Cold Climate Variety Trial

UMass Cold Spring Orchard Research and Education Center
Belchertown, MA

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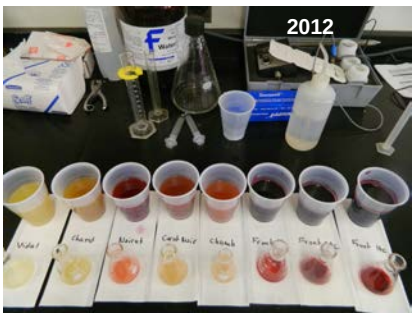
Background and Rationale: Understanding cultivar performance under a range of climate and soil conditions is needed in order for wine grape growers to make informed decisions about which cultivars to plant and how to manage them to optimize their potential under the specific conditions found in their vineyards. In order to make reliable information available to growers, an array of data characterizing vine phenology and fruit quality and yield under varying conditions is needed. This trial contributes data toward that end.

Treatments:

- 9 cold climate cultivars planted in 2008; 3 vine panels, 8 replications
  - Chambourcin (101-14)
  - Frontenac
  - St. Croix
  - Vidal (101-14)
  - Corot Noir
  - La Crescent
  - Marquette
  - Noiret (101-14)
  - Riesling (*V. vinifera*)

Methods:

- Vines planted at 8' spacing, rows at 10' spacing, trained to high cordon (except Riesling which is trained to VSP)
- Vines pruned in dormant season, pruning weight data collected (see data table).
- Bud survival, budbreak, bloom and veraison data collected (see data table).
- Standard weed, insect, disease management program used.
- Row middles mowed as needed
- Fruit harvested and harvest data collected (see data table)
- Fruit distributed to cooperating wineries for test fermentations



Results:
Marquette and Noiret showed the most vigor as measured by pruning weights collected in March 2013. Chambourcin, Corot Noir and Vidal were least vigorous, and St. Croix, La Crescent and Frontenac were intermediate (see Table 1). Bloom dates among the 8 cultivars recorded were fairly similar with Frontenac earliest and Vidal latest, but separated only by 5 days. Marquette was the earliest ripening and Vidal the latest with 22 days separating them (See Table 1.)

Table 1. Pruning weights and dates of phenological stages bloom, veraison, and harvest.

Cultivar	Pruning weight (g)	Bloom DOY[1]	Veraison DOY[1]	Harvest DOY[1]	Days from Bloom to Harvest
Marquette	3,030	158	209 209 261	261	103
Noiret	2,903	159	214	268	109
St Croix	2,259	159	214	277	118
La Crescent	1,742	158	211	263	105
Frontenac	1,551	156	211	263	107
Chambourcin	753	159	218	271	112
Corot Noir	753	159	218	268	109
Vidal	671	161	220	283	122

[1] *Julian day of the calendar year (from Jan 1)*

Frontenac, Chambourcin and St. Croix produced the highest yield, although no crop adjustments were made and the vines were allowed to produce more fruit than most commercial operations would allow (7.7, 7.4 and 6.5 T/acre respectively). Vidal, La Crescent and Marquette produced the lowest yield but within appropriate guidelines for commercial production (Table 2). Soluble solids (brix) were highest in Frontenac, Marquette, Vidal and St. Croix with Corot Noir and Chambourcin only reaching very low brix levels under 2013 growing conditions.

Table 2. Yield and fruit quality data for 8 cold climate wine grape varieties in 2013.

Cultivar	Plot Yield (KG)	Kg Per vine	Tukey HSD	KG/ row meter	Lb/ row ft	Lb/ vine	T/ acre	Clusters/ vine	Cluster wt (g)	Berry wt	brix	TA
Frontenac	37.81	12.60	a	5.2	1.4	28.2	7.7	74.4	169.5	0.82	23.5	9.6
Chambourcin	36.54	12.18	a	5.0	1.4	27.3	7.4	51.2	237.8	0.52	13.1	9.4
St Croix	31.95	10.65	ab	4.4	1.2	23.9	6.5	58.7	181.5	0.59	20.0	5.9
Corot Noir	21.27	7.09	bc	2.9	0.8	15.9	4.3	38.3	185.2		14.0	6.6
Noiret	20.98	6.99	bc	2.9	0.8	15.7	4.3	44.0	158.8		18.1	6.7
Vidal	19.84	6.61	c	2.7	0.8	14.8	4.0	44.3	149.4		20.1	8.3
La Crescent	18.01	6.00	c	2.5	0.7	13.4	3.7	57.8	103.9		19.1	4.5
Marquette	17.67	5.89	c	2.4	0.7	13.2	3.6	64.2	91.7	0.82	23.3	8.3

What the results mean:

- Marquette and Noiret pose challenges for managing vigor and achieving balance in the vines but fruit quality of Marquette is very good.
- Corot Noir showed low vigor and poor ripening in 2013, which might indicate poor suitability to growing conditions and soil characteristics of the site.

- While Vidal showed low vigor, fruit quality was good, which might indicate good suitability to growing conditions and soil characteristics of the site if higher yield can be supported through nutrient and canopy management.
- Early ripening of Marquette, La Crescent and Frontenac was driven mainly by breakdown of the fruit and poses a challenge for growers to achieve timely harvest while maintaining high fruit quality for the winery.