# 2003
# RUTGERS
# Turfgrass Proceedings


## THE NEW JERSEY TURFGRASS ASSOCIATION

In Cooperation With

RUTGERS COOPERATIVE RESEARCH & EXTENSION
NEW JERSEY AGRICULTURAL EXPERIMENT STATION
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
NEW BRUNSWICK

# 2003 RUTGERS TURFGRASS PROCEEDINGS

**of the**

**New Jersey Turfgrass Expo**
**December 9-11, 2003**
**Trump Taj Mahal**
**Atlantic City, New Jersey**

The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, Cook College, Rutgers, The State University of New Jersey in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public.

This publication includes lecture notes of papers presented at the 2003 New Jersey Turfgrass Expo. Publication of these lectures provides a readily available source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

Special thanks are given to those who have submitted papers for this proceedings, to the New Jersey Turfgrass Association for financial assistance, and to those individuals who have provided support to the Rutgers Turfgrass Research Program at Cook College, Rutgers, The State University of New Jersey.

Dr. Ann Brooks Gould, Editor
Dr. Bruce B. Clarke, Coordinator

# PERFORMANCE OF BENTGRASS CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS

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A number of *Agrostis* species are used for specialty, close cut turf, including creeping bentgrass (*Agrostis stolonifera* L., also called *Agrostis palustris* Huds.), colonial bentgrass (*A. tenuis* Sibth. or *A. capillaris* L.), highland or dryland bentgrass (*A. castellana* Boiss. & Reut.), and *velvet bentgrass* (A. canina L.). Due to their low, prostrate growth habit, all of these species are more tolerant of close mowing than other cool season turfgrass species. This single characteristic makes bentgrass the ideal choice for high quality sports turf.

Creeping bentgrasses are popular for use on golf course putting greens because of their aggressive, stoloniferous growth habit and their adaptability to a wide range of environmental conditions that occur within both the cool temperate and warm, humid environments of the United States. In 1954, H. B. Musser released Penncross, the first improved seeded variety of creeping bentgrass. Since that time, university and commercial breeding programs have dramatically improved creeping bentgrass varieties to meet the ever increasing demands placed on putting green turf. Turf managers now benefit from recent releases of improved creeping bentgrass varieties that have better turf quality, higher shoot density, improved traffic tolerance, enhanced competitive ability against invasion by annual bluegrass (*Poa annua*), and greater disease and stress tolerance than older varieties such as Penncross.

Colonial bentgrass has traditionally been used as a lawn grass in regions such as northern Europe and New Zealand where the climate is cooler compared to the humid regions of the United States. Colonial bentgrasses are typically brighter green and maintain better color in cool weather compared to creeping bentgrass, but they lack the aggressive spreading characteristic of creeping bentgrass due to the presence of limited rhizomes. Colonial bentgrass has better resistance to dollar spot (caused by *Sclerotinia homoeocarpa*) than creeping bentgrass but tends to be more susceptible to brown patch (caused by *Rhizoctonia solani*). The susceptibility of colonial bentgrass to brown patch, along with an inability to perform consistently at heights of cut below 3/8 inch, has kept this species from being widely used on putting greens. At cutting heights above 3/8 inch, colonial bentgrass forms an attractive turf that is suitable for use on golf course fairways and tees. The current limitation of colonial bentgrass on fairways and tees is the high susceptibility of this species to brown patch. Identifying sources of colonial bentgrass germplasm with improved resistance to brown patch continues to be a major objective of the Rutgers Turfgrass Breeding Program.

Another species that continues to receive some attention in bentgrass breeding programs is dryland bentgrass. Historically, there has been confusion over the taxonomic classification of this species. Some researchers have suggested that dryland bentgrass may be the same species or a sub-species of colonial bentgrass. Dryland bentgrass is very similar to colonial bentgrass in growth habit, adaptation, and use, but has a more blue-green color and more extensive rhizomes than its colonial counterpart. Bonos et al. (2002) confirmed that dryland bentgrass has 42 chromosomes whereas colonial bentgrass has 28 chromosomes. This finding supports the classification of these grasses as distinct species.

Velvet bentgrass is the densest of the bentgrasses used for turf, and a well managed stand of this grass resembles a green velvet carpet. Although the use of this species has been limited, early breeding efforts with velvet bentgrass predate the development of Penncross creeping bentgrass. As

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early as 1945, Sprague reported that improved strains of velvet bentgrass were available as seed. The superior strains of velvet bentgrass available at that time were Piper, Kernwood, Emerald, and Raritan (Sprague, 1945). It appears that production of these early varieties was stopped prior to or during World War II.

Velvet bentgrass has tremendous potential as a sports turf surface. Sprague (1945) recognized the following unique characteristics of this grass prior to the initiation of many university turfgrass breeding programs:

> "Although velvet bent has not enjoyed so wide use as other turf grasses, because of the comparatively recent availability of seed supplies, it has the widest range of usefulness of any species. It thrives under close mowing as well as creeping bent, but is also well suited for use on lawns. Velvet bent is more aggressive than colonial bent, although it spreads in the same manner, by short aboveground creeping stems...It is one of the most drought-resistant of turf grasses for temperate regions and is tolerant of heat and cold. Unlike the other bents, it is well adapted for use in shady locations, as well as in the sun. Consequently, it should be used in mixtures for shaded areas, as well as for fine turf in the open. It is the finest of all grasses for putting greens and bowling greens, and also blends nicely in mixtures of grasses for lawns and parks. Velvet bent is rather tolerant of infertile soils but does not thrive on soils that are poorly aerated and poorly drained."

Within the last decade, university and commercial breeding programs have shown renewed interest in developing new cultivars of velvet bentgrass. This is in no doubt a response to the "rediscovery" of many of the unique attributes of this species. Research and breeding efforts are focused on evaluating the potential of this species as a viable alternative to creeping bentgrass. In recent turf trials in New Jersey, velvet bentgrass selections had a brighter green color, better dollar spot and brown patch resistance, and were less prone to localized dry spot than creeping bentgrass. Additionally, the apparent drought tolerance of velvet bentgrass would be a tremendous benefit to turf managers, particularly in light of frequent water restrictions in recent years and the potential for further reductions of water allocations in the future. Velvet bentgrass does, however, tend to form thatch more rapidly under management practices employed for the cultivation of creeping bentgrass. Additional shortcomings include increased susceptibility to *Pythium* when in the seedling stage and overall increased susceptibility to copper spot compared to other bentgrass species.

The Rutgers Turfgrass Breeding Program is part of the New Jersey Agricultural Experiment Station and evaluates germplasm, selections, and cultivars from its own sources as well as from the sources of other turfgrass breeders. The bentgrass improvement program at Rutgers involves extensive field evaluation of collections from the United States, Europe, and Asia. Recent collection trips to Poland, Bulgaria, China, Romania, Germany, Greece, Portugal, Finland, France, Spain, Switzerland, Italy, Croatia, Norway, and the Slovac Republic have enhanced the diversity of germplasm sources that are incorporated in bentgrasses in our program.

## PROCEDURES

Nine bentgrass trials were established at the Rutgers Horticultural Research Farm II in North Brunswick, NJ between 2000 and 2002 (Tables 1a to 7). All trials, including putting green and fairway/tee tests, were established on Nixon loam soils. All tests were hand seeded at an approximate seeding rate of 0.5 lb/1000 $ft^2$. Plot size for all trials was 3 x 5 ft and tests were set up in a randomized complete block design with three replications.

All trials were mowed frequently during periods of active growth. Putting green trials were mowed five to six times a week with either a triplex or walk-behind reel mower, and fairway/tee trials received three weekly mowings with a triplex mower. In all cases clippings were removed. All tests were irrigated to avoid drought stress, and soil pH was maintained between 6.0 and 6.5 with agricultural limestone. Mowing height, rate of nitrogen applied, aerification practices, topdressing practices, application of wetting agents, and any fungicide, insecticide, or herbicide treatments for each test are presented in Table 8.

All tests were rated frequently throughout the growing season for turf quality (which is a subjective rating that includes attributes such as color, brightness, leaf texture, density, uniformity, and amount of disease and insect damage). Other characteristics were evaluated on some tests when differences among entries were apparent. These characteristics

included dollar spot (Tables 1a, 1b, and 3 to 7), brown patch (Tables 2a, 2b, 5 to 7), establishment (Tables 6 to 7), and wilt stress (Tables 6 to 7). All ratings were based on a 1 to 9 scale, where 9 represented the most favorable turf quality or desirable turf characteristic. Throughout the season, various people scored ratings to reduce individual preferences toward a particular trait. All data were summarized and subjected to an analysis of variance. Means were separated using the least significant difference (LSD) multiple comparisons test.

## RESULTS AND DISCUSSION

### Turf Quality Evaluations

Entries in Tables 1 through 5 are ranked by the overall (multiple year) turfgrass quality average. Tables 6 and 7 are ranked by the turfgrass quality average for the 2003 growing season. The best performing cultivars in the 2000 putting green trial were C952, C953, CIS AC-1, WPE comp, and C954 (Table 1a). All of these varieties are creeping bentgrasses except for CIS AC-1, which is a velvet bentgrass. The C952 and C953 lines have performed extremely well since this trial was established. Penncross and Crenshaw creeping bentgrass were among the lowest rated entries. In an additional 2000 putting green trial for velvet bentgrasses (Table 1b), EFD, DSV, and Greenwich were the top ranked entries.

