‘Victoria Red’ Grape

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‘Victoria Red’ is the eighth grape cultivar (*Vitis* hybrid) developed by the University of Arkansas Division of Agriculture (Clark, 2010). This release is a cooperative endeavor with Texas A&M University and Tarkington Vineyard of Victoria, TX. The most significant characteristic of ‘Victoria Red’ is its disease resistance, vigor, and productivity in coastal Texas, an area of the United States with extremely high Pierce’s disease (*Xylella fastidiosa* Wells et al.) pressure. It is a seeded grape with bright red skin color and large, attractive clusters. The skin is tender. This cultivar resists cracking at maturity resulting from rainfall. It has a neutral flavor. Winter-hardiness is a limitation of the cultivar, because it routinely experienced cane and trunk injury in testing in west-central Arkansas. ‘Victoria Red’ is recommended primarily as a fresh-fruit cultivar for on-farm and local market sales in USDA hardiness zones 7b or warmer. Although resistance to Pierce’s disease has not been proved, it is recommended for trial in areas where this disease is prevalent.

Origin

‘Victoria Red’ is a result of a cross of Ark. 1123 × ‘Exotic’ made in 1971 (Fig. 1; the pedigree extends beyond named cultivar parents to species information when possible to fully reflect its background). The paternal parent is pure *Vitis vinifera* L., whereas the female parent is a derivation of largely French-American hybrids produced in

France in the late 1800s. The French-American hybrids incorporated a number of American *Vitis* species with *V. vinifera*. The original plant was selected in 1974 by James N. Moore from a seedling field at the University of Arkansas Fruit Research Station, Clarksville, AR (west-central Arkansas; lat. 35°28′17″ N, long. 93°80′0″; USDA hardiness zone 7a) and tested as selection Ark. 1475. It was released and named ‘Victoria Red’ in 2010. Initial testing of ‘Victoria Red’ was performed at that location, but more extensive evaluation was followed in Texas. Hardwood cuttings of Ark. 1475 were sent to Texas A&M University in 1981, and cuttings were then sent to a private vineyard owned by Friench and Martha Tarkington, Victoria, TX (southeast Texas; lat. 28°48′18″ N, long. 97°0′11″ W; USDA hardiness zone 9a). This location is ≈64 km from the Gulf of Mexico and has very high Pierce’s disease pressure with substantial infestations of xylem-feeding insects, mainly the leafhopper group known as sharpshooters [consisting of two tribes, Proconiini and Cicadellini (Hemiptera: Cicadellidae)] that vector this disease (J. Kamas, personal communication).

A second Texas test site was at the Texas AgriLife Research and Extension Center, Stephenville (north-central Texas; lat. 32°13′14″ N, long. 98°12′6″ W; USDA hardiness zone 7b).

Description and Performance

A single, three-vine plot was established at the University of Arkansas Fruit Research Station, Clarksville, on a fine sandy loam soil in the summer of 1975. The vines were trained to a four-arm Kniffen system and spaced 2.4 m. Observational data were taken on ‘Victoria Red’ on this plot for the fruiting seasons of 1979 through 1983. In 1984, all vines were killed to the ground as a result of winter cold, and an additional three-plant plot was established; however, the young vines were never able to establish or fruit as a result of winter injury and in 1994, the selection was discarded after being completely killed. Overall, low temperatures ranged from –15

to –11 °C during the evaluation of ‘Victoria Red’ in Arkansas and were damaging or lethal to canes, trunks, and young plants. Fungicides were applied at a commercial requirement to control black rot (*Guignardia bidwellii* Viala & Ravaz), powdery (*Erysiphe necator* Schw. [syns. *Uncinula necator* (Schw.) Burr., *E. tuckeri* Berk., *U. americana* Howe, and *U. spiralis* Berk. & Curt; anamorph *Oidium tuckeri* Berk.] and downy mildews (*Plasmopara viticola* Berl. & de Toni), and anthracnose (*Elsinoë ampelina* Shear). Data at Clarksville were collected for berry weight (based on a 25-berry sample collected once each season) and average cluster weight of a five-cluster sample for 1980, 1981, and 1983. Soluble solids were measured in 1981 and 1983 using a handheld refractometer. Fruit traits were observed regarding harvest date, crop load, cluster size, berry appearance, and disease susceptibility. Winter injury for the cane, trunk, or whole vine was evaluated each year at the time of fruiting.

