

Wine Grape Cultivar Trial Performance in 2006

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Introduction

To assess the regional adaptation of wine grape cultivars to Iowa, a trial was established in 2003 through an Iowa Department of Agriculture and Land Stewardship (IDALS) specialty crops grant awarded to the Iowa Wine Growers Association. The trial was designed to evaluate up to 20 cultivars or advanced selections at four ISU farms representing different geographic, climatic, and soil conditions: Horticulture Research Station (HRS), Ames; the Armstrong Research Farm (ARF), Lewis; the Southeast Research Farm (SERF), Crawfordsville; and the Northeast Research Farm (NERF), Nashua. The SERF and NERF plantings also included the 15 cultivars being evaluated in the 2002 grape cultivar by management system trial. This report summarizes the results for the 2006 growing season.

Materials and Methods

The vines were spaced 8x10 ft apart (545 vines/A) with three vines/replication. Treatments were replicated four times at each site (12 vines/cultivar). Vines were trained to the bilateral cordon system on a two-wire trellis with wires at 3.5 ft and 6.0 ft above the ground. Vines with a procumbent or trailing growth habit are being trained to the top wire, while those with a semi-upright to upright growth habit were trained to the vertical shoot positioning (VSP) system.

In late September 2005, shoots were rated for periderm formation (when shoots become lignified and turn brown) based on the amount of development that had occurred on the primary shoots. In the spring, vines were pruned, the 1-year-old trimmings were weighed, and the amount of established 2-year-old cordon was measured. During the growing season, vines at all the sites were exposed 2,4-D herbicide drift and were rated for the severity of injury. Following veraison, berry samples were collected from the mid-cluster position to test for maturity based on percentage soluble solids (SS), pH and titratable acids (TA). Time of harvest was based upon these measurements, and either local winery requirements or fruit condition. At harvest, the number of clusters per vine were counted and weighed.

Results and Discussion

During the study, several significant freezes have occurred and have influenced the vine establishment and productivity (Table 1). During the past dormant period frosts or freezing events were recorded on 8 October, on 7 or 9 December 2005, 18 February and 26 April or 6 May 2006.

Generally, periderm development was more advanced at NERF than at the other sites (Table 2). However, those vines had ceased vegetative growth earlier than at the other sites in 2005. Vines at SERF were under draught conditions for much of the 2005 growing season and also tended to have high rates of periderm formation. For those cultivars planted in 2003 or 2004, NY76.0844.24, NY84.0101.04 and Vidal Blanc were the slowest in developing the periderm. Base upon pruning weights, vines grew the best in 2005 at HRS and ARF (Table 2). Cultivars that tended to have high pruning weights across all sites included La Crescent, Prairie Star and Leon Millot. Marquette (MN -1211) vines grew relatively well at HRS, but not at the other sites where vines characteristically had spindly trunks and were generally weak. Among the 15 cultivars from the cultivar by management study, St Croix and Frontenac had higher pruning weights than the other cultivars at SERF and NERF. After three growing seasons, the amount of established cordon per vine reflected the growing conditions at the sites, differences in exposure to freezing events, and the development of the periderm (Table 3). Vines at ARF experienced some of the mildest freezing events, and most frequently had the greatest amount of established cordon per vine. Most often, cultivars that were slow in developing a periderm, had less of an established cordon. Across sites, La Crescent, Prairie Star and Leon Millot had the greatest amount of established cordon among the 20 cultivars being evaluated at all the sites. Among the 15 cultivars from the 2002 cultivar by management system study, Frontenac, St. Croix and La Crosse had the greatest amount of established cordon at both sites.

Vines at each of the sites were exposed to 2,4-D drift during the growing season (Table 3). Vines at ARF followed by NERF exhibited the severest symptoms. Among cultivars, NY76, Swenson White, and Esprit exhibited the most severe symptoms at each of the sites. Of concern is the severity of symptoms exhibited by Marquette (MN-1211) at ARF. Among the 15 cultivars from the 2002 study, Vanessa and Cynthia

exhibited the severest symptoms, followed by Marechal Foch.

