

**Department of Agriculture, Trade and Consumer Protection**  
**Division of Agricultural Development**  
**Agricultural Development & Diversification Program (ADD)**  
**Grant Project Final Report**

Contract Number: 22039

Grant Project Title: Table Grape Trials for Fresh Market Production

Amount of Funding Awarded: \$22,500

Name of Principal Contact Person: Judith Reith-Rozelle

Organization: Board of Regents of the University of Wisconsin

WEB Address: <http://www.ars.wisc.edu/>

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1) Original Intent of the Grant:

The primary purpose of the proposal was to implement a field trial of new seedless table grape cultivars in Southwest Wisconsin's - Zone 4/5 for fresh market production. Interest in grape production has been rapidly growing in Wisconsin for the last ten years. Trials have been implemented on a very limited basis for determining wine and juice grape cultivars, but not seedless table grapes. The study evaluated 15 cultivars of table grapes for cold hardiness. Table grape production in Wisconsin can help increase the profitability for the fresh market growers on existing land, and will prove to be an incentive for new producers, and increase the competitive edge for imported table grapes for CSAs in Wisconsin.

Our main goal was to trial at least fifteen seedless table grape cultivars to determine if any would be hardy in Wisconsin. We hope to begin the evaluations to find seedless red and white grapes that would be more marketable for the fresh market growers. There are two seedless grapes that are hardy in the state but both are "Concord" or "slipskin" grapes that are not generally palatable to the consumers in Wisconsin. Our ultimate goal was to find at least five of the fifteen that would have the following characteristics: relatively disease resistant, over-winter, break bud later in spring than some cultivars, and develop ripe fruit that taste good during Wisconsin's short growing season.

The significance of this crop for farm market growers, CSAs and small road-side stand growers is dual fold. Seedless table grapes are a high value crop. Per acre income can be more than many other fruit crops in Wisconsin and general agricultural row crops. Once established grapes are a long-lived crop, and can live for more than 25 years in some cases. Seedless table grape production has been limited by the few cultivars available for growers to plant. Determining if any additional cultivars are hardy in the state would increase what fresh market, road-side stands, and CSA growers have as "locally grown" fruit to add to their market baskets. Also, determining a grape ripening sequence that could add weeks to the fresh production of grapes would expand the sales for these growers.

The opportunity to diversity Wisconsin's agricultural by increasing the production of table grapes is of great interest to farmers seeking to add value to land production. And by increasing the interest in locally grown foods, consumers will seek other "Wisconsin Grown" fruits and vegetables.

## 2) Steps Taken to Reach the Goal Established in Grant Application:

The first action taken to begin the project establishing contacts with a local wine owner to discuss interest in the project and to find local support from the grape industry. Meetings were held in 2006 and 2007 to develop an action plan that would secure funding for research and to expand the interest in grape growing to farmers and growers across the state.

A grant was written and secured from DATCP and we began to implement a five year plan for seedless grape production at the West Madison Ag. Research Station.

Through Mr. Coquard at Wollersheim Winery we secured vines for 15 cultivars of seedless table grapes. Zone hardiness ranged from Zone 4 to Zone 6. Six red, five white and four blue grape cultivars were chosen to be included in the trial. The ripening time ranged from early to late so a long period of harvest for fresh market production would be more economically feasible for growers.

In May of 2007 a plot 50' x 120' was established at the station. The area to be planted was in a heavy sod cover. We used a sod cutter and removed strips of sod that were 24 inches wide and 120 feet long. The soil within these strips was then tilled deeply so as to develop a deep soil base for the root development of the vines.

The plants arrived in late May and were placed in cold storage until planting area was prepared and all chance of frost had passed. (Attachment #1, Cultivar List, includes overall ratings for diseases and insect resistant from breeders).

