

# 2007 NTEP Bermudagrass Trial – Year 1 and 2 Results

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**Additional index words:** *Cynodon dactylon*, *Cynodon dactylon* x *C. transvaalensis*, turfgrass, cultivars, quality, color, spring green-up, leaf texture, seed heads

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Bermudagrass cultivar trial

Photo by Aaron Patton

**Summary.** Bermudagrass continues to be the prevailing turfgrass species used in Arkansas for golf courses, sports fields, home lawns and utility turf situations. Identifying adapted cultivars for the region remains a central focus of the University of Arkansas turfgrass research program. The National Turfgrass Evaluation Program is the predominant means by which cultivars are tested throughout North America. A bermudagrass cultivar trial was planted in the summer of 2007 at Fayetteville, Ark. This trial was maintained under typical lawn conditions and data on spring green-up, overall quality, leaf color, leaf texture, and

seed head formation were collected from summer 2007 through 2008. Average turf quality across months for the year was highest for OKC-1119, OKC-1134, PSG-9Y20, Tifgreen, Quickstand, RAD-CD1, GN-1, Premier, and SWI-1113. Turf quality for the year was least for PSG-91215, PSG-9BAN, PSG-94524, Sunsport, and Numex Sahara. Future evaluations over the next four years will provide a more complete picture of cultivars that perform best under these management and climate conditions.

**Abbreviations:** NTEP, National Turfgrass Evaluation Program.

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Bermudagrass (*Cynodon* spp.) remains the most commonly used turfgrass on golf courses, sports fields, and lawns in Arkansas and throughout southern and transition-zone environments. Bermudagrass has many positive attributes that have made it a successful turfgrass species, including good heat and drought tolerance, pest resistance, traffic tolerance, and tolerance to a wide range of soil types and water quality.

The National Turfgrass Evaluation Program (NTEP) is an organization within the U.S. Dept. of Agriculture that annually oversees turfgrass cultivar evaluation experiments at various sites throughout the U.S. and Canada. Each turfgrass species is tested on a four- to five-year cycle at sites throughout the growing region for that particular species. The University of Arkansas has been an active participant in the NTEP and has conducted several tests on bermudagrass cultivars since 1986. This report will describe the data collected in 2007 and 2008 for the 2007 NTEP bermudagrass trial at Fayetteville, Ark.

## Materials and Methods

The majority of the bermudagrass entries in this trial were planted on 9 June 2007 at the University of Arkansas Research and Extension Center in Fayetteville. Some additional entries were planted in August for comparison over the life of the trial (Table 1). Plot size was 7 by 8 ft and there were three replications of each cultivar. Vegetative cultivars were planted as 2-inch diameter plugs on 12-inch spacings within the plots, while seeded cultivars were broadcast-planted at a seeding rate of 1.0 lb/1000 ft<sup>2</sup>. Plots were maintained under lawn conditions, with a mowing height of 1.5 inch, and monthly applications of 1.0 lb N/1000 ft<sup>2</sup> during the growing season. Irrigation was applied as needed to promote germination and establishment and to prevent stress.

Overall turf quality was evaluated beginning in October 2007 and then monthly during the growing season in 2008. Quality was visually assessed on a 1 to 9 scale, with 9 representing ideal dark green, uniform, fine-textured turf and 1 representing dead turf. Seedling vigor was rated using a 1 to 9 scale, with 9 representing maximum vigor

(quick germination and rapid growth) and 1 representing no germination. Turfgrass coverage was also monitored throughout the study as visual estimates. Turf genetic color was visually evaluated on a scale of 1 to 9, with 9 representing ideal, dark green turf and 1 representing tan or brown turf. Leaf texture was visually evaluated on a scale of 1 to 9, with 9 representing extremely fine turf texture and 1 representing extremely coarse texture. Cultivars were visually evaluated for spring green-up using a scale of 1 to 9, with 9 representing complete green color and 1 representing a completely dormant turf stand. Density was rated on a scale of 1 to 9, with 9 representing maximum density. Seed head density was evaluated using a scale of 1 to 9, with 9 representing no visible seed heads.