The 2006 growing season was the first time vines in this study were allowed to carry a crop. The growing season was characterized by above normal temperatures in July, and frequent rains during the harvest period. When testing for maturity on a weekly basis, SS often exhibited little change while TA declined. As a result, some harvest dates varied considerably between sites (Tables 4 and 5). Yields per vine were generally the highest at ARF followed in order by HRS, SERF and NERF (Tables 4 and 5). Among the 20 cultivars planted at all sites, Esprit vines produced relatively high yields across each of the sites. Cayuga White was relatively productive at the warmer sites (ARF and SERF) but not at the colder sites. Vidal Blanc was productive at ARF but not at any of the other sites. Among 15 cultivars from the 2002 study planted at SERF and NERF, Frontenac and Croix produced relatively high yield at both sites while Seyval Blanc produce a high yield at SERF but not at NERF. Average cluster weight tended to similar for a cultivar across each of the sites. The notable exception was with St. Vincent that produced larger clusters at ARF and SERF than at HRS and NERF.

Acknowledgments

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Table 1. Significant minimum temperatures (°F) recorded at the ISU research farms during the study.

Date	HRS	ARF	SERF	NERF
2 Oct 03	26	30	21	21
6 Jan 04	-5	-11	-11	-5
27 Jan-1 Feb 04	-12	-11	-12	-19
3 May 04	28	32	31	28
4 Oct 04	29	28	28	27
23 Dec 05	-12	-9	-3	-16
16 Jan 05	-14	-11	-6	-19
13 Ma 05	10	12	13	9
30 Apr-3May 05	24	29	24	21
8 Oct 05	26	28	32	30
7-9 Dec 05	-16	-10	-12	-16
18 Feb 06	-15	-10	-10	-20
26 Apr-6 May 06	28	37	31	31

Table 2. Periderm formation in 2005 and 2006 pruning weight for 20 cultivars in the ISU 2003 wine grape cultivar trial planted in 2003 at the Horticulture Research Station (HRS) and the Armstrong Research Farm (ARF), and 35 cultivars at the Southeast (SERF), and Northeast (NERF) Research Farms.

Treatment	2005 Priderm Formation				Pruning Weight (lb.)			
	HRS	ARF	SERF	NERF	HRS	ARF	SERF	NERF
GR-7	4.6	5.0	4.6	4.8	1.8	1.4	.6	.2
Noiret v	4.1	5.0	4.0	5.0	1.1	1.9	.3	.3
NY76.0844.24 y	1.3	2.3	3.7	4.6	.5	.2	.1	.1
NY84.0101.04	2.9	4.0	3.9	4.6	1.0	1.4	.2	.1
Corot noir v	3.9	5.0	3.9	4.8	1.3	1.7	.3	.1

La Crescent	4.9	5.0	4.8	5.0	2.3	2.2	.7	.8
Prairie Star	4.9	5.0	4.8	4.8	1.5	2.6	.9	.4
Frontenac Gris x	4.3	.	.	.	.6	.	.	.
Swenson White w	2.5	3.9	4.1	5.0	.1	.1	.1	.1
Briana y	4.2	4.2	4.2	4.8	.6	.7	.1	.1
Marquette y,v	3.8	4.2	4.2	4.3	.8	.4	.1	.1
MN-1198 y	4.0	4.3	4.3	5.0	.4	.2	.1	.1
Cayuga White	3.7	4.7	4.3	4.8	.6	1.9	.7	.1
Chancellor	3.1	4.8	3.9	4.6	.6	1.9	.2	.1
De Chaunac	4.8	5.0	4.5	5.0	1.5	2.2	.2	.2
Esprit	5.0	5.0	4.9	5.0	1.7	2.1	.7	.2
Landot 4511	3.4	4.7	4.3	4.8	.8	1.3	.4	.2
Leon Millot	4.6	4.3	4.3	5.0	1.5	2.3	1.4	.8
St. Vincent	4.3	5.0	4.5	3.9	1.6	2.5	.4	.1
Vidal Blanc	2.5	4.3	3.2	3.7	.8	1.7	.2	.1
Marechal Foch			4.0	5.0			.5	.3
Frontenac			5.0	5.0			.9	.7
Cynthiana			4.2	4.8			.2	.1
St. Croix			4.8	5.0			1.1	.6
Chambourcin			4.2	4.7			.4	.2
Seyval Blanc			4.5	4.3			.3	.1
La Crosse			4.6	5.0			.4	.4
Vignole			4.1	3.8			.3	.1
Traminett			3.8	4.1			.1	.2
Edelweiss			4.5	4.7			.3	.4
Marquis			3.8	4.2			.1	.1
Vanessa			4.4	4.9			.2	.1
Reliance			4.0	5.0			.5	.3
Mars			4.9	5.0			.7	.2
Jupiter			3.8	3.9			.1	.1
LSD, P≤.05	.6	.3	.4	.5	.5	.3	.3	.2

^z Periderm rating scale 0-5: 0 = none of the primary shoot was lignified; 1 = 1 to 20% of the shoot length was lignified; 2 = 21 to 40% lignified; 3 = 41 to 60% was lignified; 4 = 61 to 80% lignified; 5 = 81 to 100% lignified.

