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2003 Wine Grape Cultivar Trial

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Abstract
Through an Iowa Department of Agriculture and Land Stewardship (IDALS) specialty crops grant awarded to the Iowa Grape Growers Association (now the Iowa Wine Growers Association) and contracted to the ISU Department of Horticulture, a wine grape cultivar trial was established in 2003 to evaluate the adaptability, productivity, and wine-making quality of up to 20 cultivars or advanced selections. Four ISU farms representing different geographic, climatic, and soil conditions were selected for the trial: the Horticulture Station (Hort Station), Ames; the Armstrong Research Farm, Lewis; the Southeast Research Farm, Crawfordsville; and the Northeast Research Farm, Nashua. Cultivars and selections planted in 2003 included Rubiana (GR-7), NY73.136.17, NY84.0101.04, NY70.0809.10, La Crescent, Prairie Star, Cayuga White, Chancellor, De Chaunac, Esprit, Landot 4511, Leon Millot, St. Vincent, and Vidal Blanc. An additional five cultivars (NY76.0844.24, Frontenac Gris, Briana, MN- 1211, and MN-1198) were added to the trial in 2004.

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Introduction

Through an Iowa Department of Agriculture and Land Stewardship (IDALS) specialty crops grant awarded to the Iowa Grape Growers Association (now the Iowa Wine Growers Association) and contracted to the ISU Department of Horticulture, a wine grape cultivar trial was established in 2003 to evaluate the adaptability, productivity, and wine-making quality of up to 20 cultivars or advanced selections. Four ISU farms representing different geographic, climatic, and soil conditions were selected for the trial: the Horticulture Station (Hort Station), Ames; the Armstrong Research Farm, Lewis; the Southeast Research Farm, Crawfordsville; and the Northeast Research Farm, Nashua. Cultivars and selections planted in 2003 included Rubiana (GR-7), NY73.136.17, NY84.0101.04, NY70.0809.10, La Crescent, Prairie Star, Cayuga White, Chancellor, De Chaunac, Esprit, Landot 4511, Leon Millot, St. Vincent, and Vidal Blanc. An additional five cultivars (NY76.0844.24, Frontenac Gris, Briana, MN-1211, and MN-1198) were added to the trial in 2004.

Materials and Methods

The vines were planted 8 × 10 ft apart (545 vines/acre) with three vines/replication. The Southeast and Northeast Research Farm plantings also included 15 cultivars being evaluated in the 2002 cultivar by management system trial (Maréchal Foch, Frontenac, Cynthiana, St. Croix, Chambourcin, Seyval Blanc, La Crosse, Vignole, Traminette, Edelweiss, Marquis, Vanessa, Reliance, Mars, and Jupiter). Treatments were replicated four times at each site (12 vines/cultivar). Vines are being trained to the bilateral cordon system on a two-wire trellis with wires at 3.5 and 6.0 ft above the ground and line posts spaced 24 ft apart. Vines with a procumbent (trailing) growth habit are being trained to the top wire, whereas those with a semiupright to upright growth habit (Prairie Star, De Chaunac, St. Vincent; and Chambourcin, La Crosse, Seyval, Traminette, and Vignole from the 2002 trial) are being trained to the midlevel wire with three sets of catch wires added above. This report summarizes results for the 2004-growing season.

Results and Discussion

In 2004, the Northeast and Southeast Farm plots were fertilized with urea at a rate of 30 lb/acre actual N, and the Armstrong and Hort Station plots were fertilized at the rate of 40 lb/acre actual N. Weeds were controlled with a preemergence application of oryzalin followed with wick applications of glyphosate as needed. For disease control, each plot received a dormant application of liquid lime sulfur. Beginning in July, captan fungicide sprays were applied on a weekly basis at the Hort Station. At the Armstrong Farm and the Northeast Farm, two applications of captan were applied in August and September, respectively. No fungicides were applied at the Southeast Farm. No insecticides were required at any of the sites in 2004.

