

# 'Bienville' Sweetpotato

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*Additional index words.* vegetable breeding, disease resistance, variety

'Bienville' sweetpotato [*Ipomoea batatas* (L.) Lam.] was developed by the Louisiana Agricultural Experiment Station to provide a cultivar with characteristics similar to those of 'Beauregard' but with southern root-knot nematode resistance and improved production in sandy soils. 'Bienville' produces plants (sprouts) later and to a lesser extent than does 'Beauregard'. Days to harvest for 'Bienville' and 'Beauregard' are similar; however, 'Beauregard' can be earlier when growth conditions are ideal. The storage roots of 'Bienville' do not elongate to an objectionable degree in sandy soils as do 'Beauregard' roots. The expected place for 'Bienville' in sweetpotato production is southern root-knot nematode infested soil.

## Origin

'Bienville' originated in 1994 as a seedling from an 11-parent polycross nursery of the previous year. The female lineage is L86-33, a 1994 germplasm release by the Louisiana Agricultural Experiment Station, and L82-508 ('Beauregard').

## Description

'Bienville' has green-stemmed vines from the apex to the crown of the roots. The canopy biomass is greater than 'Beauregard' and slightly more than 'Jewel'. The canopy architecture is upright and erect prior to spreading, while 'Beauregard' exhibits a prostrate growth habit. Unfolded immature leaves are dark purple with some green abaxial veins, changing gradually over one to two nodes from the apex to dark green laminae. Some vestigial purple mottling is found on the third leaf from the apex. Mature leaves have an acute apex and either a cordate or hastate base. Abaxial

and adaxial veins are light purple. Leaves, in general, are darker than 'Beauregard'. The petiole is purple at its junction with the leaf and changes to green before becoming slightly purple again at the node. The dormant nodal meristem is also purple. The flower corolla has a rotate, pale purple limb with a purple throat; sepals are obovate with an acute apex. Storage roots are elongate without lobing and similar to 'Beauregard'. Skin is light rose at harvest and fades in storage. 'Beauregard' is similar, but darker rose at harvest. The cortex is 4–5 mm in depth, and the flesh is uniformly orange and darker than 'Beauregard'. Hunter colorimeter values for cross sections of freshly harvested 'Bienville' and 'Beauregard' storage roots were as follows: 'Bienville'— $L = 66.42 + 1.27$ ,  $a = 32.97 + 1.19$ , and  $b = 41.14 + 1.56$ ; 'Beauregard'— $L = 69.41 + 1.01$ ,  $a = 30.13 + 1.93$ , and  $b = 38.8 + 2.11$ , using a Minolta spectrophotometer cm 3500d (Minolta Co., Ltd., Osaka, Japan).

## Disease reactions

'Bienville' and 'Beauregard' have reacted similarly for most diseases we have evaluated in controlled tests. 'Bienville' is resistant to soil rot, caused by *Streptomyces ipomoeae* (Person & W.J. Martin) Waksman & Henrici. In severely infested fields, yield of 'Bienville' is unaffected and storage roots have few lesions; while yield of 'Beauregard' is also unaffected, storage roots often have lesions. 'Bienville' is resistant to Fusarium wilt or stem rot, caused by *Fusarium oxysporum* Schlecht. f. sp. *batatas* (Wollenw.) Snyder & Hans.; resistance is greater than intermediate 'Centennial' or susceptible 'Porto Rico' and similar to 'Beauregard'. In greenhouse tests measuring nematode reproduction 'Bienville' is highly resistant to southern root-knot nematode, *Meloidogyne incognita* (Kofoid & White 1919) Chitwood 1949 race 3; resistance is greater than resistant 'Jewel' and highly susceptible 'Beauregard'. In 2000, race 3 ratings for egg masses and number of galls and eggs/plant for 'Bienville' were 0.00 ('Beauregard' = 4.75; 'Jewel' = 3.25), 0.00 ('Beauregard' = 2.00; 'Jewel' = 0.25) and 58 ('Beauregard' = 172,000; 'Jewel' = 43,400), respectively. Egg masses and galls were estimated using a scale of 0–5 where 0 = no symptoms, 1 = 1–3/plant, 2 = 4–10/plant, 3 = 11–30/plant, 4 = 31–100/plant, and 5 = >100/plant. Results for 1999 were similar. 'Bienville' is resistant to development of internal cork, a disease presumed to be caused by a strain of sweetpotato feathery mottle virus, but some storage roots developed an

unusual discoloration of the vascular ring at the proximal end. 'Bienville' is resistant to Fusarium root rot, caused by *Fusarium solani* (Sacc.) Mart. emend. Snyder & Hans., similar to 'Beauregard' and slightly more resistant than 'Jewel'. At the time of harvest, storage roots are more resistant to bacterial soft rot (caused by *Erwinia chrysanthemi* Burkholder, McFadden & Dimock) than are 'Beauregard' roots, but after 3–5 months storage, 'Bienville' shows comparable susceptibility to that of 'Beauregard'. 'Bienville' is resistant to *Rhizopus* soft rot, caused by *Rhizopus stolonifer* (Ehr. ex. Fr.) Lind., similar to 'Beauregard' and more resistant than 'Hernandez' or 'Jewel'. Incidence of circular spot, caused by *Sclerotium rolfsii* Sacc., has been 0.5%–5.5%; similar to 'Beauregard' (1.4%–14.1%) in this reaction.

