'Princess' and 'Prince' Napiergrass

Wayne W. Hanna¹

Department of Crop and Soil Sciences, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793

John M. Ruter

Department of Horticulture, University of Georgia, Coastal Plain Experiment Station, Tifton, GA 31793

Additional index words. *Pennisetum purpureum*, ornamental grass, grass breeding

'Princess' and 'Prince' are dwarf and semi-dwarf, respectively, purple-foliaged napiergrasses [*Pennisetum purpureum* (L.) Schum.] being jointly released by the U.S. Dept. of Agriculture and University of Georgia College of Agricultural and Environmental Sciences. These grasses are perennial in USDA hardiness zones 8 to 10. However, they can be grown as vigorous annuals in more northern zones. These plants flower under short days, therefore, these cultivars will not produce seed where winter temperatures reach freezing (0 °C) or below.

Origin

Seeds of two napiergrass accessions, designated Anae Roxo CNPGL, were received from CENARGEN-EMBRAPA in Brazil in April 1996. Seedlings were grown under quarantine in the greenhouse during the winter of 1996–97. The plants segregated for a wide variety of green and various shades of purple plants with a range of vigor. The most vigorous purple pigmented plant in each accession, given the Tifton numbers N240 and N241, were selfed. Seeds of these plants were planted in the field in 1997. The progenies from these selfed plants again segregated for color and vigor in the field. Three vigorous plants, from each accession, with different shades of purple pigment development, were vegetatively propagated for further evaluation in a napiergrass maintenance nursery in 1998. In 1999, two accessions, N241-5 (dwarf) and N241-8 (semidwarf) were selected for further evaluation. In 2003, we assigned the names 'Princess' to N241-5 and 'Prince' to N241-8.

Description and Performance

In 1999, multiplant observation plantings were made at the University of Georgia Coastal Plain Experiment Station Dairy Research Center and the National Environmentally Sound Production Agriculture Laboratory. Replicated tests were planted in 2000 at Blairsville (USDA 6b), Griffin (USDA 7b), and Savannah (USDA 8b) (Table 1) and at Tifton (USDA 8a) in 2001 and 2003 (Tables 2–4). All test sites except Tifton were irrigated. Plants in Blairsville and Griffin did not recover in 2001 following

temperatures as low as –17 °C. Plants in Tifton and Savannah survived low temperatures of –6 and –8 °C, respectively.

Height of 'Princess' ranged from 123 to 142 cm and from 65 to 126 cm, whereas, height of 'Prince' ranged from 179 to 218 cm and 94 to 200 cm for the Savannah and Tifton locations, respectively (Tables 1–4). The greater growth of both cultivars was observed in 2003 when rainfall during the growing period at Tifton was 807 mm compared to 525 and 459 mm in 2001 and 2002, respectively. Height differences between years were especially evident under the nonirrigated conditions at Tifton.

Both 'Prince' and 'Princess' are quite vigorous and can produce about 40 tillers in one year under nonirrigated conditions (Tables 2–4) and twice that many under irrigated conditions (Table 1). Tiller numbers for both cultivars rapidly increase with age of the plant as the circumference of the base of the plant increases (Tables 1–4). Diameter of the top canopy can range from 99 to 154 cm for 'Princess' and from 138 to 338 cm for 'Prince' (Tables 1–4) depending on age and moisture conditions. 'Princess' is similar to *Pennisetum setaceum* 'Rubrum' for height and number of tillers under nonirrigated conditions (Table 2), but 'Princess' will produce twice as many tillers under irrigated conditions (Table 1). 'Prince' significantly exceeds 'Rubrum' in all characteristics measured (Table 1). *Pennisetum setaceum* 'Rubrum' is not reliably cold hardy in

USDA zone 8 and died during the first winter in the field trials.

'Princess' has longer leaves than 'Rubrum' (Table 5). 'Prince' has significantly longer leaves than 'Princess', but leaf width is similar for the two cultivars. Both 'Prince' and 'Princess' can be easily propagated by stem cuttings (Table 6). Stem cuttings with two nodes tended to produce the most shoots, although somewhat reduced in vigor, based on three-week plant heights. One or two node cuttings produced the most shoots for 'Prince', but the two-node cuttings were more vigorous.