## Results and Discussion

There were significant differences in seedling vigor among cultivars (Table 1). Seedling vigor on 19 June 2007 was greatest for Sunsport, Numex Sahara, PSG-9BAN, SWI-1117, IS-CD10, SWI-1083, PSG-91215, PSG-94524, SWI-1113, PSG-9Y20, J-720, and SWI-1070. Seedling vigor on 25 July 2007 was greatest among Sunsport, Numex Sahara, SWI-1117, SWI-1083, PSG-91215, PSG-94524, and SWI-1113. Riviera, BAR-7CD5, Veracruz, and PST-R6FLT were among the cultivars with the least seedling vigor on 25 July 2007.

There were significant differences in turf coverage among cultivars on each rating date in 2007 (Table 1). At 51 days after planting (30 July), coverage was greatest for SWI-1083, SWI-1117, PSG 91215, J-720, SWI-1057, Numex Sahara, SWI-1113, SWI-1070, PSG-94524, OKS-2004-2, PSG-9BAN, IS-CD10, Sunsport, RAD-CD1, SWI-1122, and Princess 77, all of which were seeded entries (Table 1). Among the vegetative entries, Quickstand had the greatest coverage but was not significantly greater than other vegetative entries. Seventy-five days after planting (23 August), Quickstand coverage (91.7%) was greater than other vegetative entries. Premier, Celebration, and Patriot were the next quickest to establish with 75.0, 71.7, and 70.0% coverage, respectively.

Spring green-up was greater for vegetatively established cultivars compared to seeded cultivars when evaluated in April (Table 2). Spring green-up was greatest for Tifgreen and OKC-1119 and least for Veracruz, PST-R6LA, PST R6ON, Sunsport, PSG-91215, SWI-1083, SWI 1113, PST-R6FLT, SWI-1057, and Princess 77 on 7 April 2008. Spring green-up was greatest for Tifgreen, OKC-1134, OKC-1119, Tifsport, Tifway, Quickstand, and Tift-11 and least for Veracruz, Sunsport, SWI-1117, SWI 1113, PSG-91215, PSG-94524, SWI-1057, Numex Sahara, and Princess 77 on 30 April 2008.

Leaf texture was finest for cultivars established vegetatively compared to those established by seed (Table 2). Among individual cultivars, leaf texture was finest among OKC-1119, OKC-1134, and Premier and coarsest for Sunsport, PSG-94524, SWI-1081, PSG-9Y20, PSG-PROK, Quickstand, SWI-1117, SWI-1083, PSG-91215, BAR-7CD5, and Numex Sahara.

Turfgrass genetic color was darker for cultivars established vegetatively compared to those established by seed (Table 2). Among individual cultivars, turfgrass genetic color was darkest for Patriot, Premier, GN-1, SWI-1083, OKC-1119, Celebration, Tift-11, Tifway, and OKS-2004-2.

Turf density was densest for cultivars established vegetatively compared to those established by seed (Table 2). Turfgrass density was greatest for OKC-1119, OKC-1134, Tifway, Tifgreen, Tifsport, and Premier and least for SWI-1117, Sunsport, SWI-1083, PSG-91215, and Numex Sahara.

Seed heads were present in greatest quantities for PST-R6EY, Princess 77, and PST-R6LA. No seed heads were present in OKC 1134 and few seed heads were present in Patriot, OKC-1119, Premier, and GN-1 (Table 2). As expected, culti-

vars established by seed had more seed heads present than those established vegetatively (Table 2).

There were significant differences in turf quality among cultivars in October 2007 (Table 1). At that time, SWI-1113, PST R6LA, OKS 2004-2, PST-R6FLT, and SWI-1070 were among the top-rated cultivars for turfgrass quality.

On five of the six rating dates in 2008, turf quality was greatest for vegetatively established cultivars (Table 3). In September, however, turf quality was greatest for cultivars established by seed. Turf quality in 2008 varied for each cultivar by month. Average turf quality across months for the year was highest for OKC-1119, OKC-1134, PSG-9Y20, Tifgreen, Quickstand, RAD-CD1, GN-1, Premier, and SWI-1113. Turf quality for the year was least for PSG-91215, PSG-9BAN, PSG-94524, Sunsport, and Numex Sahara.

