

Replicated Seedless Table Grape Cultivar Trial  
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A study was initiated in 2005 to look at the possibility of growing seedless, fresh market table grapes (*Vitis labrusca*) in the northern Piedmont of North Carolina. Research done on these grapes is scant and to my knowledge, no one has grown these grapes on a commercial scale in the NC Piedmont.

A local specialty crop grower, Doreathy Booth, who farms north of Oxford, was looking for a high value horticultural crop that she could gain additional income from. I suggested that she take a look at seedless table grapes, since no one was growing them locally. I thought it would be a high-value horticultural crop that could be added to her crop mix of blackberries and blueberries.

I, along with Theresa Nartea, Extension Specialist with A&T, applied for an Innovative Program Grant, sponsored by NC A&T State University. Doreathy received the grant for \$15,000, which paid for the cost of the trellis wire and electric fence around the one-acre perimeter to control the deer, and labor. Her out of pocket expenses included the grapevines, trellis posts, bamboo stakes, irrigation system, grow-tubes, mulch, fertilizer, herbicides, and insecticides, which amounted to about \$10,000.

I decided to put out a replicated cultivar trial on her farm, consisting of 14 different table grapes on one acre, which were varieties from the breeding programs at Cornell University and the University of Arkansas to see what cultivars would perform best in the Piedmont. This consisted of planting 360 vines on one acre. A randomized complete block design with 5 plants per plot and 5 replications was used. Vines were spaced 10 feet between vines in the row and 10 feet between rows and were planted on May 18, 2005 in a clay loam soil. So, the Innovative Program Grant featured a new crop, coupled with applied research.

During 2005 and 2006, the vines were trained and pruned to prepare for a first harvest in 2007. Despite a freeze on Easter weekend in 2007, which killed the primary buds, the secondary buds emerged and produced a crop of 909 lbs. actual yield on the entire acre. In 2008, hail destroyed most of the grape crop so yield data was not taken. In 2009, 2,100 lbs. actual yield was harvested from the trial.

## **Trial Cultivar Descriptions (comments adapted from Dr. Bruce Reisch, Grape Breeder, Cornell University)**

Grape breeders have responded to consumer preferences for seedless grapes with the development of numerous improved varieties. The seedless trait in grapes was originally derived from cultivars of ancient origin such as Thompson Seedless and Black Monukka. Most seedless grapes suitable for the eastern United States are descended from crosses with these two cultivars.

Because the trait originated in cultivars not suitable for surviving the cold temperatures of New York winters, many seedless varieties are not sufficiently winter hardy in New York, although they are much hardier than their seedless parents. More recently named seedless cultivars such as Canadice, Einset Seedless, Reliance, and Vanessa represent a distinct improvement in cold hardiness. Breeding programs in New York, Ontario, Arkansas, and elsewhere continue to produce seedless selections with improved hardiness and quality.

A wide range of flavors and appearances are available among the seedless table grapes. *Vitis labrusca* is the parent species of many of the flavorful eastern grapes. Fruit of *V. labrusca* have a pronounced fruity, some say “foxy” flavor. Since North Carolina has warmer winters than the Northeastern United States, these cultivars should perform excellent in our climate.

Berry color is usually classified as white, red, blue, or black. White grapes usually range in color from light green to amber or light orange. Red varieties may vary from pink to deep red and their coloration may vary with degree of ripeness and exposure of fruit to sunlight. The blue range includes types that have a reddish-blue color. Black grapes are typified by a dark purplish-black color.

The degree of seedlessness varies greatly among seedless grape varieties. Most seedless grapes have vestigial seed traces that range in size from very small to large and noticeable. Seed traces in berries of the same variety may vary greatly in size and in the hardness of seed coats. Climate is also known to affect seed trace size. Occasionally the seed traces in some seedless grapes are large enough to be bothersome to consumers.

## **Trial Cultivar Descriptions (most are New York varieties, except for Arkansas and Canada varieties, as noted).**

### **White Grapes**

**Marquis**, a cross of Athens x Emerald Seedless, released in 1996, is a white seedless grape with excellent mild American flavor. The berries are large, often 3.5-5.0 grams/berry, with a juicy, melting texture. Clusters are large and attractive, while the vines are very productive. Ripens in Oxford (NC) from August 2 – 10. Ripe fruit holds well on the vine, with the flavors going from a mild fruity flavor when first ripe, to a stronger labrusca flavor two weeks later. Vines are very vigorous and productive.

**Himrod**, produced from a cross between Ontario and Thompson Seedless, is the most successful table grape released from the Cornell University grape breeding program (1952). It produces large bunches of white seedless grapes with excellent, honey-like flavor and melting, juicy texture. The clusters are loosely filled (cluster weight = 0.36 lb., berry weight = 2.1g). Ripens in Oxford July 20 – 27.

**Lakemont**, was also produced from the same cross as Himrod but has a milder flavor and more compact clusters of small to medium-sized berries. Cluster thinning prevents overcropping (cluster weight = 0.48lb., berry weight = 1.7g). Ripens in Oxford July 26 – August 3.

**Interlaken** is a sister seedling of Himrod (same parents) with seedless green to golden berries. The clusters are medium sized and compact with small, white berries that ripen very early. Cluster weight = 0.27lb., berry weight = 1.5g. Harvest was not taken in 2007 due to the vines not being planted until 2006.

### **Red Grapes**

**Einset Seedless**, resulted from the cross of ‘Fredonia’ x ‘Canner’ (‘Hunisa’ x ‘Sultanina’) made in 1963 by G.W. Remaily. The berries are oval and bright red with a light waxy bloom (powdery covering on the fruit). The medium soft seed remnant is not usually noticeable. Berries are medium sized (cluster weight = 0.32 lb., berry weight = 2.3g). The skin is slightly tough and adheres to the tender flesh. The flavor is fruity with a mild note of labrusca and sweet strawberry-like taste. Ripens in Oxford July 20 – 26.