In the 2000 fairway/tee trial (Table 2a), the velvet bentgrasses CIS AC-1 and SR 7200 and the creeping bentgrasses C952 and C953 were among the best entries. Penncross performed poorly in this test. In the 2000 trial for colonial and dryland bentgrasses (Table 2b), SRX EW-IS-22 colonial bentgrass and two new experimentals, HCD comp and HCE comp, were among the top ranked entries. The single dryland bentgrass entry, SRX 7DLBNN, ranked at the bottom of this test (Table 2b).

The experimentals C952 and C953 were once again among the top performing entries in the 2001 putting green trial (Table 3). In a separate putting green test of velvet bentgrasses (Table 4), the experimentals EFD and PST EVU and the cultivar Greenwich ranked very well. In the 2001 fairway/tee trial (Table 5), SR 7200 velvet bentgrass ranked higher than all other entries in the test. SRX-781-22, 9BNC-2001, SRX- 7CRCO, and Tiger II were among the other top performing colonial bentgrasses in this test, and SRX IG57 was the top performing creeping bentgrass entry.

Among the best performing entries in the 2002 putting green trial were DSB creeping bentgrass, Declaration creeping bentgrass, and EFD velvet bentgrass (Table 6). Some of the poorer ranked varieties in this test included Penncross, Pennlinks, Providence, 18th Green, and Kromi creeping bentgrasses. In the 2002 fairway/tee trial (Table 7), EFD and SR 7200 were among the top performing bentgrass entries. Benchmark DSR, C953, 235050 CB, and C952 were among the top ranked creeping bentgrass entries, and HCG comp was the top performing colonial bentgrass entry. Penncross and 18th green creeping bentgrasses ranked poorly, as did PST-Syn-9NE colonial bentgrass.

### Dollar Spot

Dollar spot is the most common fungal disease of bentgrass turf in New Jersey. In the 2000 putting green trial (Table 1a), disease resistance exhibited by the velvet bentgrass CIS AC-1 and creeping bentgrasses L-93, C952, and C953 is impressive when compared to the susceptibility of some of the commercial varieties in this trial (e.g., Penn G-2, Penn A-4, Century, Backspin, Penncross, and Crenshaw). It is also interesting to note that in a separate velvet bentgrass putting green trial (Table 1b), the experimental entries SRX7EW57-23 and SRX7EWRIVI were highly susceptible to dollar spot in 2003. As a species, the velvet bentgrasses appear to be more resistant to this disease; however, these observations indicate that there is some susceptibility within this species.

The entries PST OEB, L-93, Pennlinks II, Seaside II, MS7, Syn ORO, SRX 1BPAA, and PST ORM-1 exhibited the highest resistance to dollar spot in the 2001 putting green trial (Table 3). In a separate 2001 putting green trial (Table 4), all of velvet bentgrasses exhibited resistance to this disease. In the 2001 fairway/tee trial, SR 7200 velvet bentgrass and many of the colonial bentgrasses had the best resistance to dollar spot, while L-93 had the highest rating for dollar spot resistance among the creeping bentgrasses (Table 5).

In the 2002 putting green trial (Table 6), the velvet bentgrasses EFD, 00-BAG, SR 7200, CIS-AC-1, and Greenwich as well as the creeping bentgrasses Declaration, Benchmark DSR, HTL Comp, 13M, HTM Comp, PST Syn ORM6, and Trueline had excellent resistance to dollar spot throughout the 2003 growing season. Five of the top six creeping bentgrass entries were specifically developed for improved re-

sistance to dollar spot. These results indicate that selection for resistance to dollar resistance can be extremely effective. The colonial bentgrass Tiger II also showed superior dollar spot resistance in the same trial.

In a single dollar spot outbreak that occurred on the same test during August of 2003 (Table 6), the velvet bentgrasses EFD, 00-BAG, SR 7200, and Greenwich as well as the creeping bentgrasses Declaration, HTL Comp, Pennlinks II, 13M, HTM Comp, PST Syn ORM6, and Trueline were among the those most resistant to dollar spot. Dollar spot was also low in the colonial bentgrass Tiger II in the same trial. The resistance of these varieties was striking considering the uniform and severe level of infection across the trial area, as well as the high susceptibility exhibited by the entries Pick Syn96-2, SRXG222, Backspin, and 18th Green.

The colonial bentgrasses had higher dollar spot resistance than did the majority of the creeping bentgrass entries in the 2002 fairway/tee trial (Table 7). The creeping bentgrasses that had high ratings for dollar spot resistance were Trueline, Benchmark DSR, and C952. Benchmark DSR was intentionally selected for improved resistance to dollar spot. The two velvet entries in this trial also exhibited good resistance to this disease.

**Brown Patch**

In previous trials at Rutgers University, the velvet bentgrasses have shown improved resistance to brown patch, the creeping bentgrasses have been intermediate in resistance to brown patch, and the colonial bentgrasses have exhibited the lowest resistance to this disease. Breeding efforts over the last decade have focused on improving the resistance of all of the bentgrasses to brown patch. These efforts appear to have resulted in modest improvements for brown patch resistance in each of the bentgrass species.

In the 2000 fairway/tee trial, the two velvet bentgrass entries CIS AC-1 and SR 7200 and the majority of the creeping bentgrass entries had high resistance to brown patch (Table 2). The colonial bentgrasses with high ratings for brown patch resistance included HCD comp, HCE comp, EWT comp, Syn-9BC, and Syn 9FB. HCD comp, HCE comp, and EWT comp were specifically selected for improved brown patch resistance and the data for these entries indicates that improvements for this trait have been attained. These colonial bentgrass entries represent a significant improvement in brown patch resistance in comparison to the commercial colonial bentgrasses SR 7100 and Tiger.

The velvet bentgrass SR 7200 and the majority of the creeping bentgrass entries had a high level of resistance to brown patch in the 2001 fairway/tee trial (Table 5). The colonial bentgrasses showed a range of responses (from high susceptibility to moderate resistance) in this test. Among the colonial bentgrasses the experimental entry IBP comp had the highest level of resistance. This entry was selected for improved resistance to brown patch.

In the 2002 putting green trial, all of the velvet bentgrass entries had excellent resistance to brown patch (Table 6). The creeping bentgrasses in this test showed a range of responses, with SRX1G68, SRXG295D, SRX1GPinkD, SRX19294D, SRX1GD, Penn G-2, NuPenn, CBA-98, and CIS-AP-10 showing high resistance, and Penncross and Kromi exhibiting low resistance to this disease. The single colonial bentgrass entry Tiger II had low resistance to brown patch in this trial.

Two velvet bentgrasses, EFD and SR 7200, exhibited high resistance to brown patch in the 2002 fairway/tee trial (Table 7). The creeping bentgrasses in this test showed a range of responses, with Benchmark DSR, C953, 235050 CB, C952, Kingpin, CIS AP-12, Independence, SRX 1G57, SRX 1G56, SRX 1G49, and SRX 1G32 showing high resistance to brown patch, and Penncross, Viper, and Trueline having low resistance. The colonial bentgrasses PST-9VL Bulk and PST-SynA1U exhibited high ratings for brown patch resistance in this test.

## SUMMARY

The development of cultivars with improved resistance to dollar spot remains the highest priority in the breeding of colonial, creeping, and velvet bentgrasses. Breeding efforts over the last decade have made significant improvements in resistance of the bentgrasses to this disease. The second priority is resistance to brown patch. Selections made for enhanced resistance to this disease have resulted in some notable improvement for each of the major bentgrass species. Continued improvement for brown patch resistance is needed in colonial bentgrass before this species can be widely used as a fairway/tee grass.

Since 1995, velvet bentgrass has shown tremendous potential in turf trials at Rutgers. The major improvements still needed in this species are increased resistance to *Pythium* (during establishment), pink snow mold resistance, and resistance to copper spot.

## ACKNOWLEDGMENTS

New Jersey Experiment Station Publication No. E-12180-15-04. This work was conducted as part of NJAES Project No. 12180, supported by the Rutgers Center for Turfgrass Science, the New Jersey Agricultural Experiment Station, State and Hatch Act funds, as well as other grants and gifts. Additional support was received from the United States Golf Association, Golf Course Superintendents Association of America Research Fund, the New Jersey Turfgrass Association, and the New Jersey Turfgrass Foundation.

