‘Southern Sensation Seedless’ Grape

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Additional index words. fruit breeding, Pierce’s disease, table grapes, *Vitis*

‘Southern Sensation Seedless’ is a table grape cultivar (*Vitis* hybrid) developed by the University of Arkansas System Division of Agriculture. It is the second cooperative release with Texas A&M University (Moore et al., 2011). ‘Southern Sensation Seedless’ has medium to large, attractive clusters with yellow, thin-skinned berries with insignificant seed remnants. The skin is tender and the fruit has a neutral flavor. Winterhardiness is a limitation of the cultivar because it routinely experienced cane and trunk injury during testing in west-central Arkansas. ‘Southern Sensation Seedless’ is recommended as a fresh-fruit cultivar for on-farm and local market sales in U.S. Department of Agriculture (USDA) hardiness zones 7b or warmer. The most significant characteristic of ‘Southern Sensation Seedless’ is its apparent Pierce’s disease resistance (*Xylella fastidiosa* Wells et al.) in central and coastal Texas, which is an area of the United States with extremely high Pierce’s disease pressure. Pierce’s disease resistance has not been definitively proved, but it is recommended for trial in areas where this disease is prevalent.

Origin

‘Southern Sensation Seedless’ is a result of a cross of Dunstan 210 × ‘Black Monukka’ made by James N. Moore (Fig. 1). The pedigree extends beyond named cultivar parents to species information when possible to fully reflect its background. Dunstan 210 is a hybrid of *V. vinifera* ‘Black Rose’ and *Vitis*

spp. ‘Aurelia’. ‘Black Monukka’ is a *V. vinifera* cultivar derived from ‘Ichkimar’ × ‘Sultanina’. ‘Black Monukka’ produces large oval to cylindrical, seedless berries with reddish-black skin. Clusters are large, have a cylindrical shape, and are usually shouldered.

The original ‘Southern Sensation Seedless’ vine was selected in 1973 by James N. Moore from a seedling field at the University of Arkansas Fruit Research Station in Clarksville, AR (west-central Arkansas; lat. 35°28′17″ N, long. 93°80′0″ W; USDA hardiness zone 7a) and tested as selection Ark. 1400. It was released and named ‘Southern Sensation Seedless’ in 2021. Initial testing of ‘Southern Sensation Seedless’ was performed at that location, but additional evaluations were performed in Texas. Hardwood cuttings of Ark. 1400 were sent to Texas A&M University in 1986, and a test site was established at the Texas A&M AgriLife Research and Extension Center in Stephenville (north-central Texas; lat. 32°13′14″ N, long. 98°12′6″ W; USDA hardiness zone 7b). This location is ≈447 km from the Gulf of Mexico and has moderate Pierce’s disease pressure with 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 (Kamas, 2014). In 1992, a cultivar trial was established 4 miles north of Castroville, TX, (Southwest Texas; lat. 29°24′31.9″ N, long. 98°54.0′6.0″ W; USDA hardiness zone 9A), which is ≈274 km from the Gulf of Mexico and a location that has high Pierce’s disease pressure. In 2017, a trial was established at the Texas A&M University Horticulture Teaching Research and Extension Center in Somerville (southeast Texas; lat. 30°20′41″ N, long. 96°31′49″ W; USDA hardiness zone 8B). This location is ≈191 km from the Gulf Coast and has extremely high Pierce’s Disease pressure.

Description and Performance

After selection in 1973, a single, three-vine plot was established at the University of Arkansas Fruit Research Station in Clarksville. The soil was a fine sandy loam. Vines were trained to a four-arm Kniffen system and spaced at 2.4 m. Data were collected for ‘Southern Sensation Seedless’ during 16 fruiting seasons between 1978 and 1996.

In 1985, all vines experienced severe winter injury but were retrained and produced fruit the following year. In 1996, all vines were killed to the ground and the selection was discarded. During the evaluation period, minimum winter temperatures ranged from –15 to –11 °C, resulting in damage or death to canes and trunks.

