

# **Performance of Bentgrass Cultivars and Selections under Fairway Conditions (1998-2002)**

P.J. Landschoot, B.S. Park, and D. Livingston

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## **Introduction**

Tests of commercially available turfgrass cultivars and experimental selections are conducted annually in University Park, PA to provide turfgrass managers, seed industry representatives, county extension agents, and other interested persons with information about turfgrass characteristics and performance. In September 1998, 26 bentgrass cultivars and selections were established at the Joseph Valentine Turfgrass Research Center in University Park, PA. Entries were supplied by the National Turfgrass Evaluation Program (NTEP). The following is a report on the performance of these entries from 1998 through 2002.

## **Materials and Methods**

Entries were seeded on September 14, 1998 in 5 by 9 ft plots at a rate of 1.1 lbs seed/1000 ft<sup>2</sup>. The entire test site received full sunlight. Three replicate plots of each entry were used in this test and plots were arranged in a randomized complete block design. Prior to seeding, the test area received starter fertilizer (10-13-3) at a rate of 1.0 lb N/1000 ft<sup>2</sup>. The test was mowed at 0.5 inch in height. To ensure aggressive establishment, three fertilizer applications were made between seeding and December 2, 1998, in which a total of 3.0 lbs N/1000 ft<sup>2</sup> was delivered.

### *Assessments of Turfgrass Performance*

All assessments of turfgrass performance were made on a visual basis. Care was taken to ensure consistent and accurate evaluations. The following performance criteria were used to assess bentgrass cultivars and selections.

Quality: Quality indicates the overall appearance of the turf and can incorporate several components including: density, texture (measure of leaf width), uniformity, and freedom from disease and insect damage. Quality is rated using a scale of 1 to 9, where 9 = highest quality.

Seedling vigor: This rating is a visual estimate of percent ground cover and plant height during the early stages of seedling establishment and reflects the rate of establishment. The plots were rated shortly after seeding using a scale of 1 to 9, where 9 = most vigorous seedling growth.

Spring green-up: Spring green-up provides an indication of how soon the turf breaks out of winter dormancy. The plots were rated for spring green-up using a scale of 1-9, with 9 = the most uniform green color.

Texture: This rating provides an indication of the relative coarseness/fineness of turf leaf width. Texture is rated on a scale of 1-9, where 9 = the finest-textured turf.

Color: Color ratings reflect the inherent color of the entry, not yellowing or browning due to mower injury, drought stress, disease, etc. Color ratings are taken when grass is not under stress. Color is rated on a scale of 1-9, with 9 = the darkest green color.

Density: Density is a visual estimate of the number of plants per unit area. Density is rated on a scale of 1-9, with 9 = the most dense turf.

Disease ratings: Disease ratings provide an indication of an entry's reaction to a particular disease. Disease ratings are based on a scale of 1-9 (with 1 = extensive disease damage and 9 = no disease present). Multiple disease ratings of dollar spot and brown patch are included in this report. All disease infestations occurred naturally.

## Results and Discussion

### *Interpretation of Results*

Data for the above criteria are presented in Tables 1, 2, and 3. Cultivars that are commercially available are in bold type and experimental selections are in plain type. Differences between two entries are statistically significant only if the LSD (Least Significant Difference) value, listed at the bottom of each column in Tables 1, 2, and 3 is exceeded by the numerical difference between two entries. For example, if cultivar 'A' is 3.0 units higher in quality than cultivar 'B', then this difference is only significant if the LSD value is 3.0 or less. If the LSD is greater than 3.0, then the numerical difference between the two cultivars may be due to inherent variability in the test area or some other element of chance.

Keep in mind that the results of this test reflect cultivar performance for the management regime imposed at this site and environmental conditions in central Pennsylvania.

### *Summary of Results*

The entries with the highest average seasonal quality (Table 1) for 1999-2002 were **L-93**, **SRX 1BPAA**, **SR 1119**, **ISI At-5**, **Seaside II**, **Imperial**, **Trueline**, **Penn G-6**, and **Grand Prix**. These entries showed excellent color, density, uniformity, and disease resistance throughout the test. The entry that ranked lowest in turf quality during the test period was **Seaside**.

