

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 2016 growing season.

Materials and Methods

Grapevines were spaced 8 × 10 ft apart (545 vines/acre) with three vines per 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.

Primary buds were evaluated March 14 to assess winter injury levels. Percent injury was determined by evaluating five buds/cane, two canes/vine. Buds were determined to be dead

if they had any discoloration in the primary bud. Vines that did not contain spurs from the previous year were not included.

Results and Discussion

Winter 2015-2016 was on average warmer than normal. Temperatures in March exceeded the average high by 9.1°F and the low by 6.8°F. These above average temperatures were followed by a hard freeze April 8-9 (Table 1). However, the trial planting did not appear to be impacted. Overall, spring temperatures (March, April, and May) averaged 51.4°F, which was 3.1°F above normal. Precipitation totaled 2.56 inches, resulting in 1.66 inches below normal precipitation amounts. Summer temperatures (June, July, and August) averaged 73.6°F or 2°F below normal, and precipitation totaled 17.69 inches, which was 3.98 inches above normal.

Winter bud injury assessment determined Corot Noir vines had the greatest bud injury following the 2015–2016 winter (Table 2). Bud injury coincided with yield data, with the lowest yields (cluster number/vine and cluster weight/vine) reported for Corot Noir. Arandell had the least winter bud injury compared with all other cultivars, yet had the lowest cluster weight/vine.

Selection MN 1189 and cultivar Corot Noir both exhibited infection from crown gall, which appeared to be the result of winter injury. This injury resulted in reduced vigor, the death of a few vines in various blocks (live vines), and reduced yields (Table 2). Selection MN 1189 exhibited extreme bunch rot resulting in non-marketable fruit. In addition, MN 1189 was the earliest cultivar to ripen in 2016 with only 14 days between 50 percent veraison and harvest. La Crescent vines exhibited moderate susceptibility to downy

mildew and infection became evident just before harvest. The moderate downy mildew infection resulted in defoliation of mature leaves within the vine canopy but did not attack fruit clusters. Marquette vines required the greatest amount of pruning (pruning weight/vine) compared with all cultivars and selections and the number of clusters/vine was nearly double the amount of shoots remaining after pruning.

Frontenac, Marquette, MN 1200, and Petit Ami™ had the longest maturation period resulting in fruit that was harvested at or beyond 40 days after 50 percent veraison.

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Table 1. Minimum temperatures recorded in the NE-1020 Multi-state Evaluation of Wine Grape Cultivars and Clones trial plot during the 2015–16 dormant season at the ISU Horticulture Research Station, Ames, IA.

Date	Temperature (°F)
January 9	-5.7
January 10	-7.8
January 12	-2.9
January 16	-3.2
January 17	-10.7
January 18	-8.1
February 11	-4.9
February 13	-3.7
April 8	23.8
April 9	16.6

Table 2. Growth and development of 12 wine grape cultivars and selections in the NE-1020 cold-hardy cultivar trial at the ISU Horticulture Research Station, Ames, IA.

Cultivar or selection	Vine growth			Yield variables			Phenology		
	Live vines (no.)	Bud injury (%)	Pruning weight per vine (g)	Shoot number per vine	Cluster number per vine	Weight per vine (kg)	50% Veraison (Julian)	Harvest date (Julian)	Days between veraison and harvest (no.)
Corot Noir	16	21.9	28.5	15.2	30.4	2.9	224	259	35
Frontenac	18	16.1	920.6	64.7	93.3	4.6	211	256	45
La Crescent	18	9.4	578.2	71.6	88.4	5.9	211	246	35
Marquette	18	7.8	1186.4	65.2	118.0	5.6	204	244	40
MN1189	14	5.6	268.8	38.3	61.3	.	204	218	14
MN1200	18	13.3	645.8	81.0	151.9	4.8	202	250	48
MN1220	18	11.7	650.3	76.3	103.0	6.3	209	239	30
MN1235	15	16.1	558.6	64.5	100.4	5.9	211	250	39
MN1258	18	23.3	309.4	48.6	70.6	3.5	211	240	29
Arandell	17	3.9	177.2	43.5	40.9	1.9	222	259	37
(NY95.0301-01)									
Petit Ami™	18	11.1	273.3	51.7	136.3	8.3	213	256	43
St. Croix	18	5.6	467.0	78.8	102.6	6.9	213	239	26
LSD	-	13.3	181	11.2	33.7	1.9	0.8	0	0.8