^y Planted in 2004.

^x Planted in 2004 at the Horticulture Research Farm, and in 2006 at the other sites.

^w Planted in 2005,

^v Named and released in 2006: Noiret (NY73.136.17); Corot noir (NY70.0809.10); and Marquette (MN-1211).

Table 3. Cordon establishment after pruning, and 2,4-D injury in 2006 for 20 cultivars in the ISU wine grape cultivar trail planted in 2004 at the Horticulture Research Station (HRS) and the Armstrong Research Farm (ARF), and 35 cultivars at the Southeast (SERF), and Northeast (NERF) Research Farms.

Treatment	Feet of Cordon per Vine				2,4-D Injury Rating ^z			
	HRS	ARF	SERF	NERF	HRS	ARF	SERF	NERF
GR-7	6.8	7.3	3.5	2.7	1.1	1.7	1.1	1.2
Noiret ^w	5.0	7.2	4.3	2.0	1.2	1.4	1.0	1.3
NY76.0844.24 ^z	.9	.5	.8	.0	3.4	4.7	2.9	4.5
NY84.0101.04	.2	5.7	.4	.5	1.1	2.8	1.3	3.2
Corot noir ^w	5.2	7.0	4.5	1.7	1.1	1.5	1.0	1.7
La Crescent	7.7	7.8	6.7	7.9	1.0	2.4	1.0	1.1
Prairie Star	6.8	7.6	5.6	6.3	1.8	2.9	1.3	2.3
Frontenac Gris ^y	5.3	.	.	.	1.0	1.1	1.0	1.0
Swenson White ^x	.0	.9	.0	.0	3.1	4.6	1.6	4.1
Briana ^z	6.0	4.2	3.6	.7	1.0	1.5	1.1	1.7
Marquette ^{z,w}	7.9	3.9	.0	.3	1.7	3.0	1.3	2.1
MN-1198 ^z	4.5	1.7	1.0	.2	1.0	2.9	1.2	1.5
Cayuga White	4.4	7.5	6.3	1.0	1.0	1.8	1.0	1.3
Chancellor	2.7	7.3	2.3	1.1	1.0	1.0	1.0	1.2
De Chaunac	6.7	7.8	4.0	3.6	1.0	1.1	1.1	1.0
Esprit	7.6	7.7	5.5	3.2	3.9	3.1	2.2	3.7
Landot 4511	2.2	7.3	4.8	.4	2.5	2.9	1.0	2.6
Leon Millot	7.2	7.7	6.2	5.4	2.8	3.8	1.6	3.3
St. Vincent	6.3	6.5	4.8	.5	1.0	1.0	1.0	1.0
Vidal Blanc	.0	7.8	2.6	.1	1.0	1.4	1.0	1.4
Marechal Foch			4.0	3.8			2.6	3.0
Frontenac			5.5	7.3			1.0	1.0
Cynthiana			3.2	.2			2.8	3.8
St. Croix			5.5	6.6			1.1	1.3
Chambourcin			3.6	1.3			1.0	1.0
Seyval Blanc			4.2	.9			1.0	1.1
La Crosse			4.9	6.5			1.0	1.0
Vignole			4.3	1.9			1.0	1.3
Traminette			2.8	.3			1.3	1.9
Edelweiss			5.9	2.9			1.6	3.2
Marquis			.7	.0			1.6	2.8
Vanessa			4.2	1.7			2.9	4.1
Reliance			5.2	2.9			1.8	2.1
Mars			5.1	1.3			1.5	2.3

Jupiter			1.7	.0			2.3	3.0
LSD, P≤.05	1.9	.9	1.9	1.6	.4	.4	.4	.6

^z Planted in 2004.

