

# Hydrogen Cyanamide Trial on Table Grapes, 1985/1986

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## Introduction

An important problem encountered in growing grapes in the desert southwest is an erratic bud break due to insufficient chilling during dormancy. The use of hydrogen cyanamide, applied to the vines at least three weeks before expected bud break, has been found to improve bud break under these conditions. This was confirmed by research conducted at Red Mountain Farm and White Wing Ranch during the 1984-1985 season. Of the three rates tested, a five percent concentration provided the best results. Depending on the timing of applications, it was possible to obtain an earlier and/or more uniform development.

The purpose of this research is to determine if the length of time between pruning and the application of hydrogen cyanamide alters its effectiveness.

## Methods and Materials

Two studies were conducted on third year Perlette, Flame Seedless and Thompson Seedless vines grown under drip irrigation. In both studies the treatments were applied to three vines replicated four times in a randomized complete block design. The purpose of the first study was to determine the effect of pruning the vines at different times before application of hydrogen cyanamide. The first treatment was: pruned January 13, the same day as application; the second was pruned January 6, 7 days before application; the third was pruned January 2, 11 days before application, and the fourth was untreated control vines pruned on January 13. A 5 percent concentration of hydrogen cyanamide was applied to the treatments using a backpack sprayer on January 13.

The purpose of the second study was to determine the effect of pruning after applying hydrogen cyanamide. A 5 percent solution of hydrogen cyanamide was applied to all treatments on December 30. The first treatment was both pruned and sprayed on December 30; the second was pruned on January 6, 7 days after the application; the third was pruned on January 13, 14 days after the application and the fourth was an untreated control pruned on December 30.

Counts of the number of open buds were taken on January 24, January 31, February 7, February 13, February 19, February 26 and March 5. Buds were considered open if green was visible. Total bud counts were taken on the Perlette and Flame Seedless, while only the buds on the first three canes of the Thompson Seedless were counted, beginning at the north cane on the west side of the vine.

Counts of the bunches that had over 50 percent bloom were taken on March 12, March 20, March 26, and April 3. Bunch counts were made following the same procedure used in counting buds.

Grape maturity was determined using a refractometer to measure percent soluble solids. A two grape sample was taken from one of the more mature bunches on each vine. Bunch maturity was determined by observing the change in color of the stem from green to brown, as well as berry size and color. On the Thompson

Seedless, two samples per vine were taken on the first observation date and four samples per vine on the second. Maturity data were collected for the Perlettes on May 7 and May 14, for the Flame Seedless on May 14, and for the Thompson Seedless on May 23 and June 4.

## Results and Discussion

### **Bud Break**

In the first study, statistically significant differences between bud break in the treated vines and the control vines were seen in all three varieties. This supports research conducted during 1984/1985 indicating that vines treated with a 5 percent concentration of hydrogen cyanamide produces an earlier bud break than untreated vines.

Vines pruned at different intervals showed no statistically significant differences, except on some observation dates in Flame Seedless between vines pruned one week before application of hydrogen cyanamide and those pruned the same day or 11 days before application. It would appear that this difference is due to variation in vines rather than treatments, unless it is assumed that it is better to either prune the same day or wait for 11 days before application of hydrogen cyanamide to Flame Seedless vines. In all three varieties the total number of buds to break was increased with the use of hydrogen cyanamide as shown in Figure 1.

In the second study, two Japanese exchange students were used to make bud counts. Because of the resulting variability in counts, patterns can be established but no statistical analyses were run.

Results of the study indicate that hydrogen cyanamide produces a similar result even when pruning took place up to two weeks after application. The Flame Seedless grapes showed a gradual reduction in the materials effectiveness with increased length of time after pruning, while the Perlettes and Thompson Seedless showed similar results for all treated vines as shown in Figure 2.

### **Blossom**

In the first study, all three varieties showed statistically significant differences between the treated and untreated vines. The only significant difference between pruning dates was seen on the Perlettes where the vines pruned the same day as application showed a significant increase in bunches at blossom over the vines pruned 11 days before application of hydrogen cyanamide as shown in Figure 3.

