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‘Avoyelles’ Sweetpotato

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‘Avoyelles’ sweetpotato [*Ipomoea batatas* (L.) Lam.] was developed by the Louisiana Agricultural Experiment Station to provide an orange-flesh, light-rose- to copper-skin cultivar with superior root shape, disease resistance to southern root-knot nematode, good storage qualities, and early harvest date. ‘Avoyelles’ is average in production beds with proper presprouting. ‘Avoyelles’ can be harvested 93 to 98 d after planting (DAP), which is 10 to 20 d earlier than ‘Orleans’ (LaBonte et al. 2012, 2013a) or ‘Beauregard’ (Rolston et al. 1987), and has a superior US #1 grade yield (diameter, 5.1–8.9 cm; length, 7.6–22.9 cm). The US #1 grade yield is comparable to ‘Orleans’ and ‘Beauregard’ when harvested after 100 DAP; however, total marketable yield (US #1 grade; canner diameter, 2.5–5.1 cm; canner length, 5.1–17.8 cm; jumbo is larger than US #1 in diameter or length or both, and without objectionable defects) exceeds ‘Orleans’ and ‘Beauregard’, as oversize jumbos increase in weight and number. The skin of ‘Avoyelles’ is mostly smooth, and lobing has been reported in a few testing environments (data not shown). ‘Avoyelles’ is highly resistant to southern root-knot nematode, *Meloidogyne incognita*; ‘Orleans’ and ‘Beauregard’ are susceptible. The cultivar has maintained a consistent shape across silt-loam soils of the Gulf South and sandy soils in South Carolina. It is not known whether ‘Avoyelles’ is adapted to sandy soils typical for the production area in California.

Identified and evaluated initially as ‘LA18-100’, the cultivar is named for a parish in Louisiana and in recognition of this important production region.

Origin

‘Avoyelles’ was first grown in 2018 and originated from an open-pollinated polycross nursery consisting of 19 lines in 2017. It was tested under the line designation ‘LA18-100’. The female lineage is ‘07-146’ or ‘Bayou Belle’ (LaBonte et al. 2013b) from the Louisiana State University AgCenter Sweetpotato Breeding Program. The male parent is unknown.

Description

Fast-growing, unfolded immature leaves are green and corresponded to color charts as 5 G (green) Y (yellow) (4/4) (Munsell® Color, New Windsor, NY, USA). The numerical and letter designations for color represents the hue; the fraction represents the value or chroma. Mature leaves transition nominally over one to two nodes from the apex to a slightly darker green adaxial surface [5 G (green) Y (yellow) (3/4)]. The abaxial surface is lighter green [5 G (green) Y (yellow) (4/4)]. Mature leaves at five nodes from the apex have an acute apex and mostly a cordate base, and an entire leaf margin. Some leaves have one to three small cusps that project 3 mm on each side of the lamina. Mature leaves are ≈13 cm long and 11 cm wide, and are similar in size to ‘Orleans’ and ‘Beauregard’. Abaxial and adaxial surfaces are slightly puckered between veins. The petiole is green [5 G (green) Y (yellow) (3/4)] and transitions toward the base of the stem to a lighter green that matches the stem color [2.5 G (green) Y (yellow) (5/6)]. No change in color occurs at the base of the leaf junction with the petiole. Anthocyanin pigmentation is absent in veins, leaf junctions, and nodes. The ‘Avoyelles’ canopy biomass is similar to ‘Orleans’ and ‘Beauregard’.

A typical inflorescence of ‘Avoyelles’ has one cluster of three, five, or seven flowers per peduncle. Individual flowers are ≈2.7 cm long from the base of the calyx, and the corolla is 3 cm wide at the opening. The inner and outer limbs of the corolla (corolla’s outermost area, distal from the calyx) are light purple [10 P (purple) (5/6)]. Stigmata appear light purple [2.5 R (red) P (purple) (5/6)]. The five stamens are inferior to stigmata and attached to the ovary.

