

## Effect of Cluster Thinning, Berry Thinning, and Gibberellin Application on Fruit Yield and Quality of 'Reliance' and 'Swenson Red' Grape

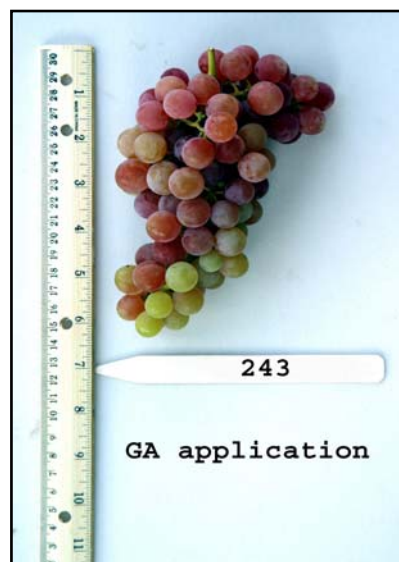
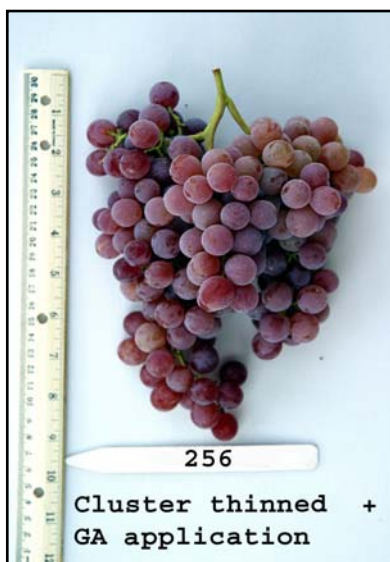
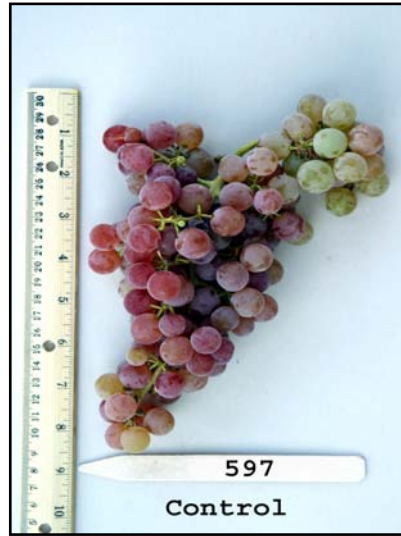
*Jill Crozier, Gail Nonnecke and Paul Domoto  
Department of Horticulture, Iowa State University, Ames, IA*

Two studies were conducted on mature 'Reliance' (seedless type) and 'Swenson Red' (seeded type) vines located at the Iowa State University Horticulture Research Station. For each cultivar vines were selected for uniformity. In the 'Swenson Red' seeded table grape experiment, treatments included all combinations of plus or minus cluster thinning in combination with removing 0, 1/3, or 1/2 of the cluster (berry thinning). Treatments were arranged as a randomized complete block design and replicated 5 times in 2002 and 4 times in 2003. In the 'Reliance' seedless table grape experiment, the treatments included all combination of plus or minus cluster thinning; removing 0, 1/3 or 1/2 of the cluster, and plus or minus a 50 ppm GA<sub>3</sub> application. Treatments were arranged in a randomized complete block design and replicated 4 times in 2002 and 2003. Cluster thinning on 'Swenson Red' was done prior to bloom while on 'Reliance' it was done after bloom. For both cultivars berry thinning was done after shatter. For 'Reliance', the GA<sub>3</sub> treatment was applied when the average berry diameter had reached the 4-5 mm range. For both cultivars, normal cultural practices, including shoot positioning and pest control were carried out during the season. Consumers (n=168) rated the cluster and berry attractiveness at farmer's markets and CSAs by completing a formal survey, 2003.

At harvest, the number of clusters per vine and yield per vine were recorded. From the clusters harvested a sub-sample of 54 berries per vine was randomly selected to determine average berry weight and size. Maturity was determined by total soluble solids, pH, and total titratable acids.