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Table 1a. Performance of bentgrass cultivars and selections in a putting green trial seeded in September 2000 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2001-2003 Avg. | Turf Quality[1] 2001 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|---|---|
| 1 | C952 | Creeping | 6.6 | 6.0 | 6.9 | 6.9 | 7.3 |
| 2 | C953 | Creeping | 6.4 | 6.6 | 6.7 | 5.7 | 6.7 |
| 3 | CIS AC-1 | Velvet | 6.2 | 5.9 | 5.5 | 7.2 | 8.3 |
| 4 | WPE comp | Creeping | 6.1 | 6.1 | 6.7 | 5.6 | 6.0 |
| 5 | C954 | Creeping | 5.8 | 6.3 | 5.6 | 5.5 | 4.7 |
| 6 | CIS AC-1/AT-5 | vel/col | 5.8 | 5.8 | 4.9 | 6.6 | 8.0 |
| 7 | CIS AC-1/AP-5/AT-5 | vel/cr/col | 5.5 | 5.2 | 4.8 | 6.5 | 7.3 |
| 8 | RTE comp | Creeping | 5.4 | 6.3 | 5.1 | 4.9 | 4.7 |
| 9 | CIS AC-1/AP-5 | vel/cr/col | 5.4 | 4.9 | 4.8 | 6.4 | 7.0 |
| 10 | L-93 | Creeping | 5.2 | 5.2 | 5.2 | 5.4 | 7.0 |
| 11 | EMC comp | Creeping | 5.2 | 5.9 | 4.8 | 4.8 | 5.0 |
| 12 | Penn G-2 | Creeping | 5.1 | 5.3 | 5.2 | 4.7 | 3.7 |
| 13 | SRX 1EWW1CR1 | Creeping | 5.0 | 5.4 | 4.6 | 5.0 | 5.7 |
| 14 | 00-108 | Creeping | 5.0 | 5.4 | 4.7 | 5.0 | 3.7 |
| 15 | CIS AP-5 | Creeping | 4.7 | 4.8 | 4.4 | 4.7 | 3.7 |
| 16 | MCB comp | Creeping | 4.6 | 5.3 | 4.3 | 4.1 | 3.0 |
| 17 | SRX 1NJH | Creeping | 4.6 | 5.2 | 4.1 | 4.5 | 4.3 |
| 18 | Penn A-4 | Creeping | 4.6 | 5.4 | 4.0 | 4.2 | 2.0 |
| 19 | Brighton | Creeping | 4.6 | 5.1 | 4.2 | 4.4 | 4.0 |
| 20 | SRX 1EWW1CR3 | Creeping | 4.6 | 5.2 | 4.4 | 4.1 | 3.3 |
| 21 | Syn-AIU | Creeping | 4.5 | 4.8 | 4.5 | 4.4 | 4.7 |
| 22 | SRX 1DIN | Creeping | 4.5 | 5.0 | 4.4 | 4.2 | 3.0 |
| 23 | SRX 1EW46-12 | Creeping | 4.5 | 4.9 | 4.1 | 4.6 | 2.7 |
| 24 | SRX 1EWW1CR4 | Creeping | 4.5 | 4.8 | 4.6 | 4.0 | 4.0 |
| 25 | CIS AP-7 | Creeping | 4.4 | 5.0 | 4.0 | 4.1 | 3.3 |
| 26 | SR 1119 | Creeping | 4.4 | 5.3 | 4.1 | 3.7 | 2.3 |
| 27 | C951 | Creeping | 4.3 | 4.4 | 4.5 | 3.9 | 3.7 |
| 28 | SRX 1BPAA | Creeping | 4.3 | 4.6 | 4.2 | 4.1 | 3.3 |
| 29 | SRX 1EWW1CR2 | Creeping | 4.3 | 5.1 | 4.1 | 3.6 | 3.0 |
| 30 | Pick Syn 96-2 | Creeping | 4.2 | 5.3 | 3.4 | 4.0 | 2.7 |
| 31 | SRX 1COCR | Creeping | 4.2 | 5.0 | 3.9 | 3.6 | 2.7 |
| 32 | Cato | Creeping | 4.2 | 5.1 | 3.7 | 3.7 | 4.0 |
| 33 | Pick ECB | Creeping | 4.1 | 4.8 | 3.8 | 3.6 | 2.3 |
| 34 | SR 7100 | Colonial | 4.1 | 4.3 | 3.9 | 3.9 | 6.0 |
| 35 | SRX 1MOCR1 | Creeping | 4.0 | 5.1 | 3.5 | 3.3 | 1.7 |

(Continued)

Table 1a (continued).

| | Cultivar or Selection | Species | Turf Quality[1] 2001-2003 Avg. | Turf Quality[1] 2001 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|---|---|
| 36 | Backspin | Creeping | 4.0 | 4.4 | 3.8 | 3.7 | 2.0 |
| 37 | Century | Creeping | 4.0 | 4.6 | 3.4 | 3.9 | 2.3 |
| 38 | Southshore | Creeping | 3.9 | 4.6 | 3.6 | 3.6 | 4.3 |
| 39 | Providence | Creeping | 3.8 | 4.2 | 3.6 | 3.5 | 3.3 |
| 40 | Crenshaw | Creeping | 3.4 | 4.2 | 2.9 | 3.2 | 1.3 |
| 41 | Penncross | Creeping | 3.3 | 3.3 | 3.0 | 3.4 | 3.3 |
| | LSD at 5% = | | 0.6 | 0.6 | 0.8 | 1.1 | 1.8 |

[1] 9 = best turf quality
[2] 9 = least disease

Table 1b. Performance of velvet bentgrass cultivars and selections in a putting green trial seeded in September 2000 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2001-2003 Avg. | Turf Quality[1] 2001 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|---|---|
| 1 | EFD comp | Velvet | 6.3 | 5.8 | 6.3 | 6.9 | 8.0 |
| 2 | DSV comp | Velvet | 6.2 | 5.7 | 6.7 | 6.0 | 7.0 |
| 3 | Greenwich | Velvet | 6.0 | 5.5 | 6.1 | 6.4 | 6.3 |
| 4 | MAL comp | Velvet | 5.8 | 6.0 | 5.5 | 5.9 | 7.3 |
| 5 | SYN-EVN | Velvet | 5.8 | 6.1 | 5.9 | 5.4 | 5.0 |
| 6 | MAM comp | Velvet | 5.4 | 5.7 | 5.0 | 5.3 | 5.3 |
| 7 | MAC comp | Velvet | 5.3 | 5.5 | 5.2 | 5.3 | 6.0 |
| 8 | SR7200 | Velvet | 4.8 | 5.3 | 4.5 | 4.5 | 6.3 |
| 9 | SRX7EW57-23 | Velvet | 4.4 | 4.9 | 4.5 | 3.7 | 2.0 |
| 10 | SRX7EWRIVI | Velvet | 4.2 | 4.8 | 4.4 | 3.3 | 1.7 |
| | LSD at 5% = | | 0.6 | 0.5 | 0.8 | 0.8 | 1.9 |

[1] 9 = best turf quality
[2] 9 = least disease

Table 2a. Performance of bentgrass cultivars and selections in a fairway/tee trial seeded in September 2000 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2001-2003 Avg. | Turf Quality[1] 2001 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Brown Patch[2] June 2003 |
|---|---|---|---|---|---|---|---|
| 1 | CIS AC-1 | Velvet | 7.3 | 6.9 | 8.2 | 6.6 | 8.3 |
| 2 | C952 | Creeping | 6.9 | 7.4 | 7.3 | 5.9 | 9.0 |
| 3 | SR 7200 | Velvet | 6.8 | 6.7 | 7.1 | 6.7 | 8.3 |
| 4 | C953 | Creeping | 6.6 | 7.8 | 6.9 | 4.9 | 8.7 |
| 5 | CIS AC-1/AT-5 | vel/col | 6.4 | 6.5 | 6.6 | 6.1 | 8.0 |
| 6 | C954 | Creeping | 6.2 | 6.3 | 6.0 | 6.3 | 9.0 |
| 7 | CIS AC-1/AP-5 | vel/cr | 6.0 | 6.1 | 6.5 | 5.7 | 8.0 |
| 8 | CIS AC-1/AP-5/AT-5 | cr/col/vel | 5.6 | 5.7 | 5.4 | 5.6 | 8.3 |
| 9 | 00-108 | Creeping | 5.4 | 5.5 | 5.2 | 5.6 | 9.0 |
| 10 | Penn A-4 | Creeping | 5.3 | 6.2 | 4.1 | 5.5 | 8.7 |
| 11 | L93 | Creeping | 5.2 | 5.4 | 5.2 | 4.9 | 8.7 |
| 12 | Penn G-2 | Creeping | 5.1 | 5.9 | 4.8 | 4.7 | 7.7 |
| 13 | SRX 1NJH | Creeping | 5.1 | 5.1 | 5.0 | 5.0 | 9.0 |
| 14 | Tiger II | Colonial | 5.1 | 5.8 | 5.2 | 4.3 | 4.3 |
| 15 | Pick 96-2 | Creeping | 4.9 | 6.1 | 4.1 | 4.4 | 7.3 |
| 16 | SRX 1BPAA | Creeping | 4.7 | 5.3 | 4.3 | 4.5 | 8.7 |
| 17 | SRX 1DIN | Creeping | 4.7 | 5.8 | 3.9 | 4.3 | 8.0 |
| 18 | Brighton | Creeping | 4.6 | 5.9 | 3.8 | 4.2 | 8.7 |
| 19 | SR 1119 | Creeping | 4.5 | 5.5 | 4.2 | 4.0 | 8.3 |
| 20 | Pick ECB | Creeping | 4.5 | 5.7 | 3.8 | 4.2 | 8.7 |
| 21 | C951 | Creeping | 4.5 | 4.7 | 4.4 | 4.6 | 8.0 |
| 22 | SRX 1EW46-12 | Creeping | 4.4 | 5.1 | 3.8 | 4.3 | 8.3 |
| 23 | Cato | Creeping | 4.4 | 5.3 | 3.9 | 4.0 | 9.0 |
| 24 | SRX 1COCR | Creeping | 4.4 | 5.3 | 4.2 | 3.5 | 8.3 |
| 25 | Pennlinks | Creeping | 4.3 | 4.6 | 4.1 | 4.4 | 8.7 |
| 26 | Crenshaw | Creeping | 4.1 | 5.6 | 3.6 | 3.3 | 8.3 |
| 27 | Providence | Creeping | 4.1 | 4.8 | 3.9 | 3.6 | 8.0 |
| 28 | Southshore | Creeping | 4.0 | 4.2 | 3.8 | 3.9 | 8.3 |
| 29 | Syn RHU | Creeping | 3.7 | 3.9 | 3.4 | 4.0 | 8.0 |
| 30 | Syn ORM | Creeping | 3.4 | 3.7 | 3.2 | 3.3 | 8.0 |
| 31 | Syn ORE | Creeping | 3.1 | 3.7 | 2.6 | 3.0 | 8.3 |
| 32 | Penncross | Creeping | 2.9 | 3.7 | 2.4 | 2.7 | 7.3 |
| | LSD at 5% = | | 0.8 | 0.9 | 0.9 | 1.1 | 1.4 |