The vines were pruned in the spring to either 1/4-inch-diameter wood or to what appeared to be live tissue in the canes, and pruning weights were recorded (Table 1). Generally, Esprit and NY84.0101.04 had the highest pruning weights across the sites, while NY70.0809.10 and DeChaunac had low pruning weights. Among the cultivars from the 2002 trial, Frontenac had

the highest pruning weights (Table 3). However, because of the October 2, 2003 freeze that occurred at the Hort Station and the Southeast and Northeast Farms, pruning weights were not a good indicator of vine growth in 2003. Following bud break, the height of terminal bud emergence above the ground was recorded (Table 2). Generally this reflected the severity of the October 2, 2003 freeze with the emergence heights at the Southeast and Northeast Farms being much closer to the ground than those at the Hort Station and Armstrong Farm. At the Armstrong Farm, La Crescent, Vidal Blanc, Cayuga White, and Esprit vines emerged the highest above the ground, but this trend was not evident at the other sites. Among the cultivars from the 2002 trial, Frontenac and St. Croix had the highest emergence heights (Table 3).

During the growing season, vines in the Armstrong planting were exposed to 2,4-D herbicide drift (Table 4). Esprit, NY76.0844.24, NY84.0101.04, and Leon Millot vines exhibited the greatest injury, while Briana, MN-1211, MN-1198, Chancellor, De Chaunac, and St. Vincent vines exhibited no injury. Little herbicide injury was observed at the other sites.

In September, vines in each of the planting were rated for the incidence and severity of anthracnose (*Elsinoe ampelina*), powdery mildew (*Uncinula necator*), and downy mildew (*Plasmopara viticola*) infection. At the Hort Station and the Armstrong and Southeast Farms, Vidal Blanc vines exhibited a high incidence of anthracnose injury, but this was not evident at the Northeast Farm (Table 4). Among the 2002 trial cultivars planted at the Northeast and Southeast Farms, Reliance and Marquis exhibited the highest incidence of anthracnose injury (Table 7). The incidence of powdery mildew infection tended to reflect the intensity of the spray program with vines at the Hort Station exhibiting no powdery mildew infection (Table 5). At the other sites, a trend for a high incidence of powdery mildew infection on Leon Millot vines and low levels of infection on St. Vincent, NY76.0844.24, NY84.0101.04, and Cayuga White vines was evident. Among the 2002 trial cultivars, Marquis was severely infected at the Southeast Farm but not at the Northeast Farm (Table 7). At the Northeast Farm, Maréchal Foch and Frontenac had the highest incidence of powdery mildew infection. Generally, Jupiter, Vignole, and Cynthiana had the lowest level of powdery mildew infection. Across all sites, Chancellor was associated with the highest incidence of downy mildew infection (Table 6). It was followed by NY70.0809.10 at the Hort Station and the Southeast and Northeast Farms, but not at the Armstrong Farm. Among the 2002 trial cultivars, Marquis followed by Jupiter had the highest incidence of downy mildew infection at both sites (Table 7). At the Southeast Farm, Reliance also had a high level of infection.

Acknowledgments

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Table 1. Pruning weight (oz) of 14 cultivars in the ISU 2003 wine grape cultivar trial planted in 2003 at the Hort Station and the Armstrong, Southeast, and Northeast Research Farms for 2004. [z]

Cultivar	Hort Station		Armstrong		Southeast		Northeast	
Rubiana (GR-7)	1.8	a	1.4	b	2.2	abc	1.5	cde
NY73.136.17	1.2	ab	1.5	b	1.1	c	1.5	cde
NY84.0101.04	1.8	a	2.0	ab	2.9	a	2.0	abcde
NY70.0809.10	1.3	ab	1.5	b	1.2	c	1.1	de
La Crescent	1.3	ab	1.8	ab	1.4	bc	2.2	abcd
Prairie Star	1.5	ab	2.1	ab	1.9	abc	1.7	bcde
Cayuga White	<1.0	b	1.2	b	1.8	abc	1.5	cde
Chancellor	<1.0	b	1.7	ab	1.1	c	<1.0	e
De Chaunac	<1.0	b	1.3	b	1.1	c	<1.0	e
Esprit	1.6	ab	2.7	a	2.3	abc	2.7	ab
Landot 4511	1.2	ab	1.5	b	2.1	abc	2.3	abc
Leon Millot	1.3	ab	2.2	ab	2.1	abc	2.1	abcd
St. Vincent	1.7	ab	2.3	ab	2.4	ab	2.0	abcde
Vidal Blanc	<1.0	b	1.5	b	1.8	abc	1.5	cde

[z] Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.

