Bentgrass Cultivars Face Dose of Putting Green Reality

By Dan Dinelli, Certified Superintendent

Selecting the best cultivar relates to the level of commitment and resources available at each site.

Recent bentgrass tests were conducted here at the North Shore Country Club (NSCC) in the Chicago suburb of Northbrook. Cultivar differences in seedling vigor, green speed and general quality ratings were formally assessed in the five-year study.

I feel very fortunate to have been part of the on-site putting green bentgrass evaluation project sponsored by the National Turfgrass Evaluation Program (NTEP), United States Golf Association (USGA) and Golf Course Superintendents of America Association (GCSAA). The goal of the study was to evaluate the performance of bentgrass cultivars under real-world putting green conditions.

The green serves our members and guests as a putting and short-game practice facility, complete with two green-side bunkers and a 70-yard bentgrass fairway. Since completion of the five-year data collection period, Tom Voigt from the University of Illinois has accumulated much useful information.

Selecting a cultivar or blend of cultivars for putting green use is very important and not a simple task. Many considerations must be studied for long-term success. Soliciting information from several resources is often the best approach to understand a cultivars personality. Data from NTEP, researchers at universities, turfgrass breeders, turf pathologists, sod farm growers, turfgrass seed producers and fellow superintendents all contribute to understanding cultivars needs, strengths and weaknesses.

Lessons learned the hard way

I recall that when the C-15 decline (*Xanthomonas campestris*) hit in the early 1980s, it was our first known bacterial blight on turf in the Chicago area. Many Toronto C-15 putting greens were affected and succumbed to this disease.

One lesson we learned was about the possibility of potential problems due to planting of cloned monocultures. At North Shore, we had 11 putting greens, collars, nursery turf and tees growing Toronto C-15. However, only turf grown under the stress of putting green conditions succumbed to the disease.

Most superintendents growing C-15 greens looked to regrassing. Seaside, Emerald, Penncross and Penneagle were the seeded cultivars from which to choose. After we consulted with experts, it was recommended that we replant greens with Penneagle creeping bentgrass.

This was a pressure job. North Shore was to host the 83rd U.S. Amateur. The theory was Penneagle's fine texture, upright shoot growth and reduced thatch potential would produce the highest-quality putting surface. Because it was fairly new to the market, expert understanding of Penneagle's nature was gained from nursery trials. Clubs in the area started to plant Penneagle on their greens.

In a few years, Penneagle's lack of vigor demonstrated poor putting surfaces when grown under the stress of putting green conditions. Here was another tough lesson learned the hard way.

Ball mark recovery, wear from play (golfers wore metal spikes then) and *Poa annua* infestation all became highly problematic for Penneagle. Penneagle is no longer considered a turf for putting green use but one of the better performers for fairway use. Many of these lessons could have been learned under the rigors of putting green trials.

Challenges with on-site testing

Anytime one is doing a test, one major challenge is to be fair when maintaining the various cultivars grown. I was instructed to maintain the green as one of the 18 greens used in regulation. This in itself was challenging, for the other 18 greens are mostly *Poa annua* growing on a "pushup" rootzone.

However, I understood the goal and viewed the putting surface as a product needing to be comparable to those greens played in regulation.

There are officially 18 cultivars growing in the trial at NSCC. Living in the world of researchers, one learns of the forced compromises in field eval-

uations. To be consistent, and to generate scientific data, a management program needed to be maintained equally across all cultivars.

Mowing heights, topdress frequency, grooming, nitrogen application rates, disease management and other cultural practices can differ greatly from one cultivar's needs to another. For example, large differentials in dollar spot (*Sclerotinia homoeocarpa*) susceptibility occurred with several cultivars.

If a plan were implemented based on suppressing symptoms of a disease-prone cultivar, over-application of plant protectants would be applied to other less disease-prone cultivars. This high application rate may mask disease symptoms that may otherwise be found on a susceptible cultivar .

At first it was a struggle developing a management plan, for it could impact quality ratings on certain cultivars. Common sense dictated not to tailor to individual cultivar needs but to manage everything as a general stand of turf.

I subscribe to "less is better" most of the time. In general, daily mowing heights were maintained at 120 to 125 thousandths of an inch. We topdressed every three weeks. There was daily grooming, water as needed and fertilizing based on soil and tissue tests and according to general color and clipping yield.

Disease controls applied only as needed based on symptoms observed on least disease-prone cultivars. Under this disease management program, cultivars prone to dollar spot got pretty ugly at times. It demonstrated clearly that great differentials occur with plant genetics vs. susceptibility to various diseases.

Data generated from this study would prove very useful to anyone selecting a new turf for putting green construction or overseeding. Perhaps less obvious is the useful information gained from the study on how to best manage these new cultivars.

The test green attracted a lot of attention from many individuals, stimulating much discussion on various management issues. Voigt, Randy Kane, Hank Wilkinson, Bruce Branham, Tom Fermanian, Andy Hamblin, USGA agronomist Paul Vermeulen and others combined with experiences from the study, contributed to a database on how to best manage various cultivars.

What makes on-site testing fairly unique are the tools and resources available. Better understanding the impacts of such inputs prove helpful and adds direct correlation to the practitioner. We all learned from each other in a growing environment found at most courses.

