

Demonstration Vineyard for Seedless Table Grapes for Cool Climates

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This project was designed to evaluate the suitability of seedless table grape varieties for production in a USDA Zone-5 climate. This will require multiple years of observation and assessment, particularly with regard to winter hardiness. The project also seeks to develop information for growers on best-management practices for growing table grapes in our climate successfully. Once the vines are fully established, demonstration of canopy management, cluster thinning, cane girdling, and other treatments can commence. These trails will be guided by work done in other cold-climate grape production areas, such as Minnesota, Michigan, and New York.

Significant interest among consumers in seedless table grape consumption, coupled with the availability of many new cultivars with increased winter hardiness, has prompted the need for this type of evaluation. Many tree-fruit growers have expressed interest in learning more about viticulture, which makes the inclusion of this project at the UMass Cold Springs Orchard Research & Education Center especially appropriate. Growers are encouraged to visit any time of year to look at the vines and fruit. Growers throughout New England have expressed a high degree of interest in this vineyard and UMass Cold Spring Orchard Store customers have been very receptive to

Table 1. Table grape vineyard layout* and winter injury evaluations. Planting includes 12 cultivars, 12 vines of each. There are three vine replications between line posts spaced 6 feet in the row and 12 feet between rows, with three rows.^z

<i>Field & Woods</i>	Concord (2.58)^y	Kyoho	Reliance - L^x	<i>Cold Springs Rd.</i>
	Jupiter (2.75)	Himrod	Lakemont - S	
	Venus (0.33)	Canadice	Mars - M	
	Neptune (2.75)	Marquis	Vanessa - M	
	Marquis (0.83)	Venus	Neptune - S/T	
	Kyoho (0.00)	Mars	Mars - M	
	Concord (2.58)	Reliance	Lakemont - S	
	Neptune (2.75)	Vanessa	Vanessa - M	
	Reliance (2.33)	Lakemont	Kyoho - T	
	Vanessa (2.25)	Jupiter	Venus - S	
	Jupiter (2.75)	Lakemont	Canadice - S	
	Venus (0.33)	Kyoho	Marquis - M/S	
Himrod (1.67)	Himrod	Concord - M/S		
Canadice (2.22)	Neptune	Himrod - M		
Lakemont (2.67)	Concord	Jupiter - L		
Mars (2.92)	Marquis	Reliance - L		

^z Detailed descriptions of these cultivars can be found at: <http://www.msue.msu.edu/msue/imp/modfr/26429701.html> or <http://www.nysaes.cornell.edu/hort/faculty/reisch/bulletin/table/>

^y Summer evaluation 0=dead, 1=almost dead, 2=damaged but alive, 3=no damage

^x Winter evaluation L=light, M=moderate, S=severe, T=toast.

Table 2. Fruit characteristics in 2005.

Variety	First Harvest	°Brix*	Cluster weight (lbs)	Yield/vine (lbs)	Comments
Lakemont	8/26	18.5-20.0	0.27	3.67	Very low yield but excellent flavor and crisp texture. Yield may improve as vines become stronger. High level of winter injury in 2004-05.
Vanessa	8/26	17.5-19.0	0.22	8.15	Low yield but superior flavor and crisp melting texture. Customer favorite. Yield may improve as vines mature. Moderate winter injury in 2004-05.
Venus	8/26	16-18	0.48	5.80	Low yield, attractive fruit in tight, compact clusters. Flavor good. High level of winter injury over two winters.
Canadice	8/29	19-20	0.25	8.33	Low to moderate yield. Flavor excellent, slip skin. Yield may improve as vines mature. High level of winter injury over two winters.
Reliance	8/29	18.5-20.5	0.32	8.25	Low yield. Flavor excellent, similar to Vanessa. Crisp melting texture. Popular with customers. Yield should improve with vine maturity. High level of winter injury in 2004-05. Also should improve with vine maturity.
Himrod	8/29	18.2-19.5	0.22	2.75	Low yield. Good flavor. Only two surviving vines. Too few to evaluate effectively.
Marquis	9/6	18	0.57	8.5	Moderate yield. Large clusters with good to excellent flavor. Popular with customers. Shows bruising from stink bug stings.
Mars	9/6	17	0.25-0.33	10	Good yield. Slip skin, Concord type flavor. Sparse clusters in 2005 as compared with compact clusters in 2004. Could be too much vegetative vigor. May try cane girdling in 2006.
Neptune	9/15	21	1.00	18	Yield high, large attractive clusters. Need cluster thinning and/or brushing to lessen cluster compactness. Also, significant damage from stink bugs.
Jupiter	9/15	15-16	0.36	12	Good yield. Small well formed clusters. Many with seeds. Good flavor.

