Summary of the 2008 NTEP Bentgrass Putting Green Trial– 1st Year Data

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Photo by Josh Summerford

2008 NTEP Bentgrass Putting Green Trial at Fayetteville, Ark. The four plots with severe stress symptoms are all velvet bentgrass.

Summary. Creeping bentgrass continues to be the prevailing turfgrass species used for golf course putting greens throughout northern and central Arkansas. Identifying cultivars that are well-adapted to Arkansas remains a goal of the University of Arkansas turfgrass research program. A bentgrass cultivar trial, including 30 selections of bentgrass (creeping or velvet) was planted in the fall of 2008 at the University of Arkansas Research and Extension Center (Fayetteville, Ark.). Following establishment, the trial was maintained using typical golf course putting green management practices for the region. Turfgrass quality was evaluated monthly and turfgrass color and density were evaluated once in 2009. Significant differences existed among the cultivars for all evaluations. Towards the end of the 2009 growing season, T-1, Tyee, and Shark were the commercially-available cultivars that had the best quality, darkest color, and finest leaf texture. This trial will be evaluated for the next several years as these cultivars mature.

Abbreviations: NTEP, National Turfgrass Evaluation Program

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Creeping bentgrass (*Agrostis stolonifera*) provides the most uniform and fastest surface for golf course putting greens in northern and central Arkansas and in other environments throughout the transition zone and northern United States. Over the past several decades, improvements in density, heat tolerance, and disease resistance have made this species ideal for putting greens.

The National Turfgrass Evaluation Program (NTEP) is an organization within the United States Department of Agriculture that administers turfgrass cultivar evaluation experiments at various sites throughout the U.S. and Canada each year. Each commonly-used 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 was awarded a site for the 2008 NTEP Bentgrass Putting Green Trial, which includes both creeping bentgrass and velvet bentgrass (*Agrostis canina*) cultivars. This report will summarize quality, color, and texture data from 2009, the first full growing season for these cultivars.

Materials and Methods

This cultivar trial was planted on 30 September 2008 at the University of Arkansas Research and Extension Center in Fayetteville on a sand-based rootzone that was constructed according to United States Golf Association recommendations. Nineteen cultivars were officially included in the 2008 NTEP Bentgrass Putting Green Trial and an additional eleven cultivars were included at the Arkansas site (Crystal Bluelinks, CY-2, MacKenzie, Crenshaw, Penn A-4, Penn G-1, Penn G-2, Penn G-6, Shark, SR 1020, and Tyee) due to either their common use in this region or superior performance in a previous cultivar trial (Summerford et al., 2009). Each cultivar was broadcast seeded into four replicate 6 by 6 ft plots at a seeding rate of 1 lb/1000 ft^2. Following establishment, the trial was maintained under golf course putting green conditions, with a mowing height of 0.125 inch and nitrogen applications of 0.5 lb N/1000 ft^2 per month of active growth. Irrigation was applied during establishment as needed to promote germination and thereafter to avoid drought stress. Pesticides were applied on a curative basis.

Cultivars were visually rated for turfgrass quality monthly throughout the 2009 growing season using a 1 to 9 scale, where 9 represents ideal dark green, dense, uniform turf and 1 represents dead turf. Turf color and texture were evaluated on 25 September 2009. Color was visually rated using a 1 to 9 scale, where 9 represents ideal dark green color and 1 represents yellow/brown color. Texture was visually rated on a 1 to 9 scale, where 9 represents extremely fine-texture (narrow leaf blade width) and 1 represents very coarse texture (wide leaf blade width).

Results and Discussion

Turf quality. There were significant differences in seasonal average turf quality among bentgrass cultivars in 2009 (Table 1). In addition, there were significant differences in turf quality among cultivars in each month. In April, which was only six months following seeding, the top performing cultivars that are commercially available were Penn G-2, Authority, Crystal Bluelinks, MacKenzie, CY-2, Declaration, Penn G-1, Penncross, Shark, and Villa. Although these cultivars were the fastest to approach an acceptable level of turf quality following seeding, by the end of the growing season many were no longer among the top cultivars with regard to turf quality. In September, at approximately one year following seeding, the top performing cultivars that are commercially available were Tyee, T-1, Shark, CY-2, Authority, Penn G-6, MacKenzie, Declaration, and Alpha. At that time the two velvet bentgrass cultivars, SR 7200 and Villa, had significantly lower quality than all of the other cultivars in the trial. Early results from this trial and results from previous trials (Karcher et al., 2008) suggest that velvet bentgrass is not well-adapted to Arkansas. When averaging turf quality across the 2009 season, the top performing cultivars that are commercially available were Shark, Authority, MacKenzie, Penn G-2, CY-2, Penn G-6, Declaration, and Tyee.