^y Planted in 2004 at the Horticulture Research Farm, and in 2006 at the other sites.

^x Planted in 2005.

^w Named and released in 2006: Noiret (NY73.136.17); Corot noir (NY70.0809.10); and Marquette (MN-1211).

Table 4. Fruit yield and harvest characteristics in 2006 for 20 cultivars in the ISU wine grape cultivar trial planted in 2003 at the Horticulture Research Station and the Armstrong Research Farm.

Horticulture Research Station

Armstrong Research Farm

Treatment	Date	% SS	pH	TA ^z	Yield /vine (lb)	Cluster wt. (lb)	Date	% SS	pH	TA ^z	Yield /vine (lb)	Cluster wt. (lb)
GR-7	9.3	19.5	3.62	8.1	3.2	.23	9.4	20.0	3.75	10.2	8.5	.23
Noiret	10.4	19.7	.	.	.1	.15	10.2	19.6	4.11	8.4	10.7	.37
NY76.0844.24 ^y	.	.	.	.	.	.	9.2	16.2	3.50	8.3	.3	.35
NY84.0101.04	.	.	.	.	.	.	8.29	19.1	3.54	8.4	11.5	.46
Corot noir	9.20	18.2	3.41	7.5	3.3	.48	9.2	18.0	3.62	7.1	10.8	.47
La Crescent	9.6	22.5	3.28	9.9	2.8	.20	8.21	21.9	3.58	13.2	10.3	.24
Prairie Star	8.28	18.2	3.70	6.8	5.5	.28	8.22	18.1	3.76	6.8	10.1	.24
Frontenac Gris ^x	9.13	25.3	3.48	9.3	2.5	.22	.	.	.	.	.	.
Swenson White ^w	.	.	.	.	.	.	8.23	18.2	3.83	8.0	.6	.34
Briana ^y	8.24	20.0	3.68	5.4	3.0	.28	8.23	21.1	3.86	7.5	5.4	.23
Marquette ^{y,v}	8.31	24.3	3.40	8.1	2.4	.19	8.20	23.4	3.48	12.2	1.9	.12
MN-1198 ^y	9.20	22.4	3.28	8.8	2.0	.29	8.20	22.7	3.40	10.4	1.3	.21
Cayuga White	9.19	20.2	3.37	5.9	1.0	.43	8.29	19.0	3.55	7.8	15.3	.52
Chancellor	10.4	20.2	3.46	8.4	.7	.21	10.2	23.0	4.16	9.8	7.2	.17
De Chaunac	10.4	20.2	3.45	9.3	.8	.10	9.25	20.1	3.72	9.9	6.8	.13
Esprit	9.13	18.7	3.55	7.7	5.0	.57	9.4	17.9	3.70	8.9	20.7	.63
Landot 4511	9.19	23.4	.	.	.3	.17	8.22	17.4	3.54	8.7	6.0	.19
Leon Millot	8.24	20.1	3.66	6.1	2.1	.16	8.21	21.3	3.80	7.5	10.7	.21
St. Vincent	10.4	20.8	3.10	11.3	1.4	.31	10.9	20.8	4.01	11.0	8.2	.45
Vidal Blanc	.	.	.	.	.	.	9.25	20.2	3.66	5.5	17.4	.61
LSD, P≤.05					1.5	.08					3.1	.08

^z Titratable acids reported in grams/liter.

^y Planted in 2004.

^x Planted in 2004 at the Horticulture Research Farm, and in 2006 at the other sites.

^w Planted in 2005.

^v Named and released in 2006: Noiret (NY73.136.17); Corot noir (NY70.0809.10); and Marquette (MN-1211).

Table 5. Fruit yield and harvest characteristics in 2006 for 35 cultivars in the ISU wine grape cultivar trial planted in 2003 at the Southeast and Northeast Research Farms.

