

2003 Wine Grape Cultivar Trial

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Iowa has experienced a tremendous increase in commercial grape plantings in recent years, and the interest in establishing additional plantings continues to increase. However, as new plantings are planned, new cultivars can only be recommended with reservation until they are thoroughly tested under Iowa's climatic conditions. Through an Iowa Department of Agriculture and Land Stewardship (IDALS) specialty crops grant awarded to the Iowa Grape Growers Association (IGGA) 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 20 new cultivars, advanced selections at four locations in Iowa that represent three different climatic and four different soil conditions: ISU Horticulture Research Station, Ames; ISU Armstrong R & D Farm, Lewis; ISU Southeast R & D Farm, Crawfordsville; and ISU Northeast R & D Farm, Nashua. Cultivars and selections planted in 2003 include 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 six cultivars (NT76.0844.24, Frontenac Gris, Swenson White, Briana, MN-1211, and MN-1198) will be added to the trial in 2004.

The vines were spaced 8 x 10 ft apart (545 vines per acre) with three vines per replication. The Southeast and Northeast R&D Farm plantings also included 15 cultivars being evaluated in the 2002 Leopold grape cultivar by management trial. Treatments were replicated four times at each site (12 vines per cultivar). Vines are being trained to the bi-lateral cordon system on a 2-wire trellis with wires at 3.5 and 6.0 feet, and post spaced 24 feet apart. Vines with a procumbent (trailing) growth habit will be trained to the top wire, while those with a semi-upright to upright growth habit will be trained to the mid-level wire with catch wires added above. This report summarized results for the first growing season.

With the wet spring conditions that prevailed across all sites beginning in late April (Table 1), planting of the vines was delayed. Planting dates for the sites were: Horticulture Farm, 21 May; Armstrong Farm, 22 May; Southeast Farm, 28 May; and Northeast Farm, 29 May. By the end of the growing season, difference in vine growth between sites and cultivars were evident (Table 2). Differences in total shoot growth between sites tended to corresponded with the amount of precipitation received from July through September (Table 1) with vines at the Armstrong Farm, which received the least precipitation, producing the least growth. By cultivar, Esprit was the most vigorous at each site. It appears that De Chaunac, Chancellor and NY73.136.17 will be low vigor cultivars. Some cultivar differences between sites were evident for NY84.0101.04, Landot 4511, Leon Millot, and St. Vincent. Among the 15 cultivars from the Leopold cultivar by management system trial planted at Southeast and Northeast Farms, differences in shoot growth between cultivars was evident with a similar pattern existing at each site (Table 5).

In August and September, the sites were visited to evaluate the vines for 2,4-D herbicide drift injury, and other observed symptoms. No 2,4-D injury was observed in the plantings at the Armstrong and Southeast Farms. At the Horticulture and Northeast Farms, 2,4-D injury was

minimal, and confined to two ‘GR-7’ vines at the Horticulture Farm, and one ‘NY73.136.17’ vine at Northeast Farm (data not shown). At the Horticulture, Armstrong, and Southeast Farms, the vines exhibited a “crinkly” leaf pattern that appeared to have been caused by leafhopper feeding (Table 3). When rated on a scale of 1 (no apparent injury) to 5 (very severe symptoms), ‘NY84.0101.04’ exhibited the severest symptoms at the Horticulture and Armstrong Farms, while ‘La Crescent’ exhibited the severest symptoms at the Southeast Farm. The pattern of injury observed has often been associated with potato leafhoppers, which were evident in apple and Persian walnut plantings at the Horticulture Farm, and probably caused the injury to the grape vines there and at the Armstrong Farm. Another leafhopper species may have caused the injury in the Southeast Farm planting. Among the 15 cultivars from the Leopold cultivar by management system trial planted at the Southeast Farm, ‘La Crosse’ vines exhibited more injury than ‘Marechal Foch’, ‘St. Croix’, or ‘Jupiter’ (Table 5).