Table 2. Height of shoot emergence (in.) above the ground of 14 cultivars in the ISU 2003 wine grape cultivar trial planted in 2003 at the Hort Station and the Armstrong, Southeast, and Northeast Research Farms for 2004. [z]

Min. Temp(F) on Oct 2, 03:	26		30		21		21	
Cultivar	Hort Station		Armstrong		Southeast		Northeast	
Rubiana (GR-7)	12.4	ab	11.4	d	6.2	bcde	1.4	b
NY73.136.17	1.3	b	16.5	bcd	1.9	cde	1.7	b
NY84.0101.04	8.7	ab	16.7	bcd	.2	de	.0	b
NY70.0809.10	18.0	a	13.9	d	.3	de	.0	b
La Crescent	8.3	ab	31.8	a	3.4	cde	3.0	b
Prairie Star	17.9	a	11.8	d	.1	de	1.1	b
Cayuga White	5.1	ab	27.3	abc	5.7	bcde	1.1	b
Chancellor	3.2	ab	17.5	bcd	.6	de	.4	b
De Chaunac	1.1	b	11.4	d	.1	de	.1	b
Esprit	15.8	ab	22.7	abcd	1.8	cde	1.3	b
Landot 4511	16.1	ab	14.6	d	.6	de	.8	b
Leon Millot	2.0	b	15.3	cd	.8	de	.4	b
St. Vincent	9.9	ab	14.3	d	.5	de	.0	b
Vidal Blanc	1.7	b	28.0	ab	.0	e	.2	b

[z] Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.

Table 3. Pruning weight and height of bud emergence of 15 cultivars from the Leopold Center grape cultivar by management system trial that were included in the Southeast and Northeast Research Farm plantings of the ISU 2003 wine grape cultivar trial for 2004. [z]

	Pruning weight (oz)		Height of bud emergence (in.)	
Cultivar	Southeast	Northeast	Southeast	Northeast
Maréchal Foch	2.4 abc	2.0 abcde	5.1 bcde	3.7 b
Frontenac	2.5 ab	3.0 a	11.7 ab	17.2 a
Cynthiana	1.3 bc	1.3 cde	.1 de	.0 b
St. Croix	2.2 abc	1.9 bcde	15.4 a	17.2 a
Chambourcin	2.0 abc	1.9 bcde	.2 de	.0 b
Seyval Blanc	1.7 bc	1.5 cde	.0 e	.0 b
La Crosse	1.7 bc	1.5 cde	6.3 bcde	5.5 b
Vignole	1.4 bc	1.2 de	.6 de	.0 b
Traminette	1.3 bc	<1.0 e	.3 de	.0 b
Edelweiss	1.5 bc	1.9 bcde	6.0 bcde	7.5 b
Marquis	1.5 bc	1.3 cde	.7 de	.0 b
Vanessa	1.4 bc	1.4 cde	.2 de	.7 b
Reliance	1.3 bc	1.4 cde	7.2 bcd	7.1 b
Mars	2.3 abc	1.4 cde	8.7 abc	8.1 b
Jupiter	1.9 abc	1.3 cde	.0 e	.0 b

[z] Respective means are comparable to those in Tables 1and 2. Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.

Table 4. 2,4-D rating at the Armstrong Farm, and anthracnose ratings on 19 cultivars in the ISU 2003 wine grape cultivar trial at the Hort Station and the Armstrong, Southeast, and Northeast Research Farms for 2004. [z]