**Vanessa** was developed by the Horticultural Research Institute of Ontario, Canada, and is a red dessert grape of excellent quality. The seed remnant is usually large and soft when noticeable. Berries are medium in size on medium, well-filled clusters. The flavor is mild and fruity, and berry texture is firm to crisp. The fruit quality is among the best of the red seedless types. Ripens in Oxford July 20 – 27.

**Canadice** produces medium, excessively compact clusters with small red berries (cluster weight = 0.50lb., berry weight = 1.6g). Ripens in Oxford July 26.

**Reliance** comes from the University of Arkansas, and produces large clusters of round, red, medium-sized berries. The skin is tender, and the flesh is melting in texture, with a sweet labrusca flavor. Cold hardiness is among the highest of the seedless varieties (cluster weight = 0.62lb., berry weight = 2.3 grams). No harvest was taken in 2007 due to vines not being planted until 2006.

**Suffolk Red** produces medium to large clusters of mild-flavored red berries. The clusters are loose (cluster weight = 0.32lb., berry weight = 2.7g). Ripens in Oxford on August 10.

**Blue Grapes**

**Mars** is a release from the University of Arkansas, and is a vigorous, blue seedless grape. The flavor is mildly labrusca and the berries are slipskin (having a tough skin which separates readily from the pulpy flesh). Clusters are medium-sized, cylindrical, and well filled. A very high-yielding cultivar (cluster weight = 0.40lb., berry weight = 3g. It has a long ripening season from July 27 to August 10 in Oxford.

**Venus**, also from the University of Arkansas, is a vigorous and productive blue-black grape. The medium-large clusters produce large berries with mild labrusca flavors. Cluster weight = 0.60 lb. Berry weight = 2.9g. Seed traces may be noticeable. Ripens from July 20 – August 3 in Oxford.

**Glenora** produces medium-sized blue berries. An excellent flavorful seedless variety. Ripens in Oxford from July 20 -27.

**Jupiter** was released from the University of Arkansas in 1998. It is an early maturing reddish-blue to blue variety when mature. It has large, firm, non-slipskin berries on medium-sized clusters. Fruit has a distinct Muscat flavor. Cluster weight = 0.5lb., berry weight = 5g. Ripens from July 20 – 27 in Oxford.

**Concord Seedless** is similar in flavor and texture to Concord. The clusters and berries are much smaller than those of Concord. Ripens August 10 in Oxford. Productivity is erratic, due to its uneven ripening under hot temperatures.

**Seedless Table Grape Cultivar Trial  
Angels Nest Farm, Oxford, NC**

Cultivar	Yield(lbs./Acre) <sup>1</sup>		%Sugar	Harvest Dates
	<u>2007</u>	<u>2009</u>		
Mars	4329a	11954a	17	7/27, 8/2, 8/10
Marquis	4295a	4341 b	18	8/2, 8/10
Venus	1972 b	4344 b	18	7/20, 7/27, 8/3
Jupiter	1686 b	1795 b	19	7/20, 7/26
Lakemont	970 b	4256 b	20	7/26, 8/3
Glenora	705 b	2450 b	19	7/20, 7/27
Einset	668 b	3228 b	17	7/20, 7/26
Canadice	559 b	1847 b	18	7/26
Vanessa	503 b	3668 b	21	7/20/7/27
Concord Seedless	341 b	-----	19	8/10
Suffolk Red	250 b	1064 b	22	8/10
Himrod	241 b	1536 b	17	7/20, 7/27
Reliance	-----	-----	---	-----
Interlaken	-----	-----	---	-----

<sup>1</sup>Yields with the same letter within columns are not statistically significant, Duncan’s Multiple Range Test, .05 level.

The actual yield from each row is extrapolated to come up with yield per acre.

Jupiter's yields did not increase much in 2009 due to severe pressure from a raccoon that devoured them until he was finally trapped. Marquis' yield only increased slightly due to the heavy leaf canopy it produces, creating a humid environment around the fruit, enhanced by heavy rains, which also made it difficult to spray on a timely basis. The thick canopy held moisture without fungicide protection and the Marquis variety developed sour rot, a fungus disease, which rotted many grapes in the cluster.

Concord Seedless was taken out of the trial in 2009 because of the actual presence of seeds and its uneven ripening characteristics. Reliance and Interlaken were taken out because of many missing vines. These varieties were not planted until 2006 and never became fully established.

Vines were purchased from:

Double A Vineyards, 10277 Christy Road, Fredonia, NY 14063

North Carolina State University does not endorse Double A Vineyards. It is just listed as a source and undoubtedly, there are other suitable sources of grape vines.

#### Vineyard Establishment Costs

Installation of deer fence, grape trellis, and labor	\$15,000.00
Bamboo stakes	121.00
Fiberglass stakes	462.00
Drip Irrigation pump, pipe hookups, faucets	2,340.00
Grape Vines	2,460.00
Snap and grow tubes	1,462.00
Tapener guns to attach vines to trellis	133.00
Fungicides	540.00
Round-Up for 3 years	387.00
Vegetable Wash	49.00
Protective Gear for Spraying	214.00
Grape Lugs for Harvesting	308.00
Fertilizer	234.00
Private Pesticide Applicator License	6.00
Marking spray for vine placement	11.00
Grass seed for row middles	358.00
Diesel fuel	200.00
Gasoline for lawn mower	210.00
Reflective tape to exclude birds	108.00
Labor (800 hours, 3 people)	-----
Other irrigation installation help	<u>1,000.00</u>
Total	\$25,603.00