Turf color. There were significant differences in color among bentgrass cultivars on the 25 September 2009 evaluation date (Table 2). Average

color for the cultivars ranged from a high of 9.0 for T-1 to a low of 5.0 for SR 7200. No other cultivars were as dark as T-1. Of the remaining commercially-available cultivars, Alpha, CY-2, Tyee, and Shark had the darkest green color. On average, the creeping bentgrass cultivars had significantly darker color than the two velvet bentgrass cultivars, which were the bottom two cultivars with regard to dark green color. The ten cultivars with the darkest green color were all either relatively new releases (within the last 10 years) or experimental varieties, indicating that breeding efforts have been successful in producing darker green color in bentgrass varieties.

Turf texture. There were significant differences in leaf texture among bentgrass cultivars on the 25 September 2009 evaluation date (Table 2). Cultivar leaf texture ratings ranged from a high of 8.7 for Villa to a low of 5.8 for Penncross. The two velvet bentgrass cultivars, Villa and SR 7200 had the finest leaf texture. However, these cultivars do not seem to be well-adapted to Arkansas, based on their poor turf quality throughout 2009 (Table 1). Among the creeping bentgrass cultivars with the finest leaf texture, those that are commercially available include Shark, Tyee, and T-1 (Table 2). It is important to note that the turf evaluated in this trial was less than one year old and that the relative texture of the cultivars is likely to change as this trial is evaluated over the next several years as the turf matures. Similar to the color evaluations, all of the top creeping bentgrass cultivars with regard to fine-leaf texture are newer releases or experimental cultivars, indicating the successful breeding efforts in producing finer-leaf textures in creeping bentgrass.

Significant differences exist among creeping bentgrass cultivars in turfgrass quality, color, and texture. Many of the newer cultivars have improved quality components, especially when compared to older cultivars, like Penncross. It is important to note that these data represent only a few rating dates during the first full growing season for these cultivars. There are likely to be shifts in how the cultivars rank in quality, color, and texture as they mature. As such, this trial will continue to be evaluated over the next several growing seasons.

Literature Cited

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Table 1. Turf quality ratings throughout the 2009 growing season for creeping and velvet bentgrass cultivars in the 2008 NTEP Bentgrass Putting Green Trial. Cultivars are listed by rank, from best to worst quality when averaged across the season.