[1] 9 = best turf quality
[2] 9 = least disease

Table 2b. Performance of colonial and dryland bentgrass cultivars and selections in a fairway/tee trial seeded in September 2000 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2001-2003 Avg. | Turf Quality[1] 2001 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Brown Patch[2] June 2003 |
|---|---|---|---|---|---|---|---|
| 1 | HCD comp | Colonial | 5.8 | 5.4 | 5.9 | 6.2 | 7.0 |
| 2 | HCE comp | Colonial | 5.7 | 5.3 | 5.9 | 5.8 | 7.0 |
| 3 | SRX EW15-22 | Colonial | 5.7 | 6.3 | 5.9 | 4.9 | 4.0 |
| 4 | NST comp | Colonial | 5.6 | 5.1 | 5.9 | 5.6 | 4.0 |
| 5 | EWT comp | Colonial | 5.5 | 5.3 | 6.1 | 5.2 | 6.7 |
| 6 | Syn-9BNC | Colonial | 5.2 | 5.8 | 4.8 | 5.0 | 5.3 |
| 7 | Syn-9BC | Colonial | 5.1 | 5.8 | 4.9 | 4.6 | 6.3 |
| 8 | SRX 7EW81-11 | Colonial | 5.1 | 5.4 | 4.9 | 5.1 | 6.0 |
| 9 | Tiger II | Colonial | 5.1 | 5.7 | 5.1 | 4.5 | 5.3 |
| 10 | Syn-945y | Colonial | 5.0 | 4.8 | 5.2 | 5.0 | 5.0 |
| 11 | SRX 7MODD | Colonial | 4.9 | 5.4 | 5.1 | 4.4 | 3.0 |
| 12 | SRX 7CRCO | Colonial | 4.9 | 5.0 | 5.5 | 4.2 | 4.3 |
| 13 | SRX 7EE | Colonial | 4.8 | 4.9 | 4.8 | 4.7 | 3.7 |
| 14 | SRX 7EW65-1 | Colonial | 4.8 | 5.4 | 5.0 | 4.2 | 4.0 |
| 15 | SRX 7EW80-15 | Colonial | 4.8 | 5.0 | 4.8 | 4.7 | 5.0 |
| 16 | SR 7100 | Colonial | 4.8 | 5.2 | 4.7 | 4.5 | 3.3 |
| 17 | SRX 7EE25 | Colonial | 4.8 | 5.1 | 4.7 | 4.7 | 4.7 |
| 18 | SRX 7EW81-13 | Colonial | 4.8 | 5.9 | 4.4 | 4.1 | 3.7 |
| 19 | SRX 7MOBB | Colonial | 4.8 | 5.8 | 4.7 | 3.8 | 4.7 |
| 20 | SRX 7EW65-15 | Colonial | 4.8 | 4.9 | 4.8 | 4.7 | 5.3 |
| 21 | SRX 7EW86-6 | Colonial | 4.8 | 5.2 | 4.5 | 4.6 | 3.7 |
| 22 | SRX 7EW81-3 | Colonial | 4.7 | 5.0 | 4.7 | 4.6 | 3.7 |
| 23 | SRX 7EW65-5 | Colonial | 4.6 | 4.7 | 5.0 | 4.2 | 5.3 |
| 24 | Syn 9FB | Colonial | 4.6 | 4.6 | 5.1 | 4.2 | 6.7 |
| 25 | SRX 7EW65-9 | Colonial | 4.6 | 5.2 | 4.7 | 3.9 | 5.3 |
| 26 | SRX 7EE20 | Colonial | 4.6 | 5.0 | 4.7 | 3.9 | 3.3 |
| 27 | SRX 7EW80-19 | Colonial | 4.5 | 5.2 | 4.3 | 4.1 | 3.3 |
| 28 | SRX EW 67-7 | Colonial | 4.5 | 4.8 | 4.7 | 4.1 | 5.3 |
| 29 | SRX 7EW65-11 | Colonial | 4.5 | 4.7 | 4.6 | 4.1 | 5.3 |
| 30 | SRX 7EW80-6 | Colonial | 4.4 | 5.0 | 4.4 | 4.0 | 3.3 |
| 31 | SRX 7EW86-5 | Colonial | 4.3 | 4.7 | 4.5 | 3.8 | 3.7 |
| 32 | SRX 7EW80-17 | Colonial | 4.3 | 4.8 | 4.3 | 3.8 | 2.3 |
| 33 | SRX 7EW65-3 | Colonial | 4.1 | 4.4 | 4.6 | 3.4 | 3.7 |
| 34 | SRX 7EW17-23 | Colonial | 4.1 | 5.0 | 3.9 | 3.4 | 8.0 |
| 35 | SRX 7EW81-21 | Colonial | 3.9 | 4.5 | 3.8 | 3.5 | 4.7 |

(Continued)

Table 2b (continued).

| | Cultivar or Selection | Species | Turf Quality[1] 2001-2003 Avg. | Turf Quality[1] 2001 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Brown Patch[2] June 2003 |
|---|---|---|---|---|---|---|---|
| 36 | Tiger | Colonial | 3.7 | 4.5 | 3.6 | 3.2 | 4.0 |
| 37 | Punawai | Browntop | 3.5 | 4.3 | 3.1 | 3.0 | 6.7 |
| 38 | SRX 7DLBNN | Dryland | 3.4 | 3.9 | 3.6 | 2.8 | 5.7 |
| | LSD at 5% = | | 0.5 | 0.6 | 0.7 | 0.8 | 1.9 |

[1] 9 = best turf quality
[2] 9 = least disease

Table 3. Performance of creeping bentgrass cultivars and selections in a putting green trial seeded in September 2001 at North Brunswick, NJ.

| | Cultivar or Selection | Turf Quality[1] 2002-2003 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|
| 1 | C952 | 6.6 | 7.2 | 6.0 | 6.7 |
| 2 | C953 | 6.5 | 7.6 | 5.4 | 4.7 |
| 3 | PST OEB | 6.0 | 6.3 | 5.6 | 7.7 |
| 4 | C954 | 5.9 | 6.1 | 5.6 | 4.7 |
| 5 | Syn ORO | 5.8 | 5.5 | 6.0 | 7.0 |
| 6 | PST-OPNB | 5.7 | 5.9 | 5.5 | 6.3 |
| 7 | Penn A-1 | 5.6 | 5.7 | 5.6 | 6.0 |
| 8 | Penn A-2 | 5.5 | 5.7 | 5.2 | 5.0 |
| 9 | CIS-AP9 | 5.5 | 5.7 | 5.2 | 5.7 |
| 10 | Bengal | 5.4 | 5.8 | 5.0 | 5.0 |
| 11 | Penn A-4 | 5.3 | 5.5 | 5.1 | 4.3 |
| 12 | ORU-2001 | 5.2 | 5.8 | 4.7 | 5.7 |
| 13 | SRX 1R1V1 | 5.2 | 5.5 | 4.9 | 4.0 |
| 14 | SRX 1G222 | 5.2 | 6.3 | 4.1 | 3.0 |
| 15 | Nu-Penn Blend | 5.2 | 5.4 | 5.0 | 5.7 |
| 16 | Penn G-1 | 5.2 | 5.1 | 5.1 | 4.3 |
| 17 | SRX 1G54 | 5.1 | 6.2 | 3.9 | 3.0 |
| 18 | SRX 1G32 | 5.1 | 5.6 | 4.5 | 4.0 |
| 19 | Penneagle II | 5.0 | 5.7 | 4.4 | 4.7 |
| 20 | SRX 1G68 | 5.0 | 5.9 | 4.2 | 3.3 |
| 21 | L-93 | 5.0 | 4.7 | 5.3 | 8.0 |
| 22 | Pennlinks II | 5.0 | 4.7 | 5.2 | 7.7 |
| 23 | Penn G-6 | 4.9 | 4.7 | 5.1 | 4.7 |
| 24 | SRX R1E2 | 4.9 | 5.4 | 4.5 | 2.3 |
| 25 | SRX W1CR1 | 4.9 | 5.1 | 4.7 | 6.3 |
| 26 | SRX 146-12 | 4.9 | 5.2 | 4.5 | 3.0 |
| 27 | SRX 1G46 | 4.8 | 5.8 | 3.8 | 3.0 |
| 28 | Independence | 4.8 | 5.8 | 3.8 | 2.7 |
| 29 | PST ORM-1 | 4.8 | 4.4 | 5.1 | 7.0 |
| 30 | Seaside II | 4.8 | 4.0 | 5.5 | 7.3 |
| 31 | SRX 1W1CR2 | 4.6 | 4.9 | 4.4 | 5.3 |
| 32 | SRX 1H Blue | 4.6 | 4.8 | 4.4 | 5.0 |
| 33 | SR 1119 | 4.6 | 4.7 | 4.5 | 5.7 |
| 34 | SRX 1COCR | 4.6 | 4.8 | 4.3 | 3.7 |
| 35 | Brighton | 4.6 | 4.6 | 4.5 | 6.0 |