A trellising system was installed directly after plot preparation. Poles used for trellising were 4 inches around x 8 feet tall and were made of Western Red Cedar. Red Cedar was used so that organic growing conditions could be followed if possible. Treated poles are not allowed in organic systems so our choice was the cedar. Poles were placed at 21 foot intervals, along the 120 feet of trellising. High tensile wire was strung across the poles and secured at each end of the grape trellising by 5 inch x 8 feet poles. The first wire was placed at 32 inches from soil and two more wires were strung at 12 inches intervals up the post. We eventually found we had to place an additional wire on the trellising due to upright training systems that the majority of the table grapes required for best growth.

On June 5 of 2007, all grape vines were placed in containers and soaked over-night before planting. June 6, all vines were planted in the pre-prepared plot. Rebars were set in the ground next to each grape vine to provide the support for strong, healthy trunk development. The rebars were all six feet long. Each was pounded into the ground to a level of four feet above ground.

The design for the planting was established following the general rule for planting either wine or table grapes. Vines were spaced seven feet apart within the rows and nine feet apart between rows. Three rows 120 feet long were established. This spacing allows for small tractors to maneuver through the vines for spraying for disease and insect prevention, and for mowing grass that was established between the grape trellising. Wollersheim Winery staff visited the trial site several times during the summer of 2007 – 2008 to provide technical assistance and training for WMARS staff and student interns.

All plants were irrigated through-out the summer if less than one acre inch of rain was received during the growing period. Weather conditions were monitored using a Vantage PRO weather station, which recorded rain,

During the first year of growth we had tremendously vigorous plant development. Each vine was secured to the wires and rebars, and allowed to grow upright for the whole growing seasons. Grape vines need to develop straight trunks when young. Straight trunks are stronger, lead to fewer problems during winter fluctuating temperatures, and the stress of heavy fruit loads. All cultivars were monitored for insect and disease development. A spray plan was established and implemented. Organic compounds were used for the first 2 months (See attachment #2, 2008 Insect and Disease Ratings at WMARS).

We found that the spacing worked well, planting techniques and irrigation provided for healthy growth and very strong development for first year establishment. The trellising was strong and provided the needed support for the heavy growth. We did need to add an additional wire. The post should have been a foot longer and we could have established the fourth wire in the beginning.

The first fall we mulched all of the soil around all vines with ground alfalfa, as suggested in the publication "Winter Injury to Grapevines and Methods of Protection" by Michigan State University. We found this was not something we would do in the future with new plantings. The alfalfa was compressed by the heavy snows we had during the winter of 2007 – 2008. Due to the compaction of the mulch, the soil stayed cold too long into the spring and a mold began to grow in the mulch. We had to remove the mulch and spray the trunks of all vines with a fungicide to control the mold.

We sprayed all vines during the summer of 2007 with an organic fungicide and used an organic insecticide for Japanese Beetles. The sprays worked well the first year. The fungal and insect pressure was minimal due to a drier year and fewer beetles.

All fruit clusters were removed during the 2007 – 2008 growing season. Removal of fruit enhances the development of root systems for all grape vines. Strong, healthy root development is essential to overwintering capabilities.

During the spring of 2008 buds broke early due to a very early warm spell and an early May frost. We lost all buds on plants except the Seedless Concord. Plants grew from the trunks and reestablished very quickly. (See attachment #3, 2008 Winter/Frost Damage Injury)

Our first biggest challenge was a possible herbicide. During the 2007 growing season we had five of the cultivars hit by drift from what was suspected to be Roundup. We could not verify this, but all of the symptoms pointed to drift from an herbicide. We had to replant selections within these cultivars and severely prune the remaining plants. Those cultivars struggled to regain health and vigor and reach the growth pace of the other ten cultivars. The summer of 2009 each has begun to establish hardy, strong growth, and we have begun to develop strong cordons.

The second biggest challenge we faced was an infestation of Japanese Beetles during the second growing season – 2008. Thousands of beetles invaded the vineyard in mid-July. The organic compound did not control new infestations. It did kill the insects on the plant, but new flights of beetles were constantly arriving and devouring the leaves of most selections. We found that those cultivars that were derived from crosses with concord grapes had few if any beetles. The cultivar 'Concord Seedless' had no problems with Japanese Beetles. We attributed this to the leaf texture of species of concords, which is very rugous.

