

NE-1020 Cold-Hardy Wine Grape Cultivar Trial

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Introduction

In conjunction with the Northeast Regional Research Project NE-1020 “Multi-state Evaluation of Wine Grape Cultivars and Clones,” Iowa State University (ISU) established a cold-hardy wine grape cultivar trial in 2008 at the ISU Horticulture Research Station (HRS), Ames, Iowa. The Iowa trial evaluates the performance of Corot Noir, La Crescent, Marquette, Petit Ami™ (planted in 2009), NY95.0301-01 (Arandell), MN1189, MN1200, MN1220, MN1235, MN1258, with Frontenac and St. Croix serving as control cultivars. Selection NY95.0300-01 (Aramella) was shipped by mistake and was planted in the guard rows and as end-of-row guard vines and Louise Swenson was used as replacement plants in blocks containing MN1235 vines that died (results not reported here). This report summarizes the results for the 2017 growing season.

Materials and Methods

The vines were spaced 8 x 10 ft apart (545 vines/acre) with three vines/replication. Selections were replicated six times (18 vines/cultivar) in a randomized complete block design. Vines were trained to the high-wire as a bilateral cordon system from twin trunks with the trellis wire 6 ft above the ground. Data collected included vine survival, bud injury, vegetative growth (pruning weights), phenology (veraison to harvest

time), and yield (cluster number and weight/vine). Bud injury was determined by assessing two canes/vine March 6. From each vine, two canes originating from a previous year’s spur were removed and the first five buds were sliced and examined for injury to the primary bud. Any vines that did not contain spurs from the previous year were not included.

Results and Discussion

Iowa experienced slightly above-average temperatures during the 2017 growing season, with the exception of spring temperatures, which were slightly below average (Table 1).

Bud injury. Frontenac and St. Croix have a history of growing in cold regions, which is why they were included in the trial as control vines. Grape vines have a compound bud, which means they have an internal backup plan for cold weather. Moreover, a reproductive compound bud on grape vines consist of a primary, secondary, and tertiary bud. Meaning, if the primary bud is injured the secondary or tertiary bud will presume growth. Although winter temperatures were slightly warmer than average, all cultivars and selections exhibited bud injury and can be categorized into one of three groups: less than 10 percent, between 11–20 percent, or greater than 21 percent. Petit Ami and Arandell had 58.8 percent and 39.6 percent bud death, respectively (Table 2), and significantly more bud injury compared with Frontenac (2.2%) and St. Croix (7.2%).

Vegetative growth. While St. Croix, Marquette, and MN1200 vines required significantly more pruning than the rest of the cultivars or selections, canes removed were similar to or less than Frontenac and St. Croix. Marquette vines had the most canes removed but did not see an increase in cluster number

or weight/vine. Alternatively, St Croix and MN1200 had more clusters/vine and a greater yield (weight/vine).

Phenology. Frontenac, La Crescent, Marquette, MN 1235, and MN 1258 had the longest maturation period resulting in fruit that was harvested at or beyond 50 days after 50 percent veraison. Selection MN 1189 was the earliest cultivar to ripen in 2017 with only 22 days between 50 percent veraison and harvest.

Yield. Frontenac produced 96.6 clusters/vine, second in number only to St. Croix, which produced 132 clusters/vine. St. Croix out produced Frontenac and seven other cultivars: Corot noir, MN1189, Marquette, MN1258, La Crescent, and MN1235. Corot noir (32.5) was the only cultivar to produce fewer clusters than Frontenac. Frontenac had the highest cluster weight/vine compared with all other cultivars or selections with the exception of Petit Ami (19.8). In addition, Corot noir,

MN1189, Marquette, MN1258, La Crescent and Arandell were the lowest yielding vines compared with both Frontenac and St. Croix.

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Table 1. Seasonal high and low temperatures compared with averages for Ames, IA.

Months	Avg. temperature (°F)		2017 temperature (°F)	
	High	Low	High	Low
Dec. - Feb.	30.6	13.4	35.4	19.1
March - May	59.8	38.3	57.9	35.4
June - Aug.	80.7	59.3	84.2	60.0
Sept. - Nov.	63.0	40.2	64.4	41.4

Table 2. Growth and development of 12 wine grape cultivars or selections in the NE-1020 cold-hardy cultivar trial.

Cultivar or selection	Vine growth			Yield variables		Phenology		
	Live vines (no.)	Bud injury (%)	Pruning weight/vine (g)	Cluster number/vine	Weight/vine (kg)	50% veraison (Julian)	Harvest date (Julian)	Days between veraison and harvest (no.)
Corot Noir	16	25.0	515.5	32.5	3.8	220	265	45
Frontenac	18	2.2	880.0	96.6	9.2	208	265	57
La Crescent	18	5.6	859.4	80.4	4.9	208	263	55
Marquette	18	12.2	1,069.3	90.1	3.9	205	263	58
MN1189	14	15.8	215.3	72.5	5.0	206	228	22
MN1200	18	6.7	1024.4	122.1	5.9	206	242	36
MN1220	18	12.2	630.7	106.8	7.0	210	240	30
MN1235	15	6.0	732.7	94.1	7.1	208	264	56
MN1258	18	8.3	519.6	82.2	4.0	211	264	54
Arandell	17							
(NY95.0301-01)		39.6	226.4	68.4	3.8	218	249	31
Petit Ami™	18	58.8	255.6	124.5	9.5	212	248	36
St. Croix	18	7.2	1,075.3	132.0	7.1	212	237	25
HSD ^z	-	20.9	390.0	34.0	2.4	-	-	-

^zMeans (within a column) are not statistically different according to Tukey's Honestly Significant Difference test, $\alpha = 0.05$.