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Evaluating new, extra-hardy grape cultivars in Vermont.

SARE Farmer/Grower Grant – Final report, Winter 2005-6

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Goals

The purpose of this project was to test a series of new, extra-hardy grape cultivars for their suitability in Vermont's Champlain valley, and other areas with similar climates. Because of the time necessary to establish a vineyard and harvest fruit, the project lasted three years.

Vineyard condition

We made further plantings in 2005, and our vineyard now covers about 7 acres. We made a sizable planting of the new grape cultivar Marquette which was just released by the University of Minnesota. The variety has generated much interest among northern grape growers. The cuttings we planted in the first year of this project bore fruit in 2005, so we had enough grapes to make some good evaluations.

We removed our vines of Landot Noir after they died back to the ground in each of the first two winters.

At our farm, all of the cultivars have made extremely vigorous growth. To keep the vines in a state of balance between fruitfulness and vegetative vigor, we have changed our training system to the Geneva Double Curtain (GDC) which spreads each vine's canopy over a larger section of trellis.

Cooperators

The cooperators were Peter Hemstad, grape breeder at the University of Minnesota, and Tom Plocher, a grape grower in Minnesota who is active in continuing the legacy of the late Elmer Swenson, a private grape breeder from Wisconsin who passed away in 2004. Both Hemstad and Plocher supplied me with cuttings of the cultivars to be tested, as well as advice on rooting and growing them. In 2004, Plocher also supplied cuttings of 22 new selections from Elmer Swenson's vineyard. So there will be further results from even more grape cultivars than was

first proposed in this project, though these results will come in after the conclusion of this project.

Grape cultivars included in this trial:

Frontenac	Sabrevois	LaCrescent
Louise Swenson	Prairie Star	Somerset Seedless
LaCrosse	St Pepin	Swenson White
St Croix	Marquette	
Shannon	Alpenglow	Swenson Red
Frontenac Gris	ES 6-16-30	ES 7-11-22
Brianna	Mars	
ES 8-2-43	ES 10-18-30	Beta

Plus the 22 numbered selections from Swenson.

Activities

I rooted the cuttings on bottom heat, and planted them out in prepared beds with black plastic mulch and drip irrigation. I put a bamboo stake by each plant, and trained and tied up the new growth. I established grass sod in the aisles between the grape rows. I installed a trellis with posts and wire. The vines continued to grow well, beginning to fill out the trellis. The newly rooted cuttings are also well established. I think it is safe to say that we now have the largest collection of cold-hardy grape cultivars in the northeastern U.S. I expect that growers will be visiting to learn about these cultivars long after this project has been completed.

Observations on the cultivars

In general, these northern cultivars have lots of vegetative vigor, a trailing growth habit, are quite disease resistant compared to *Vitis vinifera* (the traditional European wine grapes), and produce grapes that are high in acid. At my farm in Vermont's Champlain Valley, where the winter minimum rarely goes below -20F, all of these grapes are perfectly hardy and can be grown with basically no concern for winter injury. Most of them are still productive after -30F, and some are hardier than that.

Detailed cultivar descriptions of most of these grapes can be found at the Minnesota Grape Growers Association website: www.mngrapes.org. so I'll just share some observations based on my own experience. Other growers may have had other results, so I'll emphasize that these are personal observations on what I have found to be the most promising cultivars.

Reds:

Frontenac is the best known of the northern grapes – a red grape, with very vigorous growth, and an in-between growth habit, starting up, then flopping over. It's extremely winter-hardy, but requires a long ripening season to bring down its high acidity. It ripened nicely in 2005 at my place with 2600 GDD, but with a season under 2500, it probably won't make it, though it does make a good, if deeply colored, rose'. It also makes an excellent port. Whether on top-wire cordon or GDC, it requires downward shoot positioning; I'm using a catchwire on swing arms to pull down the shoots on my GDC. The acidity is the big challenge, but with shoot positioning, cluster thinning, balanced pruning, a long warm autumn, malolactic fermentation, cold stabilizing, and maybe some blending, it can make a very nice red table wine. It's susceptible to powdery mildew at my place, and quite prone to foliar phylloxera. From U Minn. There's a good article on winemaking with Frontenac at <http://winegrapes.coafes.umn.edu/frontenac.html>