Initial leaves on 'Prince' emerge with a purple midrib (187B) and mottled purple/green (187C/137B) blade. Later, the leaves emerge purple (187B) from the whorls. 'Prince' has bloom (155C) on the stems, abundant trichomes (1 to 2 mm long) on the sheath, trichomes (up to 4 mm long) 12 cm up the blade margin from the collar, and sparse trichomes (1 mm long) on the adaxial leaf surface. Margins of leaf blades have prominent trichomes (0.2 mm long). The abaxial leaf surface is smooth. Leaf color best fit the greyed-purple group 187B (Royal Horticultural Society, 2001).

Initial leaves on 'Princess' emerge green (137B) with purple (187D) margins and purple midrib (187C). The lower blade rapidly become mottled purple/green (187D/137B) and then emerge purple (187C) from the whorl. Stems of 'Princess' have bloom (155C) on the stems, trichomes (0.5 to 1 mm long) on the leaf sheath, trichomes (3 mm long) 5 cm up the margin of the blade from the collar, and sparse trichomes (<1 mm long) on the adaxial surface of leaf blade. Leaf margins have inconspicuous trichomes, and the abaxial surface is smooth. Leaf color best fit the greyed-purple group 187B.

Culture

Two or three node cuttings with foliage removed root well in 8.3 cm liner pots. Rooting percentages in excess of 90% can be expected under ideal conditions. A well drained substrate and minimal misting increases survival of cuttings. Terminal cuttings have not performed

Table 1. Plant characteristics of purple napiergrass planted in 2000 in Savannah, Ga. Measurements taken 28 Nov. 2001 and 11 July 2002.

Entry	Ht (cm)		Base circumference (cm)		Top canopy spread ² (cm)		Tillers (no.)	
	2001	2002	2001	2002	2001	2002	2001	2002
Princess	123	142	161	352	141	154	82	83
Prince	179	218	137	371	218	338	70	168
Rubrum	120	108	47	40	100	70	46	37
LSD _{0.05}	14	15	43	75	30	116	24	41

²Diameter of arching leaves at top of plant.

Table 2. Plant characteristics of purple napiergrass planted in Tifton, Ga. 28 Nov. 2001 and 11 July 2002. *Pennisetum setaceum* 'Rubrum' was winterkilled during 2001–02.

Entry	Ht (cm)		Base circumference (cm)		Top canopy spread ² (cm)		Tillers (no.)	
	2001	2002	2001	2002	2001	2002	2001	2002
Princess	73	102	114	204	115	125	42	76
Rubrum	103	*	34		71		43	
LSD _{0.05}	7		9		9		9	

²Diameter of arching leaves at top of plant.

Received for publication 27 July 2004. Accepted for publication 18 Sept. 2004.

¹Retired.

Table 3. Plant characteristics of purple napiergrass planted in 2001 adjacent to the Natural Products Laboratory in Tifton, Ga. Measurements taken 28 Nov. 2001, 11 July 2002, and 27 Aug. 2003.

Entry	Ht (cm)			Base circumference (cm)			Top canopy spread ^z (cm)			Tillers (no.)		
	2001	2002	2003	2001	2002	2003	2001	2002	2003	2001	2002	2003
Princess	95	92	126	143	188	353	122	117	182	43	53	79
Prince	182	159	200	124	177	259	185	162	259	41	55	91
LSD _{0.05}	21	12	13	13	59	58	9	17	11	9	20	40

Table 4. 2003 plant characteristics of purple napiergrass planted in 2003 in the RDC Field at Tifton, Ga. Measurements taken 27 Aug. 2003.

Entry	Ht (cm)		Base circumference (cm)		Top canopy spread ^z (cm)		Tillers (no.)	
	2001	2002	2001	2002	2001	2002	2001	2002
Princess	65	123	99	40				
Prince	94	66	138	20				
LSD _{0.05}	6	28	27	14				

^zDiameter of arching leaves at top of plant.

Table 5. Leaf characteristics of purple napiergrass planted in 2001 and 2003 in Tifton, Ga.