During the 2007 – 2008 trial period the assistant superintendent of the station/ project manager met with grape growers and began to work toward forming a Wisconsin Grape Growers Association (WGGA). The assistant superintendent now serves on the board of the WGGA as an Ex-Officio Member. Part of the impetus for the meetings and the growing interaction with grape growers and wineries across the state was due to the publicity generated by the grant, and the excitement that growers felt in knowing that the University was beginning to develop a program for grape trials and possible research on wine grapes.

In the fall of 2007 and spring of 2008, work began to develop a research trial on wine grapes and the Peninsular, Spooner and West Madison Research Stations. This work was the result of the interest garnered through the table grape project. The Dean of the College of Ag and Life Sciences began the discussion to develop the program and was open to a grant being submitted for the research on wine grapes.

The Wisconsin Fruit and Vegetable Growers Association (WFVGA) requested that the assistant superintendent speak at the January 2009, conference and present a program on the Seedless Table Grape Project and the newly emerging Wine Grape Research Program at the three research stations. Over 90 participants were in attendance for the whole three day grape section of the WFVG conference.

The assistant superintendent and the WGGa also developed a Spring Vineyard School that was held at Wollersheim Winery in April of 2009, as part of the outreach program for the grape project. The attendance for this program was over 100 grape growers, vintners and farmers seeking information on grape growing and the grape industry in Wisconsin.

### 3) What We Were Able to Accomplish:

Fifteen cultivars of seedless table grapes were planted, trellising developed, and strong cordon development established. Winter injury data, summer growth development, veraison/periderm (Veraison/periderm is the term used to describe the level of dormancy that each vine has reached in late fall. Vines need to reach 90 to 100 % veraison before hard frost.) Development tracked in late summer and fall for all fifteen cultivars (See Attached # 4 Periderm development, 2009).

An overall understanding of what cultivars that are more disease tolerant, insect prone, and periderm development and bud acclimation for the selected cultivars has been collected and data recorded for the summers of 2007 and 2008. Winter hardiness has been collected for two winters, and time of bud break, which is important in the early spring. Early bud break can lead to loss of all buds on plants if a late frost occurs.

Most cultivars overwintered very well. Five were behind due to growth problems from previous year due to possible herbicide injury (See Attached # 5, Winter Injury 2009). Grape vines are growing very strong, heavy flower clusters set on all selections this year. Nine of the cultivars had tremendously heavy fruit set – Saturn, Somerset Seedless, Trollhaugen, Vanessa, Einset, Mars, and Concord Seedless (Concord is used as standard for other cultivars), (See Attached # 6, Fruit Set 2009). Third summer development of the vines is progressing well. Ninety percent of all flower clusters were removed in spring of 2009. Root development is still compromised by heavy fruit set. In 2010 numbers of fruit clusters will be pruned to normal production levels for market production.

### 4) Conclusions Gathered Based through Project Work:

At this point we can state positively that there are nine of the cultivars that have overwintered well, during the winters of 2008 - 2009. The plants are very strong, and would be producing an abundance of fruit if not thinned for the season. By the end of the growing season in 2009, we will also know which cultivars will ripen before frost and how each will taste, given Wisconsin's growing season.

We do know that Concord Seedless, Saturn, Venassa, Canadice, Somerset Seedless, Trollhaugen, Mars, Einset, and Venus are ones we are watching very closely, and from data and observation may be those that will be recommended for growing in Wisconsin. We are still questioning, Glenora, Interlaken, Lakemont, Venus, Reliance and Marquis. Lakemont and Interlaken are growing well and have some fruit development this year. We would like to evaluate these for at least two more years before making any definitive statement. They are Zone 6 grapes so we are unsure of their development in future years. Venus, Reliance, Marquis, and Glenora were damaged in 2007 by an unknown pesticide so are only beginning to grow well, develop strong cordons and set a few fruit.

