Results of the Creeping Bentgrass Variety Trial at Cantigny Golf

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One-quarter of the 8,000 square foot research putting green at Cantigny is dedicated to evaluating the new bentgrass cultivars that are coming onto the market. Our trial includes 20 creeping bentgrasses, many of which are experimental or newly released varieties. In the past ten years, approximately 25 to 30 creeping bents have been developed for use on golf courses. Several of the newest varieties are noted for their fine leaf texture and high plant density at very low cutting heights. Selection for heat and drought tolerance has also been a target of several breeding programs.

Our 2,000 sq. ft. variety trial was seeded in mid September 1994, and several plots were treated with Roundup/Finale and reseeded during the summer of '95. Most of the '95 season was devoted to grow-in and maturation. Due to the extreme summer stress, fertility was kept fairly low, and cutting height was maintained at 3/16 in. (.188) throughout 1995. Early in 1996, the cutting height was dropped to 5/32 in. (.150), where it stayed for the remainder of the season. The cold and wet spring of '96 slowed greenup of the varieties, and 2.2 lbs. of N were applied between April 1 and June 20 to try to get things growing. Only another 2 lbs. of N was applied to the variety trial for the remainder of '96. Once the grass took off in late June, we tried to keep the turf "lean and mean" for the rest of the summer. If nothing else, the low to moderate fertility regime encouraged some dollar spot, so we were able to get good data on dollar spot susceptibility for many of the new varieties.

What makes a high-quality bentgrass for putting green turf? The main factors to look for are dark green color, fine leaf texture, and an upright growth habit from high shoot density.

Of the 20 varieties we included in the Cantigny green, 16 are also in the 1993 National Bentgrass Test administered by the National Turfgrass Evaluation Program (see the article on NTEP in the September '96 *On Course* by Fermanian and Voigt). NTEP evaluates new and existing cultivars of all types of turfgrasses at universities around the country. The closest sites to Chicago for comparative purposes are Urbana-Champaign (U of I), East Lansing (MSU) and Madison (UW). Since the Chicago environment can be quite different from these areas, we wanted to have a NTEP-type evaluation in the Chicago metro area. Also, the maintenance and soils/rootzones of NTEP bentgrass test sites are quite variable and are often not consistent with the level of maintenance locally. It is interesting to note, as an aside, that the USGA, GCSAA and NTEP are cooperating to establish putting green variety evaluations at up to 15 golf courses around the country. This will further improve the evaluation of new and existing varieties since they will be placed under more intensive maintenance and traffic conditions.

Quality Ratings

What makes a high-quality bentgrass for putting green turf? The main factors to look for are dark green color, fine leaf texture, and an upright growth habit from high shoot density. Other traits to look for are tolerance to low cutting heights, disease and insect resistance, traffic tolerance and competitiveness against *Poa annua*. The quality ratings presented here for '96 are based primarily on four factors: color, texture, density, and disease resistance. The monthly numerical ratings were compiled by Randy Kane with input from Scott Witte and student assistants. Since one person did all of the ratings, hopefully some consistency was maintained. However, the rater's own biases were also reinforced.

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Results of the Creeping Bentgrass...
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The overall average rating for 1996 for each variety is presented in Table 1, ranked from highest to lowest. The new Penn State varieties (A2, A4, G2, G6 from Tee-2-Green and Lesco) occupy four of the top five spots. These varieties are very fine leaved and dense, with almost a dwarf-like growth habit. Another notable variety with quality comparable to the Penn series is Loft's L-93, which is an advancement of Loft's earlier variety Southshore. Two varieties from the Texas A & M program (Century, Imperial - Burlingham Seeds) also rate highly because of their fine texture and density.

Several other varieties that perform well and are noteworthy include: Providence and SR 1020 (Seed Research), Cato (Pickseed West), Southshore and Crenshaw (Lofts), and Pennlinks (Tee-2-Green). Note that due to space limitations, Penncross was not included in our trial, although there is over 4,000 sq. ft. of Penncross on the green. At best, Penncross would rank in the bottom third of this trial because of its relatively coarse texture and low plant density.

Table 2 presents the quality data on a monthly basis, which gives an alternative view of the '96 results. Although the monthly rankings bounce around a little, you can still see that the top-rated varieties were pretty consistent from month to month. Many of the varieties in our trial are purported to have improved heat tolerance and would, therefore, be expected to rate higher in the heat of the summer. This was evident for Crenshaw, Century, 18th Green, and SR 1020 in the summer of '95 (data not presented). However, since the summer of '96 was much cooler, these differences were not as obvious. You will note, however, that Crenshaw's and 18th Green's highest rankings were in July or August. Crenshaw and 18th Green also appear to react more to the first hard frost of the fall, with some thinning and dark green to purple color noted.