TABLE 1

NTEP On-site Green *Poa* Overseeding Rating

North Shore Country Club
(rated May 10, 2004)

	Percent Poa		
Cultivar	**Seeded**	**Unseeded**	**Standard Deviation**
L-93	23.3	13.3	8.2
Putter	21.7	16.7	4.9
Cato	26.7	20.0	7.5
Crenshaw	12.7	18.3	8.3
Grand Prix (LCB-103)	6.0	4.3	2.6
Penncross	23.3	21.7	10.4
Backspin	10.0	8.3	3.8
Trueline	13.3	13.3	4.1
Providence	11.0	8.3	3.3
SR 1020	21.7	15.0	11.3
SR 1119	13.3	9.3	2.9
Viper	23.3	20.0	6.8
Century	11.0	6.0	6.2
Imperial	7.3	5.0	2.0
Penn A-1	5.0	4.3	2.6
Penn A-4.	4.3	4.3	2.7
Penn G-6	11.0	8.3	4.5
Penn G-1	8.7	6.0	4.7
LSD 0.05	8.4		

Mean for seeded plots = 14.1; mean for unseeded plots = 11.3

The $64 question

"Which cultivar is the best?" is the key question. One might think that question deserves an easy answer. The best way I can respond is by first sharing which cultivars performed poorly. Often this relates to a cultivar's susceptibility to diseases. Color, texture and general quality did differ, but differences could be challenged with some if the varieties were not grown side-by-side.

I feel many cultivars can produce high-quality putting surfaces. In part, selecting the best cultivar relates to the level of commitment and resources available at each site. The higher-density cultivars require management practices that differ from those with half the shoot density. Like any relationship, the best fit is one where both parties can fulfill one another's needs.

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TABLE 2

North Shore NTEP Disease Rating (June 9, 2004)

Plot #	Cultivar	Dollar Spot %	LSD		Bipolaris %	LSD**		Moss %	LSD**
15	A-1	0.00	a	Dominant*	0.00	--	A-1	0.00	a
19	Dominant*	0.00	-	L-93	0.00	a	Dominant*	0.00	--
18	G-1	0.67	ab	L-93+SR 1119*	0.00	--	L-93+SR 1119*	0.00	--
1	L-93	1.00	ab	SRX1DIN*	0.00	--	Providence	0.00	a
22	L-93+SR 1119*	1.00	-	Providence	0.00	a	SRX1DIN*	0.25	--
20	SRX1DIN*	1.25	-	SRX1120*	0.00	a	A-4	0.33	ab
9	Providence	1.33	ab	A-4	0.00	a	Backspin	0.33	ab
21	SRX1120*	1.50	-	SR 1119	0.00	a	G-1	0.67	ab
8	Trueline	1.67	ab	Century	0.00	a	L-93	0.67	ab
17	G-6	2.33	ab	G-6	0.33	ab	G-6	0.67	ab
3	Cato	3.67	ab	LCB-103	0.33	ab	Putter	1.33	ab
6	Penncross	3.67	ab	Viper*	0.50	--	LCB-103	1.33	ab
16	A-4	4.00	ab	A-1	0.67	ab	SR 1119	1.33	ab
2	Putter	6.67	abc	G-1	0.67	ab	Crenshaw	1.33	ab
5	LCB-103	8.33	bcd	Trueline	0.67	ab	Trueline	1.67	ab
12	Viper*	8.50	-	Imperial	0.67	ab	SR 1020	1.75	ab
11	SR 1119	12.33	cde	Cato	1.00	ab	Cato	2.00	ab
10	SR 1020	15.50	de	Penncross	1.00	ab	Imperial	2.00	ab
7	Backspin	16.67	e	Backspin	1.00	ab	Century	4.00	bc
14	Imperial	16.67	e	Crenshaw	1.00	ab	Penncross	6.00	c
4	Crenshaw	18.33	e	Putter	2.00	b	Viper*	6.00	--
13	Century	20.00	e	SR 1020	2.00	b	SRX1120*	15.00	--

* — Not averaged over at least three reps or randomized. ** — Pr>F values not significant (Bipolaris = .47, Moss = .32, should be less than .05). Therefore statistical separation of means is not permissible because it is not clear if the different cultivars had any influence on pest presence.

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Now that the formal five-year commitment has been completed, we are free to look into other questions on potential cultivar differences. Competitiveness against *Poa annua*, ball mark recovery, long-term genetic disease resistance, genotype segregation, cultivar response to various *Poa annua* control chemistries, tolerance to ultra-low mowing heights, drought tolerance and attraction to plant parasitic nematodes, to name a few.

With help from Branham and Voigt and Kane of the Chicago District Golf Association, several of these questions are already being addressed.

A *Poa annua* study is underway to evaluate the bentgrass cultivars' competitiveness against *Poa annua*. In June 2003 *Poa annua* seed was used to overseed each variety cell. After double-core aerification with three-eighths-of-an-inch tines, the replicated 5x10-foot plots were divided in half, overseeding only half of the cell. A 5x5-foot isolation box was used to ensure no seed escaped outside the overseeded area.

Before removing the isolation box, the seed was worked in with a broom. Upon completion of the overseeding process, the entire green was topdressed with straight sand and watered in.

Over a several years we hope to see differentials of *Poa annua* establishment in cultivars. The second part of the study will include two objectives: to evaluate variety's tolerance to *Poa annua* control products and varieties ability to out-compete *Poa annua* when control products are implemented.

Overall, the study was very beneficial to our industry and especially fruitful for us in the Chicago area. We will continue to observe and utilize the on-site test green as a research site.

Visitors are always welcome to observe for themselves the evaluation plots. I also have other data easily shared via e-mail or hardcopy.

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