Southeast Research Farm

Northeast Research Farm

Treatment	Date	% SS	pH	TA ^z	Yield /vine (lb)	Cluster wt. (lb)	Date	% SS	pH	TA ^z	Yield /vine (lb)	Cluster wt. (lb)
GR-7	8.25	20.9	4.16	4.9	2.9	.16	8.25	21.0	3.39	12.4	.3	.11
Noiret ^v	10.10	19.6	3.76	5.0	5.1	.25	10.4	22.2	3.58	7.7	.4	.27
NY76.0844.24 ^y	-	-	-	-	-	-	-	-	-	-	-	-
NY84.0101.04	8.25	18.7	3.17	7.4	1.0	.21	-	-	-	-	-	-
Corot noir ^v	10.10	21.4	3.96	4.4	7.4	.35	10.4	20.0	3.61	6.5	.6	.35
La Crescent	9.29	26.0	3.75	7.4	2.6	.16	8.26	24.0	3.45	6.0	3.2	.29
Prairie Star	8.25	17.8	3.41	7.7	4.5	.25	8.25	18.0	3.68	6.0	2.6	.32
Frontenac Gris ^x	-	-	-	-	-	-	-	-	-	-	-	-
Swenson White ^w	-	-	-	-	-	-	-	-	-	-	-	-
Briana ^y	8.25	20.0	3.37	5.7	1.7	.18	8.25	22.0	3.63	7.5	.4	.22
Marquette ^{y,v}	-	-	-	-	-	-	-	-	-	-	-	-
MN-1198 ^y	9.29	23.6	3.46	7.5	.6	.14	9.6	24.0	-	-	.1	.20
Cayuga White	8.25	16.6	3.01	9.2	13.0	.46	9.15	21.0	3.42	4.2	.2	.41
Chancellor	10.10	22.0	3.54	5.4	3.5	.17	10.4	23.2	3.58	7.7	1.1	.24
De Chaunac	9.29	21.8	3.36	5.1	1.8	.19	9.6	22.0	3.39	9.3	1.6	.24
Esprit	9.29	21.3	3.85	5.2	8.8	.53	9.21	22.0	3.75	7.4	1.8	.61
Landot 4511	9.29	24.2	3.90	3.7	7.1	.27	9.28	23.0	-	-	.1	-
Leon Millot	8.25	19.9	3.18	7.7	5.0	.17	8.25	21.0	3.57	7.1	1.2	.13
St. Vincent	10.10	19.7	3.06	7.5	8.2	.50	10.4	20.0	3.61	6.5	.3	.27
Vidal Blanc	10.10	24.3	3.74	6.0	2.5	.44	-	-	-	-	-	-
Marechal Foch	8.25	19.1	3.03	8.4	1.4	.10	8.31	22.0	3.57	5.4	.9	.14
Frontenac	9.29	25.3	3.39	9.0	6.8	.20	9.15	24.5	3.37	12.2	3.3	.32
Cynthiana	10.10	24.6	3.47	11.0	1.9	.15	-	-	-	-	-	-
St. Croix	9.26	21.3	4.16	4.0	5.8	.18	8.25	20.2	3.49	10.2	2.4	.21
Chambourcin	10.10	25.5	3.46	5.9	5.0	.41	10.4	23.8	3.48	6.5	.3	.52
Seyval Blanc	8.25	26.7	3.57	8.4	9.0	.52	9.6	23.0	3.45	6.9	.6	.40
La Crosse	9.26	22.4	3.33	5.3	4.1	.18	8.31	20.3	3.43	10.7	3.4	.27
Vignole	10.10	27.0	3.24	7.2	3.4	.17	9.13	22.0	3.40	10.3	.3	.14
Traminette	9.1	18.3	2.85	5.5	1.9	.23	-	-	-	-	-	-
Edelweiss	8.25	16.9	3.25	6.0	3.2	.28	8.18	16.0	3.33	13.5	2.1	.37
Marquis	8.25	13.9	6.06	5.7	1.1	.35	-	-	-	-	-	-
Vanessa	8.21	19.0	3.60	4.7	1.3	.33	-	-	-	-	-	-
Reliance	9.1	19.4	3.65	5.4	4.7	-	8.25	21.5	3.45	5.7	.4	.21
Mars	9.1	19.0	3.48	5.1	3.4	.20	8.25	18.0	3.47	6.0	.6	.20

Jupiter	8.21	20.4	3.91	3.1	1.7	.26	-	-	-	-	-	-
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LSD, $P \leq 05$

2.4 .09

.8 .06

^z Titratable acids reported in grams/liter.

^y Planted in 2004.

^x Planted in 2004 at the Horticulture Research Farm, and in 2006 at the other sites.

^w Planted in 2005.

^v Named and released in 2006: Noiret (NY73.136.17); Corot noir (NY70.0809.10) and Marquette (MN-1211).