These early data should be interpreted with caution since they are only the average of a few rating dates, and plots were less than 16 months old when rated. Historically, there are shifts in cultivar performance as the plots age and are subjected to various stresses. Additionally, these plots are maintained at 1.5 inches, which is common for a home lawn or sports field and may not compare well to previous data collected at our location at a lower mowing height of 0.5 inch (Patton et al., 2008). Future evaluations over the next four years will provide a more complete picture of the cultivars that perform best under these management and climate conditions.

#### Literature Cited

Patton, A., M. Richardson, D. Karcher, J. McCalla and J. Landreth. 2008. 2002 NTEP bermudagrass trial—summary. Arkansas Turfgrass Report 2007, Ark. Ag. Exp. Stn. Res. Ser. 557:33-36.

**Table 1. Seedling vigor ratings, coverage, and quality ratings for various bermudagrass cultivars in Fayetteville, Ark. Data are from 1 season (2007) after planting on 9 June, 2007.**

Cultivar	Seedling vigor <sup>z</sup>		Coverage				Turf quality <sup>y</sup>
	June 19	July 25	June 19	July 30	Aug. 23	Sept. 18	Oct. 5
	rated on a 1-9 scale		-----%				rating 1-9
BAR 7CD5 <sup>x</sup>	2.3	2.3	2.3	16.3	84.0	98.7	5.7
Celebration	.	.	6.0	12.7	71.7	98.3	5.3
GN-1 <sup>w</sup>	.	.			8.7	40.0	2.7
IS-01-201 <sup>x</sup>	2.7	4.0	3.3	64.3	98.3	99.0	6.0
IS-CD10 <sup>x</sup>	4.7	6.0	9.3	82.3	98.0	99.7	6.7
J-720 <sup>x</sup>	4.3	5.7	8.3	93.3	99.3	100.0	6.3
Midlawn	.	.	8.0	16.3	55.0	95.3	5.7
NuMex -Sahara <sup>x</sup>	5.7	8.0	21.7	93.0	99.7	100.0	6.0
OKC 1119	.	.	6.7	9.0	37.7	91.7	5.0
OKC 1134	.	.	7.7	10.7	43.3	94.0	5.3
OKS 2004-2 <sup>x</sup>	3.3	5.0	6.7	85.7	98.0	99.0	7.0
Patriot	.	.	8.3	23.0	70.0	98.3	5.7
Premier	.	.	10.3	20.7	75.0	99.0	5.3
Princess 77 <sup>x</sup>	3.7	5.0	8.0	68.7	99.0	100.0	6.3
PSG 91215 <sup>x</sup>	4.7	6.7	13.3	94.7	99.7	100.0	6.0
PSG 94524 <sup>x</sup>	4.7	7.0	15.0	89.7	100.0	100.0	6.0
PSG 9BAN <sup>x</sup>	5.0	6.0	11.7	84.3	98.0	100.0	6.3
PSG 9Y2O <sup>x</sup>	4.3	4.7	10.0	60.0	94.3	99.3	6.3
PSG PROK <sup>x</sup>	3.7	5.0	8.3	56.0	93.3	99.3	6.0
PST R6EY <sup>x</sup>	3.7	4.7	5.3	65.0	96.7	99.3	6.7
PST R6LA <sup>x</sup>	2.7	4.3	4.7	63.0	98.7	100.0	7.0
PST R6ON <sup>x</sup>	3.7	5.3	7.0	62.7	93.3	98.0	6.7
PST-R6FLT <sup>x</sup>	2.7	3.7	5.7	46.3	89.7	99.7	7.0
Quickstand	.	.	9.3	30.3	91.7	99.7	6.0
RAD-CD1 <sup>x</sup>	3.7	5.0	7.3	78.7	99.7	99.7	6.7
Riviera <sup>x</sup>	2.7	3.7	4.0	53.0	97.0	99.0	6.7
Sunsport <sup>x</sup>	6.0	7.7	28.3	81.3	99.3	100.0	6.0
SWI-1057 <sup>x</sup>	3.7	6.0	11.3	93.0	99.0	100.0	6.3
SWI-1070 <sup>x</sup>	4.3	5.7	11.0	90.3	99.3	100.0	7.0
SWI-1081 <sup>x</sup>	3.0	4.7	8.7	59.3	94.3	99.7	6.0
SWI-1083 <sup>x</sup>	4.7	7.3	20.0	96.0	99.7	100.0	6.7
SWI-1113 <sup>x</sup>	4.3	6.7	18.3	91.3	100.0	100.0	7.7
SWI-1117 <sup>x</sup>	5.0	7.3	20.0	95.3	99.7	100.0	6.0
SWI-1122 <sup>x</sup>	4.0	6.0	9.3	78.3	96.0	99.3	6.3
Tifgreen <sup>w</sup>	.	.			8.7	53.3	4.0
Tifsport <sup>w</sup>	.	.		6.3	26.7	71.7	4.0
Tift-11 <sup>w</sup>	.	.		2.7	24.0	76.7	4.7
Tifway	.	.	11.3	11.3	28.3	66.7	3.0
Veracruz <sup>x</sup>	2.3	3.7	3.3	46.3	96.0	98.3	5.7
Yukon <sup>x</sup>	4.0	4.7	10.0	55.3	87.0	97.7	5.7
Average	3.9	5.4	9.2	54.7	81.2	94.3	5.9
LSD (P=0.05)	1.7	1.7	9.2	30.3	14.0	7.9	1.0