Data collected at Clarksville regarding fruit characteristics included berry weight (based on a 25-berry sample collected once each season), average cluster weight of a five-cluster sample, and soluble solids using a hand-held refractometer. Fruit traits crop load, cluster size, berry appearance, and disease susceptibility were also recorded at harvest. Spring frost injury was evaluated after the occurrence of sub-freezing temperatures after budbreak, and winter injury for cane, trunk, or whole-vine was evaluated each year at the time of fruiting.

In Stephenville, own-rooted vines were planted in 1986, and they produced fruit beginning in 1988 (Stein, 1992a, 1992b). The vines involved in the trial were either head-trained and cane-pruned or cordon-trained and spur-pruned, and they had a similar number of buds retained with each training system. Data collection during 1991 and 1992 at Stephenville included harvest date, berry size, cluster weight, yield per vine, soluble solids content, and comments regarding fruit appearance. In 1990, winter injury was observed because of a winter temperature of –22 °C, but the vines still produced a crop.

Only observational data were collected from the Southwest Texas location, but it was the only cultivar to remain alive after more than 20 years. It was suspected that cultivars like Flame seedless, Blush seedless, and Beauty seedless succumbed to Pierce’s disease.

In Somerville, a 20-vine plot was established in 2017. Vines were grafted onto ‘Paulsen 1103’ rootstock and trained to the Watson Training System (Scheiner et al., 2020). Row-by-vine spacing was 3.04 × 2.44 m. The first crop was produced in 2020, and data regarding berry weight, berry size, cluster weight, number of berries per cluster, soluble solids, juice pH, and titratable acidity were collected. Vines were cluster-thinned to a single cluster per shoot at berry set.

Standard cultural practices for bunch grape culture were practiced at all trial sites, including annual dormant pruning, weed control using mechanical and chemical methods, and drip irrigation applied as needed. Annual nitrogen applications and complete fertilizers were used for fertilization as needed.

Fungicides were applied to control black rot (*Guignardia bidwellii* Viala & Ravaz),

Received for publication 27 Aug. 2021. Accepted for publication 5 Nov. 2021.

Published online 20 January 2022.

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Fig. 1. Pedigree of 'Southern Sensation Seedless' grape.

powdery mildew (*Erysiphe necator* Schw. [syns. *Uncinula necator* (Schw.) Burr., *E. tuckeri* Berk., *U. americana* Howe, and *U. spiralis* Berk. & Curt; anamorph *Oidium tuckeri* Berk.]) downy mildew (*Plasmopara viticola* Berl. & de Toni), and

Fig. 2. Clusters of 'Southern Sensation Seedless' grape.

anthracnose (*Elsinoë ampelina* Shear) as per commercial requirements for the area.

Berry characteristics. Berries of 'Southern Sensation Seedless' are of medium size, oblong, and dull light green to bright yellow in color (Figs. 2 and 3). The average berry weight was 1.97 g in Arkansas (Table 1) and 2.30 g in Somerville, TX (Table 2). Berry length ranged from 15.9 to 17.4 mm long in Stephenville and Somerville, which is an average of 62% of the length of 'Victoria Red' berries. The quality of 'Southern Sensation Seedless' berries is high, with a neutral, fruity flavor and a crisp texture. The skin is thin, tender, and palatable. Cracking was observed during 3 of 15 years of observation in Arkansas, but no cracking was observed in Texas. Seed remnants are small and not noticeable in the mouth. Soluble solids ranged from 13.2 to 20.7 in Arkansas (Table 1), and they averaged 13.7 in Stephenville, TX (Table 2). Juice pH was 3.96 and titratable acidity was 4.61 g/L in Somerville

(Table 3). Overall, the observed fruit quality was high.