Storage roots are round-elliptical without lobing and are consistent in shape; however, some lobing has been reported at several test sites. The skin of ‘Avoyelles’ has a lighter color value [5 Y (yellow) R (red) 7/6)] from the light- to medium-rose ‘Orleans’ [5 Y (yellow) R (red) 6/6)]. Skin does vary in coloration in different soils and in colder soils; rose hues fade in storage. The cortex is 3.7 mm in depth and the flesh is uniformly orange [2.5 Y (yellow) R (red) 7/10]; both traits are similar to ‘Orleans’.

Disease Reactions

‘Avoyelles’ was compared with ‘Orleans’ in controlled tests for resistance to common pathogens affecting sweetpotatoes. It was like ‘Orleans’ (intermediate to resistant) for soil rot, caused by *Streptomyces ipomoeae* (Person and Martin, Waksman and Henrici). ‘Avoyelles’ was susceptible to intermediate and ‘Orleans’ was resistant to Fusarium wilt or stem rot caused by *Fusarium oxysporum* Schlect. f. sp. *batatas* race 0 (Wollenw.) Snyder and Hansen, 1940, but were not tested with race 1, which occurs in California. ‘Avoyelles’ was very resistant; ‘Orleans’ and ‘Beauregard’ were susceptible to race 3 of southern root-knot nematode, *Meloidogyne incognit*a (Kofoid and White 1919) Chitwood, 1949. ‘Avoyelles’ and ‘Orleans’ were susceptible to guava root-knot nematode, *Meloidogyne enterolobii* (Yang and Eisenback 1983). ‘Avoyelles’ and ‘Orleans’ were susceptible to bacterial soft rot in storage roots caused by *Dickeya dadantii* (Samson et al. 2005) (=*Erwinia chrysanthemi* Burkholder, McFadden & Dimock). ‘Avoyelles’ was susceptible to intermediate and ‘Orleans’ was resistant in reaction to *Rhizopus* soft rot caused by *Rhizopus stolonifer* (Ehr. ex. Fr.) Lind. Russet

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crack symptoms have not been observed in California.

Insect Resistance

'Avoyelles' is currently being evaluated for relative insect resistance. It ranked similar in banded cucumber beetle damage (*Diabrotica balteata* LeConte) in comparison with 'Orleans' in 2021 and 2022 replicated trials at Alexandria, LA, USA (unpublished data). There was similar damage (data not shown) from the sweetpotato weevil, *Cylas formicarius elegantulus* (Summers), in comparison with 'Orleans' and more damage in the percentage of uninjured roots to 'Murasaki-29' (LaBonte et al. 2008), a resistant check variety (Chen et al. 2019). 'Avoyelles' has not demonstrated any unusual propensity for insect damage in numerous on-farm trials in the Gulf South.

Production

'Avoyelles' plant production from propagation beds is less than 'Beauregard' or 'Orleans' unless presprouted for 7 d at 29 °C. Grower observations indicate excellent plant survivability in hot and dry conditions in comparison to 'Beauregard' or 'Orleans'.

'Avoyelles' was compared with 'Orleans' in randomized complete block trials, with three or four replications, at various locations in Arkansas, Mississippi, South Carolina, and Louisiana, USA. Trials covered a range of planting dates and growing days (mostly 93–147 d). 'Avoyelles' US #1 yields exceeded 'Orleans' in five trials and had comparable yield in the other five trials (Table 1). 'Avoyelles' yield at 93 to 98 DAP exceeded 'Orleans' in two of four trials of US #1 grade and exceeded 'Orleans' for total marketable yield in all four trials. This is indicative of a gain in rank across all grades and underscores fewer DAP needed to reach a marketable crop. Producers often harvest an undersize crop early to fill orders, and 'Avoyelles' represents an opportunity to supply retailers and processors before the primary crop is harvested, with less loss of tonnage. Relative rank for 'Avoyelles' was greater than 'Orleans' at all trial sites for US #1 grade and total marketable yields (Table 1). Irrigation has been essential in optimizing yield for early harvest. Yield and shape quality are equal or superior to 'Orleans' in poor environments. Storage is good. Roots are sound and marketable after 6 to 8 months in storage; some late pithiness has been noted if the crop was grown under water stress.