Vines in the planting were exposed to early season frosts and freezes in late September and/or early October (Table 4). At the Horticulture Farm, the vines were rated for frost injury on 2 October when it dropped to 26 F before the leaves had thawed (Table 3). ‘GR-7’, ‘Prairie Star’, ‘Chancellor’ and ‘NY70.0809.10’ exhibited the best tolerance to fall frost injury. At the Armstrong Farm, ‘NY70.0809.10’, ‘Chancellor’ and ‘St. Vincent’ exhibited the greatest fall frost tolerance. Rating for frost injury could not be taken at the Southeast and Northeast Farms before it dropped to 21 F on 2 October. At the Armstrong Farm where the vines were not exposed to a severe freeze on 2 October and no frosts or freezes occurred afterwards, a rating was taken on leaf senescence and drop on 25 October (Table 3). For cultivars that experienced slight frost injury on 2 October, these results would appear to indicate the ability of the cultivars to acclimate for the winter.

Thanks to the Iowa Department of Agriculture and Land Stewardship, and Iowa Grape Growers Association for providing support to establish these plantings through a specialty crops grant. Thanks to the staff at the ISU Horticulture Station; the ISU Armstrong, Southeast and Northeast R&D Farms; and summer employees Casey Barickman and Brian Keehner for their assistance in establishing and maintaining the plantings.

Table 1. Monthly precipitation (in inches) recorded at the four research farm sites for the ISU 2003 wine grape cultivar trial.

Month	Horticulture	Armstrong	Southeast	Northeast
April	4.17	3.78	2.59	3.84
May	4.11	4.68	6.48	3.89
June	5.16	2.43	4.30	6.09
July	4.97	2.15	1.77	2.99
August	1.10	.68	.87	.49
September	3.38	1.93	4.34	1.94

Table 2. Total shoot growth (ft) of the three longest canes during the first year for 14 cultivars in the ISU 2003 wine grape cultivar trial being conducted at four research farm sites in Iowa.^z

Cultivar	Horticulture		Armstrong		Southeast		Northeast	
GR-7	9.2	bc	5.5	cd	10.0	bcd	12.4	bcde
NY73.136.17	7.7	c	4.8	d	6.5	d	10.5	cde
NY84.0101.04	9.8	bc	5.5	cd	9.4	bcd	12.2	bcde
NY70.0809.10	9.6	bc	7.0	bcd	7.9	bcd	10.3	cde
La Crescent	10.2	abc	10.1	ab	10.7	abc	11.8	bcde
Prairie Star	10.0	bc	8.2	bc	8.4	bcd	11.9	bcde
Cayuga White	8.2	c	6.5	cd	9.1	bcd	10.5	cde
Chancellor	7.4	c	7.2	bcd	7.1	cd	7.5	e
De Chaunac	6.8	c	5.2	cd	6.9	cd	8.0	e
Esprit	14.0	a	13.2	a	14.4	a	19.4	a
Landot 4511	9.1	bc	4.8	d	11.1	ab	13.9	bcd
Leon Millot	8.7	c	5.5	cd	10.5	abcd	14.3	bc
St. Vincent	13.0	ab	6.0	cd	11.3	ab	16.1	ab
Vidal Blanc	8.8	bc	6.9	cd	11.4	ab	11.1	cde

^z Mean separation by Tukey's HSD ($P=0.05$).

Table 3. Leaf crinkle, frost injury and leaf senescence ratings during the first growing season for 14 cultivars in the ISU 2003 wine grape cultivar trial being conducted at four research farm sites in Iowa.^z