Cluster characteristics. The clusters of 'Southern Sensation Seedless' are large, often shouldered, cylindrical, and range from 111.5 to

Fig. 3. Mature 'Southern Sensation Seedless' clusters after 3 weeks of storage at 5°C and 80% to 90% relative humidity.

Table 1. Observation plot data of total per vine weight (wt) in kilograms (kg), cluster weight (g), and berry weight (g) for ‘Southern Sensation Seedless’ collected on the harvest date at Fruit Research Station, Clarksville, AR.

Selection	Harvest date ^z	Total wt per vine (kg) ^y	Cluster wt (g) ^z	Berry wt (g) ^z	Soluble solids (%) ^z
Southern Sensation Seedless	5 Aug. (9.7)	7.27	302.4 (169.3)	1.97 (0.29)	16.84 (2.22)
Mars	4 Aug. (6.0)	6.74	183.4 (67.74)	3.07 (0.69)	17.49 (1.73)
Reliance	28 July (6.8)	7.72	274.0 (123.7)	2.24 (0.36)	21.92 (1.04)
Venus	16 July (7.3)	11.41	259.9 (123.0)	3.23 (0.68)	16.90 (1.53)

^zMeans and standard deviations (in parentheses) calculated for years 1979–96.

^yMeans calculated for year 1980.

453.6 g in Arkansas (Table 1). In Texas, cluster weights averaged 575.5 g in Stephenville and 237.42 in Somerville. Clusters are well filled to tightly filled. The impact of cluster thinning or cultural manipulation on cluster characteristics was not evaluated, and no postharvest storage trials have been conducted. However, in 2020, it was observed that mature ‘Southern Sensation Seedless’ stored at 5 °C with 80% to 90% relative humidity did not show signs of berry shrivel or rot after 3 weeks of storage.

Vine characteristics. ‘Southern Sensation Seedless’ was observed to have good vigor on its own roots in Arkansas and in Texas. In Somerville, third-leaf grafted vines had dormant pruning weights that averaged 1.31 kg, with a mean cane weight of 45.47 g (Table 2). The growth habit is semi-erect. Although winter injury was observed in Arkansas and Stephenville, the vines continued to produce fruit the same year when injury occurred (Stephenville) or the following year (Arkansas). In Stephenville, vines that received cold injury in 1990 and 1991 had yields that were approximately half of their 5-year average.

In Arkansas, budbreak was observed between 24 Mar. and 1 Apr. (data not shown), which is before that of ‘Venus’ and similar to that of ‘Mars’ and ‘Reliance’. In Somerville, budbreak occurred on 4 March, which is 2 d before that of ‘Victoria Red’ (Table 2). The bloom date was 12 Apr., and harvest was 16 July. In Arkansas, harvest occurred from 23 July to 24 Aug.

A limitation of ‘Southern Sensation Seedless’ in more northerly climates is its winterhardiness. As previously indicated, temperatures of –15 to –11 °C caused serious cane and trunk damage in Arkansas. In Stephenville, ‘Southern Sensation Seedless’ was injured following a winter low of –13 °C in 1991, but vines continued to produce fruit. ‘Southern Sensation Seedless’ is likely reliably hardy in the mid-South, but not the upper South. It is recommended that ‘Southern Sensation Seedless’ should be planted in USDA hardiness zone 7b or warmer.

Perhaps the most valuable characteristic of ‘Southern Sensation Seedless’ is its survival in central and southeastern Texas, which are regions of the United States that have extreme pressure from Pierce’s Disease (PD) (Kamas, 2014). Although formal testing for PD tolerance has not occurred, its survival and lack of symptoms for 34 years in Texas suggest tolerance or some level of resistance. Furthermore, the pollen parent of ‘Southern Sensation Seedless’, Dunstan 210, is a grandparent of ‘Victoria Red’, a prior University of Arkansas, Texas A&M University release with reported tolerance to PD. The progenitor source of PD tolerance is unknown, but the shared relative ‘Villard Blanc’ (S.V. 12-375) and species *Vitis berlandieri* Planch. have been reported to have durable tolerance under field conditions (Krivanek and Walker, 2005; Walker and Tenschler, 2004). Currently, ‘Southern Sensation Seedless’ represents

one of few seedless grape cultivars with tolerance to PD. Thus, growers in USDA zone 7b and warmer areas where PD limits bunch grape production should consider trialing ‘Southern Sensation Seedless’. No symptoms of PD have been observed at any location in Texas.