<sup>z</sup> Seedling vigor was rated using a 1 to 9 (9= maximum vigor (quick germination and rapid growth), 1= representing no germination).<sup>y</sup> Turf quality rated on a scale of 1 to 9 (9= ideal dark green, uniform, dense, fine-textured turf, 1=dead).<sup>x</sup> Seeded bermudagrass cultivar.<sup>w</sup> Cultivars GN-1, Tifgreen, Tifway, Tifsport, and Tift-11 were not planted until August 2007.

**Table 2. Spring green-up, texture, color, density, and seed head ratings in 2008 for various bermudagrass cultivars in Fayetteville, Ark.**

Cultivar	Spring green-up <sup>z</sup>		Texture <sup>y</sup>	Color <sup>x</sup>	Density <sup>w</sup>	Seed heads <sup>v</sup>
	April 7	April 30	July 21	July 18	July 21	July 21
-----visually rated on a 1-9 scale-----						
BAR 7CD5 <sup>u</sup>	2.3	5.7	3.7	6.0	5.0	6.3
Celebration	2.7	6.0	5.7	7.0	6.0	7.0
GN-1	4.3	6.2	5.3	7.3	6.3	8.0
IS-01-201 <sup>u</sup>	2.0	4.7	5.0	6.0	4.3	5.7
IS-CD10 <sup>u</sup>	2.0	4.7	5.0	6.0	4.7	6.2
J-720 <sup>u</sup>	2.0	5.0	5.0	6.3	4.7	6.0
Midlawn	2.7	6.0	6.0	6.0	6.7	7.3
NuMex -Sahara <sup>u</sup>	2.0	3.0	3.7	5.8	2.3	6.0
OKC 1119	4.7	7.0	8.0	7.0	8.0	8.3
OKC 1134	4.3	7.7	7.3	6.7	7.7	9.0
OKS 2004-2 <sup>u</sup>	2.3	5.7	5.3	6.8	5.0	6.0
Patriot	2.0	5.7	6.0	7.5	6.7	8.3
Premier	2.7	5.3	7.3	7.5	7.0	8.0
Princess 77 <sup>u</sup>	1.0	2.7	4.7	6.3	4.0	4.3
PSG 91215 <sup>u</sup>	1.7	3.3	4.0	6.0	3.0	6.3
PSG 94524 <sup>u</sup>	2.0	3.7	4.3	6.3	3.7	6.7
PSG 9BAN <sup>u</sup>	2.0	4.8	4.7	6.5	3.7	5.7
PSG 9Y2O <sup>u</sup>	3.0	5.3	4.3	6.7	4.3	6.3
PSG PROK <sup>u</sup>	2.0	4.7	4.0	6.7	3.7	6.0
PST R6EY <sup>u</sup>	2.0	5.3	5.0	6.3	3.7	4.0
PST R6LA <sup>u</sup>	1.7	4.8	5.0	6.3	5.0	5.3
PST R6ON <sup>u</sup>	1.7	5.0	5.3	6.3	4.7	4.7
PST-R6FLT <sup>u</sup>	1.3	4.3	5.3	6.2	5.0	5.3