Cultivar	Leaf Crinkle Rating ^y			Frost Injury Rating ^x		Senescence ^u
	Horti-culture	Arm-strong	South-east	Horti-culture ^w	Arm-strong ^v	Arm-strong
GR-7	1.8 bcd	3.0 bc	1.6 bc	3.0 e	2.0 bcd	1.5 bc
NY73.136.17	1.8 bcd	1.3 e	1.2 bc	4.0 abcde	1.5 cd	2.3 b
NY84.0101.04	3.8 a	5.0 a	1.6 bc	4.3 abc	2.8 ab	1.0 c
NY70.0809.10	2.0 bc	1.1 e	1.2 bc	3.3 cde	1.3 d	1.8 bc
La Crescent	1.3 cd	1.2 e	3.2 a	4.7 ab	2.3 bcd	4.0 a
Prairie Star	1.1 d	1.1 e	1.0 c	3.0 e	3.5 a	3.9 ab
Cayuga White	2.0 bc	1.0 e	1.8 bc	4.1 abcd	1.5 cd	4.5 a
Chancellor	2.0 bc	2.3 cd	1.0 c	3.2 de	1.3 d	2.3 b
De Chaunac	1.3 cd	1.1 e	1.3 bc	3.6 bcde	1.8 bcd	2.3 b
Esprit	1.0 d	1.1 e	1.0 c	4.3 abc	2.5 abc	4.5 a
Landot 4511	1.0 d	3.3 b	1.0 c	4.9 a	2.8 ab	3.8 a
Leon Millot	1.3 cd	3.8 b	1.9 bc	4.0 abcd	2.8 ab	2.3 b
St. Vincent	1.0 d	1.5 de	1.9 bc	3.8 bcde	1.3 d	1.8 bc
Vidal Blanc	2.4 b	1.8 de	1.4 bc	4.1 abc	2.5 bcd	2.3 b

^z Mean separation by Tukey's HSD ($P=0.05$).

^y Leaf crinkle rating scale 1 -5: 1 = no apparent injury; 2= slight symptoms of abnormal crinkling; 3 = moderate; 4 = severe; 5 = very severe.

^x Frost injury scale 1 - 5: 1 = no apparent injury; 2= slight, injury confined to youngest leaves; 3 = moderate, some older leaves exhibiting injury; 4 = severe, over 50% of the leaves injured; 5 = very severe, over 90% of the leaves injured.

^w Following successive freezes on 29, 30 September and 1 October 2003; recorded on the morning of 2 October before the leaf tissue had thawed.

^v Following a freeze on 2 October 2003; recorded on 5 October.

^u Leaf senescence recorded on 25 October. Rating scale 1 - 6: 1 = completely green; 2 = beginning to show a color change but mostly green; 3 = half or more of the leaves have turned color; 4 = leaves turned color and beginning to drop; 5 = over half of the leaves have dropped; 6= all the leaves have dropped.

Table 4. Minimum temperatures recorded at the four research farm sites for the 2003 wine grape cultivar trial.

Date	Temperature (F)			
	Horticulture	Armstrong	Southeast	Northeast
29 Sept.	32	36	30	32
30 Sept.	32	37	33	29
1 Oct.	31	33	26	27
2 Oct.	26	30	21	21

Table 5. Total shoot growth of the three longest canes, and leaf crinkle rating for 15 cultivars from the Leopold cultivar by management trial planted at two research farm sites in Iowa.^z

Cultivar	Total Shoot Growth (ft)		Leaf Crinkle Rating ^y	
	Southeast	Northeast	Southeast	
Marechal Foch	7.6 bcd	10.0 de	1.0	c
Frontenac	11.4 ab	14.9 abc	1.2	bc
Cynthiana (Norton)	7.8 bcd	9.6 de	1.5	bc
St. Croix	9.9 bcd	13.9 bcd	1.0	c
Chamroucin	11.2 ab	13.9 bcd	1.6	bc
Seyval Blanc	10.1 bcd	11.8 bcde	1.3	bc
La Crosse	11.2 ab	11.2 bcde	2.0	b
Vignole	8.6 bcd	9.1 de	1.3	bc
Traminette	6.6 d	9.0 de	1.6	bc
Edelweiss	9.7 bcd	13.5 bcd	1.1	bc
Marquis	8.1 bcd	10.7 cde	1.6	bc
Vanessa	9.2 bcd	11.2 bcde	1.3	bc
Reliance	7.6 bcd	11.1 cde	1.8	bc
Mars	9.0 bcd	9.1 de	1.7	bc
Jupiter	10.3 bcd	12.3 bcde	1.0	c

^z Mean separation by Tukey's HSD ($P=0.05$). Means for a site are comparable to those in Tables 2 and 3.

^y Leaf crinkle rating scale 1-5: 1 = no apparent injury; 2 = slight symptoms of abnormal crinkling; 3 = moderate; 4 = severe; 5 = very severe.