Entry	Leaf length (cm)					Leaf width (mm)				
	2001 ^z	2001 ^a	2001 ^y	2001 ^x	2003 ^x	2001 ^a	2001 ^z	2001 ^y	2001 ^x	2003 ^x
Princess	58.6	55.2	64.3	51.1	47.6	27.7	30.8	37.5	32.1	22.8
Prince		85.5	84.3	84.0	83.9		30.8	35.1	30.7	28.9
Rubrum	30.5					8.1				
LSD _{0.05}	1.9	7.6	6.3	9.1	5.3	0.9	2.5	2.3	4.2	3.2

^zMeasurements made 28 Nov. 2001.

^yMeasurements made 11 July 2002.

^xMeasurements made 27 Aug. 2003.

Table 6. Propagation response of 'Prince' and 'Princess' purple napiergrasses in the greenhouse. Planted 31 Oct. 2002 and rated 20 Nov. 2002.

Entry	Treatment	Shoots (no.)	Ht (cm)
Princess	Uncut stems(no sheath)	22.8	10.9
	Uncut stems(sheath)	14.5	9.6
	One node stems(no sheath)	18.0	3.1
	Two node stems(no sheath)	40.3	5.0
Mean		30.6	7.1
Prince	Uncut stems(no sheath)	19.2	10.7
	Uncut stems(sheath)	11.0	10.0
	One node stems(no sheath)	33.3	5.8
	Two node stems(no sheath)	30.3	9.1
Mean		23.4	8.9
LSD _{0.05} treatment		7.9	0.5
LSD _{0.05} entry		6.5	0.4

as well as nodal cuttings from the stem. Well rooted liners of 'Prince' shifted from 8.3-cm pots to #5 (19.0-L) containers in mid-April produced salable plants at a commercial nursery in 40 days. After cutting back, plants were again salable after 57 d. In 19-L containers using a pine bark-based substrate, paclobutrazol drenches were not economically feasible for

reducing plant growth. Hard pruning to control plant size results in good regrowth.

Helminthosporium leaf spot has been noted on the foliage in the field and under overhead sprinklers in container nurseries, but control has not been necessary. Two-lined spittlebug (*Prosapia bicincta* (Say)) has also been noted to feed on the bases of field and container-grown

plants. In the field, plants should be cut back in the late winter to remove debris that harbors spittlebugs.

Plants are not recommended for landscape use in areas where a hard freeze does not regularly occur by 1 Dec. (USDA 9-11) since reseeding may be an issue, particularly in humid, subtropical environments. Napiergrass is considered an exotic pest plant in Florida (Langeland and Burks, 1998) and plants can not be shipped to or grown in California (Liz Johnson, personal communication). According to the USDA (Natural Resources Conservation Service, 2003), napiergrass is also naturalized in Texas, Hawaii, Puerto Rico, and the Virgin Islands. Thus, 'Prince' and 'Princess' selections of ornamental napiergrass are not recommended for frost-free subtropical areas but can be used as cold-hardy perennials in USDA 8a or as summer annuals further north.

Availability

A U.S. Plant Patent for 'Princess' and 'Prince' has been applied for on behalf of the U.S. Department of Agriculture, Agricultural Research Service. Contact the authors for more information. Field plantings of 'Princess' and 'Prince', respectively, are maintained in the breeder nursery at Tifton, Ga. As protected cultivars, 'Prince' and 'Princess' can only be produced by nurseries licensed by the Georgia Seed Development Commission (GSDC) under guidelines established in conjunction with the University of Georgia Research Foundation (UGARF). Contact the GSDC (<http://www.gsdc.com>) for information on availability.

Literature Cited

- Langeland, K.A. and K.C. Burks (eds.). 1998. Identification and biology of nonnative plants in Florida's natural areas. Univ. Fla., Gainesville.
- Natural Resources Conservation Service. 2002. Plants profile: *Pennisetum purpureum* Schumacher. Wash., D.C. 5 Mar. 2003. http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=PEPU2.
- Royal Horticultural Society. 2001. RHS colour chart. Royal Hort. Soc., London.