Another factor in late season reduction of ratings for several varieties was chronic infection by the dollar spot fungus. Eighteenth Green was especially hard hit by dollar spot, and several other varieties appear to be highly susceptible to this disease (Table 3). Dollar spot is very common in northern Illinois, but in most cases is not as significant on greens as it is on fairways. A prob-

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Table 1
Cantigny Golf, Wheaton, IL
BENTGRASS VARIETY TRIAL
Visual Quality Ratings for 1996

RANK	ENTRY NAME		
1	Penn A2	7.61	A
2	Penn G2	7.33	AB
3	Lofts L-93	7.28	AB
4	Penn G6	7.17	ABC
5	Century	6.97	ABCD
5	Penn A4	6.97	ABCD
7	Imperial	6.78	BCDE
8	Providence	6.58	CDEF
9	Cato	6.53	CDEF
10	Pennlinks	6.50	DEF
10	SR 1020	6.50	DEF
12	Southshore	6.44	DEF
12	Regent	6.44	DEF
14	Crenshaw	6.39	DEF
14	Cobra	6.39	DEF
16	ProCup	6.36	DEF
17	Viper	6.33	DEF
17	18th Green	6.33	DEF
19	Putter	6.17	EF
20	Lopez	6.03	F
		LSD=0.65	

Means followed by the same letter are not statistically different at the 5% level.

Table 2
Cantigny Golf, Wheaton, IL
BENTGRASS VARIETY TRIAL
1996 Monthly Turf Quality Ratings

	JUNE 6		JUNE 26		JULY 19		AUG 16		SEP 11		OCT 21	
ENTRY NAME	MEAN	RANK	MEAN	RANK	MEAN	RANK	MEAN	RANK	MEAN	RANK	MEAN	RANK
Pennlinks	5.8	12	6.2	12	6.7	10	6.2	15	7.0	14	7.2	5
Providence	6.2	7	6.2	12	6.5	13	6.2	15	7.7	7	6.8	9
Putter	5.5	16	5.5	18	6.2	17	6.0	18	7.2	11	6.7	12
Southshore	6.0	10	5.8	17	6.8	5	6.3	11	7.0	14	6.7	12
ProCup	5.7	14	6.3	8	6.3	15	6.0	18	7.2	11	6.7	12
SR 1020	6.2	7	6.5	6	6.7	10	6.3	11	7.0	14	6.3	17
Lofts L-93	6.7	2	7.0	4	6.8	5	7.2	2	8.2	4	7.8	1
Viper	5.5	16	5.5	18	6.0	18	6.8	7	7.3	9	6.8	9
Cobra	5.8	12	6.0	15	6.0	18	6.2	15	7.2	11	7.2	5
Cato	6.0	10	6.2	12	6.8	5	6.3	11	7.0	14	6.8	9
Crenshaw	5.5	16	6.5	6	6.5	13	7.0	5	7.0	14	5.8	19
18th Green	5.7	14	6.3	8	6.8	5	6.8	7	7.0	14	5.3	20
Penn A2	6.5	3	7.8	1	7.8	1	7.5	1	8.5	1	7.5	4
Penn A4	6.2	7	6.3	8	7.2	3	7.2	2	8.0	5	7.0	8
Penn G2	6.8	1	7.2	2	7.0	4	7.0	5	8.3	2	7.7	3
Penn G6	6.5	3	6.3	8	6.8	5	7.2	2	8.3	2	7.8	1
Century	6.3	5	7.2	2	7.5	2	6.8	7	7.8	6	6.2	18
Imperial	6.3	5	6.7	5	6.7	10	6.7	10	7.7	7	6.7	12
Regent	5.5	16	6.0	15	6.3	15	6.3	11	7.3	9	7.2	5
Lopez	5.3	20	5.5	18	6.0	18	6.0	18	6.8	20	6.5	16
	LSD=0.9		LSD=0.6		LSD=0.6		LSD=0.6		LSD=0.7		LSD=0.7	

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able reason for this is that greens are mowed early in the morning (every day!), which removes dew and other leaf surface water, thus reducing the activity of leaf surface fungi. Dollar spot can become a problem on greens if fertility is low, if control measures are not applied in a timely manner, or if the fungicides used have become ineffective. Whether or not some of these new heat-tolerant and fine-textured varieties should be used on greens in Illinois is a controversial topic, because many are so susceptible to dollar spot. However, if dollar spot is not a strong consideration on greens, use of these newer varieties may not lead to a dollar spot problem.