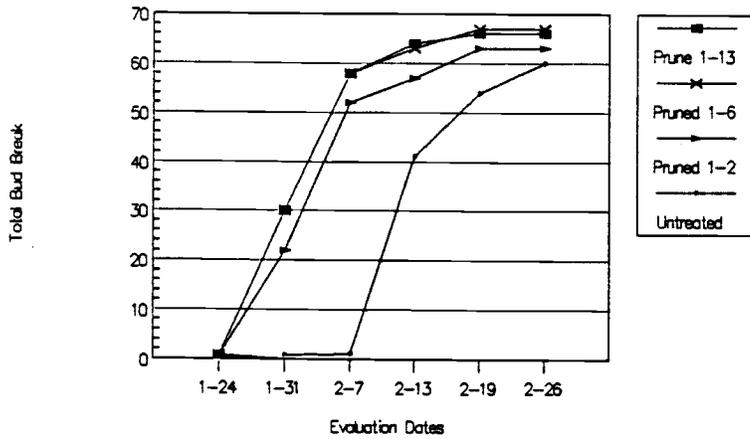
When the vines were pruned after application of hydrogen cyanamide, there were significant differences in the treated and untreated vines of Perlettes, Thompson Seedless and the March 20 observation of the Flame Seedless as shown in Figure 4. On both observation dates, the Flame Seedless pruned on the same day as application showed significantly greater bunches in blossom than the other treatments.

### **Fruit Maturity**

Brix counts taken at harvest to determine maturity did not produce any statistically significant differences except in isolated cases. The number of samples per vine were doubled and then increased to four on the Thompson Seedless in an effort to improve the reliability of the data, without any measurable effect. The use of the more mature bunches could have helped to push all the scores together, but increasing the number of samples would be expected to have had a countering effect. The unusually warm weather experienced during berry development may have pushed the maturity dates together, masking the earliness of the vines treated with hydrogen cyanamide. Harvest crews, however, were able to harvest the entire crop from treated vines the first time through the field. This would seem to indicate either an earlier or more uniform maturity, even though there were no statistical differences with the evaluation methods used.

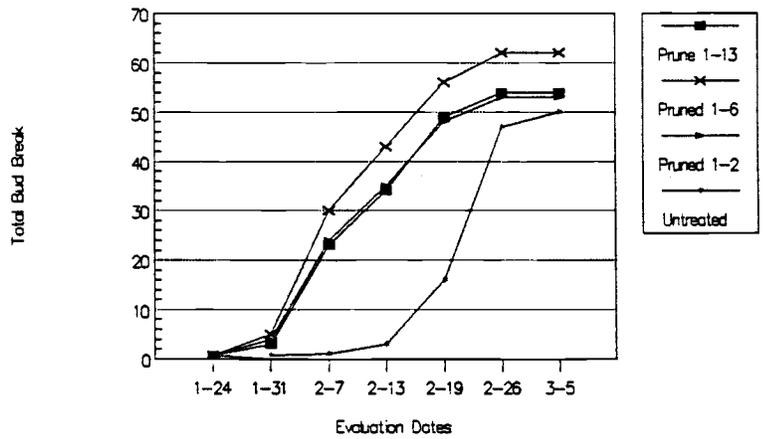
# PERLETTE GRAPES

January 13, 1986 Application



# FLAME SEEDLESS GRAPES

January 13, 1986 Application



# THOMPSON SEEDLESS GRAPES

January 13, 1986 Application

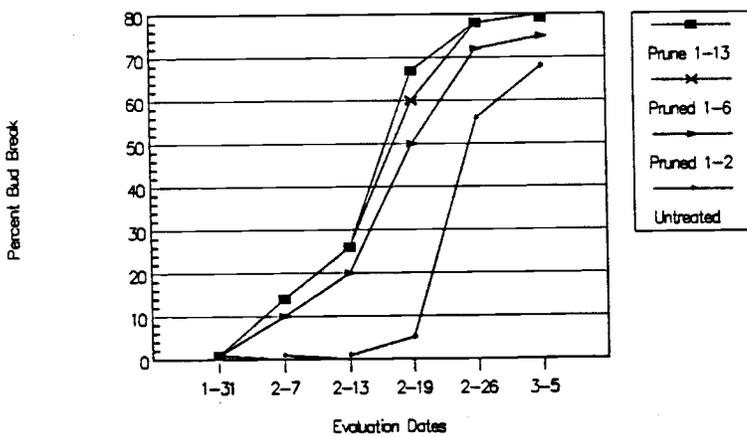
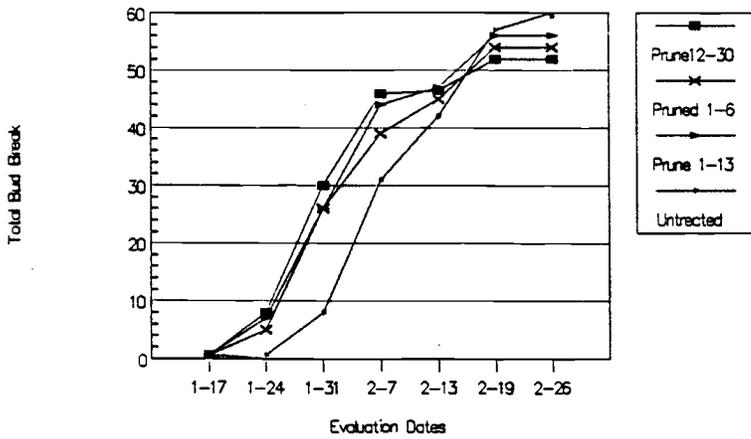