‘Victoria Red’ was grafted onto three ‘Champanel’ rootstocks in a vineyard at Victoria, TX, in 1981. Also, three own-rooted vines were field-planted in 1982. The trial was expanded to 20 grafted and ungrafted vines in 1984. Vines were spaced a 2.4 m and trained to a Munson “T” trellis using a cordon system with spur pruning. Own-root vines did not survive, however, and were thought to be killed by cotton root rot [caused by *Phymatotrichopsis omnivora* (Duggar) Hennebert], which is epidemic in the Victoria area and had been diagnosed as killing grapevines at this site prior (Friench Tarkington, personal communication). Grafted vines were maintained at this site from 1983 to 2004. However, care of the vines was more thorough from 1983 to 1990 with routine fungicides applied to control diseases. From 1991 to 2000, the vines were not routinely sprayed and overall vineyard care was minimal, although vines were pruned each dormant season. However, vine survival continued to be monitored and ‘Victoria Red’ did not present symptoms of Pierce’s disease during this test period. The vines were severely damaged by Hurricane Claudette in 2003, and the vines died in 2004 as a result of to this damage. New vines were propagated on *V. ×champini* Planch. rootstock in 2006 and re-established at Victoria, and data were collected on the vines in 2008. Data for 1983 to 1986 were recorded for bloom and fruit harvest dates, soluble solids content, berry and cluster weight, and yield (Texas Agricultural Extension Service, 1986). Data collected in 2008 on three 2006-established vines included budbreak and full bloom date, average cluster weight and length of five to nine clusters, average berry weight, and soluble solids.

Own-rooted vines were planted at the Stephenville site in 1987 and first fruited in 1989, although we collected data only for 1991 and 1992 (Stein, 1992a, 1992b). However, the vines cropped 3 of 4 years between 1989 and 1992 and the crop was lost in 1 year

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Fig. 1. Pedigree of 'Victoria Red' grape.

(1990) as a result of a winter temperature of -22°C in the winter of 1989–1990. The vines in the trial were either head-trained and cordoned-pruned or cordon-trained and spur-pruned and had close numbers of buds retained with each training system. Data collection for 1991 and 1992 at Stephenville included harvest date, berry size, cluster weight, yield per vine, soluble solids content, and comments on fruit appearance.

In all plantings, standard cultural practices for bunch grape culture were practiced including annual dormant pruning, weed control using mechanical and chemical methods, and irrigation applied as needed. Either annual nitrogen applications or complete fertilizers were used for fertilization.

Berry characteristics. Berries of 'Victoria Red' are large, bright red, attractive, and usually color well even in high-heat conditions (Fig. 2). Shape is oblong to round. Average berry weight in Arkansas was 4.6 g (Table 1). Berry weight in the older Victoria planting was substantially larger and averaged 8.0 g (Table 2), and in the 2006, planting averaged 6.4 g (data not shown). Berry size at the Stephenville location ranged from 25 to near 29 mm long (Table 3). Overall, the seeded berries of 'Victoria Red' were larger than comparison seedless or seeded cultivars. Berries are of high quality and *V. vinifera*-like in texture and crispness. Skin is tender and edible. Fruits have usually resisted cracking at maturity in summer rainfall, a major

limitation for table grapes with a significant *V. vinifera* genetic character. Fruit cracking was noted 1 year in Arkansas but was the result of berry infection with powdery mildew. Flavor is mostly neutral, not fruity as are most other American-type table grapes. Soluble solids content averaged 17.1% in Arkansas (Table 1) and 18.0% in the older Victoria planting (Table 2). Soluble solids content in the younger Victoria planting averaged 18.9%. Stephenville soluble solids values overall were 18.0% across years and pruning types. Berries usually contained two fully developed seeds and an additional less developed seed (trace).

Cluster characteristics. Clusters of 'Victoria Red' are attractive, large, and often long and

Fig. 2. Clusters of 'Victoria Red' grape.

Table 1. Fruit characteristics of four table grape cultivars at the University of Arkansas Fruit Research Station, Clarksville.

Characteristic	Victoria Red	Mars	Reliance	Venus
Soluble solids (%) ^z	17.1 ± 3.8	16.9 ± 2.3	21.2 ± 0.0	14.8 ± 0.0
Cluster wt (g) ^y	335 ± 67.3	173 ± 23.2	211 ± 70.7	245 ± 44.7
Berry wt (g) ^y	4.6 ± 0.3	2.3 ± 0.6	2.4 ± 0.4	3.1 ± 0.7

^zMeans of 2 years, 1980, 1983 ± SD.

^yMeans of 3 years, 1980, 1981, 1983 ± SD.