## Insect resistance

'Bienville' did not exhibit resistance to white grub, *Plectris aliena* Chapin or *Phyllophaga* sp., based on National Sweetpotato Collaborators Insect Resistance Trials conducted by D.M. Jackson and J.R. Bohac (USDA Vegetable Laboratory, Charleston, S.C.) in 1999, 2000, and 2001. In these same tests, it did not exhibit resistance to the WDS (Wireworm, Diabrotica, Systema) complex nor meaningful resistance to the sweet potato flea beetle, *Chaetoncnema confinis* Crotch. Susceptibility to WDS appears similar to that of 'Beauregard' in South Carolina. Susceptibility to *Diabrotica balteata* LeConte in Louisiana is similar to that of 'Beauregard'. 'Bienville' has no resistance to the sweetpotato weevil, *Cylas formicarius* (fab.), in field root infestation studies in Louisiana.

## Production

'Bienville' was compared with 'Beauregard' in randomized complete-block trials with four or five replications at various locations in Louisiana. There were 18 trials over a 3-year period (1998, 1999, and 2000). These covered a wide range of planting dates and growing days. Yield and grade of 'Bienville' compared favorably with that of 'Beauregard' (Table 1). Differences between these cultivars in yield of U.S. #1 grade roots were statistically significant ( $P \leq 0.05$ ) in three of the 18 trials, and in two of these instances 'Beauregard' produced the greater yield. 'Bienville' and 'Beauregard' were included in the National Sweetpotato Collaborators 1998, 2000, and 2001 trials at 8, 10, and 9 locations, respectively. 'Bienville' ranked lower in yield than did 'Beauregard' (Table 2).

Plants of 'Bienville' reach a harvestable stage for first cutting a week later than 'Beauregard'. Plant production is poor; 30% to 40% more roots are needed for bedding to achieve comparable quantities of plants in comparison to 'Beauregard'; regrowth is poor. Plants are straight and sturdy and well suited for mechanical harvesting and planting. 'Bienville' is generally ready to harvest in unison with 'Beauregard' when the two cultivars are planted at the same time. 'Beauregard' tends

Received for publication 26 Apr. 2002. Accepted for publication 25 Sept. 2002. Approved for publication by the Director of the Louisiana Agricultural Experiment Station as manuscript number 02-28-0294. Supported by state and matching funds allocated to the Louisiana State University Agricultural Center and the Louisiana Sweet Potato Advertising and Development Commission.

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to be earlier when growing conditions are ideal, as evidenced by more jumbo grade roots at harvest.

Culinary characteristics of 'Bienville' are similar to those of 'Beauregard'. Physiologically sound roots of 'Bienville' store well and remain marketable up to 6 to 7 months in controlled environments; 'Beauregard' tends to store better for a longer period in comparison. 'Bienville' appears to have more resistance to rot in water-logged soils than 'Beauregard', yet these stressed roots tend to breakdown in storage after resistance to bacterial soft rot diminishes.

**Availability**

Limited quantities of foundation seed stock will be commercially available for the 2003 crop season. Requests for roots should be made to the Sweet Potato Research Station; P.O. Box 120; Chase, LA 71324. Plant patent protection will be sought.

Table 1. Average yield by grade of 'Bienville' and 'Beauregard' in replicated trials in Louisiana.

Cultivar	U.S. # 1	Avg yield (Mt-ha <sup>-1</sup> ) <sup>z,y</sup>		
		Canner	Jumbo	Total marketable
<i>1998</i>				
Bienville	18.3	10.7	1.0	29.7
Beauregard	23.5	8.6	4.4	35.7
<i>1999</i>				
Bienville	20.1	9.8	3.5	33.4
Beauregard	19.1	6.6	4.6	30.3
<i>2000</i>				
Bienville	16.1	8.1	0.9	25.1
Beauregard	14.2	8.0	0.8	23.0

<sup>z</sup>Average of six trials in 1998, six in 1999, and six in 2000. No significant difference in 15 trials; 'Bienville' had significantly higher yields in one trial while 'Beauregard' was higher in two trials.

<sup>y</sup>Sizes of roots: U.S. #1: 5.1–8.9 cm diameter, 7.6–22.9 cm long; canner: 2.5–5.1 cm diameter, 5.1–17.8 cm long; jumbo: larger than U.S. #1 in diameter or length or both, and without objectionable defects.

Table 2. Average yield by grade of 'Bienville' and 'Beauregard' in National Sweetpotato Collaborator Regional trials.<sup>z</sup>

Cultivar	U.S. # 1	Avg yield (Mt-ha <sup>-1</sup> )		
		Canner	Jumbo	Total marketable
<i>1998</i>				
Beauregard	21.9	7.8	5.6	35.1
Bienville	16.2	5.0	2.0	26.3
<i>2000</i>				
Beauregard	20.1	9.5	4.8	34.8
Bienville	18.0	9.6	4.1	32.2
<i>2001</i>				
Beauregard	22.3	9.2	5.7	36.6
Bienville	18.0	9.5	3.1	27.9

<sup>z</sup>Statistical treatment of these tests was not feasible.