There are no substantial data to support fungal disease resistance of ‘Southern Sensation Seedless’, particularly to the more common diseases such as black rot, powdery and downy mildews, and anthracnose. Powdery mildew was observed on leaves and berries during 1 year in Arkansas. Extensive fungal disease observations were not performed in Texas; however, at the Stephenville location, ‘Southern Sensation Seedless’ 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). Downy mildew was observed in Somerville in 2020, after a period of intense pressure, but vines retained more foliage than ‘Blanc Du Bois’ in a neighboring row.

‘Southern Sensation Seedless’ should be considered for production for local markets in the southern United States. Its seedless berries, large and attractive clusters, and excellent quality are primary attributes. PD 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 prevalent.

Observational data in 1988 suggest that ‘Southern Sensation Seedless’ will respond to gibberellic acid (GA) treatments, as used on some other table grapes. In 1989, clusters of ‘Southern Sensation Seedless’ were treated with 10 ppm GA at bloom, followed by 10 ppm at BB berry size (≈4 mm) and again 2 weeks later. Berry length of treated clusters was 23.8 mm, as opposed to 15.9 mm for untreated clusters. In addition, GA treated cluster size was 590 g, as opposed to 304 g for untreated clusters.

Availability

‘Southern Sensation Seedless’ is a joint release of the University of Arkansas Division of Agriculture and Texas A&M University. This cultivar will be patented and plants are available from Double A Vineyards (<https://doubleavineyards.com/>).

Table 2. Fruit characteristics of two table grape cultivars at the Texas A&M University Horticulture Teaching Research and Extension Center, Somerville, TX.

Characteristic	Selection	
	Southern Sensation Seedless	Victoria Red
Budbreak	4 Mar.	6 Mar.
Bloom	12 Apr.	13 Apr.
Harvest	16 July	16 July
Berry wt (g) ^z	2.30 (0.40)	6.91 (0.57)
Berry length	16.60 (2.10)	28.37 (3.07)
Berries/cluster	122.7 (10.5)	—
Clusters/vine	33.6 (12.22)	31.8 (8.12)
Cluster wt (g)	237.42 (44.1)	421.14 (56.3)
Yield (kg/vine)	5.53 (1.10)	12.7 (2.21)
Soluble solids (%)	16.0 (1.67)	15.8 (2.44)
Juice pH	3.96 (0.28)	3.84 (0.37)
Titratable acidity (g/L) ^y	4.61 (0.34)	4.71 (0.38)
Shoots/vine	28.81 (5.99)	37.10 (6.23)
Pruning weight (kg)	1.31 (0.42)	—

^zMeans and standard deviations (in parentheses) calculated for year 2020.

^yTartaric acid equivalents.

Table 3. Comparison of ‘Southern Sensation Seedless’ and six other cultivars for 1991 and 1992 at the Texas AgriLife Research and Extension Center in Stephenville.^z

Cultivar	Yr	Pruning	Harvest date	Cluster wt (g)	Berry length (mm)	Yield (kg/vine)	Soluble solids (%)
Southern Sensation Seedless	1991	Cordon	22 July	158.8	17.4	7.9	14.0
	1992	Cane	22 July	548.8	17.4	3.9	14.0
Mars	1991	Cordon	23 July	725.7	15.9	15.9	13.3
		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
	1992	Cordon	20 Aug.	249.5	15.9	5.5	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, 1992b).

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