

## **1997 NTEP Bermudagrass Cultivar Evaluation – Final Results**

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### **Objective**

The objective of this study was to determine the survivability and performance of seeded and vegetatively established bermudagrass in Evansville, IN.

### **Rationale**

With genetically improved cultivars, bermudagrass is being used or considered for golf course fairways and athletic fields in southern IN. There has been tremendous genetic improvement in winter survivability and leaf texture for bermudagrass and so this species may now be better adapted to Southern IN than it has been in the past. Additionally, seeded varieties are now available which will decrease the cost of establishing bermudagrass. However, we are unsure of the long term winter survival of bermudagrass on the northern edge of the transition zone.

### **How It Was Done**

The study was located on the Wessman Par-3 Course in Evansville IN. Roundup was applied to the seedbed and then tilled to a 2 inch depth. A starter fertilizer (8-22-16) was applied prior to seeding at 1.5 lbs P<sub>2</sub>O<sub>5</sub>/1000 ft<sup>2</sup>. On 25 June 1997, two separate but adjacent studies for seeded types and vegetative types were established. Plot size for each study was 6 ft X 6 ft with 1.5 ft borders and each study contained 3 replications. Nineteen seeded Bermudagrass cultivars were seeded at 0.85 lbs/1000 ft<sup>2</sup> and then “dimpled in” with tires of a sand rake. Eleven bermudagrass cultivars were plugged with 1.5 in X 1.5 in plugs on 12 inch centers. The seeded varieties were covered with seed cloth to encourage germination, and then the entire area was watered 2 to 3 times daily to encourage germination and establishment. The area was mowed at 1 inch, irrigated to prevent moisture stress, and received 1.0 lb N/1000 ft<sup>2</sup> with a 25-4-12 fertilizer on 10 July and 5 Aug. Annual maintenance included mowing at 1 inch once or twice per week, irrigation to prevent dormancy, and 0.5-0.75 lb N/1000 ft<sup>2</sup>/growing month. Final data was collected in 2001.

### **Results**

#### ***Vegetative Cultivars***

- Bermudagrass is sensitive to winterkill, especially in the first winter following establishment. Though all of the cultivars in our study survived the first three winters of the study, Mini-verde winterkilled during the winter of 2000-01.
- OKC19-9 and OKC18-4 were the top vegetative performers in 2001, followed by Midlawn and Shanghai (Table 1). Mini-Verde winterkilled during the winter of 2000-01 and thus had poor performance ratings in 2001
- Over all four years of the study, the best performing vegetative varieties were OKC18-4 and OKC19-9. The second-tier vegetative varieties included all three “Tif-“ varieties and Midlawn.
- The vegetative cultivars green-up more quickly in the spring, have provided better cover, and are finer-textured than the seeded cultivars.

- Mini-Verde performed poorly in this test because it has a better fit for greens. It is a very dense growing cultivar and does not grow taller than about 0.25 - 0.5 inch.
- The overall poor ratings of Meyer zoysia are due to its low cover, for it was plugged into the plots spaced too far apart and never fully covered by the end of the study.

### *Seeded Cultivars*

- Riviera (formerly OKS-95-1) was the top performer again in 2001 for the third consecutive year (Table 3). Majestic, Continental, and Princess were in the second tier of performers in 2001.
- Overall, Riviera was easily the top performer in this study (Table 4). Riviera is a fine bladed grass that creates a dense turf resulting in high quality ratings. Princess was the 2<sup>nd</sup> best performer throughout and it is coarser textured and greens-up slightly slower than Riviera. The second-tier performers include Continental, Savannah, and SWI-11.
- Significant genetic improvement has occurred with the seeded bermudagrasses. Most of the newer cultivars consistently outperform Arizona Common, which was the initial seeded bermudagrass.
- Seeded cultivars of bermudagrass are adapted and can be used in southern IN.

**Table 1.** Color, greenup, leaf texture, and visual quality of vegetatively established bermudagrass cultivars in 2001.