Table 2. Comparison of 'Victoria Red' and four other cultivars at Victoria Vineyards evaluation site at Victoria, TX, with average values for the years of data collection for several variables.^z

Cultivar	Yrs	Bud break	Bloom date	Harvest date	Soluble solids (%)	Cluster wt (g)	Berry wt (g)	Yield (kg/vine)
Champanel	1981–1986	14 Mar.	—	1 Aug.	15.2	103	4.0	5.7
Mid South	1982–1986	10 Mar.	—	29 July	15.9	104	4.0	4.0
Miss Blue	1982–1986	11 Mar.	—	10 July	16.7	125	3.4	4.4
Venus	1982–1986	11 Mar. ^y	20 Apr.	19 June	18.6	121	3.3	1.0
Victoria Red	1983–1986	13 Mar.	20 Apr.	3 July	18.0	477	8.0	9.1

^zVine numbers varied from two to 20 in the planting. Data drawn from Texas Agricultural Extension Service (1986).

^yFruit lost 1 year as a result of spring freeze.

averaged 335 g in Arkansas (Table 1). Cluster weight in the older Victoria planting averaged 477 g (Table 2). Cluster weight averaged 357 g and clusters were 23 cm in length for the 2006-established Victoria vines. Stephenville cluster weight ranged from 317 to over 600 g (Table 3). 'Victoria Red' was the largest-clustered entry in the various trials. Clusters are conical to cylindrical. Clusters are loose in berry fill and were noted in Arkansas to usually be adequately filled. At Victoria, the loose clusters were noted to have less fruit rot (organisms not identified) near maturity compared with more tightly filled genotypes, likely as a result of better fungicide coverage and good drying of berry surfaces after rain or morning dew. No postharvest storage trials have been conducted on 'Victoria Red' to determine storage potential nor berry attachment retention to the pedicels or rachis. Also, no flower cluster thinning or other

cultural manipulations have been evaluated on 'Victoria Red'.

Vine characteristics. Productivity of 'Victoria Red' in Arkansas was poor as a result of winter injury and no yield data were collected. Yield in Victoria averaged 9.1 kg/vine (Table 2) and in Stephenville ranged from 3.5 to 6.6 kg/vine (Table 3). Also at Stephenville, cordon-trained, spur-pruned vines were more productive than those cane-pruned in both years of data collection. Overall, 'Victoria Red' was higher-yielding compared with most comparison cultivars in the plantings.

Budbreak date at Victoria averaged 13 Mar., and bloom date averaged 20 Apr. (Table 2). Fruit maturity date was quite variable in Arkansas, ranging from late July to mid-Aug. (data not shown); this variation was likely the result of winter injury to buds in some years with secondary buds leading to a later ripening. In Victoria, the average harvest

date was 3 July (Table 2). In Stephenville, harvest date was 8 July in 1991 for cordon vines and 29 July for cane-pruned vines; in 1992, the harvest date for the two training systems was 27 July (Table 3). The harvest date in 1992 was later as a result of cooler temperatures or possibly some secondary bud fruiting caused by winter injury to primary buds.

Vigor of 'Victoria Red' was variable in Arkansas as a result of winter injury but was moderate to high in observations in Victoria. The growth habit is semierect, more typical of *V. vinifera* than *V. labrusca* L.

A substantial limitation of 'Victoria Red' is its winter-hardiness. As discussed earlier, temperatures of –15 to –11 °C in Arkansas usually caused cane and trunk damage. At Stephenville, 'Victoria Red' produced fruit after a winter low of –13 °C in 1991 but vines were killed to the ground after exposure to –22 °C in the winter of 1989–1990. Fruiting was consistent at Victoria where winter lows were seldom below –6 °C. Therefore, 'Victoria Red' is likely reliably hardy in the mid-South, not the upper South such as northern Arkansas and similar latitudes and should be planted in USDA hardiness zone 7b or warmer.