Figure 1. Bud break through time for vines pruned on various dates before application of hydrogen cyanamide.

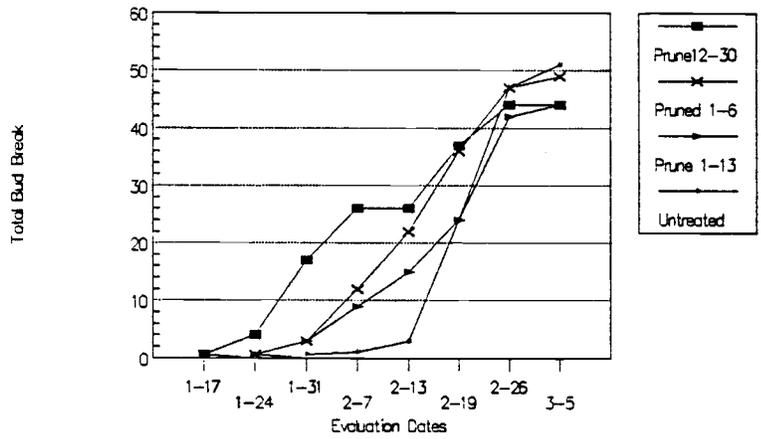
# PERLETTE GRAPES

December 30, 1985 Application



# FLAME SEEDLESS GRAPES

December 30, 1985 Application



# THOMPSON SEEDLESS GRAPES

December 30, 1985 Application

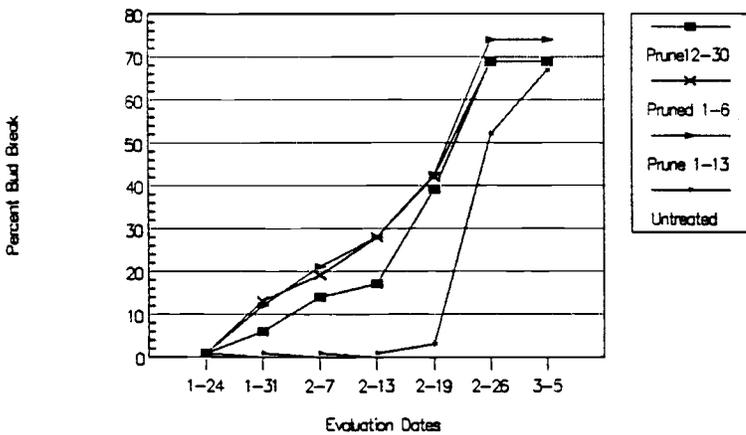
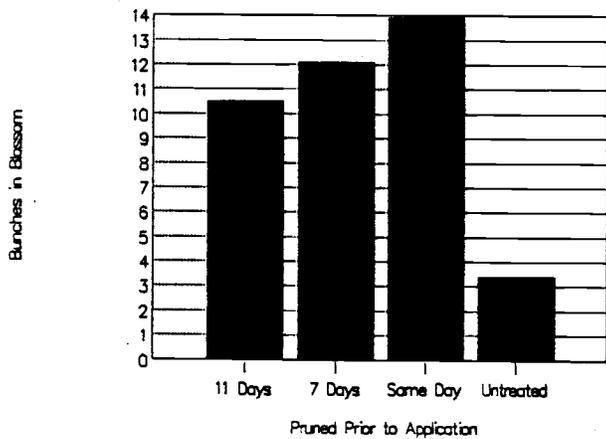


Figure 2. Bud break through time for vines pruned on various dates after application of hydrogen cyanamide.