Given one or two more years, we will be in a position to release a list of cultivars we have trialed, that overwintered well and produce fruit that meet market standards for seedless table grapes.

We are garnering knowledge on all cultivars as to which are less disease prone and have fewer insect problems. We see great differences in the *Vitis vinifera* and *Vitis labrusca*, and French-American hybrids. The *vinifera* vines are less prone to diseases and Japanese Beetles. However, they are more susceptible to sulfur toxicity and thus are more problematic when sprays are needed.

The grape industry in Wisconsin is a rapidly growing agricultural industry. The future of the table and wine grape crops as a viable income for farmers is more evident. And "conventional" farmers are beginning to see the possibility of grapes as an added value crop to supplement their traditional farming crop income.

5) What do you plan to do in the future as a result of this project?

We will be continuing the evaluation for winter hardiness, disease and insect resistance, production quality, harvest periods, training of student interns, and continuing with outreach programs to spread the knowledge we are gaining related to all selections of grapes. We will evaluate the fruit all cultivars for brix, the percent of soluble solids present in grape juice. This measure is an indicator of the sweetness of the grapes, which indicate the ripening time for each cultivar.

We also plan to add a few more seedless table grape cultivars as they are released from breeding programs and as we learn more about additional cultivars on the market. Replacement of any cultivars that are not winter hardy, with new ones that may be more so will be ongoing to keep the program active and useful to farmers in the future.

We will be presenting information at conferences and on our field days related to the data collected.

We will continue to work with the WGGGA and provide outreach programs on the production of seedless table grapes. And continue to feature the trial at our outreach gardens at WMARS.

6) What information or additional resources are needed to commercially develop this enterprise?

A few more years of funding for a project manager would be very helpful. Two or three years from now, or in 2011 we can begin to make strong recommendations for the cultivars we find hardy, taste good, are disease and insect resistant, and holds well for market production.

7) How should the agricultural industry use the results from your grant project?

In another year, the agricultural industry may begin to plant a limited selection of the seedless table grapes that we have determined hardy for Wisconsin. Wisconsin Grape Growers Association will be releasing some of the information. A few of the more adventurous farmers could begin to plant a few of the French-American hybrids that we see as overwintering well and do small trials of their own.

Seedless Table Grapes - Table # 1 Overall Ratings and Characteristics

Cultivar Name	Color	USDA Hardiness Zone	Harvest Season	Growth Habit	Vigor	Suggested Training System	Susceptibility to:				
							Black Rot	Downy Mildew	Powdery Mildew	Botrytis	Sulfur Sensitivity
Canadice	Red	5	Early	Semi-upright	Medium Vigor	Mid Wire Cordon	High	Low	Low	Medium	No
Concord Seedless	Blue	4	Mid	Trailing	Vigorous	Top Wire Cordon	Medium	Low	Medium	Medium	Yes
Einset	Red	5	Early	Semi-Upright	Vigorous	Mid Wire Cordon	High	Medium	High	Low	?
Glenora	Blue	6	Mid	Upright	Vigorous	Mid Wire Cordon	Medium	Medium	High	Low	?
Himrod	White	5	Early	Semi-upright	Vigorous	Mid Wire Cordon	High	Low	Medium	Low	No
Interlaken	White	6	Early	Semi-upright	Medium Vigor	Mid Wire Cordon	High	Low	High	Medium	No
Lakemont	White	6	Early	Semi-upright	Medium Vigor	Mid Wire Cordon	Medium	Low	Medium	Medium	No
Marquis	White	5	Mid	Semi-Trailing	Medium Vigor	Mid Wire Cordon	Medium	Medium	Medium	Low	?
Mars	Blue	5	Mid	Trailing	Vigorous	Mid Wire Cordon	Low	Low	Low	Low	?
Reliance	Red	5	Early	Trailing	Medium Vigor	Mid Wire Cordon	High	Medium	Medium	High	?
Saturn	Red	4 ~ 5	Mid-Late		Medium Vigor		Medium	Medium	Medium	Medium	?
Trollhaugen	Blue	Hardy to -30F									
Vanessa	Red	5	Early	Trailing	Medium Vigor	Mid Wire Cordon	High	Medium	Medium	Low	?
Venus	Blue	5	Early	Semi-Trailing	Vigorous	Mid Wire Cordon	Low	Medium	Low	High	?