Sabrevois and St Croix: These are sister seedlings from Elmer Swenson for red wine. St Croix is better known, and has found a home in Connecticut where the wine has a loyal following. Both grapes have lots of vigor and big leaves; the clusters tend to get buried in the foliage. St Croix has some susceptibility to downy mildew. Sabrevois is very disease resistant and would be a good choice for an organic grower. It seems to pick up an unpleasant herbaceous flavor from the skins, but this seems to be eliminated with vigorous aeration during winemaking. It could also be made as rose', or with carbonic maceration, techniques that minimize skin contact, and overcome this problem. Both are a couple weeks earlier than Frontenac. St Croix needs snow cover for full hardiness.

Marquette. A brand-new release from U Minn, tested as MN 1211. I've tried the wine several times, and found it to be a level above the other red grapes mentioned – more complex flavor, structure, tannin, lower acid. It seems to have an open habit without an excess of foliage. It's more upright than most, so could be trained to a Vertical Shoot Positioning system (VSP), though I'm going with GDC. I like it enough to have made a significant (for me) planting. But, it's brand new; we have a lot to learn. It's also in short supply from nurseries. It's reported to be quite disease resistant.

Whites:

LaCrescent. From U Minn, it's one-quarter Muscat of Hamburg. This is another high acid grape, to be made as a somewhat sweet wine. But what a flavor! Think of Riesling, then double the fruit, and add some apricot and grapefruit. It has a strongly trailing habit, and it's fun to work with because when you position a shoot, it stays down where you put it! Prone to downy and powdery, so needs a good spray program.

Frontenac Gris. A sport of Frontenac, a reddish-gray grape that makes a white wine that's deeper in color than most, with peach flavors. Otherwise, identical to Frontenac, including high acidity, so this will be a wine with some residual sugar.

Louise Swenson. This is a favorite of Tom Plocher. Very hardy and disease resistant; another good choice for an organic grower. It has moderate acid, and makes a pleasing, if light bodied, dry white wine. Tom compares it to a Loire white. Lower vigor than the others here. I train it to a top wire, but it needs careful positioning to get the shoots growing down in an orderly way.

Swenson White. One of Swenson's earliest named grapes. Much bigger clusters and berries than most of these northern grapes. It also has moderate acid, and would make a very tasty table grape, though with seeds. I've only tasted my own wine, but I find it pleasing as another dry white. It has kind of a rangy growth habit. I put it on a top wire. It's the only grape mentioned that requires anthracnose control at my place.

Prairie Star. This is another white from Swenson, with lower acid. It has good body, to blend with whites above. I've had good results training this one to VSP, though it needs plenty of encouragement to go vertical. It might work just as well up high.

LaCrosse and Brianna, are two white wine grapes from Elmer Swenson that have found commercial success in Nebraska. LaCrosse may not be hardy enough to be grown in a climate much colder than the Champlain Valley. It can make a good white wine, in a style using oak and malolactic fermentation. Brianna is makes a fruitier white wine that has grapefruit flavors.

ES 8-2-43 and ES 10-18-30. These are extra-hardy and extra early white wine grapes from Swenson. They ripen by early September, so would be good choices for especially cold and short-season locations. I've found them to have an upright growth habit, and would train them to VSP.

Table grapes

Somerset, a seedless, pink table grape, that has done well for me. There seems to be a ready local market for a tasty seedless grape like this. I've sold mine at a price well above the price I get for wine grapes. Harvest season can be stretched from mid-August into early September. I've trained it to a top-wire.

That's my A-list, though there are many other extra-hardy northern grapes to consider. Peter Hemstad has some very promising selections coming down his pipeline. Tom Plocher is working hard to preserve and evaluate Elmer's legacy. All this puts growers in a situation similar to a computer buyer's: do you commit to what's available now, or wait for the next big thing?