* °Brix was determined with a hand refractometer.

the crop.

In the spring of 2002, 12 vines each of 12 different seedless cultivars were planted (See Table 1 for list of cultivars.). Grow tubes were placed on the vines for the first 3 months to accelerate growth and protect young vines from herbicide applications or deer browsing. Cold winter temperatures set back some vines, but most were trained to a Four-arm Kniffen system during the summer of 2003. The trellis was installed in 2004. No fruit was allowed to set in 2003 so roots and trunks could more fully develop. Routine fertilizer and pesticide applications were made according to recommendations from the *NY/PA Pest Management Guidelines for Grapes*. Again severe winter temperatures set many vines back, requiring some to be replaced. Winter injury ratings were made in the winter and following summer and are represented in column one of Table 1. Among the cultivars that withstood the extreme cold the best were Mars, Jupiter, Lakemont and Concord. The cultivars most damaged by winter injury were Kyoho, Venus, Marquis, and Interlaken. Canadice, Himrod, Neptune, Vanessa, and Reliance had moderate levels of injury.

Results in 2004

Fruit were allowed to set on some vines in 2004. Routine fertilizer and pesticide applications were made according to recommendations from the *NY/PA Pest Management Guidelines for Grapes*. Never-the-less, some fruit injury from Grape Berry Moth was noted during harvest. Fruit were harvested weekly from mid September to mid October and sold at the UMass Cold Spring Orchard Store. The most fruit was harvested from Mars (approx 120 lbs). Approximately 60 lbs of Vanessa were harvested and very well received. Concord also produced enough fruit to harvest for sale. Other cultivars, such as Neptune, Lakemont, Canadice and Himrod only produced small quantities of fruit in 2004.

Results in 2005

Again, routine fertilizer and pesticide applications were made according to recommendations from the *NY/PA Pest Management Guidelines for Grapes*. In addition, Isomate GBM Plus mating disruption ties

were deployed for grape berry moth. No berry moth damage was noted at harvest time.

In 2005, fruit were harvested from early varieties (Lakemont, Vanessa, and Venus) on August 26. The next harvest date was August 29, when fruit from Canadice, Reliance, and Himrod were harvested. Harvest of midseason varieties started on September 6 through September 12. These varieties included Marquis and Mars. Harvest of late-season varieties was on September 16. These varieties included Neptune, Jupiter, and Concord Seedless. A summary of harvest data can be found in Table 2. Very little bird damage or cracking was observed in the grapes this year. A Bird Gard Pro™ unit was in use during the ripening and harvest period.

Future plans include continued work with these varieties to demonstrate recommended pruning, trellising and canopy management practices. Many vines will be converted from the current Four-arm Kniffen system they are trained to, to a High Cordon training system or Vertical Shoot Positioned system, depending on the cultivar. Those with a more trailing habit will be pruned to a High Cordon, and those with a more erect habit will be trained to the Vertical Shoot Positioned system. This will improve canopy efficiency and ripening conditions and will facilitate harvesting. The Four-arm Kniffen system generated too much shoot growth at low levels of the canopy which led to either an overly dense canopy if the shoots were trained up with catch wires, or interfered with mowing if allowed to grow untrained.

As we learn more about these cultivars, additional vines may be planted of the most successful ones to increase the amount available for sale through the UMass Cold Spring Orchard Store.

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Special Note

Please see this article on the UMass Fruit Advisor (<http://www.umass.edu/fruitadvisor/>) for color pictures of discussed varieties.





Figure 1. 'Vanessa' seedless table grape fruit in 2004



Figure 2. 'Neptune' seedless table grape fruit in 2004

2005 Harvest Photos



'Venus' (Arkansas)



'Marquis' (New York)