Information for Insect Resistance - Table 2a Grape Trial West Madison Agriculture Research Station

Cultivar Name	Color	USDA Hardiness Zone	Japanese Beetles	Asian Lady Beetles	Vigor	Suggested Training System	Downy Mildew	Powdery Mildew	Botrytis	Sulfur Sensitivity
Canadice	Red	5	---	***	Medium Vigor	Mid Wire Cordon	Medium	Low	Medium	No
Concord Seedless	Blue	4	+++	***	Vigorous	Top Wire Cordon	Low	Medium	Medium	Yes
Einset	Red	5	-	***	Vigorous	Mid Wire Cordon	medium	High	Low	?
Glenora	Blue	6	---	***	Vigorous	Mid Wire Cordon	Medium	High	Low	?
Himrod	White	5	---	***	Vigorous	Mid Wire Cordon	Low	Medium	Low	No
Interflaken	White	6	---	***	Medium Vigor	Mid Wire Cordon	Low	High	Medium	No
Lakemont	White	6	---	***	Medium Vigor	Mid Wire Cordon	Low	Medium	Medium	No
Marquis	White	5	---	***	Medium Vigor	Mid Wire Cordon	Medium	Medium	Low	?
Mars	Blue	5	+++	***	Vigorous	Mid Wire Cordon	Low	Low	Low	?
Reliance	Red	5	++	***	Medium Vigor	Mid Wire Cordon	Medium	Medium	High	?
Satum	Red	4 ~ 5	---	***	Medium Vigor		Medium	Medium	Medium	?
Somererset Seedless	White	4	-	***		Top Wire Cordon	?	?	?	?
Trollhaugen	Blue	Hardy to -30f	+++	***						
Vanessa	Red	5	+	***	Medium Vigor	Mid Wire Cordon	Medium	Medium	Low	?
Venus	Blue	5	+	***	Vigorous	Mid Wire Cordon	Medium	Low	High	?

+++ (Few Japanese Beetles on plants and little damage

++(More Japanese Beetles and some damage, but not at threshold that destroyed leaves)

+(30% more and needed to spray and leaf damage very noticable

- (Beetle damage on all leaves - sprayed several times

--(Fairly sever damage and very hard to control

---(Sever damage - hundreds of beetles on leaves and organic sprays every few days

\*\*\* Very few due to fruit removed this year.

DISEASES - Black Rot was not seen on leaves and since fruit was removed we did not have Black Rot to monitor on fruit.

Information for Insect Resistance - Table 2B Grape Trial West Madison Agriculture Research Station