(Continued)

Table 3 (continued).

| | Cultivar or Selection | Turf Quality[1] 2002-2003 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|
| 36 | Penneagle | 4.5 | 4.2 | 4.8 | 5.7 |
| 37 | SRX 1NJ H | 4.5 | 4.4 | 4.7 | 5.7 |
| 38 | Pennway Blend | 4.5 | 4.3 | 4.7 | 5.7 |
| 39 | SRX 1H Pink | 4.5 | 4.4 | 4.5 | 3.7 |
| 40 | SRX 1D1N | 4.5 | 4.9 | 4.0 | 3.7 |
| 41 | SRX 1G57 | 4.4 | 4.9 | 3.8 | 2.0 |
| 42 | SRX 1G44 | 4.4 | 5.5 | 3.3 | 2.0 |
| 43 | G-6 | 4.4 | 3.8 | 4.9 | 5.0 |
| 44 | SRX 1W1CR3 | 4.4 | 5.2 | 3.5 | 2.0 |
| 45 | Pick Syn 96-2 | 4.4 | 5.2 | 3.5 | 4.3 |
| 46 | Pick 01-3CB | 4.4 | 4.1 | 4.6 | 5.3 |
| 47 | Pick ECB | 4.4 | 4.8 | 3.9 | 3.0 |
| 48 | SRX 1BPAA | 4.3 | 4.7 | 3.9 | 7.0 |
| 49 | 7CMS4 | 4.3 | 5.1 | 3.4 | 3.7 |
| 50 | SRX H Silver | 4.2 | 4.2 | 4.2 | 5.0 |
| 51 | SRX 1G56 | 4.2 | 5.0 | 3.4 | 1.0 |
| 52 | Pick CB13.94.98 | 4.1 | 3.9 | 4.4 | 4.7 |
| 53 | C951 | 4.1 | 4.0 | 4.2 | 6.3 |
| 54 | Southshore | 4.1 | 4.0 | 4.1 | 4.3 |
| 55 | 7RMS4 | 4.1 | 4.9 | 3.2 | 4.0 |
| 56 | PST-ORE1 | 4.0 | 3.8 | 4.3 | 6.7 |
| 57 | Pennlinks | 4.0 | 3.7 | 4.4 | 6.0 |
| 58 | MS4 | 4.0 | 4.8 | 3.3 | 4.3 |
| 59 | Cato | 3.9 | 3.5 | 4.3 | 6.0 |
| 60 | MS7 | 3.9 | 4.1 | 3.8 | 7.0 |
| 61 | Putter | 3.9 | 3.8 | 4.0 | 4.0 |
| 62 | 01-4CB | 3.9 | 4.2 | 3.6 | 4.0 |
| 63 | MS5 | 3.9 | 4.4 | 3.4 | 5.0 |
| 64 | Providence | 3.8 | 3.3 | 4.2 | 5.3 |
| 65 | SRX MOCR1 | 3.6 | 4.4 | 2.9 | 1.7 |
| 66 | Regent | 3.6 | 3.3 | 3.8 | 5.7 |
| 67 | MS6 | 3.5 | 4.0 | 2.8 | 4.7 |
| 68 | Penncross | 3.4 | 3.0 | 3.8 | 5.3 |
| 69 | Penn Trio Blend | 3.3 | 3.0 | 3.7 | 5.3 |
| 70 | Pick CB4.94.01 | 3.2 | 2.8 | 3.6 | 5.7 |

(Continued)

Table 3 (continued).

| | Cultivar or Selection | Turf Quality[1] 2002-2003 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|
| 71 | Pick CB6.94.01 | 3.0 | 2.8 | 3.2 | 6.7 |
| | LSD at 5% = | 0.6 | 0.7 | 0.9 | 1.9 |

[1] 9 = best turf quality
[2] 9 = least disease

Table 4. Performance of velvet bentgrass cultivars and selections in a putting green trial seeded in September 2001 at North Brunswick, NJ.

| | Cultivar or Selection | Turf Quality[1] 2002-2003 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Dollar Spot[2] May 2003 |
|---|---|---|---|---|---|
| 1 | EFD | 6.3 | 6.1 | 6.4 | 8.7 |
| 2 | Greenwich | 6.1 | 6.2 | 6.0 | 8.0 |
| 3 | PST EVU | 6.1 | 6.1 | 5.9 | 8.3 |
| 4 | CIS-AC1 | 5.9 | 5.8 | 6.1 | 8.0 |
| 5 | IVD comp | 5.9 | 5.9 | 5.9 | 6.7 |
| 6 | IVM comp | 5.7 | 5.7 | 5.8 | 7.7 |
| 7 | ISC comp | 5.5 | 5.8 | 5.2 | 7.3 |
| 8 | SR 7200 | 5.2 | 5.5 | 4.9 | 8.3 |
| 9 | IVC comp | 5.1 | 5.0 | 5.1 | 8.3 |
| | LSD at 5% = | 0.8 | NS | 0.9 | NS |

[1] 9 = best turf quality
[2] 9 = least disease

Table 5. Performance of bentgrass cultivars and selections in a fairway/tee trial seeded in September 2001 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2002-2003 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Brown Patch[2] 2003 Avg. | Dollar Spot[2] 2003 Avg. |
|---|---|---|---|---|---|---|---|
| 1 | SR 7200 | Velvet | 6.6 | 6.4 | 6.8 | 7.8 | 5.2 |
| 2 | SRX 781-22 | Colonial | 5.9 | 6.2 | 5.7 | 3.8 | 5.8 |
| 3 | 9BNC-2001 | Colonial | 5.5 | 5.8 | 5.2 | 5.7 | 3.7 |
| 4 | SRX 7CRCO | Colonial | 5.4 | 6.2 | 4.6 | 4.5 | 5.7 |
| 5 | Tiger II | Colonial | 5.4 | 6.1 | 4.7 | 4.5 | 4.8 |
| 6 | 9ER Blk-5 Bulk | Colonial | 5.3 | 5.3 | 5.3 | 5.3 | 6.0 |
| 7 | SRX 7MOBB | Colonial | 5.3 | 6.0 | 4.6 | 3.2 | 3.5 |
| 8 | EWTR comp | Colonial | 5.2 | 5.0 | 5.5 | 5.3 | 5.5 |
| 9 | HCDR comp | Colonial | 5.2 | 4.8 | 5.6 | 5.7 | 7.2 |
| 10 | SRX IG57 | Creeping | 5.2 | 5.8 | 4.6 | 8.2 | 4.0 |
| 11 | SRX 7MODD | Colonial | 5.1 | 5.7 | 4.6 | 4.7 | 4.0 |
| 12 | SRX 7EE4 | Colonial | 5.1 | 5.7 | 4.5 | 3.7 | 4.5 |
| 13 | Allister | Colonial | 5.1 | 5.3 | 4.9 | 5.2 | 3.7 |
| 14 | SRX 7EE5 | Colonial | 5.1 | 5.7 | 4.4 | 4.5 | 4.3 |
| 15 | SRX 7EE25 | Colonial | 5.1 | 5.1 | 5.1 | 4.8 | 6.7 |
| 16 | SRX 781-3 | Colonial | 5.1 | 5.2 | 4.9 | 3.8 | 6.7 |
| 17 | Glory | Colonial | 5.0 | 5.0 | 4.9 | 4.5 | 4.0 |
| 18 | SRX 767-7 | Colonial | 4.9 | 5.3 | 4.6 | 4.2 | 6.7 |
| 19 | SRX IG44 | Creeping | 4.9 | 6.0 | 3.9 | 8.0 | 2.3 |
| 20 | SRX IG56 | Creeping | 4.9 | 6.0 | 3.9 | 8.2 | 2.7 |
| 21 | SRX IH Pink | Creeping | 4.9 | 5.4 | 4.4 | 8.2 | 3.7 |
| 22 | SRX IG46 | Creeping | 4.9 | 5.9 | 4.0 | 8.5 | 2.3 |
| 23 | Independence | Creeping | 4.9 | 6.2 | 3.6 | 7.8 | 2.5 |
| 24 | SRX 7EE | Colonial | 4.9 | 5.1 | 4.6 | 3.8 | 6.7 |
| 25 | Bengal | Creeping | 4.9 | 6.1 | 3.6 | 8.3 | 2.3 |
| 26 | L-93 | Creeping | 4.9 | 4.9 | 4.8 | 7.3 | 4.5 |
| 27 | Heriot | Colonial | 4.8 | 4.8 | 4.8 | 4.5 | 6.7 |
| 28 | SRX IG32 | Creeping | 4.8 | 5.6 | 4.0 | 8.0 | 1.8 |
| 29 | SRX 7EE20 | Colonial | 4.8 | 4.6 | 4.9 | 5.3 | 6.2 |
| 30 | SRX 781-13 | Colonial | 4.8 | 5.3 | 4.2 | 2.8 | 4.7 |
| 31 | SRX IH Silver | Creeping | 4.8 | 5.0 | 4.6 | 7.8 | 4.2 |
| 32 | SRX 1G68 | Creeping | 4.8 | 5.6 | 3.8 | 7.8 | 1.7 |
| 33 | SRX ICOCR | Creeping | 4.8 | 5.6 | 3.9 | 7.8 | 2.3 |
| 34 | SRX IG222 | Creeping | 4.7 | 5.7 | 3.7 | 8.0 | 1.8 |
| 35 | Bardot | Colonial | 4.7 | 4.5 | 4.9 | 5.5 | 5.3 |