Seedling vigor (Table 2) was greatest with **Penncross**, **Tiger**, **Princeville**, **GolfStar**, **Providence**, **SR 7100**, **Seaside II**, and **Backspin**. The selections that were slowest to establish included, **PST-9PM**, **SRX 7MODD**, **SRX 7MOBB**, **SRX 1BPAA**, and **Brighton**.

Six colonial bentgrasses showed the finest leaf texture in 2001 including, **SRX 7MODD**, **SRX 7MOBB**, **SR 7100**, **ABT-Col-2**, **ISI At-5**, and **Tiger**. The coarsest leaf texture was displayed by **Seaside**.

Spring green-up ratings from 1999 through 2002 revealed that **PST-9PM**, **Glory**, **SR 7100**, **Tiger**, and **ISI At-5** broke winter dormancy sooner than all other selections and varieties (Table 2). **Seaside II**, **Seaside**, **Penneagle**, **Princeville**, **Penncross**, **Penn G-6**, and **SR 1119** showed the slowest combined spring green-up.

Although cultivar color is usually not considered an important criterion in terms of playability, it can be a consideration when trying to achieve a uniform-appearing stand with a blend of several cultivars. **GolfStar**, an Idaho bentgrass, showed the darkest blue/green color, followed by **PST-0VN**, **SRX 7MODD**, and **SRX 1BPAA** (Table 2). **Seaside** was the lightest green (yellow/green) entry.

The following bentgrasses, **ISI At-5**, **SRX 7MOBB**, **SRX 7MODD**, **Imperial**, **Seaside II**, **Grand Prix**, and **Century** received the highest

combined density rating for 1999-2002. **Seaside** showed the lowest combined density rating (Table 2).

Differences in disease susceptibility were noticed among entries and are reported in Table 3. Colonial bentgrasses and the Idaho bentgrass generally showed excellent resistance to dollar spot. Some creeping bentgrasses showed good resistance to dollar spot (**L-93**, **Seaside II**, and **Seaside**) while others (**Backspin** and **Century**) were relatively susceptible. Colonial bentgrasses were highly susceptible to brown patch, whereas the creeping bentgrasses were generally more resistant.

Table 1. Quality ratings of bentgrass cultivars and selections for 1999-2002. This trial was established in September, 1998 at the Joseph Valentine Research Center, University Park, PA.

Entry <sup>2</sup>	Species <sup>3</sup>	Turfgrass Quality Ratings <sup>1</sup>				
		Combined Season Averages				Combined
		Average				
1999	2000	2001	2002	1999-02		
<b>L-93</b>	CRB	7.5	7.8	7.5	7.8	7.6
SRX 1BPAA	CRB	7.9	7.9	7.3	7.3	7.6
<b>SR 1119</b>	CRB	7.8	7.7	7.3	7.5	7.6
ISI At-5	COL	7.8	7.8	7.0	7.4	7.5
<b>Seaside II</b>	CRB	7.1	7.8	6.8	7.5	7.3
<b>Imperial</b>	CRB	7.1	7.6	7.1	7.5	7.3
<b>Trueline</b>	CRB	7.2	7.3	7.1	7.4	7.3
<b>Penn G-6</b>	CRB	7.2	7.6	6.9	7.2	7.2
<b>Grand Prix</b>	CRB	7.3	7.4	7.0	7.1	7.2
PST-0VN	CRB	7.3	7.2	6.5	6.8	7.0
<b>Brighton</b> (SRX 1120)	CRB	7.1	7.2	6.3	7.0	6.9
<b>Providence</b>	CRB	7.0	7.6	5.9	7.1	6.9
<b>Century</b>	CRB	6.8	6.6	6.3	7.3	6.8
<b>Backspin</b>	CRB	6.6	7.1	6.1	7.2	6.8
<b>Glory</b> (PST -9HG)	COL	6.9	7.3	5.7	6.9	6.7
SRX 7MODD	COL	6.8	7.2	5.7	6.4	6.5
<b>Princeville</b>	CRB	6.2	6.8	6.2	6.5	6.5
SRX 7MOBB	COL	6.7	6.9	5.7	6.3	6.4
<b>Penncross</b>	CRB	5.9	6.3	6.0	6.4	6.2
<b>SR 7100</b>	COL	6.5	6.9	5.1	5.7	6.0
<b>Penneagle</b>	CRB	5.4	5.9	6.2	6.3	6.0
ABT-Col-2	COL	6.5	6.5	4.9	5.9	5.9
<b>GolfStar</b>	IDH	6.7	6.2	4.9	5.0	5.7
<b>Tiger</b>	COL	6.1	6.4	4.5	5.2	5.6
PST-9PM	COL	6.2	6.1	3.9	4.6	5.2
<b>Seaside</b>	CRB	4.0	3.6	3.7	3.3	3.6
LSD at 5% level <sup>4</sup>		0.7	0.8	0.7	0.7	0.5