Quickstand	4.0	6.7	4.0	5.7	5.0	7.0
RAD-CD1 <sup>u</sup>	2.0	4.7	5.0	6.3	4.3	6.3
Riviera <sup>u</sup>	3.0	6.3	5.0	6.7	4.0	5.7
Sunsport <sup>u</sup>	1.7	3.3	4.3	6.3	3.3	6.3
SWI-1057 <sup>u</sup>	1.0	3.0	5.0	6.0	4.3	5.3
SWI-1070 <sup>u</sup>	2.3	5.3	5.0	6.3	4.7	6.3
SWI-1081 <sup>u</sup>	2.0	5.0	4.3	6.3	4.5	6.3
SWI-1083 <sup>u</sup>	1.7	4.7	4.0	7.2	3.3	6.0
SWI-1113 <sup>u</sup>	1.3	3.0	5.3	6.3	5.0	6.3
SWI-1117 <sup>u</sup>	2.0	3.7	4.0	6.2	3.5	6.0
SWI-1122 <sup>u</sup>	2.0	4.7	4.7	6.3	4.0	6.0
Tifgreen	5.3	7.7	6.7	6.2	7.3	7.7
Tifsport	4.3	6.8	6.7	6.3	7.3	7.3
Tift-11	3.3	6.5	5.3	7.0	6.0	6.7
Tifway	4.0	6.8	6.3	7.0	7.7	7.3
Veracruz <sup>u</sup>	1.7	3.3	4.7	6.3	4.7	6.0
Yukon <sup>u</sup>	3.0	6.0	5.3	6.2	5.3	6.7
Average	2.5	5.1	5.1	6.5	5.0	6.4
LSD (P=0.05)	0.8	1.2	0.8	0.8	1.3	1.1
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Propagation type						
Seeded	2.0	4.5	4.7	6.3	4.2	5.9
Vegetative	3.7	6.5	6.2	6.8	6.8	7.7
P – value	<0.0001	<0.0001	<0.0001	0.0019	<0.0001	<0.0001

<sup>z</sup> Spring green-up was visually evaluated for bermudagrass cultivars using a scale of 1 to 9, with 9 representing complete green color and 1 representing a completely dormant turf stand.

<sup>y</sup> Leaf texture was visually evaluated on a scale of 1 to 9, with 9 representing extremely fine turf texture and 1 representing extremely coarse texture.

<sup>x</sup> Turf genetic color was visually evaluated on a scale of 1 to 9, with 9 representing ideal, dark green turf and 1 representing tan or brown turf.

<sup>w</sup> Density was rated on a scale of 1 to 9, with 9 representing maximum density.

<sup>v</sup> Seed head density was evaluated using a scale of 1 to 9, with 9 representing no visible seed heads.

<sup>u</sup> Seeded bermudagrass cultivar.