(Continued)

Table 5 (continued).

| | Cultivar or Selection | Species | Turf Quality[1] 2002-2003 Avg. | Turf Quality[1] 2002 Avg. | Turf Quality[1] 2003 Avg. | Brown Patch[2] 2003 Avg. | Dollar Spot[2] 2003 Avg. |
|---|---|---|---|---|---|---|---|
| 36 | SRX 765-11 | Colonial | 4.7 | 4.6 | 4.7 | 4.8 | 6.2 |
| 37 | SRX IH Blue | Creeping | 4.7 | 5.2 | 4.2 | 8.7 | 3.3 |
| 38 | SRX IG54 | Creeping | 4.7 | 5.5 | 3.8 | 8.0 | 2.8 |
| 39 | SRX IBPAA | Creeping | 4.6 | 4.9 | 4.3 | 7.7 | 4.5 |
| 40 | SRX 780-19 | Colonial | 4.6 | 4.5 | 4.7 | 4.8 | 4.8 |
| 41 | SR 1119 | Creeping | 4.6 | 5.4 | 3.8 | 8.3 | 2.8 |
| 42 | SR 7100 | Colonial | 4.6 | 5.1 | 4.0 | 4.0 | 4.8 |
| 43 | SRX 765-5 | Colonial | 4.5 | 4.6 | 4.4 | 4.8 | 6.2 |
| 44 | Brighton | Creeping | 4.5 | 4.9 | 4.2 | 6.8 | 3.5 |
| 45 | SRX 780-6 | Colonial | 4.5 | 4.6 | 4.4 | 3.0 | 6.5 |
| 46 | IBP comp | Colonial | 4.4 | 4.0 | 4.9 | 6.0 | 7.5 |
| 47 | G-6 | Creeping | 4.4 | 4.6 | 4.3 | 7.2 | 3.7 |
| 48 | SRX 786-6 | Colonial | 4.4 | 5.0 | 3.8 | 3.5 | 5.5 |
| 49 | SRX IWJH | Creeping | 4.4 | 4.8 | 4.0 | 8.3 | 3.0 |
| 50 | Providence | Creeping | 4.4 | 4.7 | 4.1 | 7.3 | 4.2 |
| 51 | Regent | Creeping | 4.3 | 4.5 | 4.1 | 6.8 | 4.7 |
| 52 | SRX 781-21 | Colonial | 4.2 | 4.4 | 4.0 | 4.7 | 6.2 |
| 53 | SRX 765-3 | Colonial | 4.2 | 4.5 | 3.8 | 2.5 | 6.3 |
| 54 | SRX 146-12 | Creeping | 4.1 | 5.1 | 3.2 | 6.8 | 1.7 |
| 55 | Putter | Creeping | 4.1 | 4.3 | 3.9 | 7.3 | 2.3 |
| 56 | SRX IDIN | Creeping | 4.1 | 5.0 | 3.2 | 7.5 | 1.5 |
| 57 | Southshore | Creeping | 4.1 | 4.6 | 3.5 | 7.0 | 3.0 |
| 58 | PST-9ED | Colonial | 3.0 | 2.5 | 3.5 | 5.2 | 4.7 |
| 59 | AT-1 | Colonial | 3.0 | 2.6 | 3.4 | 5.2 | 4.5 |
| | LSD at 5% = | | 0.6 | 0.8 | 0.9 | 1.4 | 1.4 |

[1] 9 = best turf quality
[2] 9 = least disease

Table 6. Performance of creeping bentgrass cultivars and selections in a putting green trial seeded in September 2002 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2003 Avg. | Establishment[2] Oct. 2002 | Brown Patch[3] Aug. 2003 | Wilt Stress[4] June 2003 | Dollar Spot[3] 2003 Avg. | Dollar Spot (%) Aug. 2003 |
|---|---|---|---|---|---|---|---|---|
| 1 | DSB | Creeping | 7.0 | 5.0 | 7.0 | 8.7 | 6.8 | 10.7 |
| 2 | Declaration | Creeping | 6.8 | 2.7 | 7.7 | 7.7 | 8.7 | 3.3 |
| 3 | EFD | Velvet | 6.8 | 7.3 | 7.7 | 9.0 | 8.8 | 3.0 |
| 4 | 235050CB | Creeping | 6.7 | 3.3 | 7.3 | 8.7 | 7.1 | 7.0 |
| 5 | 00BAG | Velvet | 6.7 | 6.3 | 7.7 | 9.0 | 8.1 | 3.0 |
| 6 | CIS-AP-9 | Creeping | 6.6 | 5.3 | 7.3 | 8.0 | 6.3 | 14.3 |
| 7 | C952 | Creeping | 6.6 | 3.7 | 6.3 | 7.0 | 7.3 | 8.0 |
| 8 | C953 | Creeping | 6.4 | 2.0 | 6.0 | 8.7 | 6.0 | 14.3 |
| 9 | SR 7200 | Velvet | 6.3 | 6.7 | 8.7 | 8.7 | 8.4 | 2.3 |
| 10 | Benchmark DSR | Creeping | 6.3 | 4.7 | 5.3 | 7.3 | 8.3 | 6.7 |
| 11 | CIS-AC-1 | Velvet | 6.2 | 6.0 | 7.0 | 9.0 | 8.2 | 6.7 |
| 12 | HTL Comp | Creeping | 6.1 | 1.7 | 6.3 | 7.3 | 8.7 | 2.7 |
| 13 | SRX1GPinkD | Creeping | 6.0 | 4.7 | 8.3 | 7.7 | 5.9 | 15.0 |
| 14 | SRX1G68 | Creeping | 6.0 | 4.0 | 9.0 | 8.7 | 4.6 | 25.0 |
| 15 | Vesper | Velvet | 6.0 | 7.0 | 8.7 | 9.0 | 6.8 | 8.3 |
| 16 | Greenwich | Velvet | 5.9 | 8.3 | 8.0 | 9.0 | 8.4 | 4.0 |
| 17 | SRX19294D | Creeping | 5.8 | 5.7 | 8.7 | 8.7 | 4.2 | 25.0 |
| 18 | PST SynOEB | Creeping | 5.7 | 3.7 | 7.7 | 8.0 | 6.7 | 9.3 |
| 19 | Penn A-1 | Creeping | 5.7 | 7.7 | 6.3 | 6.7 | 7.0 | 13.3 |
| 20 | SRX1BL2G | Creeping | 5.6 | 7.0 | 7.7 | 8.0 | 5.5 | 20.0 |
| 21 | SRX1SQZG | Creeping | 5.6 | 5.7 | 7.7 | 8.0 | 4.2 | 28.3 |
| 22 | SRX1GD | Creeping | 5.6 | 5.3 | 8.0 | 7.3 | 5.4 | 28.3 |
| 23 | SRX1TR3E | Creeping | 5.6 | 5.3 | 6.7 | 7.3 | 6.1 | 13.3 |
| 24 | Penn G-6 | Creeping | 5.6 | 6.3 | 6.0 | 5.3 | 6.1 | 15.0 |
| 25 | CIS-AP-12 | Creeping | 5.6 | 6.0 | 7.7 | 6.0 | 6.3 | 15.0 |
| 26 | Kingpin | Creeping | 5.6 | 2.7 | 6.0 | 7.3 | 7.2 | 10.0 |
| 27 | SRXG295D | Creeping | 5.6 | 4.7 | 9.0 | 8.0 | 4.4 | 25.0 |
| 28 | Penn G-2 | Creeping | 5.6 | 5.7 | 8.0 | 6.0 | 6.5 | 11.7 |
| 29 | Pennlinks II | Creeping | 5.6 | 6.3 | 5.7 | 6.7 | 7.6 | 5.7 |
| 30 | 13M | Creeping | 5.5 | 6.0 | 4.7 | 4.7 | 8.1 | 4.7 |
| 31 | NuPenn | Creeping | 5.5 | 5.3 | 8.0 | 6.3 | 5.9 | 15.0 |
| 32 | SRX1G32 | Creeping | 5.5 | 5.3 | 6.3 | 8.3 | 4.1 | 26.7 |
| 33 | Penn A-2 | Creeping | 5.4 | 7.7 | 7.0 | 7.7 | 4.7 | 30.0 |
| 34 | SRX1BPAA | Creeping | 5.4 | 6.3 | 7.0 | 5.3 | 7.1 | 11.0 |
| 35 | SRX1W1G | Creeping | 5.4 | 4.7 | 7.0 | 7.0 | 4.2 | 35.0 |