<sup>1</sup> Refer to 'Assessments of Turfgrass Performance' for an explanation of performance criteria ratings.

<sup>2</sup> Names that are in bold type are commercially available cultivars, those that are in plain type are experimental selections (not available to the general public).

<sup>3</sup> Bentgrass species designated by the following letters: CRB = creeping bentgrass, COL = colonial bentgrass. IDH = Idaho bentgrass

<sup>4</sup> LSD = least significant difference. The LSD values at the bottom of each column represent the minimum difference between any two entries necessary to be 95% confident that the difference is not attributable to chance.

Table 2. Performance of bentgrass cultivars and selections for 1998-02. This trial was established in September, 1998 at the Joseph Valentine Research Center, University Park, PA.

Entry <sup>2</sup>	Species <sup>3</sup>	Turfgrass Ratings <sup>1</sup>				
		Seedling Vigor 9/20/98	Leaf Texture 2001	Combined Spring Greenup 2000-02	Combined Color 1999-00, 02	Combined Density 1999-00
<b>L-93</b>	CRB	6.0	7.0	5.6	6.3	7.8
SRX 1BPAA	CRB	1.7	7.0	5.8	7.4	7.4
<b>SR 1119</b>	CRB	4.7	6.7	5.4	6.4	7.6
ISI At-5	COL	4.7	8.7	7.2	5.4	8.3
<b>Seaside II</b>	CRB	6.3	7.7	4.7	5.1	8.0
<b>Imperial</b>	CRB	5.3	7.3	6.2	5.4	8.1
<b>Trueline</b>	CRB	5.7	7.0	5.7	6.8	7.3
<b>Penn G-6</b>	CRB	6.0	7.0	5.4	5.9	7.2
<b>Grand Prix</b>	CRB	5.7	7.7	5.7	5.3	7.9
PST-0VN	CRB	5.0	6.7	5.6	7.9	7.1
<b>Brighton (SRX 1120)</b>	CRB	2.0	7.0	5.8	5.9	7.4
<b>Providence</b>	CRB	6.7	7.3	5.8	5.8	7.4
<b>Century</b>	CRB	5.0	8.0	5.9	5.2	7.9
<b>Backspin</b>	CRB	6.3	8.0	6.1	4.8	7.7
<b>Glory (PST -9HG)</b>	COL	2.7	8.0	7.8	5.9	7.7
SRX 7MODD	COL	1.0	9.0	7.0	7.8	8.2
<b>Princeville</b>	CRB	7.7	7.3	5.2	4.9	6.5
SRX 7MOBB	COL	1.7	9.0	6.9	6.6	8.2
<b>Penncross</b>	CRB	7.7	5.0	5.3	6.2	6.2
<b>SR 7100</b>	COL	6.7	9.0	7.8	4.4	7.6
<b>Penneagle</b>	CRB	4.3	6.0	5.0	5.3	6.0
ABT-Col-2	COL	2.7	9.0	6.3	4.6	7.8
<b>GolfStar</b>	IDH	7.0	7.3	6.7	8.6	6.8
<b>Tiger</b>	COL	7.7	8.3	7.2	5.2	7.2
PST-9PM	COL	1.0	8.0	7.9	6.8	6.6
<b>Seaside</b>	CRB	5.3	3.3	4.9	3.2	3.7
LSD at 5% level <sup>4</sup>		1.5	0.7	0.7	0.7	0.4

<sup>1</sup> Refer to 'Assessments of Turfgrass Performance' for an explanation of performance criteria ratings.

