

Effects of Applying Alar between First and Full Bloom, and Time of Harvest, on Fruiting Characteristics, Pruning Weight, Fruit Ripening, and Juice Quality of Concord Grapes (Means of 9 Replications) 1970

Measure	Alar treatment (ppm)			F value	LSD @5%	Time of harvest			F value	LSD @5%	
	-0	500	750			1,000	Early (Aug. 17)	Mid Late (Aug. 24)			(Sept. 1)
	Mean of 3 harvest dates						Mean of 4 treatments				
Yield (lb/vine)	18.2	20.3	21.1	23.6	3.31 *	3	.522.3	20.0	20.1	1.51	N.S.
Berry weight (grams)	2.7	2.5	2.4	2.3	11.13 **	0.2	2.4	2.5	2.5	2.38	N.S.
Berries/cluster (no.)	46	58.0	68.0	71.0	30.65 **	6.0	58.0	62.0	62.0	1.72	N.S.
Cluster weight (grams)	132	154.0	162.0	166.0	10.52 **	13.0	142.0	162.0	156.0	6.28 **	12.0
Cluster length (inches)	4.5	4.6	4.7	4.9	3.06 *	0.2	4.6	4.8	4.6	4.28*	0.2
Cluster width (inches)	2.8	3.2	3.4	3.4	25.38 **	0.2	3.0	3.4	3.2	14.25**	0.1
Pruning weight (lb/vine)	3.2	2.8	2.3	2.0	4.15**	0.7	2.7	2.5	2.6	0.11	N.S.
% fruit ripe by weight	97.0	96.0	92.0	93.0	5.46 **	3	93.0	95.0	96.0	3.88* ¹	3
% soluble solids	14:3	13.9	13.4	13.1	7.67 **	0.5	13.1	13.3	14.6	25.00**	0.5
T@520 nml	46.0	55.0	61	65.0	15.85 **	6	60.0	59.0	50.0	8.84 **	5
pH of juice	3.6	3.7	3.6	3.6	0.50	N.S.	3.4	3.8	3.7	20.83**	0.1
Titrateable acidity ²	9.7	9.4	9.6	9.4	0.89	N.S.	8.5	10.4	9.6	39.18**	0.4

¹The lower the transmittance, the darker the juice.

²Milliliters of 0.1 N NaOH required to neutralize 10 ml

• Significant at 5 percent; » • Significant at 1

Further Studies on Alar Use on Grapes

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GRAPES ARE an important Arkansas fruit crop. Concord (*Vitis labrusca L.*) is the most widely grown cultivar in the area ranging north from the Arkansas River Valley, and most of its production is utilized by the processing industry.

Research in other regions has shown that Alar (succinamic acid-2,2-dimethylhydrazide) retards vine growth and increases yields of Concord grapes. A 3-year study was started in 1969 in experimental vineyards at the Main Experiment Station to determine if Alar would influence production, growth, and quality of 'Concord' grapes in Arkansas. A report of progress in the first year was published in 1970 (Vol. 19, No. 2, of Arkansas Farm Research).

Vines treated with Alar in 1969 were again sprayed in 1970 and 1971. In these years, Alar was applied as a dilute spray solution at concentrations of 0 (not sprayed), 500, 750, and 1,000 ppm. The entire vines were wetted to the point of drip. All applications were made between first and full bloom (50 to 60 percent of clusters blooming designated as full bloom). Three harvests were established as early, mid, and late with reference to commercial harvest in the vineyard.

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harvest for quality analysis. One-year prunings removed from each vine were weighed to determine treatment effects on vine growth.

Application of Alar at 1,000 ppm in 1970 resulted in a significant increase in yield (see table), amounting to 5.4 lb/vine or nearly 1.5 tons/acre (544 vines/acre). As in 1969, yield increases were directly related to increases in berry set. Alar application did not increase set, and as a result did not increase yields, in 1971.

Treatment with Alar at all concentrations in 1970 resulted in a significant reduction in berry weight. A similar but nonsignificant trend existed in 1969. This change in size probably was a direct result of increased fruit set. Effects on fruit set as related to total production were apparently greater than on berry size, since application of Alar also resulted in greater cluster weight, length, and width in 1970. Cluster weight, length, and width reached a maximum at the middle harvest and then declined.

Applying Alar at rates of 750 ppm or higher significantly reduced vegetative growth in 1970, as shown by pruning weights. Similar results were seen in 1969 and 1971.

In 1970 fruit from treated vines was less ripe than from nontreated vines (percent ripe by weight). Probably as a direct result of this, percent soluble solids was lower in juice from treated

samples. Treatment with Alar also resulted in lighter juice color. Alar did not affect pH or titrateable acidity. Similar effects on juice quality were seen in 1969, but Alar did not affect these parameters of juice quality in 1971.

Delaying harvest in 1970 partially overcame the retarded ripening related to Alar. The Alar-induced retardation of ripening is probably a result of the heavier fruit load on treated vines, rather than a direct effect of the chemical itself, since Alar has been shown to stimulate color development in other crops. When the crop load is increased, there is a greater demand on the vine to produce adequate sugars and pigments for uniform ripening. This theory is supported by the fact that Alar did not affect fruit set or yields in 1971, and neither did it affect ripening.

Results of this study indicate two possible uses of Alar for Concord grape producers in Arkansas. Applying the compound at 1,000 ppm between first and full bloom may result in a significant increase in yield, especially in years when natural fruit set is poor. Also, Alar has been shown to limit vegetative growth, which may be of significance where vines are extremely vigorous. Rates and timing of Alar application required for the latter effect appear to coincide with those outlined for improving production. Additional work will be required to determine if use of Alar necessitates changing pruning guidelines.

Though Alar has been shown to retard ripening, results of this study indicate that this will not occur if yields are not increased. There appears to be little danger that Alar might fail to increase production and yet lower juice quality in the same year.