.0 ab | 84a | 22.6a | 9.5a | 1.7 b | .26a | 34.2 b | .37 | .55 | .42 | .26 | .41 |
| 10 | 66a | 29a | 8.5ab | 3.4 ab | 106a | 25.1a | 16.1a. | 3.0 b | .67a | 44.8ab | .38 | .56 | .35 | .20 | .42 |

Trend - early shoot length best to reduce rot