One of the most exciting characteristics of 'Victoria Red' was its survival in southeast Texas, a region of the United States that has extreme pressure from Pierce's disease (Jim Kamas, personal communication). This disease is the most devastating threat to bunch grape culture in the South. Pierce's disease did not occur on 'Victoria Red' at the development site of Clarksville; thus, no evaluation for its resistance was performed there. At the Victoria test site, susceptible cultivars usually died within 1 to 3 years after planting (Friench Tarkington, personal communication). The survival of 'Victoria Red' for over 20 years at this site indicates either tolerance or some degree of resistance to this disease. Although neither of the parents is known to be resistant or have tolerance to Pierce's disease, there are several progenitors within the lineage of Ark. 1123 (Fig. 1) that have been shown to exhibit sustained field tolerance to *X. fastidiosa* infection. Tolerant relatives include 'Villard Blanc' (S.V. 12-375) (Walker and Tenschler, 2004), 'Jacquez' (also known as 'Jaques', 'Black Spanish', and 'Lenoir'), 'Herbemont' (Hewitt, 1958) as well as the native Texas species *Vitis berlandieri* Planch. (Krivanek and Walker, 2005). Grape production along the Gulf Coast of Texas has been traditionally limited to tolerant cultivars because susceptible cultivars commonly die very rapidly from Pierce's disease (Kamas et al., 2000). Growers in the deep South should consider testing 'Victoria Red' in other intense Pierce's disease areas such as Florida to see if vines can survive there.

In the 2006-established planting, vines showed possible Pierce's disease symptoms in 2007. An enzyme-linked immunosorbent assay test was done on the vines, and it was negative. At the same date, several *V. vinifera* cultivars were tested for Pierce's disease at

Table 3. Comparison of 'Victoria Red' and five other cultivars for 1991 and 1992 at the Texas AgriLife Research and Extension Center, Stephenville.^z

Cultivar	Yr	Pruning	Harvest date	Cluster wt (g)	Berry length (mm)	Yield (kg/vine)	Soluble solids (%)
Mars	1991	Cordon	22 July	158.8	19.1	3.6	19.5
		Cane	—	204.1	17.5	2.3	19.5
	1992	Cordon	27 July	254.0	15.9	10.5	17.3
		Cane	27 July	254.0	15.9	6.6	17.3
Orlando Seedless	1991	Cordon	22 July	63.5	9.5	0.7	20.0
		Cane	22 July	81.6	9.5	1.4	20.0
	1992	Cordon	23 July	140.6	7.9	8.5	23.0
		Cane	23 July	140.6	7.9	4.6	23.0
Reliance	1991	Cordon	17 July	263.1	15.9	5.2	22.3
		Cane	17 July	190.5	15.9	2.3	22.3
	1992	Cordon	15 July	217.7	15.9	4.6	20.3
		Cane	15 July	217.7	15.9	5.2	20.3
Saturn	1991	Cordon	2 Aug.	249.5	15.9	6.0	20.7
		Cane	20 Aug.	249.5	15.9	3.8	19.5
	1992	Cordon	20 Aug.	249.5	15.9	3.8	19.5
		Cane	20 Aug.	249.5	15.9	3.8	19.5
Venus	1991	Cordon	8 July	235.9	19.1	4.3	21.5
		Cane	8 July	213.2	19.1	0.6	21.5
	1992	Cordon	15 July	376.5	19.1	10.6	17.0
		Cane	15 July	340.2	19.1	8.5	17.0
Victoria Red	1991	Cordon	8 July	564.5	25.4	6.2	18.5
		Cane	29 July	317.5	25.4	3.5	18.0
	1992	Cordon	27 July	589.7	28.6	6.6	17.7
		Cane	27 July	680.4	28.6	5.8	17.7

^zData are from Stein (1992a).

this site and were found positive for infection. Since that time, no Pierce's disease symptoms have occurred on these vines and they remain healthy through the 2010 growing season (Friench Tarkington, personal communication).

There are no substantial data to support fungal disease resistance of 'Victoria Red', particularly to the more common diseases such as black rot, powdery and downy mildews, and anthracnose. Powdery mildew was observed on leaves and berries in 1 year in Arkansas. Extensive fungal disease observa-

tions were not performed in Texas; however, at the Stephenville location, 'Victoria Red' was noted to have foliar disease resistance because it retained more healthy leaves into late summer and fall than the comparison cultivars (Stein, 1992a, 1992b).

'Victoria Red' should be considered for production for local markets in the southern United States. Its attractive berries and clusters along with excellent quality are primary attributes. Pierce's disease tolerance or resistance is a major positive characteristic and should be of value to all fresh-market grape

growers in areas where this disease is prevailing.

Availability

'Victoria Red' is a joint release of the University of Arkansas Division of Agriculture, Texas A&M University, and Tarkington Vineyard. It is not patented. A very limited number of cuttings or vines is available, and requests should be made to: James Kamas, Assistant Professor and Extension Specialist, Pomology and Viticulture Texas PD Program, Outreach Coordinator, Texas AgriLife Extension, Fredericksburg, TX 78624; 830-997-7047; j-kamas@tamu.edu.

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