(Continued)

Table 6 (continued).

| | Cultivar or Selection | Species | Turf Quality[1] 2003 Avg. | Establishment[2] Oct. 2002 | Brown Patch[3] Aug. 2003 | Wilt Stress[4] June 2003 | Dollar Spot[3] 2003 Avg. | Dollar Spot (%) Aug. 2003 |
|---|---|---|---|---|---|---|---|---|
| 36 | SRX1W1CR1G | Creeping | 5.4 | 5.3 | 7.3 | 6.0 | 5.3 | 16.7 |
| 37 | Pick Syn96-2 | Creeping | 5.4 | 6.7 | 6.3 | 7.7 | 3.0 | 40.0 |
| 38 | HTM Comp | Creeping | 5.4 | 1.7 | 7.3 | 6.7 | 8.7 | 5.0 |
| 39 | SRX1HPink | Creeping | 5.4 | 5.0 | 5.7 | 7.7 | 5.2 | 20.0 |
| 40 | SRX1PDH | Creeping | 5.4 | 5.3 | 7.7 | 6.3 | 6.0 | 13.3 |
| 41 | CBA-98 | Creeping | 5.4 | 6.0 | 8.3 | 5.3 | 4.6 | 21.7 |
| 42 | Independence | Creeping | 5.3 | 6.0 | 5.3 | 8.3 | 3.1 | 36.7 |
| 43 | SRX1G57 | Creeping | 5.3 | 5.3 | 6.3 | 8.0 | 3.5 | 35.0 |
| 44 | SRX1TRUG | Creeping | 5.3 | 4.3 | 5.7 | 6.3 | 4.5 | 18.3 |
| 45 | SRXG299D | Creeping | 5.2 | 4.3 | 7.7 | 6.7 | 4.6 | 20.0 |
| 46 | Bar As2 | Creeping | 5.2 | 5.3 | 5.7 | 7.0 | 5.1 | 15.0 |
| 47 | SRX1G56 | Creeping | 5.2 | 6.3 | 7.7 | 8.7 | 2.9 | 53.3 |
| 48 | Penn G-1 | Creeping | 5.2 | 7.3 | 7.0 | 6.3 | 6.3 | 11.7 |
| 49 | CIS-AP-10 | Creeping | 5.1 | 6.0 | 7.0 | 7.7 | 3.4 | 31.7 |
| 50 | SRX1HBlue | Creeping | 5.1 | 6.3 | 4.3 | 6.0 | 4.7 | 31.7 |
| 51 | SRX1BL3G | Creeping | 5.1 | 4.3 | 4.7 | 7.0 | 3.1 | 33.3 |
| 52 | SRX1HSilver | Creeping | 5.1 | 4.7 | 6.0 | 3.7 | 7.3 | 10.0 |
| 53 | SR 1119 | Creeping | 5.0 | 6.0 | 6.0 | 6.7 | 4.9 | 31.7 |
| 54 | SRX1G49 | Creeping | 5.0 | 5.7 | 6.7 | 7.7 | 3.4 | 36.7 |
| 55 | SRX1R1G1 | Creeping | 4.9 | 5.7 | 5.3 | 6.7 | 4.5 | 30.0 |
| 56 | SRXG222 | Creeping | 4.9 | 6.0 | 7.7 | 8.3 | 2.7 | 46.7 |
| 57 | SRX146-12 | Creeping | 4.9 | 6.3 | 7.0 | 7.7 | 3.3 | 38.3 |
| 58 | Pick ECB | Creeping | 4.9 | 6.7 | 7.0 | 5.0 | 3.7 | 38.3 |
| 59 | Penn A-4 | Creeping | 4.9 | 7.0 | 5.3 | 5.3 | 5.6 | 18.3 |
| 60 | CATO | Creeping | 4.8 | 6.0 | 3.7 | 4.7 | 6.7 | 9.0 |
| 61 | Penneagle | Creeping | 4.8 | 7.3 | 7.3 | 7.0 | 4.9 | 31.7 |
| 62 | CIS-AP-13 | Creeping | 4.8 | 5.3 | 8.3 | 7.3 | 5.2 | 18.3 |
| 63 | PST SynORO | Creeping | 4.8 | 2.3 | 6.3 | 7.3 | 7.1 | 10.0 |
| 64 | PST Syn ORM6 | Creeping | 4.8 | 2.7 | 4.7 | 5.7 | 8.0 | 5.7 |
| 65 | Bengal | Creeping | 4.7 | 7.0 | 4.7 | 7.3 | 5.3 | 20.0 |
| 66 | SRX1LA1G | Creeping | 4.6 | 2.3 | 6.7 | 4.7 | 5.0 | 28.3 |
| 67 | SRX117-23 | Creeping | 4.6 | 5.3 | 6.3 | 5.3 | 3.4 | 33.3 |
| 68 | Tiger II | Colonial | 4.6 | 6.7 | 4.3 | 3.7 | 8.0 | 5.0 |
| 69 | CBNGS02 | Creeping | 4.6 | 6.0 | 4.3 | 5.3 | 5.1 | 20.0 |
| 70 | Southshore | Creeping | 4.6 | 6.0 | 6.0 | 6.3 | 5.1 | 16.7 |

(Continued)

Table 6 (continued).

| | Cultivar or Selection | Species | Turf Quality[1] 2003 Avg. | Establishment[2] Oct. 2002 | Brown Patch[3] Aug. 2003 | Wilt Stress[4] June 2003 | Dollar Spot[3] 2003 Avg. | Dollar Spot (%) Aug. 2003 |
|---|---|---|---|---|---|---|---|---|
| 71 | BGS94-96-02 | Creeping | 4.5 | 4.7 | 6.0 | 5.0 | 3.6 | 36.7 |
| 72 | AZBC | Creeping | 4.5 | 4.3 | 4.7 | 6.0 | 4.4 | 25.0 |
| 73 | MBGC-02 | Creeping | 4.5 | 5.7 | 5.0 | 5.0 | 6.5 | 12.3 |
| 74 | L93 | Creeping | 4.5 | 4.3 | 5.7 | 5.7 | 5.1 | 26.7 |
| 75 | Seaside II | Creeping | 4.4 | 7.3 | 5.7 | 6.0 | 6.4 | 13.3 |
| 76 | SRX1KOP1E | Creeping | 4.3 | 6.0 | 5.0 | 3.7 | 5.3 | 11.7 |
| 77 | Backspin | Creeping | 4.3 | 7.7 | 6.7 | 5.3 | 3.6 | 48.3 |
| 78 | PST OX5Bulk | Creeping | 4.2 | 2.3 | 5.3 | 6.3 | 6.6 | 11.0 |
| 79 | Trueline | Creeping | 4.1 | 6.3 | 4.3 | 2.7 | 8.2 | 3.3 |
| 80 | Brighton | Creeping | 4.1 | 6.7 | 5.7 | 2.7 | 7.1 | 11.7 |
| 81 | Penncross | Creeping | 4.1 | 7.3 | 3.7 | 5.0 | 6.3 | 11.7 |
| 82 | Pennlinks | Creeping | 4.0 | 6.3 | 4.7 | 4.3 | 6.5 | 14.7 |
| 83 | Penn Trio | Creeping | 3.8 | 7.3 | 4.0 | 5.3 | 6.5 | 9.7 |
| 84 | Viper | Creeping | 3.8 | 6.7 | 4.3 | 3.0 | 5.7 | 13.3 |
| 85 | Providence | Creeping | 3.7 | 8.0 | 5.0 | 4.3 | 6.6 | 11.0 |
| 86 | Pennway | Creeping | 3.7 | 6.3 | 4.3 | 3.7 | 6.8 | 13.3 |
| 87 | 18th Green | Creeping | 3.6 | 5.7 | 4.7 | 2.0 | 1.9 | 78.3 |
| 88 | CBC-02 | Creeping | 3.4 | 3.0 | 4.7 | 5.0 | 7.3 | 6.7 |
| 89 | Kromi | Creeping | 2.2 | 8.7 | 3.7 | 1.7 | 6.0 | 18.3 |
| | LSD at 5% = | | 0.7 | 1.8 | 2.2 | 1.9 | 1.2 | 12.8 |

[1] 9 = best turf quality
[2] 9 = quickest establishment
[3] 9 = least disease
[4] 9 = least wilt stress

Table 7. Performance of creeping bentgrass cultivars and selections in a fairway/tee trial seeded in September 2002 at North Brunswick, NJ.