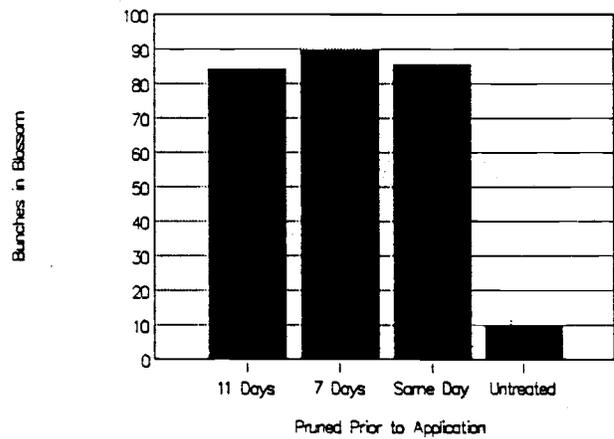
### PERLETTE GRAPES

March 20, 1986 Evaluation



### FLAME SEEDLESS GRAPES

March 26, 1986 Evaluation



### THOMPSON SEEDLESS GRAPES

March 26, 1986 Evaluation

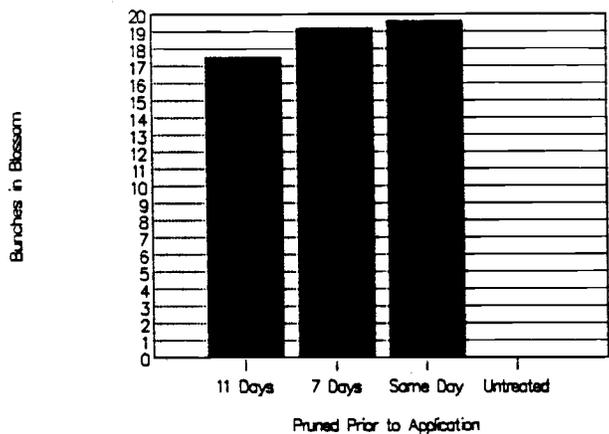
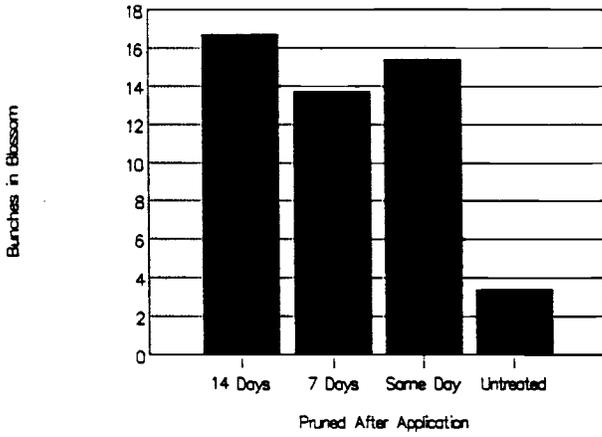


Figure 3. Blossom data for vines pruned on various dates before application of hydrogen cyanamide.

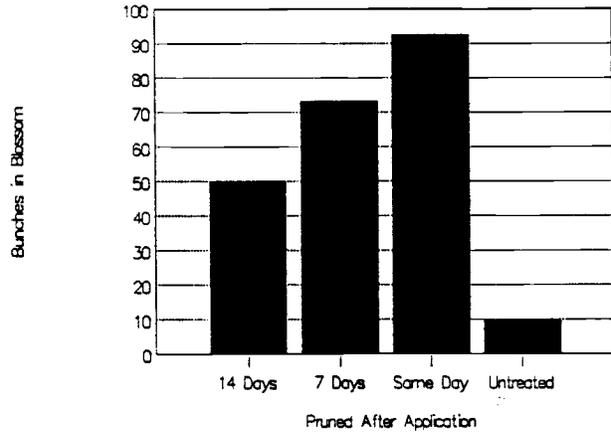
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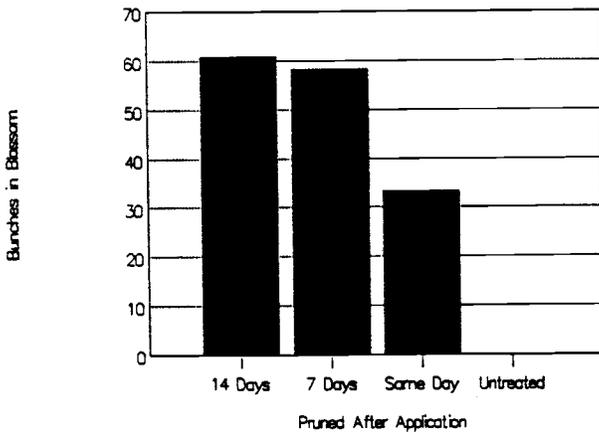


Figure 4. Blossom data for vines pruned on various dates after application of hydrogen cyanamide.