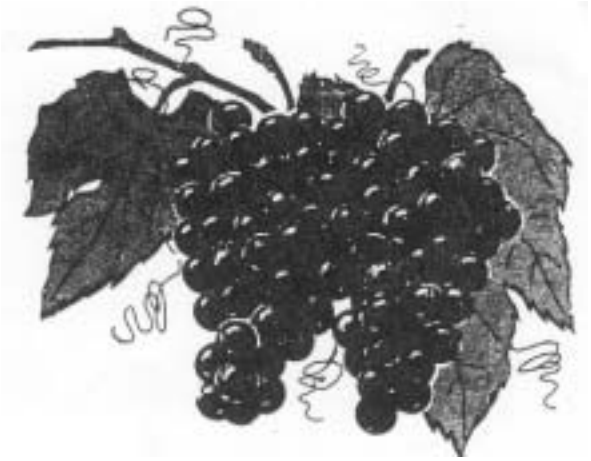

Effects of Ethephon on Maturation and Quality of 'Concord' Grapes

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In plant tissues, ethephon produces ethylene, a well-known fruit-ripening hormone. Endogenous ethylene is of questionable effect in maturation since its production rapidly declines after anthesis and remains at low levels throughout grape maturation. However, ethephon has been used successfully to improve color of many *Vitis vinifera* cultivars and to increase the rate of soluble solids accumulation. The purpose of this study was to determine the effects of ethephon on maturation of 'Concord' *Vitis labrusca* grapes.

Ethephon was applied to 21-year-old own-rooted 'Concord' grapevines in concentrations of 0, 200, 400, and 800 ppm in single applications and 0, 100, 200, and 400 ppm in two split applications. All single applications and the first part of the split application of ethephon were made 20 days before harvest, when approximately 50 percent of the berries were developing some color. The second part of the split application was made 10 days before harvest.

At harvest, fruit removal force was determined on 10 random berries from each vine using a Hunter L-500 mechanical force gauge (Hunter Spring Division, Hatfield, PA 19440). Fruit samples consisting of 3 whole basal clusters were frozen for later quality analysis.

For quality analyses, samples were thawed and blended for 15 seconds and warmed to 20°C. Soluble solids concentrations were determined with a Bausch and Lamb Abbe refractometer. After being heated for 1 hr at 85°, pulp was separated from juice with cheesecloth. A 5-ml aliquot of juice was diluted to 125 ml with distilled water, pH was recorded, and the sample was titrated to pH 8.4 with 0.1 N NaOH. Tristimulus color of the juice was determined using a Gardner Color and Color Difference meter standardized to the dark red plaque with values of "L"=23.1, "a"=22.0, and "b"=7.1.

Ethephon applied 20 days before harvest, or both 20 and 10 days before harvest, had no effect on any of the quality parameters evaluated (see table). The fruit removal force was reduced by ethephon at 800 ppm applied 20 days before harvest and at 400 ppm applied both 20 and 10 days before harvest; the single application at 800 ppm was especially effective. The reduction in fruit.removal force was enough that a high wind could have removed a major portion of the fruit.

These results show that color and maturity of 'Concord' grapes were not influenced by ethephon applications under the conditions of this study, as has been reported for many *V. vinifera* cultivars.

Effect of Single and Split Ethephon Applications on Raw Product Quality and Fruit Removal Force of 'Concord' Grapes'

Ethephon concn, (ppm)	Number of applications	Soluble solids (%)	Tartaric acid (%)	CDM color				Fruit removal force (g)
				pH	L	a	b	
0	0	15.7	.85	3.73	17.4	9.9	3.6	305
200	9	16.1	.86	3.73	15.7	11.6	2.4	311
400	1	16.9	.92	3.75	14.9	11.7	1.8	293
800	1	16.1	.93	3.74	16.1	11.3	2.7	144
100	2	16.7	.86	3.74	13.9	11.4	1.4	335
200	2	15.4	.86	3.74	19.5	10.2	4.2	291
400	2	15.0	.85	3.74	18.1	10.8	3.5	249
LSD @ 5%		NS	NS	NS	NS	NS	NS	51

'Single applications and first split applications applied 20 days before harvest (approx. 50% of berries showing some color development). The second split application was applied 10 days prior to harvest.