**Table 3. Turf quality ratings in 2008 for various bermudagrass cultivars in Fayetteville, Ark.**

Cultivar	Turfgrass Quality <sup>z</sup>						Average
	May	June	July	August	September	October	
	-----visually rated on a 1-9 scale-----						
BAR 7CD5 <sup>y</sup>	4.5	5.7	5.8	6.3	6.8	5.3	5.8
Celebration	5.3	5.5	5.7	6.0	5.7	5.3	5.6
GN-1	5.8	6.8	6.0	7.0	6.5	7.0	6.5
IS-01-201 <sup>y</sup>	4.7	5.5	5.3	6.2	7.2	5.7	5.8
IS-CD10 <sup>y</sup>	4.8	5.7	6.0	5.7	7.3	5.7	5.9
J-720 <sup>y</sup>	5.0	5.8	5.0	6.2	6.8	6.0	5.8
Midlawn	6.0	7.3	5.8	5.3	6.3	6.3	6.2
NuMex -Sahara <sup>y</sup>	3.7	4.7	4.5	5.0	6.0	5.0	4.8
OKC 1119	6.5	7.2	7.3	7.0	7.3	6.7	7.0
OKC 1134	7.0	7.5	6.5	6.5	6.2	7.3	6.8
OKS 2004-2 <sup>y</sup>	5.5	6.0	5.5	6.2	6.5	6.0	5.9
Patriot	5.0	7.0	6.2	6.7	6.3	5.3	6.1
Premier	5.8	6.3	6.7	6.7	6.8	6.7	6.5
Princess 77 <sup>y</sup>	4.5	4.8	5.3	6.8	6.7	6.3	5.8
PSG 91215 <sup>y</sup>	4.7	5.0	5.7	5.3	6.3	5.7	5.4
PSG 94524 <sup>y</sup>	4.0	5.2	5.5	5.3	6.8	5.7	5.4
PSG 9BAN <sup>y</sup>	4.3	5.0	5.0	6.2	6.7	5.3	5.4
PSG 9Y20 <sup>y</sup>	5.2	5.8	6.2	7.3	7.5	7.7	6.6
PSG PROK <sup>y</sup>	4.3	5.3	5.7	6.3	7.3	6.7	5.9
PST R6EY <sup>y</sup>	5.0	5.3	4.0	6.0	7.0	6.0	5.6
PST R6LA <sup>y</sup>	5.2	5.8	4.7	6.3	6.7	5.7	5.7
PST R6ON <sup>y</sup>	5.0	5.2	4.3	6.0	6.5	6.0	5.5
PST-R6FLT <sup>y</sup>	5.0	5.5	5.3	6.7	7.2	6.0	5.9
Quickstand	5.5	6.7	6.3	6.7	7.2	7.0	6.6
RAD-CD1 <sup>y</sup>	5.7	5.5	5.8	7.0	7.5	7.7	6.5
Riviera <sup>y</sup>	5.5	6.0	5.3	6.0	6.5	5.3	5.8
SunSport <sup>y</sup>	3.7	4.5	5.2	5.3	7.0	5.7	5.2
SWI-1057 <sup>y</sup>	4.7	5.0	4.7	6.2	6.5	6.0	5.5
SWI-1070 <sup>y</sup>	4.5	6.0	6.2	6.0	7.2	6.3	6.0
SWI-1081 <sup>y</sup>	5.3	5.5	5.7	6.8	7.0	6.3	6.1
SWI-1083 <sup>y</sup>	4.8	5.0	5.3	6.0	7.0	5.3	5.6
SWI-1113 <sup>y</sup>	4.7	6.2	6.2	6.3	7.8	7.3	6.4
SWI-1117 <sup>y</sup>	4.0	4.7	5.5	5.8	7.0	6.0	5.5
SWI-1122 <sup>y</sup>	4.5	5.8	5.7	6.3	6.7	6.7	5.9
Tifgreen	6.0	6.8	6.0	7.0	7.2	6.7	6.6
TifSport	5.7	6.7	5.7	6.8	6.3	6.3	6.3
Tift-11	6.2	5.8	5.8	7.0	6.7	6.0	6.3
Tifway	5.7	6.5	6.0	6.5	6.2	6.3	6.2
Veracruz <sup>y</sup>	5.2	5.7	5.7	6.5	7.3	7.0	6.2
Yukon <sup>y</sup>	5.2	6.2	6.0	6.3	6.8	5.7	6.0
Average	5.1	5.8	5.6	6.3	6.8	6.2	6.0
LSD (P=0.05)	1.2	0.9	1.0	1.1	0.9	1.4	0.7
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Propagation type							
Seeded	4.8	5.4	5.4	6.2	6.9	6.1	5.8
Vegetative	5.9	6.7	6.2	6.6	6.6	6.4	6.6
P - value	<0.0001	<0.0001	<0.0001	0.0056	0.0059	0.0783	<0.0001

<sup>z</sup> Turf quality rated on a scale of 1 to 9 (9= ideal dark green, uniform, dense, fine-textured turf, 1=dead).

<sup>y</sup> Seeded bermudagrass cultivar.