<sup>2</sup> Names that are in bold type are commercially available cultivars, those that are in plain type are experimental selections (not available to the general public).

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Table 3. Disease ratings of bentgrass cultivars and selections for 1999-02. This trial was established in September, 1998 at the Joseph Valentine Research Center, University Park, PA.

Entry <sup>2</sup>	Species <sup>3</sup>	Turfgrass Disease Ratings <sup>1</sup>						
		Dollar Spot				Brown patch		
		8/23/99	9/21/00	8/6/01	7/5/02	7/22/99	9/7/00	7/2/01
<b>L-93</b>	CRB	6.7	8.0	8.0	7.7	7.3	9.0	9.0
SRX 1BPAA	CRB	7.0	7.3	8.0	6.7	8.3	9.0	9.0
<b>SR 1119</b>	CRB	7.0	6.3	6.7	5.7	7.7	9.0	9.0
ISI At-5	COL	8.3	8.7	8.3	8.7	6.3	7.7	8.3
<b>Seaside II</b>	CRB	7.3	8.3	8.0	7.0	7.3	9.0	9.0
<b>Imperial</b>	CRB	5.3	6.0	5.7	5.3	8.0	9.0	9.0
<b>Trueline</b>	CRB	7.0	7.3	7.7	7.3	8.0	9.0	9.0
<b>Penn G-6</b>	CRB	6.7	7.0	6.3	7.7	7.7	9.0	9.0
<b>Grand Prix</b>	CRB	6.3	6.7	6.0	5.7	7.7	9.0	9.0
PST-0VN	CRB	7.0	8.3	7.3	8.7	8.0	8.7	9.0
<b>Brighton</b> (SRX 1120)	CRB	5.3	6.0	5.7	6.0	7.7	9.0	9.0
<b>Providence</b>	CRB	6.3	6.3	4.7	6.0	8.0	9.0	9.0
<b>Century</b>	CRB	5.3	4.3	4.3	4.7	7.7	9.0	9.0
<b>Backspin</b>	CRB	4.7	5.3	4.3	6.3	7.7	9.0	9.0
<b>Glory</b> (PST -9HG)	COL	8.0	8.7	8.3	8.0	5.7	4.0	7.7
SRX 7MODD	COL	8.0	8.7	8.0	8.3	5.3	4.0	7.7
<b>Princeville</b>	CRB	5.3	6.7	5.7	6.0	7.0	8.7	9.0
SRX 7MOBB	COL	7.7	9.0	8.3	8.3	5.7	3.7	7.3
<b>Penncross</b>	CRB	4.3	7.0	6.7	7.0	8.3	9.0	9.0
<b>SR 7100</b>	COL	8.0	9.0	8.0	8.3	5.3	4.7	7.3
<b>Penneagle</b>	CRB	6.7	7.3	6.3	7.0	7.0	9.0	9.0
ABT-Col-2	COL	8.0	8.7	7.7	8.7	4.7	3.0	6.7
<b>GolfStar</b>	IDH	8.7	9.0	8.7	9.0	6.7	6.3	8.0
<b>Tiger</b>	COL	7.7	8.7	8.0	8.7	5.7	4.3	7.3
PST-9PM	COL	8.3	9.0	7.7	9.0	5.3	4.3	7.3
<b>Seaside</b>	CRB	7.0	9.0	8.0	7.7	6.3	7.0	9.0
LSD at 5% level <sup>4</sup>		1.1	1.0	1.2	1.6	1.4	0.9	0.7

<sup>1</sup> Refer to 'Assessments of Turfgrass Performance' for an explanation of performance criteria ratings.

<sup>2</sup> Names that are in bold type are commercially available cultivars, those that are in plain type are experimental selections (not available to the general public).

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