Cultivar	Color <sup>a</sup>	Greenup <sup>b</sup>	Leaf texture <sup>c</sup>	Visual quality <sup>d</sup>					
				May	June	July	Aug	Sep	Avg
OKC19-9	7.0	2.0	7.3	6.0	6.7	7.0	6.7	7.3	6.7
OKC18-4	7.7	1.0	7.0	4.7	6.3	7.7	8.3	6.0	6.6
Midlawn <sup>e</sup>	6.3	1.0	6.3	5.3	5.7	6.3	6.0	6.0	5.9
Shanghai <sup>e</sup>	9.0	1.0	5.0	4.3	5.7	9.0	5.3	5.3	5.9
Tift94 <sup>e</sup>	5.3	1.0	7.7	2.3	2.7	5.3	8.0	8.0	5.3
Tifway <sup>e</sup>	6.0	1.0	7.0	2.3	2.7	6.0	7.3	7.3	5.1
CN2-9	5.7	1.0	6.3	2.0	2.7	5.7	6.7	7.3	4.9
Tifgreen <sup>e</sup>	4.7	1.0	7.3	2.7	3.0	4.7	6.7	7.3	4.9
Quickstand <sup>e</sup>	4.7	1.0	4.3	3.3	3.7	4.7	4.3	5.7	4.3
Cardinal	2.0	1.7	9.0	3.3	4.7	2.0	6.0	3.7	3.9
Mini-Verde <sup>e</sup>	1.0	1.0	6.3	1.3	1.3	1.0	1.3	2.0	1.4
LSD (0.05)	1.0	NS	2.4	1.2	1.4	1.0	1.0	1.6	0.6
Meyer Zoysia <sup>e</sup> (For comparison)	3.7	5.0	4.0	2.0	4.0	3.7	3.3	5.0	3.6

<sup>a</sup> Color was visually rated on 9 July on a scale of 1 to 9 where 1 = chlorotic, 5 = acceptable, and 9 = dark green.

<sup>b</sup> Greenup was visually rated on 20 Apr on a scale of 1 to 9 where 1 = brown, 5 acceptable, and 9 = fully green.

<sup>c</sup> Leaf texture was rated visually on 8-August on a scale of 1 to 9 where 1 = coarse bladed and 9 = very fine bladed.

<sup>d</sup> Quality was visually rated on a scale of 1 to 9 where 1 = dead, 5 = acceptable, and 9 = perfect.

<sup>e</sup> Commercially available as of March 2002.

**Table 2.** Yearly average visual quality<sup>d</sup> and 4-year average of vegetatively established bermudagrass cultivars.

Cultivar	1998	1999	2000	2001	Ave
OKC18-4	6.7	6.8	6.5	6.6	6.7
OKC19-9	5.4	6.8	6.7	6.7	6.4
Midlawn <sup>e</sup>	6.2	6.3	6.2	5.9	6.2
Tift94 <sup>e</sup>	5.8	6.8	6.6	5.3	6.1
Tifgreen <sup>e</sup>	6.2	6.3	6.5	4.9	6.0
Tifway <sup>e</sup>	5.9	6.4	6.3	5.1	5.9
CN2-9	5.7	6.4	6.7	4.9	5.9
Cardinal	6.2	6.1	5.9	3.9	5.5
Shanghai <sup>e</sup>	4.8	5.4	5.4	5.9	5.4
Quickstand <sup>e</sup>	5.3	5.3	5.2	4.3	5.0
Mini-Verde <sup>e</sup>	4.7	5.3	5.9	1.4	4.3
LSD (0.05)	0.8	0.7	0.7	0.6	0.6
Meyer Zoysia <sup>e</sup> (For comparison)	--	2.9	3.6	3.6	3.4

<sup>d</sup> Quality was visually rated on a scale of 1 to 9 where 1 = dead, 5 = acceptable, and 9 = perfect. Yearly averages are calculated over monthly averages of each year

<sup>e</sup> Commercially available as of March 2002.