**Table 1. Consumer preference of 'Reliance' grapes at farmer's markets and CSAs (n= 168), (CT = cluster thinned, BT = Berry thinned, GA = gibberellin application) (preliminary analysis).**

<b>Ranked preference of whole cluster</b>	<b>Treatment</b>	<b>Picture no. (See attached photo)</b>
1 <sup>st</sup>	CT and GA	256
2 <sup>nd</sup>	CT and BT and GA	419
3 <sup>rd</sup>	CT only	362
4 <sup>th</sup>	GA only	243
5 <sup>th</sup>	BT only	188
6 <sup>th</sup>	Control	597
<b>Ranked preference of berry size</b>	<b>Treatment</b>	<b>Picture no. (See attached photo)</b>
1 <sup>st</sup>	Ct and BT and GA	419
2 <sup>nd</sup>	CT and GA	256
3 <sup>rd</sup>	CT only	362
4 <sup>th</sup>	BT only	188
5 <sup>th</sup>	GA only	243
6 <sup>th</sup>	Control	597



**Table 2. The effect of cluster thinning and berry thinning on the yield and quality of ‘Swenson Red’ seeded table grapes (preliminary analysis), 2003.**

Treatment	Clusters/ vine		Yield/ vine (lbs)		Berry wt. (g)		Berry caliper		pH		Total Soluble solids (%)		Total titratable acidity	
	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
<b>Cluster thin:</b>														
<b>No berry thin</b>	62.40	29.50	13.68	6.15	3.71	3.05	17.92	17.06	3.83	3.34	20.06	20.41	0.449	0.445
<b>1/3 removed</b>	54.00	29.75	10.50	7.22	3.72	3.73	17.74	17.68	3.90	3.43	19.77	20.98	0.450	0.455
<b>1/2 removed</b>	57.20	34.25	10.20	7.05	3.85	3.55	18.34	17.35	3.82	3.46	19.83	20.64	0.444	0.425
<b>No cluster thin:</b>														
<b>No berry thin</b>	91.20	39.25	16.86	8.35	3.26	3.60	17.24	17.67	3.83	3.45	18.20	19.56	0.446	0.410
<b>1/3 removed</b>	100.60	49.25	20.00	11.13	3.82	3.23	18.14	19.56	3.97	3.46	19.65	20.88	0.470	0.424
<b>1/2 removed</b>	103.60	57.00	17.88	12.18	3.55	3.52	17.80	17.58	3.78	3.39	19.47	20.70	0.461	0.467
<sup>y</sup> <b>LSD p ≤ 0.05</b>	31.21	27.11	7.32	NS	0.39	0.50	0.81	NS	NS	NS	NS	NS	NS	NS

<sup>z</sup> Means of five replications<sup>y</sup> LSD= Least Significant Difference

**Table 3. The effect of cluster thinning and berry thinning on the yield and quality of 'Reliance' seeded table grapes (preliminary analysis), 2003.**

Treatment		Clusters/ vine		Yield/ vine (lbs)		Berry wt. (g)		Berry caliper		pH		Total Soluble solids (%)		Total titratable acidity	
		2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
Berry <u>thin</u>	GA <u>appl.</u>														
+ Cluster thin															
+	-	36.00	15.50	2.80	5.83	2.30	2.48	14.89	15.44	2.95	3.01	18.63	21.35	0.0437	0.36
-	-	42.50	10.75	3.93	3.93	1.95	2.78	14.40	15.56	2.89	3.09	16.06	21.23	0.431	0.40
+	+	33.50	14.25	0.72	7.35	2.13	3.72	14.69	17.48	2.99	3.11	15.95	21.38	0.41	0.37
-	+	29.50	14.00	0.45	7.43	1.32	2.93	12.86	16.81	2.88	3.00	16.03	21.91	0.521	0.40
- No cluster thin															
+	-	56.00	17.00	5.56	5.63	2.65	2.83	15.70	16.73	2.94	3.14	18.48	21.78	0.428	0.38
-	-	68.50	10.75	11.45	4.38	2.70	2.74	15.62	16.45	2.93	3.06	16.81	21.03	0.432	0.38
+	+	67.64	10.00	9.10	5.20	2.36	3.27	14.03	16.64	3.09	3.06	18.45	20.59	0.402	0.38
-	+	57.50	6.75	5.07	3.05	2.31	2.85	14.92	16.30	2.92	2.96	16.21	20.31	0.467	0.40
<sup>y</sup> LSD p≤ 0.05		20.96	7.91	3.02	4.17	0.09	0.55	2.29	0.92	0.13	NS	3.70	1.19	NS	NS

<sup>z</sup> Means of five replications<sup>y</sup> LSD= Least Significant Difference