Cultivar Name	Color	USDA Hardiness Zone	Japanese Beetles	Asian Lady Beetles	Vigor	Suggested Training System	Susceptibility to:					Sulfur Sensitivity
							Black Rot	Downy Mildew	Powdery Mildew	Botrytis		
Canadice	Red	5	---	***	Medium Vigor	Mid Wire Cordon	High	Low	Low	Medium	Medium	No
Concord Seedless	Blue	4	+++	***	Vigorous	Top Wire Cordon	Medium	Low	Low	Medium	Medium	Yes
Einset	Red	5	-	***	Vigorous	Mid Wire Cordon	High	Medium	High	High	Low	?
Glenora	Blue	6	---	***	Vigorous	Mid Wire Cordon	Medium	Medium	High	High	Low	?
Himrod	White	5	---	***	Vigorous	Mid Wire Cordon	High	Low	Medium	High	Low	No
Interlaken	White	6	---	***	Medium Vigor	Mid Wire Cordon	High	Low	High	High	Low	No
Lakemont	White	6	---	***	Medium Vigor	Mid Wire Cordon	Medium	Low	Low	Medium	Medium	No
Marquis	White	5	---	***	Medium Vigor	Mid Wire Cordon	Medium	Medium	Medium	Medium	Low	?
Mars	Blue	5	+++	***	Vigorous	Mid Wire Cordon	Low	Low	Low	Low	Low	?
Reliance	Red	5	++	***	Medium Vigor	Mid Wire Cordon	High	Medium	Medium	High	High	?
Saturn	Red	4 ~ 5	---	***	Medium Vigor	Mid Wire Cordon	Medium	Medium	Medium	Medium	Medium	?
Somerset Seedless	White	4	-	***	Medium Vigor	Top Wire Cordon	?	?	?	?	?	?
Trollhaugen	Blue	Hardy to -30F	++	***	Medium Vigor	Mid Wire Cordon	High	Medium	Medium	Medium	Medium	?
Vanessa	Red	5	+	***	Medium Vigor	Mid Wire Cordon	Low	Medium	Medium	Low	Low	?
Venus	Blue	5	+	***	Vigorous	Mid Wire Cordon	Low	Medium	Low	High	High	?

+++ (Few Japanese Beetles on plants and little damage)  
 ++(More Japanese Beetles and some damage, but not at threshold that destroyed leaves)  
 +(30% more and needed to spray and leaf damage very noticable)  
 - (Beetle damage on all leaves - sprayed several times)  
 ~ (Fairly sever damage and very hard to control)  
 — (Sever damage - hundreds of beetles on leaves and organic sprays every few days)

\*\*\* Very few due to fruit removed this year.

Table 3 Grape Trial West Madison Agriculture Research Station - Bud Damage Data 2008

Cultivar Name	Color	Hardiness Zone	Live Vascular System*	Live Buds on Vine	% Bud Damage on Vines	Bud Growth at Base
Canadice	Red	5	yes	no	100	yes
Concord Seedless	Blue	4	yes	yes	25	yes
Einset	Red	5	yes	yes	25	yes
Glenora	Blue	6	yes	no	100	yes
Himrod	White	5	yes	no	100	yes
Interlaken	White	6	yes	no	100	yes
Lakemont	White	6	yes	no	100	no
Marquis	White	5	yes	no	100	yes
Mars	Blue	5	yes	yes	75	yes
Reliance	Red	5	yes	no	65	yes
Saturn	Red	4 ~ 5	yes	no	100	yes
Somerses Seedless	White	4	yes	no	100	yes
Trollhaugen	Blue	Hardy to -30F	yes	yes	25	yes
Vanessa	Red	5	yes	no	100	yes
Venus	Blue	5	yes	no	100	yes

\*Live vascular system data taken on date of pruning for 2008 April 3

TABLE 4a Periderm Development Fall of 9/26/2008

Cultivar Name	Color	USDA Hardiness Zone	Verasion of Periderm Development	Vine Development	Vigor	Vine Habit
Canadice	Red	5	90%	less vigorous	Medium Vigor	Semi-upright
Concord Seedless	Blue	4	90%	v. vigorous	Vigorous	Trailing
Einset	Red	5	50%	m. vigorous	Vigorous	Semi-upright
Glenora	Blue	6	10%	less vigorous	Vigorous	Upright
Himrod	White	5	10%	v. vigorous	Vigorous	Semi-upright
Interlaken	White	6	50%	m. vigorous	Medium Vigor	Semi-upright
Lakemont	White	6	50%	m. vigorous	Medium Vigor	Semi-upright
Marquis	White	5	10%	less vigorous	Medium Vigor	Semi-Trailing
Mars	Blue	5	90%	m. vigorous	Vigorous	Trailing
Reliance	Red	5	75%	less vigorous	Medium Vigor	Trailing
Saturn	Red	4 ~ 5	75%	less vigorous	Medium Vigor	Semi-upright
Somerset Seedless	White	4	75%	v. vigorous	Vigorous	Upright
Trollhaugen	Blue	Hardy to -30F	75%	v. vigorous	Medium Vigor	Trailing
Vanessa	Red	5	75%	less vigorous	Medium Vigor	Trailing
Venus	Blue	5	50%	less vigorous	Vigorous	Semi-Trailing

