



I'm Seeding a New Green: What About Cultivar X?

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Despite all the rain, the heat, the humidity and everything else, in some ways this year was just like most other years. That's a good thing: after a couple of years of little to no activity it seems that golf course renovations are starting again. Hopefully soon the renovations will be followed by new construction. I could tell renovations are being done because more people contacted me to talk about cultivar selection.

The University of Wisconsin-Madison has run cultivar evaluations at the O.J. Noer Turfgrass Research and Educational Facility in Madison since before I arrived in 1997. The most common cultivar trials are those that are sponsored by the National Turfgrass Evaluation Program (NTEP). Trials are generally seeded in late summer, just about the time that all your student helpers and ours return to school. Trials run for a period of 4 to 5 years. Data we collect include percent germination, spring greenup, and turf quality monthly during the growing season.

Sometimes we also collect information on disease resistance, *Poa annua* invasion, amount of turf cover at various seasons, leaf texture, genetic color, and turf density.

The 2003 NTEP bentgrass putting green trial was the most recently completed putting green trial. It was seeded in late summer 2003. Turf quality data were collected from 2004 through 2007, compiled and analyzed in 2008, and posted on the NTEP website by 2009 (www.ntep.org). The site has a tremendous amount of data. The most used/useful data are usually turf quality. Turf quality is rated on a 1 to 9 scale, with 9 equal to excellent turf and 1 equal to dead or absent turf. A rating of 6 or better is considered "acceptable". In addition to quality, though, other data often should be considered. Several superintendents have commented to me over the years that they've spent hours poring over the data, and now they want my thoughts as well. Selecting a bentgrass cultivar is a big decision: greens renovation is a rare and

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costly event for a club. If the selected cultivar “fails”, whether due to some environmental factor, disease, or any other variable, very often the outcome reflects on the superintendent.

One source of confusion is the source of the data. The 2003 putting green trial had 26 cultivars planted in 20 states and one Canadian province. Six of the cultivars were velvet bentgrass, which fared poorly in many cases because the management or site conditions favored creeping bentgrass. For example, average velvet bentgrass quality was about 4.6 in Kentucky, 4.0 in New Mexico, and 3.3 in Texas, well below the averages for creeping bentgrass. In New Jersey, velvet bentgrass scores tended to be similar to those for any given creeping bentgrass. Obviously velvet bentgrass did not perform well in the southern or SW states, so there's no need to look at those data. It's tempting to look at the overall quality data averaged across all states, but if certain states or management techniques are unfavorable for a given species or cultivar, the average may be relatively meaningless, too.

My advice is to look at the data generated from the most similar climate and management conditions (e.g., mowing height, nitrogen rate, soil type) to the situation in question. Thus, if a golf course has sand based putting greens and the 2003 NTEP trial site in Wisconsin was a silt loam soil, it makes sense to look at data from Minnesota, as their trial was conducted on a sand root zone.

People also wonder what the numbers really mean. For example, 'Declaration' received the highest overall average quality score during the period 2004-2007 (Table 1). However, it didn't necessarily rate the best quality in each month over that time, nor necessarily even the best average score within a given year. One would have to look at each year's data on the NTEP website to get an idea of the amount of variation during each year. One of the most important items on each data

Table 1. Putting green turf quality of bentgrass cultivars over a 4-yr period when maintained at 0.125 inch or lower height of cut (Adapted from 2003 National Turfgrass Evaluation Program from 2004-2007 data at www.ntep.org).

Name (test number)	Species	Wisconsin data	Average (11 states)†
Declaration	Creeping	7.5‡	6.6
CY-2	Creeping	7.1	6.6
Shark	Creeping	6.9	6.6
007	Creeping	6.9	6.5
13-M	Creeping	6.9	6.2
Memorial	Creeping	6.8	6.2
Authority	Creeping	6.7	6.6
Tyee	Creeping	6.7	6.6
Penn A-1	Creeping	6.5	6.4
Cobra	Creeping	6.4	6.1
Mackenzie	Creeping	6.2	6.5
Kingpin	Creeping	6.2	6.1
LS-44	Creeping	6.2	6.2
Villa	Velvet	6.7	5.7
Legendary	Velvet	6.5	5.5
Greenwich	Velvet	6.2	5.4
Vesper	Velvet	5.5	5.1
Venus	Velvet	6.5	5.5
Alpha	Creeping	5.9	6.0
Independence	Creeping	5.9	6.3
Pennlinks II	Creeping	5.9	5.5
Bengal	Creeping	5.7	6.0
Benchmark	Creeping	5.7	6.1
T-1	Creeping	5.8	6.1
SR 7200	Velvet	4.8	5.0
Penncross	Creeping	4.7	5.0
LSD		0.9	0.3

† The 11 states were Arkansas, Michigan, North Carolina, Nebraska, New Jersey, New York, Oklahoma, Pennsylvania, Quebec (Canada), and Wisconsin.