| | Cultivar or Selection | Species | Turf Quality[1] 2003 Avg. | Establishment[2] Oct. 2002 | Wilt Stress[3] June 2003 | Brown Patch[4] 2003 Avg. | Dollar Spot[4] Aug. 2003 |
|---|---|---|---|---|---|---|---|
| 1 | EFD | Velvet | 7.2 | 6.0 | 9.0 | 9.0 | 7.0 |
| 2 | SR 7200 | Velvet | 7.0 | 6.7 | 9.0 | 8.0 | 5.7 |
| 3 | Benchmark DSR | Creeping | 6.6 | 5.0 | 7.7 | 8.0 | 6.0 |
| 4 | C953 | Creeping | 6.2 | 2.7 | 9.0 | 9.0 | 4.7 |
| 5 | 235050 CB | Creeping | 6.2 | 3.7 | 9.0 | 9.0 | 5.3 |
| 6 | C952 | Creeping | 6.1 | 5.0 | 9.0 | 8.8 | 5.7 |
| 7 | HCG Comp | Colonial | 5.8 | 3.7 | 7.7 | 6.2 | 7.3 |
| 8 | Kingpin | Creeping | 5.7 | 3.3 | 8.0 | 8.7 | 4.7 |
| 9 | CIS AT-7 | Colonial | 5.6 | 6.0 | 7.7 | 5.2 | 7.3 |
| 10 | SRX 7CRCO | Colonial | 5.6 | 5.0 | 3.3 | 4.2 | 7.7 |
| 11 | PST-9VL Bulk | Colonial | 5.5 | 3.5 | 9.0 | 7.8 | 7.5 |
| 12 | SRX 1BPAA | Creeping | 5.4 | 6.3 | 6.0 | 6.3 | 4.0 |
| 13 | PST-SynA1U | Colonial | 5.3 | 4.0 | 8.7 | 7.3 | 5.3 |
| 14 | SRX 1H Silver | Creeping | 5.3 | 5.7 | 4.7 | 5.3 | 5.0 |
| 15 | PST-Syn-9LN | Colonial | 5.3 | 4.3 | 6.0 | 5.3 | 8.7 |
| 16 | SRX 7E | Colonial | 5.2 | 5.3 | 3.7 | 2.3 | 7.3 |
| 17 | SRX 7EE4 | Colonial | 5.2 | 3.7 | 3.0 | 2.8 | 6.7 |
| 18 | CIS AP-10 | Creeping | 5.2 | 5.0 | 7.7 | 7.5 | 2.0 |
| 19 | SRX 1G 68 | Creeping | 5.2 | 3.7 | 8.7 | 7.5 | 3.3 |
| 20 | CIS AP-12 | Creeping | 5.1 | 6.3 | 8.7 | 8.2 | 3.0 |
| 21 | PST-9BNC | Colonial | 5.1 | 8.0 | 7.7 | 6.0 | 5.0 |
| 22 | EWTR Comp | Colonial | 5.1 | 3.0 | 6.3 | 4.8 | 7.0 |
| 23 | Trueline | Creeping | 5.0 | 7.3 | 2.7 | 3.5 | 6.7 |
| 24 | SRX 7 MODD | Colonial | 5.0 | 4.3 | 2.3 | 2.7 | 6.0 |
| 25 | SRX 7EE5 | Colonial | 5.0 | 3.7 | 6.3 | 4.3 | 5.7 |
| 26 | Tiger II | Colonial | 5.0 | 7.7 | 6.0 | 4.8 | 6.7 |
| 27 | CIS AT-6 | Colonial | 5.0 | 7.0 | 5.0 | 4.0 | 5.0 |
| 28 | HCF Comp | Colonial | 5.0 | 2.7 | 6.0 | 5.0 | 5.0 |
| 29 | SRX 1 Pink | Creeping | 5.0 | 4.7 | 7.7 | 4.5 | 3.7 |
| 30 | Penn A-4 | Creeping | 4.9 | 6.3 | 7.3 | 7.7 | 3.3 |
| 31 | Viter | Colonial | 4.9 | 5.7 | 5.0 | 5.7 | 7.0 |
| 32 | SRX 781-3 | Colonial | 4.9 | 2.3 | 5.7 | 1.8 | 8.0 |
| 33 | Independence | Creeping | 4.9 | 6.7 | 7.7 | 8.3 | 2.0 |
| 34 | SRX 1G 57 | Creeping | 4.9 | 6.3 | 8.7 | 8.5 | 3.0 |
| 35 | SRX 7EE | Colonial | 4.9 | 7.0 | 2.0 | 3.0 | 7.7 |

(Continued)

Table 7 (continued).

| | Cultivar or Selection | Species | Turf Quality[1] 2003 Avg. | Establishment[2] Oct. 2002 | Wilt Stress[3] June 2003 | Brown Patch[4] 2003 Avg. | Dollar Spot[4] Aug. 2003 |
|---|---|---|---|---|---|---|---|
| 36 | SRX 1G 56 | Creeping | 4.8 | 6.0 | 8.7 | 8.5 | 2.7 |
| 37 | SRX 1G 49 | Creeping | 4.7 | 5.7 | 9.0 | 8.7 | 4.0 |
| 38 | SR 1119 | Creeping | 4.7 | 6.0 | 7.7 | 5.5 | 3.0 |
| 39 | SRX 1H Blue | Creeping | 4.7 | 6.7 | 7.7 | 6.2 | 2.3 |
| 40 | SRX 7MOBB | Colonial | 4.7 | 4.3 | 3.7 | 1.8 | 5.7 |
| 41 | SRX 1G 32 | Creeping | 4.6 | 5.3 | 8.7 | 8.5 | 1.7 |
| 42 | PST-9VN Bulk | Colonial | 4.6 | 3.7 | 8.3 | 6.3 | 5.7 |
| 43 | Alister | Colonial | 4.6 | 8.3 | 5.7 | 4.3 | 5.7 |
| 44 | Glory | Colonial | 4.6 | 8.7 | 6.0 | 5.5 | 5.3 |
| 45 | Viper | Creeping | 4.5 | 6.3 | 3.7 | 3.8 | 4.7 |
| 46 | Brighton | Creeping | 4.5 | 7.0 | 5.7 | 5.0 | 3.3 |
| 47 | PST-Syn-9PY | Colonial | 4.5 | 5.3 | 3.7 | 2.8 | 9.0 |
| 48 | SRX 146-12 | Creeping | 4.5 | 6.3 | 8.0 | 7.0 | 3.7 |
| 49 | SRX 1W1CR1G | Creeping | 4.5 | 5.3 | 8.0 | 6.3 | 1.7 |
| 50 | Backspin | Creeping | 4.3 | 7.0 | 7.0 | 7.0 | 2.0 |
| 51 | SRX 117-23 | Creeping | 4.3 | 3.3 | 5.0 | 4.5 | 2.0 |
| 52 | Providence | Creeping | 4.2 | 7.7 | 4.7 | 4.0 | 4.3 |
| 53 | SRX 780-19 | Colonial | 4.1 | 3.7 | 2.3 | 1.7 | 6.7 |
| 54 | SRX 781-21 | Colonial | 4.1 | 5.0 | 2.3 | 1.2 | 7.7 |
| 55 | Penncross | Creeping | 3.7 | 7.0 | 4.7 | 3.3 | 3.0 |
| 56 | 18th Green | Creeping | 3.6 | 5.0 | 3.0 | 5.8 | 1.0 |
| 57 | PST-Syn-9NE | Colonial | 2.6 | 1.7 | 4.3 | 2.2 | 5.3 |
| | LSD at 5% = | | 0.5 | 1.5 | 1.5 | 1.7 | 1.8 |

[1] 9 = best turf quality
[2] 9 = quickest establishment
[3] 9 = least wilt stress
[4] 9 = least disease

Table 8. Maintenance practices performed in 2003 on bentgrass trials at North Brunswick, NJ.

| Table | Test | Fertility[1] | Mowing Height (inches) | Fungicides | Insecticides | Herbicides | Other |
|---|---|---|---|---|---|---|---|
| 1a-1b | 2000 Greens | 1.75 | 1/8 | May/June – Daconil Ultrex<br>July – Heritage | May – Turcam<br>July – Merit | May – Bensumec | May/June/July – Wetting agent<br>Oct. – Topdressed sand |
| 2a-2b | 2000 Fairway/Tee | 1.55 | 3/8 | June – Daconil Ultrex | July – Merit<br>Nov. – Turcam | May – Bensumec | May/June/July – Wetting agent |
| 3-4 | 2001 Greens | 2.00 | 1/8 | May/June – Daconil Ultrex<br>July – Heritage | May/July – Turcam<br>July – Merit | May – Bensumec | May/June/July – Wetting agent<br>Oct. – Topdressed sand |
| 5 | 2001 Fairway/Tee | 1.60 | 3/8 | May/June/Aug. – Daconil Ultrex<br>May/July – Heritage | May/July – Turcam | May – Bensumec<br>June – Mecamine + Lontrel | May/June/July – Wetting agent |
| 6 | 2002 Greens | 2.20 | 1/8 | May/Aug./Oct. – Daconil Ultrex | May/Nov. – Turcam<br>July – Merit | May – Bensumec | Oct. – 5/8-inch hollow tines<br>June/July/Oct./Nov. – Topdress |
| 7 | 2002 Fairway/Tee | 1.65 | 3/8 | May/July/Nov. – Daconil Ultrex | May – Turcam<br>July – Merit | May – Bensumec | |

[1] Annual nitrogen applied (lbs per 1000 $ft^2$)