Concord Seedless used as Standard for vine development

v. vigorous - long vines and cordons growing rapidly - pruned vigorously two times during summer

m. vigorous - long vines and cordons developing, but less growth than Concord Seedless - pruned twice, second time fewer leaves

less vigorous - leaves smaller, less growth on vines and pruned once during summer

Table 4b Periderm Development Fall of 10/6/2008

Cultivar Name	Color	USDA Hardiness Zone	Verasion or Periderm Development	Vigor	Vine Habit
Canadice	Red	5	100%	Medium Vigor	Semi-upright
Concord Seedless	Blue	4	100%	Vigorous	Trailing
Einset	Red	5	75%	Vigorous	Semi-upright
Glenora	Blue	6	50%	Vigorous	Upright
Himrod	White	5	50%	Vigorous	Semi-upright
Interlaken	White	6	75%	Medium Vigor	Semi-upright
Lakemont	White	6	80%	Medium Vigor	Semi-upright
Marquis	White	5	40%	Medium Vigor	Semi-Trailing
Mars	Blue	5	100%	Vigorous	Trailing
Reliance	Red	5	90%	Medium Vigor	Trailing
Saturn	Red	4 ~ 5	90%	Medium Vigor	Semi-upright
Somerset Seedless	White	4	100%		Upright
Trollhaugen	Blue	Hardy to -30F	100%		Trailing
Vanessa	Red	5	90%	Medium Vigor	Trailing
Venus	Blue	5	75%	Vigorous	Semi-Trailing

Concord Seedless used as Standard for vine development

- v. vigorous - long vines and cordons growing rapidly - pruned vigorously two times during summer
- m. vigorous - long vines and cordons developing, but less growth than Concord Seedless
  - pruned twice, second time fewer leaves removed
- less vigorous - leaves smaller, less growth on vines and pruned once during summer

Table 5  
Table Grape Trial West Madison Agriculture Research Station - Winter Injury 2009

Cultivar Name	Color	Hardiness Zone	Live Vascular System*	Live Buds on Cordon	20-Jun-09 % Bud Damage on Vines	Bud Growth at Base
Canadice	Red	5	yes	Yes	0	yes
Concord Seedless	Blue	4	yes	yes	0	yes
Einset	Red	5	yes	yes	0	yes
Glenora	Blue	6	yes	no	75	yes
Himrod	White	5	yes	no	75	yes
Interlaken	White	6	yes	Yes	25	yes
Lakemont	White	6	yes	no	25	no
Marquis	White	5	yes	no	20	yes
Mars	Blue	5	yes	yes	0	yes
Reliance	Red	5	yes	no	80	yes
Saturn	Red	4 ~ 5	yes	no	0	yes
Somerset Seedless	White	4	yes	no	0	yes
Trollhaugen	Blue	Hardy to -30F	yes	yes	0	yes
Vanessa	Red	5	yes	no	0	yes
Venus	Blue	5	yes	no	0	yes

\*Live vascular system data taken on date of pruning for 2009 April 5

### Fruit Set 2009

Table 6			1-Jul-09
Cultivar Name	Color	Hardiness Zone	Fruit Set
Canadice	Red	5	0
Concord Seedless	Blue	4	high
Einset	Red	5	high
Glenora	Blue	6	v. low
Himrod	White	5	none
Interlaken	White	6	low
Lakemont	White	6	low
Marquis	White	5	high
Mars	Blue	5	medium
Reliance	Red	5	low
Saturn	Red	4 ~ 5	high
Somerset Seedless	White	4	high
Trollhaugen	Blue	Hardy to -30F	v high
Vanessa	Red	5	high
Venus	Blue	5	v high

Pruned off many fruit clusters to allow for good root growth