Economic findings

These were my actual costs for materials to establish a vineyard (except the cost of the vines; see note):

COST TO ESTABLISH VINEYARD, NEW HAVEN, VT 2003

Per 450 foot row

Item	Unit	Price	Number	Cost
Wire	foot	\$ 0.013	900	\$ 11.70
End post	each	\$ 15.00	2	\$ 30.00
Line post	each	\$ 5.00	16	\$ 80.00
Wirelock	each	\$ 1.44	4	\$ 5.76
Earth anchor	each	\$ 5.65	2	\$ 11.30
Gripple	each	\$ 0.95	4	\$ 3.80
Concrete	bag	\$ 5.00	1	\$ 5.00
Bamboo	each	\$ 0.18	56	\$ 10.08
Plastic mulch	foot	\$ 0.025	450	\$ 11.25
Drip tube	foot	\$ 0.028	450	\$ 12.60
Grass seed	pound	\$ 1.25	15	\$ 18.75
Vines	each	\$ 3.50	56	\$ 196.00
Total per 450 foot row				\$ 396.24
Rows per acre				10
Cost per acre				\$ 3,962.40

Notes: Shorter rows would increase per acre cost because the end assemblies are the most expensive part

I did not purchase vines, but rather used cuttings donated by cooperators

This does not include labor, machine expense, soil amendments.

I used a two wire trellis. Some trellis designs use more wire.

Yield My Frontenac vines produced a harvest equal to 5 tons per acre. Some of this was from 3 year old vines which were not yet in full production. I would guess that this is a reasonable and sustainable yield. Some varieties may yield slightly less.

Return I sold my grapes to a Vermont winery for \$1500/ton. This is a higher price than hybrid grapes command in traditional wine growing areas, but the demand from wineries far exceeds the supply for Vermont grapes at this time.

Outreach In the summer of 2003, I hosted a NOFA field day, introducing these cultivars, and grape growing in general, to many gardeners and a few farmers.

On July 17, 2004 over 60 growers, and prospective growers, attended a day-long "viticulture field day" here at the vineyard. Speakers included Peter Hemstad from U. of Minnesota, and Robert Pool from Cornell. For many of those attending, this was their first look at the cultivars being tested in this trial.

Over the three years, I have had many informal visits from prospective grape growers who wanted a look at my operation.

In February 2005, I hosted a wine tasting which followed a grape growing seminar at UVM. About 25 people had the chance to taste the wine from some of these grapes, many for the first time.

In late 2005, I contributed a short chapter on these northern grape cultivars to a book on winter hardiness in grapes being edited by Mark Chien, grape extension agent from Penn State, and others.

Results I'm convinced that these grape cultivars represent a new and viable crop for northern areas. These grapes can be successfully and reliably grown in the Champlain Valley, and probably in areas with a slightly colder climate. Clearly, I have voted with a major commitment of my own resources.

But having said that, I must point out that there are obstacles to these grapes being widely and successfully grown. The long interval between planting and the first sales, much less the break-even point, limits production to people with the means and patience to wait these years. I have observed that, in many cases, this means people without farming experience who have to ascend their own learning curve as well. And many new growers, understandably, choose to plant vines on the land they already own. Some of these are not prime grape growing sites.

The relatively high price that grapes command in these new areas is helpful to growers. But even at \$1500/ton (\$.75/pound), I think that it would require several acres, expert management, careful cost control, and imaginative marketing to make grape growing a profitable enterprise.

The value of wine at retail is roughly ten times the value of the grapes that go into it. For this reason (and because of the perceived romance of being a winemaker) most new growers want to open a winery. This may well be the best decision, but it requires, of course, yet more investment, and a whole new set of technical and management skills.

But in spite of these obstacles – which apply to any new grape/wine enterprise in any location -- there certainly appear to be many successful vineyard/winery operations in many of the warmer parts of the country. With these new cultivars, there is no reason it can't happen in the north.

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