Entry	Species	April	May	June	July	Aug.	Sept.	Avg.
		Turfgrass quality (1 to 9 scale)						
V8[z]	Creeping	5.3	7.7	7.3	7.8	7.8	8.2	7.4
A08-TDN2[z]	Creeping	5.0	7.5	7.7	7.7	8.0	8.0	7.3
Shark[y]	Creeping	5.3	7.7	7.2	7.3	7.8	7.7	7.2
Authority	Creeping	6.3	7.3	7.2	7.3	7.2	7.5	7.1
PST-OJO[z]	Creeping	4.3	7.3	8.0	6.8	7.7	7.8	7.0
MacKenzie[y]	Creeping	5.7	7.2	6.7	7.3	7.5	7.3	6.9
CY-2[y]	Creeping	5.7	6.7	6.7	7.2	7.5	7.7	6.9
MVS-AP-101[z]	Creeping	5.3	7.5	7.0	7.7	6.0	7.8	6.9
Penn G-2[y]	Creeping	6.3	6.8	6.8	7.3	7.2	6.8	6.9
SRP-1GMC[z]	Creeping	5.0	7.3	7.2	7.0	7.0	7.3	6.8
Declaration	Creeping	5.7	7.5	6.7	6.7	6.8	7.3	6.8
Penn G-6[y]	Creeping	4.7	7.7	7.2	6.7	7.2	7.3	6.8
Tyee[y]	Creeping	4.0	6.5	6.7	7.3	7.8	8.0	6.7
Crystal Bluelinks[y]	Creeping	5.7	7.0	6.8	6.7	6.8	7.0	6.7
T-1	Creeping	4.3	7.0	6.7	7.2	7.2	7.7	6.7
Penn A-4[y]	Creeping	5.0	6.8	6.5	7.3	7.2	7.0	6.6
LTP-FEC[z]	Creeping	5.0	7.0	6.7	6.7	6.8	7.3	6.6
Alpha	Creeping	4.7	6.7	6.8	7.0	6.5	7.2	6.5
HTM[z]	Creeping	4.3	7.2	6.5	6.7	7.0	7.2	6.5
Penn A-1	Creeping	4.7	6.7	6.7	6.8	7.0	7.0	6.5
Penn G-1[y]	Creeping	5.3	6.8	6.2	7.2	6.5	6.7	6.4
AFM[z]	Creeping	4.7	6.7	6.3	6.8	7.0	7.0	6.4
L-93	Creeping	5.0	6.5	6.0	6.7	6.5	6.5	6.2
SRP-1BLTR3[z]	Creeping	5.0	6.2	6.0	6.3	6.5	7.0	6.2
Penn A-2	Creeping	5.0	6.7	6.0	6.3	6.3	6.5	6.1
Crenshaw[y]	Creeping	5.0	6.0	5.8	6.5	6.5	6.2	6.0
SR 1020[y]	Creeping	5.3	6.3	5.3	6.3	5.7	5.8	5.8
Penncross	Creeping	5.3	5.5	4.8	6.5	5.5	5.8	5.6
Villa	Velvet	5.3	7.0	5.8	3.8	3.8	4.3	5.0
SR 7200	Velvet	3.0	4.8	3.5	2.2	1.5	1.7	2.8
	$LSD_{(0.05)}$[x]	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*0.6*

[z] Entry is experimental and at this time not commercially available.

[y] Not an official entry of the 2008 NTEP bentgrass trial and was included as an Arkansas standard.

[x] Fisher's protected least significant difference value ($\alpha = 0.05$).

Table 2. Turf color and texture ratings for creeping and velvet bentgrass cultivars in the 2008 NTEP Bentgrass Putting Green Trial. Evaluations were done on 25 September 2009.

Entry	Species	Color	Texture
		—— Rating value (9=high, 1=low) ——	
V8[z]	Creeping	8.0	7.7
A08-TDN2[z]	Creeping	6.7	7.0
Shark[y]	Creeping	7.8	7.0
Authority	Creeping	6.2	7.2
PST-OJO[z]	Creeping	6.7	6.3
MacKenzie[y]	Creeping	6.5	6.8
CY-2[y]	Creeping	7.3	7.3
MVS-AP-101[z]	Creeping	6.8	7.3
Penn G-2[y]	Creeping	8.0	7.3
SRP-1GMC[z]	Creeping	7.0	6.3
Declaration	Creeping	7.2	7.0
Penn G-6[y]	Creeping	6.7	7.3
Tyee[y]	Creeping	6.7	7.7
Crystal Bluelinks[y]	Creeping	6.3	6.8
T-1	Creeping	6.3	6.7
Penn A-4[y]	Creeping	7.0	6.8
LTP-FEC[z]	Creeping	6.3	6.7
Alpha	Creeping	6.0	7.0
HTM[z]	Creeping	7.0	7.2
Penn A-1	Creeping	6.0	5.8
Penn G-1[y]	Creeping	7.2	8.0
AFM[z]	Creeping	7.2	7.7
L-93	Creeping	6.0	6.0
SRP-1BLTR3[z]	Creeping	5.0	8.2
Penn A-2	Creeping	6.8	7.0
Crenshaw[y]	Creeping	7.8	7.0
SR 1020[y]	Creeping	9.0	7.5
Penncross	Creeping	7.3	7.7
Villa	Velvet	6.8	8.0
SR 7200	Velvet	5.3	8.7
	$LSD_{(0.05)}$[x]	*0.7*	*0.6*

[z] Entry is experimental and at this time not commercially available.

[y] Not an official entry of the 2008 NTEP bentgrass trial and was included as an Arkansas standard.

[x] Fisher's protected least significant difference value (α = 0.05).