	2,4-D Rating [y]	Anthracnose rating [x]			
Cultivar	Armstrong	Hort Station	Armstrong	Southeast	Northeast
Rubiana (GR-7)	1.3 ef	1.0 c	1.0 b	1.0 e	1.0 b
NY73.136.17	1.6 def	1.0 c	1.0 b	1.0 e	1.0 b
NY76.0844.24*	3.3 a	1.1 bc	1.2 ab	1.4 de	1.0 b
NY84.0101.04	3.3 a	1.0 c	1.0 b	1.0 e	1.0 b
NY70.0809.10	2.0 cde	1.0 c	1.0 b	1.0 e	1.0 b
La Crescent	1.8 cde	1.0 c	1.0 b	1.0 e	1.0 b
Prairie Star	2.5 bc	1.0 c	1.0 b	1.0 e	1.0 b
Frontenac Gris*	- -	1.0 c	- -	- -	- -
Briana*	1.0 f	1.0 c	1.0 b	1.1 de	1.0 b
MN-1211*	1.0 f	1.0 c	1.1 b	1.3 de	1.0 b
MN-1198*	1.0 f	1.0 c	1.0 b	1.0 e	1.0 b
Cayuga White	2.1 cd	1.0 c	1.0 b	1.3 de	1.0 b
Chancellor	1.0 f	1.0 c	1.0 b	1.0 e	1.0 b
De Chaunac	1.0 f	1.0 c	1.0 b	1.7 d	1.0 b
Esprit	3.4 a	1.4 ab	1.0 b	2.8 c	1.2 b
Landot 4511	1.8 cde	1.1 bc	1.0 b	1.0 e	1.0 b
Leon Millot	3.2 ab	1.2 bc	1.0 b	1.4 de	1.0 b
St. Vincent	1.0 f	1.0 c	1.0 b	1.0 e	1.0 b
Vidal Blanc	1.7 def	1.6 a	1.5 a	3.7 ab	1.0 b

[z] Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.
[y] Herbicide injury scale 1–5: 1=no apparent injury; 2=slight symptoms of abnormal venation; 3=moderate; 4=severe; 5=very severe.
[x] Disease injury scale 1–5: 1=no apparent injury; 2=slight symptoms; 3=moderate; 4=severe; 5=very severe.
*Planted in 2004.

Table 5. Powdery mildew rating on 19 cultivars in the ISU 2003 wine grape cultivar trial at the Hort Station and the Armstrong, Southeast, and Northeast Research Farms for 2004. [z, y]

Cultivar	Hort Station	Armstrong	Southeast	Northeast
Rubiana (GR-7)	1.0	3.5 a	2.6 efg	1.7 bcde
NY73.136.17	1.0	2.9 abcd	2.4 efgh	1.0 f
NY76.0844.24*	1.0	1.4 f	1.4 ijk	1.0 f
NY84.0101.04	1.0	2.2 def	1.0 k	1.0 f
NY70.0809.10	1.0	2.3 cde	2.5 efg	1.0 f
La Crescent	1.0	2.2 def	2.8 defg	2.0 b
Prairie Star	1.0	3.3 ab	3.7 bcd	1.9 bc
Frontenac Gris*	1.0	- -	- -	- -
Briana*	1.0	3.1 abc	3.2 bcde	1.6 cde
MN-1211*	1.0	2.1 ef	2.4 efgh	1.3 def
MN-1198*	1.0	2.8 abcd	3.1 cdef	1.1 f
Cayuga White	1.0	1.8 f	1.5 ijk	1.0 f
Chancellor	1.0	3.5 a	2.0 ghi	1.0 f
De Chaunac	1.0	2.7 bcde	3.9 bc	1.4 cdef
Esprit	1.0	2.0 ef	2.1 ghij	1.2 ef
Landot 4511	1.0	2.2 de	2.7 efg	1.8 bcd
Leon Millot	1.0	3.1 abc	4.0 b	2.8 a
St. Vincent	1.0	1.4 f	1.0 k	1.0 f
Vidal Blanc	1.0	3.4 ab	2.8 defg	1.0 f

[z] Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.
[y] Disease injury scale 1–5: 1=no apparent injury; 2=slight symptoms; 3=moderate; 4=severe; 5=very severe.
*Planted in 2004.