Table 3
Cantigny Golf, Wheaton, IL
VARIETY TRIAL DOLLAR SPOT EVALUATION OF 8/29/96

RANK		MEAN NO. SPOTS/PLOT	
1	Penn G6	3.3	A
2	Cobra	4.3	A
3	Penn G2	7.0	A
4	Lofts L-93	7.3	A
5	Pennlinks	7.7	A
5	Putter	7.7	A
5	Penn A2	7.7	A
5	Providence	7.7	A
9	Viper	12.7	AB
9	Regent	12.7	AB
11	Cato	14.0	ABC
12	ProCup	16.7	ABCD
13	Lopez	25.0	BCDE
14	Penn A4	25.3	BCDE
15	Southshore	29.0	CDE
16	Century	30.3	DE
16	SR 1020	30.3	DE
18	Imperial	37.7	EF
19	Crenshaw	46.3	F
20	18th Green	63.0	G
		LSD=15.0	

Means followed by the same letter are not statistically different at the 5% level; Fisher's Protected LSD test.

Table 4
1993 NTEP BENTGRASS TRIAL
1995
National Rank

RANK	ENTRY NAME
1	Lofts L-93
2	Penn A1
3	Penn G2
	Cato
	Penn A4
6	Providence
	Penn G6
8	Southshore
9	Century
9	Imperial
	Pennllnks
12	Crenshaw
	SR 1020
18	Lopez
20	Regent
21	ProCup
23	Penncross
25	18th Green

Ranks out of 28 entries in trial.

Table 5
1993 NTEP TRIAL RESULTS OF 1995 FOR SIX MIDWESTERN STATES
Overall
Average Rank

ENTRY NAME	RANK
Lofts L-93	3.7
Cato	4.8
Providence	5.0
Penn G2	5.8
Penn A1	6.2
Pennlinks	7.3
Penn A4	7.7
Penn G6	8.5
Sr 1020	9.0
Southshore	9.2
Lopez	9.5
Imperial	9.8
Crenshaw	10.3
ProCup	10.8
Century	11.5
Penncross	11.7
Regent	13.3
18th Green	14.3

States averaged were: IL, IA, MI, MN, KS, MO.

Comparison to National and Regional NTEP Results

How do the ratings from Cantigny compare with the nationwide evaluation of the NTEP? If you look at Table 4, you can see that the overall national rankings are reasonably close to the rankings of varieties that we have made at Cantigny. Keep in mind that these rankings are from 1995; the '96 data is not yet available from NTEP. The Penn A and G series, L-93, Cato, Providence, Pennlinks, Century and Imperial all rank in the top 10. ProCup, 18th Green, and Lopez are in the lower part of the rankings. You can also see that most of the new varieties rank higher than Penncross. The creeping bentgrass collection and breeding programs of Drs. Duich, Engelke, Skogley, Engel, Kneebone, Funk, Hurley, Lehman and others have started to pay off in a big way!

In Table 5, you can get a different comparison of NTEP and Cantigny results by looking at data from only the six closest Midwestern testing sites to Chicago (that reported last year). It is interesting to see that the somewhat older varieties, Providence and Pennlinks, averaged out a little better than some of the newer varieties. The heat– and disease-tolerant variety, Cato, did well in Iowa, Missouri, Kansas and Michigan in 1995, which lead to its high average ranking for the six states. It will be interesting to see how these numbers play out for the much different '96 season.

What's Ahead...

For the 1997 season, we will continue to evaluate the current varieties in the Cantigny test and perhaps add some new ones coming along (e.g., SR 1119). Winter survival and spring greenup will be noted, as it was for '96. So far, there doesn't seem to be any significant differences among the new varieties for spring greenup, and all of them looked better than Penncross last April. We will probably pick up the fertility a little in '97 and keep the cutting height at .150 or below. Another trait I would like to examine is recovery from aerification or ball marks. By simulating a ball mark (sand bruise), we may be able to tell if some of these new varieties fill in aggressively or are slow to recover. This would have some bearing on possible *Poa annua* contamination in the future. We will also keep an eye on the disease situation since dollar spot, brown patch, and several other diseases have become established on the green (already!). Finally, if anyone would like to volunteer to do shoot density counts on 60 or so plots, I'm sure that information would be of interest as well. Stop on by and see these new grasses this summer, if you haven't already! ■