Quality Attributes

'Avoyelles' roots stored for 3 months in 2023 and 2024 were characterized for nutritional content by Microbac Laboratories, Inc. (Warrendale, PA, USA). The analyzed sample consisted of three randomly selected roots. Total carbohydrates for 'Avoyelles' was 18.1 g·100 g^{-1} on a fresh-weight basis (fwb). Dietary fiber was 2.53 g·100 g^{-1} fwb. Calcium was 35.2 mg·100 g^{-1} fwb and represents 4% of the daily diet per 110-g serving. Vitamin C was 8.94 mg·100 g^{-1} fwb and represents 10% of the daily diet per 110-g serving. Potassium in 'Avoyelles' was 350 mg·100 g^{-1} fwb and represents 8% of the daily diet per 100-g serving. Total vitamin A in retinol activity equivalents (RAE) in 'Avoyelles' was 566 μg·RAE 100 g^{-1} fwb and represents 70% of the daily diet per 110-g serving. Dry matter content was 20.6%.

Availability

Limited quantities of foundation seed (root) stock is commercially available for the 2024 crop season. Requests for roots should be made to the Sweet Potato Research Station, PO Box 120, Chase, LA 71324, USA, or through a licensed certified seed grower.

Table 1. Yield by grade of 'Avoyelles' and 'Orleans' in replicated trials.

	Avg yield (Mt·ha^{-1})[ii]			
Year; location; season[i] per cultivar	US #1	Canner	Jumbo	Total marketable
2020; Mansura, LA, USA; midseason				
Avoyelles	35.0 a[iii]	7.5 a	14.4 a	56.8 a
Orleans	17.1 b	9.5 a	3.2 b	27.1 b
2021; Mansura, LA, USA; late season				
Avoyelles	29.5 a	14.9 a	20.7 a	65.1 a
Orleans	18.0 b	14.5 a	11.9 a	44.6 b
2022; Senatobia, MS, USA; midseason				
Avoyelles	47.1 a	18.7 a	8.3 a	74.0 a
Orleans	30.4 b	18.7 a	5.7 a	54.3 a
2022; Windsor, SC, USA; late season				
Avoyelles	45.8 a	16.5 a	21.5 a	83.8 a
Orleans	32.9 a	10.4 a	3.4 b	46.6 b
2022; Ville Platte, LA, USA; midseason				
Avoyelles	26.7 a	6.6 a	6.4 a	39.7 a
Orleans	14.6 a	9.5 a	1.3 a	25.4 b
2022; Delhi, LA, USA; late season				
Avoyelles	32.9 a	10.5 a	14.3 a	57.5 a
Orleans	17.9 b	10.3 a	2.7 a	31.0 b
2023; Belzoni, MS, USA; late season[iv]				
Avoyelles	30.2 a	17.5 a	15.9 a	63.7 a
Orleans	11.8 b	8.1 b	0.4 b	22.2 b
2023; Vardaman, MS, USA; late season[iv]				
Avoyelles	27.0 a	19.2 a	9.9 a	54.9 a
Orleans	23.2 a	14.1 a	1.2 a	38.5 b
2023; Vardaman, MS, USA; late season[iv]				
Avoyelles	21.5 a	14.9 a	20.7 a	65.1 a
Orleans	15.9 a	14.5 a	11.9 a	44.6 b
2023; Charleston, MS, USA; late season[iv]				
Avoyelles	11.7 a	6.1 a	0.0 a	17.7 a
Orleans	3.7 b	5.5 a	0.0 a	9.3 b

[i] Midseason plantings, 16 to 30 May; late season plantings, 1 Jun into July.

[ii] Root size for US #1: diameter, 5.1–8.9 cm, length, 7.6–22.9 cm; canner: diameter, 2.5–5.1 cm; length, 5.1–17.8 cm; jumbo: larger than US #1 in diameter or length or both, and without objectionable defects.

[iii] Values within the same column followed by the same lowercase letter are not significantly different at $P = 0.05$. Means separation by Duncan's multiple range test.

[iv] Harvest at 93 to 97 d after planting.

United States plant patent and European Union Community plant variety rights will be sought.

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