

Quality of 'Concord' Grape Juice As Affected by Cultural Methods

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GRAPES are the most important small fruit crop in Arkansas. Most of the production is centered in Northwest Arkansas and is comprised primarily of 'Concord', which is used by the nonfermented juice industry. Quality of 'Concord' grapes grown in Arkansas can be a problem. Because of warm temperatures during maturation, characteristic of southern-growing areas, fruit have less acids and poorer color than 'Concord' grapes grown in the north. Soluble solids content may also be lower in years with unfavorable climatic conditions or when too high a fruit load is placed on the vines.

Fruit in the study of new training and pruning methods described on the facing page was used in this quality analysis. Fruit samples were collected in early September each year and immediately frozen in polyethylene bags. At time of analysis, samples were thawed and blended for 15 seconds and the percent soluble solids was determined. Samples then were cooked for 1 hour at 85°C and cooled, and pulp was removed by straining the samples through two layers of coarse cheesecloth.

A 5 ml aliquot of juice was diluted to 100 ml using distilled water and centrifuged for 30 minutes at 4,000 rpm. Optical density was read on the centrifuged samples at 520 nm. Another 5 ml aliquot of juice was diluted to 125 ml using distilled water and titrated to pH 7 with N/10 NaOH. Acidity is reported as percent tartaric acid.

Percent soluble solids decreased as the pruning severity decreased (see table). Acidity was not affected by pruning severity but color was poorer, as indicated by lower O.D. values with light pruning. The percent of green fruit per cluster was slightly lower at 30 + 10 and 50 + 10 than at 70 + 10 severity.

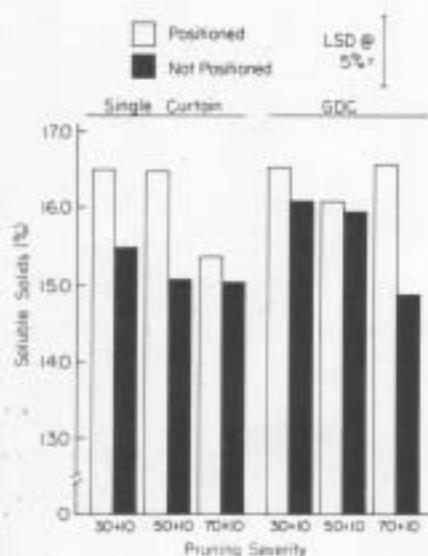
The number of nodes per bearing unit had no effect on soluble solids, acidity, color, or percent of green fruit, even though there was a considerable yield increase when vines were pruned to longer canes (see other article). Geneva Double Curtain (GDC) training increased soluble solids by 0.4%, but did not affect acids, color, or percent green fruit. When vines were shoot positioned (positioning new shoots vertically toward the vineyard floor), soluble solids were 0.8% higher, color was better, and a smaller percentage of fruit were green.

There was an interaction of pruning severity x training systems x shoot positioning on percent soluble solids (see figure). Shoot positioning significantly increased percent soluble solids on the single-curtain training system at the 30 + 10 and 50 + 10 severities. However, using a 70 + 10 pruning level on a vine trained to the single-curtain trellis with only 2.4 meters of cordon produced such a mass of foliage that shoot positioning could not alleviate the shading problem.

Percent soluble solids of fruit from vines trained to the GDC system, which has nearly 5 meters of total cordon space, was not improved by shoot positioning until the light pruning level was used. Fruit from shoot-positioned, GDC-trained vines pruned at a 70 + 10 level was as high in soluble solids as fruit from vines pruned at a 30 + 10 severity on a single-curtain trellis without shoot positioning.

The GDC training system and shoot positioning, which are practices new to the Ozark region, will improve fruit quality. These new training techniques may allow the use of a lighter pruning level than the 30 + 10 currently recommended, thereby increasing yields without at the same time sacrificing juice quality. Further evaluations will be made.

**Quality of 'Concord' Grape Juice as Affected by
Pruning Severity, Nodes per Bearing Unit, Training System,
Shoot Positioning, and Year**



Interactive effects of pruning severity x training systems x shoot positioning. (Means pooled over nodes/bearing unit and years.)

Main effects ¹	Soluble solids, %	Tartaric acid, %	O.D. at 520 nm ²	Green by count, % ³
Pruning severity				
30 + 10	16.1	.74	.40	1.2
50 + 10	15.9	.72	.27	0.8
70 + 10	15.5	.73	.24	2.3
LSD at 5%	0.5	NS	.03	0.8
Nodes/bearing unit				
3	15.8	.74	.27	1.8
6	15.8	.73	.27	1.4
9	15.9	.73	.27	1.2
LSD at 5%	NS	NS	NS	NS
Training system				
GDC	16.0	.73	.28	1.5
Single curtain	15.6	.73	.26	1.4
LSD at 5%	0.4	NS	NS	NS
Shoot positioning				
Positioned	16.2	.73	.28	0.8
Not positioned	15.4	.74	.26	2.1
LSD at 5%	0.4	NS	.02	0.7
Years				
1974	15.5	.76	.27	1.3
1975	16.1	.71	.27	1.6
LSD at 5%	0.4	.02	NS	NS

¹Means within main effect blocks are pooled over all other variables.

²Optical density at 520 nm based on 5 ml juice diluted with distilled water to 100 ml and centrifuged.

³Percent of berries per cluster that were totally green.