‡ Quality was rated each month of the growing season on a 1 to 9 scale, where 9 = excellent turf, 1= dead or missing turf, 6=acceptable.

page is the Least Significant Difference (LSD) value. The LSD is a barometer used by statisticians to determine if a value is truly significantly different from another value. If you've seen the NTEP plots at the O.J. Noer Facility you'll likely remember that each variety is planted three different times. For various reasons (soil moisture, edge effect, etc.) each of the three replications often have values different from their counterparts. For example, one cultivar may have rankings of 5, 6, and 7. Another cultivar may have rankings of 4, 6, and 9. The average value for the first cultivar is 6.0 and 6.3 for the second cultivar. The LSD helps account for the amount of variation among the replications for a given cultivar and assigns a degree of certainty that one average value is truly different from

another. To apply the LSD number, subtract it from the largest number: any variety that has a score between the highest number and the remainder is statistically similar to the highest-scoring variety. In the final data set of turf quality for the 2003 NTEP putting green trial, for example, the LSD was 0.9. Declaration had the highest score of any variety, a 7.5 out of a possible 9. Subtract the LSD value (0.9) from 7.5. The resulting value is 6.6. Thus, any cultivar with a 6.6 quality ranking or greater is statistically the same as Declaration. These included CY-2, Shark, 007, 13-M, Memorial, Authority, and Tyee.

Everyone seems to like grass that greens up early in the spring. Theoretically, the first cultivar to greenup should mean it is growing sooner in the year, and will be better

able to handle summer stress than cultivars that green up later. But being first doesn't always mean being best. Figure 1 shows a slightly negative relationship between spring greenup of the creeping bentgrass cultivars in the 2003 trial and their average turf quality over the entire trial. In some cases, those cultivars that green up early in the spring may just be better growers at cool, wet temperatures. During the height of summer it's possible some of the early greening cultivars can't stand the heat.

Budget reductions from NTEP in 2008 meant many states were unable to host an NTEP trial. At UW-Madison, we did successfully compete for a bentgrass fairway trial but not a putting green test. In order to make lemons out of lemonade, UW-Madison banded together with other states like Michigan and Iowa to develop an even more meaningful bentgrass putting green trial. On our own initiative, we seeded cultivars that were in the 2008 NTEP, and

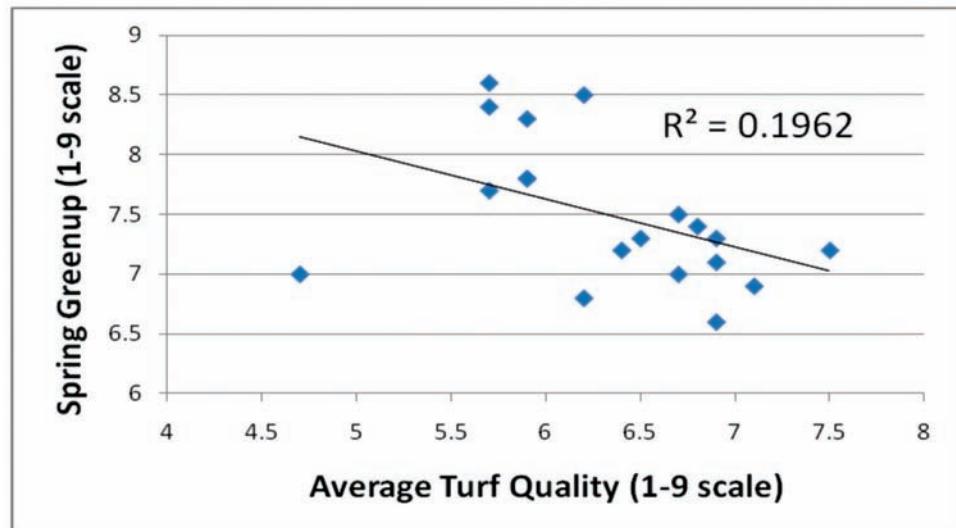


Fig. 1. Spring greenup of creeping bentgrass cultivars was a poor indicator of the average turf quality for 20 cultivars from 2004-2007, O.J. Noer Facility, Madison, WI.

added an extra dimension by using fungicides on only half of each grass plot in order to better evaluate true disease resistance.

We often have superintendents, architects, seed distributors, and breeders out to visit our NTEP plots at the O.J. Noer facility. We're open

five days a week, sometimes six! Another option—come to the WTA field day next summer. All the variety trials are on display at each field day, with a sign listing each cultivar's identity, whether they're part of the formal tour or not. 

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