**Table 3.** Color, greenup, leaf texture, and visual quality of seeded bermudagrass cultivars in 2001.

Cultivar	Color <sup>a</sup>	Greenup <sup>b</sup>	Leaf texture <sup>c</sup>	Visual quality <sup>d</sup>					
				May	June	July	Aug	Sep	Avg
Riviera <sup>e</sup>	7.0	1.0	5.7	5.3	5.7	8.3	7.3	7.0	6.7
Majestic <sup>e</sup>	6.0	1.0	4.3	3.0	4.3	6.7	5.0	6.0	5.0
Continental <sup>e</sup>	5.7	1.0	5.0	3.3	4.3	6.3	5.7	5.0	4.9
Princess <sup>e</sup>	5.7	1.0	5.7	2.0	2.3	5.3	7.3	7.3	4.9
Pyramid <sup>e</sup>	5.3	1.0	4.0	3.3	4.3	4.7	4.3	6.0	4.5
Sundevil II <sup>e</sup>	5.0	1.0	4.7	3.3	3.3	5.0	5.7	5.0	4.5
Blackjack <sup>e</sup>	4.3	1.0	4.0	3.7	5.0	5.3	3.3	5.0	4.5
Southern Star <sup>e</sup>	5.3	1.0	5.0	3.7	4.0	5.3	4.7	5.0	4.5
J-540	6.0	1.0	4.3	3.3	3.7	5.0	4.7	5.3	4.4
Blue-Muda <sup>e</sup>	5.0	1.0	4.7	3.7	4.3	4.3	4.0	5.0	4.3
Savannah <sup>e</sup>	4.7	1.0	4.7	3.0	3.3	4.7	5.0	5.7	4.3
Numex-Sahara <sup>e</sup>	4.3	1.0	5.0	3.0	4.0	4.3	4.0	5.0	4.1
Jackpot <sup>e</sup>	5.3	1.0	4.0	3.0	4.0	4.3	3.7	5.0	4.0
Sydney <sup>e</sup>	4.7	1.0	4.7	2.7	3.3	4.3	4.3	5.0	3.9
Panama <sup>e</sup>	4.7	1.0	4.0	2.3	3.3	4.3	4.0	5.3	3.9
Mirage <sup>e</sup>	4.7	1.0	4.0	3.0	3.0	4.0	4.0	5.0	3.8
Shangri-La <sup>e</sup>	5.0	1.0	4.0	2.7	3.0	4.3	4.0	4.7	3.7
SW1-11	6.0	1.0	5.3	2.0	2.0	2.7	5.3	6.0	3.6
AZ Common <sup>e</sup>	3.3	1.0	3.3	2.7	3.7	3.3	3.0	3.7	3.3
LSD (0.05)	0.8	NS	1.1	0.9	1.0	1.6	1.5	1.3	0.8

<sup>a</sup> Color was visually rated on 9 July on a scale of 1 to 9 where 1 = chlorotic, 5 = acceptable, and 9 = dark green.

<sup>b</sup> Greenup was visually rated on 20 Apr on a scale of 1 to 9 where 1 = brown, 5 acceptable, and 9 = fully green.

<sup>c</sup> Leaf texture was rated visually on 8-August on a scale of 1 to 9 where 1 = coarse bladed and 9 = very fine bladed.

<sup>d</sup> Quality was visually rated on a scale of 1 to 9 where 1 = dead, 5 = acceptable, and 9 = perfect.

<sup>e</sup> Commercially available as of March 2002.

**Table 4.** Yearly average visual quality<sup>d</sup> and 4-year average of seeded bermudagrass cultivars.

Cultivar	1998	1999	2000	2001	Ave
Riviera <sup>e</sup> (OKS95-1)	6.1	6.8	6.2	6.7	6.5
Princess <sup>e</sup>	5.8	6.4	5.8	4.9	5.7
Continental <sup>e</sup> (PST-R69C)	5.0	4.8	4.8	4.9	4.9
Savannah <sup>e</sup>	4.8	5.5	4.9	4.3	4.9
SWI-11	5.0	5.2	5.3	3.6	4.8
Majestic <sup>e</sup>	3.9	4.3	4.5	5.0	4.4
Sundevil II <sup>e</sup>	3.9	4.6	4.2	4.5	4.3
Blackjack <sup>e</sup>	4.0	4.4	4.1	4.5	4.3
Southern Star <sup>e</sup> (J-1224)	4.5	3.7	4.3	4.5	4.3
Pyramid <sup>e</sup>	3.7	3.9	4.6	4.5	4.2
Panama <sup>e</sup>	4.3	4.1	4.3	3.9	4.2
Sydney <sup>e</sup> (SWI-7)	4.0	4.3	4.1	3.9	4.1
Blue-Muda <sup>e</sup>	3.5	4.3	4.3	4.3	4.1
Mirage <sup>e</sup>	3.6	4.5	4.1	3.8	4.0
J-540	3.6	3.9	4.1	4.4	4.0
Jackpot <sup>e</sup>	3.4	4.2	3.9	4.0	3.9
Numex-Sahara <sup>e</sup>	3.4	3.5	4.0	4.1	3.8
Shangri-La <sup>e</sup>	3.3	4.0	3.9	3.7	3.7
AZ Common <sup>e</sup>	2.6	3.3	3.5	3.3	3.2
LSD (0.05)	0.7	1.0	0.6	0.8	

<sup>d</sup> Quality was visually rated on a scale of 1 to 9 where 1 = dead, 5 = acceptable, and 9 = perfect. Yearly averages were calculated over monthly averages of each year.

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