Table 6. Downy mildew rating on 19 cultivars in the ISU 2003 wine grape cultivar trial at the Hort Station and the Armstrong, Southeast, and Northeast Research Farms for 2004. [z, y]

Cultivar	Hort Station	Armstrong	Southeast	Northeast
Rubiana (GR-7)	1.0 c	1.0 c	1.0 f	1.3 fghi
NY73.136.17	1.0 c	1.7 b	1.2 ef	1.8 efghi
NY76.0844.24*	1.0 c	1.0 c	2.2 cd	2.8 bc
NY84.0101.04	1.3 c	1.0 c	2.9 bc	1.9 cdefgh
NY70.0809.10	2.3 b	1.1 c	3.6 b	3.4 b
La Crescent	1.0 c	1.0 c	1.0 f	1.0 i
Prairie Star	1.0 c	1.0 c	1.0 f	1.3 ghi
Frontenac Gris*	1.0 c	- -	- -	- -
Briana*	1.0 c	1.0 c	1.0 f	1.1 hi
MN-1211*	1.0 c	1.0 c	1.0 f	1.0 i
MN-1198*	1.0 c	1.0 c	1.0 f	2.0 cdefg
Cayuga White	1.0 c	1.0 c	1.3 ef	1.7 efghi
Chancellor	3.1 a	3.2 a	4.7 a	4.3 a
De Chaunac	1.0 c	1.5 b	1.2 ef	1.7 efghi
Esprit	1.0 c	1.0 c	1.0 f	1.0 i
Landot 4511	1.0 c	1.0 c	1.0 f	1.2 hi
Leon Millot	1.0 c	1.0 c	1.0 f	1.0 i
St. Vincent	1.3 c	1.0 c	3.1 b	1.7 efghi
Vidal Blanc	1.3 c	1.0 c	1.7 def	2.0 cdefg

[z] Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.
[y] Disease injury scale 1–5: 1=no apparent injury; 2=slight symptoms; 3=moderate; 4=severe; 5=very severe.
*Planted in 2004.

Table 7. Anthracnose, powdery mildew, and downy mildew ratings on 15 cultivars from the Leopold Center grape cultivar by management system trial that were included in the Southeast and Northeast Research Farm plantings of the ISU 2003 wine grape cultivar trial for 2004. [z, y]

	Anthracnose		Powdery mildew		Downy mildew	
Cultivar	Southeast	Northeast	Southeast	Northeast	Southeast	Northeast
Maréchal Foch	1.0 e	1.0 b	2.8 d-g	2.9 a	1.0 f	1.0 i
Frontenac	1.0 e	1.0 b	2.7 e-g	2.6 a	1.0 f	1.0 i
Cynthiana	1.0 e	1.0 b	1.6 h-k	1.0 f	1.9 de	1.0 i
St. Croix	1.0 e	1.0 b	2.0 g-j	1.9 bc	1.0 f	1.0 i
Chambourcin	1.0 e	1.0 b	2.2 g-i	1.3 d-f	1.5 d-f	1.0 i
Seyval Blanc	1.0 e	1.0 b	2.0 g-j	1.0 f	1.5 d-f	1.1 hi
La Crosse	1.0 e	1.0 b	3.8 bc	1.2 ef	1.5 d-f	1.8 f-i
Vignole	1.0 e	1.0 b	1.6 h-k	1.0 f	2.2 cd	1.8 f-i
Traminette	1.2 de	1.0 b	2.1 g-j	1.0 f	1.3 ef	1.4 e-i
Edelweiss	1.5 de	1.0 b	2.0 g-j	1.0 f	1.0 f	1.9 d-h
Marquis	3.2 bc	1.9 a	5.0 a	1.4 c-f	4.4 a	2.2 c-f
Vanessa	1.0 e	1.0 b	3.1 c-f	1.3 d-f	1.0 f	1.0 i
Reliance	4.2 a	2.5 a	2.8 e-g	1.0 f	1.4 d-f	2.7 b-d
Mars	1.3 de	1.0 b	2.3 f-i	1.0 f	1.0 f	1.4 f-i
Jupiter	1.0 e	1.0 b	1.3 jk	1.0 f	3.6 b	2.4 c-e

[z] Respective means are comparable to those in Tables 4, 5, and 6. Mean separation by Tukey's HSD (P=0.05). Values with the same letter do not differ.

[y] Disease injury scale 1–5: 1=no apparent injury; 2=slight symptoms; 3=moderate; 4=severe; 5=very severe.