

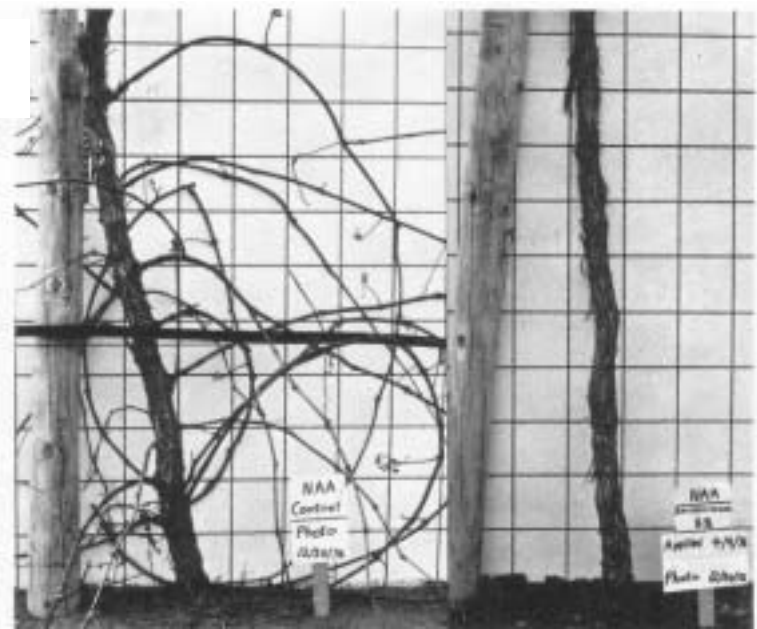
REMOVAL of suckers from grapevine trunks during the growing season is labor consuming, especially in vigorous vineyards. Naphthalene acetic acid (NAA) has been used successfully to control shoot production near pruning cuts, as well as unwanted sprout growth on several species of tropical and deciduous fruits. This study determined the effect of trunk applications of NAA on sucker production, yield, vine growth, and juice quality of 'Concord' grapes.

NAA was applied at concentrations of 0, 2, 4, and 8 percent to the trunk of 10-year-old Geneva Double Curtain trained 'Concord' grapevines on April 9, 1976, when shoot growth on trunks ranged from dormant buds to 1 cm length. Suckers had been removed manually from test vines each year before the study began. The experiment was designed as a randomized block with 16 replications.

Sucker control on the trunks was monitored for three seasons following NAA application, and yield and vine size were determined at the end of the first growing season. Fruit samples were collected at harvest from each plot and immediately frozen in polyethylene bags for later juice analysis.

For juice analysis, samples were thawed and destemmed and berry weight was recorded. Samples were blended for 15 sec in a laboratory blender, % soluble solids was determined on a Bausch and Lomb refractometer, and samples were heated for 1 hr at 85° C. After pulp was separated from juice through cheesecloth, a 5-ml aliquot of juice was diluted to 100 ml with distilled water and centrifuged. Absorbance was read on a Bausch and Lomb spectrophotometer (Model 340) at 520 nm. Another 5-ml sample of juice was diluted to 125 ml with distilled water and the sample was titrated to pH 8.4 with 0.1 N NaOH to determine acidity.

Considerable numbers of suckers are produced on grapevine trunks when not controlled (see 0% NAA concentration in table) and can require a considerable amount of hand labor. NAA significantly reduced the number of suckers at all concentrations during the initial season of application.



Left: Nontreated vine showing extensive sucker development; Right: Vine sprayed April 9, 1976, with 8% spray of NAA (both photos taken Dec. 20, 1976)

Sucker Control in 'Concord' Grape Vineyards

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However, the 2% NAA concentration significantly reduced the number of suckers only during the year of application. The 4 and 8% concentrations reduced the number of suckers compared to the control for 3 consecutive years (data not shown), although reoccurrence of suckers was not completely controlled even with the 8% NAA concentration after the initial year of treatment. Control approaching 100% would be desirable to completely eliminate hand labor.

No foliar abnormalities were observed on the non-treated parts of the 10-year-old plants used in this study. Trunk applications of NAA did not affect shoots originating below the ground surface, which is advantageous since suckers are needed for trunk renewal in mature vineyards.

Crop yield, vine size (pruning weights), berry weight, percent soluble solids, acidity, and juice color were not affected by the NAA applications.

In summary, the 8% concentration applied to 'Concord' grapevine trunks near the time of bud burst completely controlled sucker production for one season without the need for hand suckering and without adverse effects on vine yields, vine size, or fruit quality. A single application of NAA at 8% significantly reduced suckering for 3 seasons, but control did not approach 100 percent after the initial season.

Although NAA controlled sucker growth for the initial season, additional research is needed to determine the effects of repeated annual applications of these rates of NAA. Also, future considerations on use of NAA must include vine age, since preliminary results of another study indicate that NAA applied to 3-year-old trunks can cause considerable damage and result in some vine death.

Number of Suckers, Yield, Vine Size, and Fruit Quality of 'Concord' Grapes in Response to Trunk Applications of NAA

Measure ¹	NAA concentration (percent)			
	0	2	4	8
Suckers (no./ha)	6458 c	3902 b	1211 a	0 a
Yield (MT/ha)	5.9 a	6.6 a	5.5 a	6.4 a
Pruning wt (kg/vine)	1.3 a	1.2 a	1.2 a	1.3 a
Berry wt (g)	3.29 a	3.23 a	3.14 a	3.12 a
Soluble solids (%)	16.2 a	16.1 a	16.5 a	17.1 a
Tartaric acid (%)	.84 a	.82 a	.82 a	.82 a
Absorbance (520 nm)	.268 a	.272 a	.297 a	.357 a

¹Means separation within rows by Duncan's multiple range test at 5 percent.

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