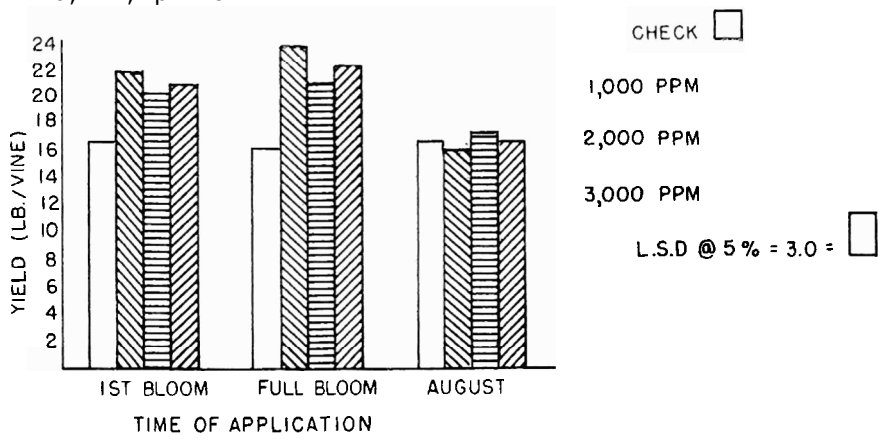

Time of Application X Concentration Interaction

Use of Alar on Concord Grapes

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ALAR (succinamic acid, 2, 2-dimethylhydrazide) is a new growth-regulating chemical that has been used successfully on some horticultural crops such as chrysanthemums and apples. Recently, Alar was registered for use on Concord grapes. Since Concord grapes are a major processing crop in Arkansas, a study was conducted in 1969 to determine if Alar would increase yields of Concord grapes or influence juice quality under Arkansas conditions.

This study was carried out in the experimental vineyards at the Main Experiment Station. Single-vine plots of uniform vigor were selected, based on pruning weights in the previous year. Alar was applied as a spray solution at concentrations of O (non-treated), 1,000, 2,000, and 3,000 ppm. The vines were covered with the spray to the point of drip. Applications were made: (1) when the first cluster began to bloom; (2) at full bloom (50 to 60% of the clusters blooming); and on August 4 (5 weeks before harvest). Treatments were replicated 9 times.

At harvest, the fruit from each plot was weighed. Representative clusters were selected and frozen immediately after harvest for quality determinations. Dormant, 1-year pruning weights were obtained to determine the effects of the treatments on vine vigor.

Yields were recorded as pounds of fruit per vine (see chart). The time of application x concentration interaction for yield indicated that all Alar treatments increased yields over the non-treated check when applied at first-bloom and full-bloom, but they had no effect on yield when applied as a post-bloom spray in early August. Concentrations of 2,000 or 3,000 ppm did not increase yield more than the concentration of 1,000 ppm did.

The increase in yield from all concentrations of Alar was a direct result of significant increase in the number of fruit set per cluster (Table 1). The data show also that all concentrations of Alar reduced berry size. However, in terms of yield the increased number of berries per cluster offset the reduced berry size. Vine vigor expressed as weight of 1-year prunings was reduced by Alar applications of 2,000 and 3,000 ppm. This reduction was due largely to a shortening of the internodes.

Alar had no effect on juice acidity (Table 2), but all concentrations of Alar resulted in a slight decrease in soluble solids in the juice. The percent transmittance of light through juice (5 ml diluted to 100 ml) at a wave-length of 520 mu, and the Hunter Color Difference Meter value "L" as determined on the juice (20 ml diluted to 100 ml), indicated a significant reduction in color intensity at concentrations of 2,000 to 3,000 ppm of Alar. This reduction in color intensity could be the result of a decrease in the percent of ripe fruit per cluster (as measured by the percent of ripe berries per cluster by weight). Alar applications of 1,000 ppm did not result in a significant decrease in percent of ripe berries. It is possible that the Alar-treated berries would have developed a higher percentage of soluble solids and a more intense color if they had been allowed to remain longer on the vine.

It appears that an application of Alar between first-bloom and full-bloom at a concentration of 1,000 ppm is sufficient to obtain the desired yield increase, and that higher concentrations result in undesirable effects on quality or retard maturation.

This study will be repeated in 1970 using lower concentrations of Alar and early and late harvests in order to provide better understanding of the influence of Alar on fruit maturation.

Table 1. Effect of Alar on Number of Berries per Cluster, Size of Berries, and Pruning Weight of Concord Grapes, 1969

Alar treatments	No. of berries per cluster	Weight of 10 berries (gm)	Pruning weight (lb/vine)
Check	40.6	34.2	5.4
1,000 ppm	52.8	31.8	4.8
2,000 ppm	62.0	31.1	3.4
3,000 ppm	64.6	30.9	3.8
L.S.D. at 5%, *; 1%, **	8.2**	2.3*	1.1**

Table 2. Effect of Alar on Quality of Concord Grapes, 1969

Alar treatments	Acidity[1]	% soluble solids	% trans-mittance[2]	Color CDM,[3] "L"	% ripe berries (by wgt)
Check	10.4	16.5	62	8.8	97.8
1,000 ppm	10.2	15.7	70	9.8	94.3
2,000 ppm	10.0	15.5	73	10.9	90.6
3,000 ppm	10.0	15.3	72	11.3	89.9
L.S.D. at 5%, *; 1%, **	N.S.	.8*	5**	1.6**	4.5**

[1]Milliliters of 1/10 N NaOH to neutralize acid in 10 ml of juice.
[2]520 mu (the higher the figure, the lighter the color).
[3]Hunter Color Difference Meter "L" values using the standard L, 91.8; a, 1.6; b, 1.6.

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