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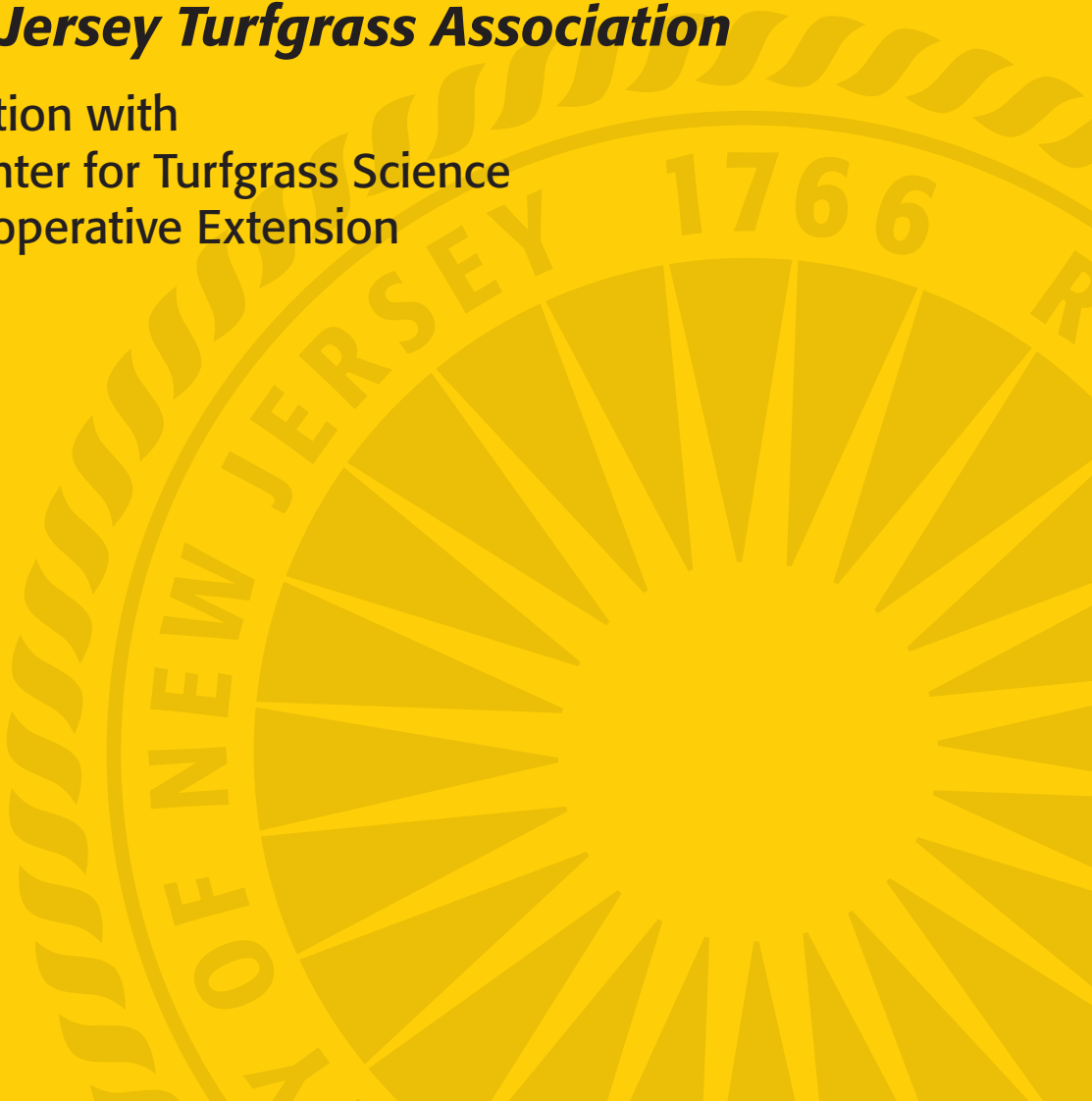

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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State 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 2017 GREEN EXPO Turf and Landscape Conference. 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.

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

PERFORMANCE OF BENTGRASS CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS, 2017

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Bentgrass species possess a distinct ability to form very dense, uniform, and fine textured surfaces under an extremely low height of cut. As a result, bentgrasses are often used in specialized, high maintenance areas such as golf course fairways, tees, and putting greens. Three bentgrass species predominantly used for turf are creeping bentgrass (*Agrostis palustris* Huds.; synonym = *A. stolonifera* L.), colonial bentgrass (*A. tenuis* L. or *A. capillaris* L.), and velvet bentgrass (*A. canina* L.). In addition, highland or dryland bentgrasses (*A. castellana* Boiss. & Reut.) can be options for turf in stressful areas, but these tend to be less commonly utilized because they are less attractive than the more common species when a high quality turf is needed. Due to an aggressive growth habit and adaptability to a variety of climates, creeping and velvet bentgrasses are most suitable for the very low cutting heights required for golf course greens in the United States. Colonial bentgrasses respond best to a slightly higher height of cut, therefore these are usually better suited for lower maintenance fairways in temperate areas of the United States.

Creeping bentgrasses are highly stoloniferous and have a prostrate growth habit, which allows for persistence under very low mowing heights. Cutting heights of 1/10 of an inch are not uncommon on many top tier golf courses. This species is highly adapted to both cool, temperate as well as warm, humid regions of the United States, making it the most popular species used on golf course putting greens in temperate areas. Its vigorous spreading growth habit also contributes to its ability to repair damaged areas quickly. In 1954, H. B. Musser released 'Penncross,' the first seeded synthetic variety of creeping bentgrass (Musser, 1959). Since then, breeding efforts have markedly improved creeping bentgrasses to withstand the increasing demands of the game of golf including the need, when compared to older varieties, for better turf quality, darker green color, improved shoot density, improved traffic tolerance and recuperative ability, and increased disease and stress tolerances.

Creeping bentgrasses are susceptible to a number of pathogens and pests. Dollar spot (caused by the fungus *Sclerotinia homoeocarpa*) is one of the main disease problems of close-cut creeping bentgrass. However, these grasses can also be susceptible to brown patch (*Rhizoctonia solani*), copper spot (*Gloeocercospora sorghi*), anthracnose (*Colletotrichum cereale*), and diseases caused by *Pythium* spp.

Colonial bentgrass, also referred to as browntop, has traditionally been used as a lawn and golf course grass in areas of Northern Europe and New Zealand that have mild (cool and humid) summers. Compared to creeping bentgrasses, colonial bentgrasses have a finer leaf texture and a more upright and less aggressive spreading growth habit and are generally better adapted for fairway or tee use in the warmer summer climates of the northern United States. Colonial bentgrasses perform best in New Jersey when mowed no lower than 3/8 of an inch. They typically have a brighter green color and better color retention during cool weather compared to creeping bentgrasses. Although colonial bentgrasses generally have better dollar spot resistance and wear tolerance, they are much more susceptible than creeping bentgrasses to brown patch and do not spread through stolons. While not lethal, the playability of golf courses may be affected if brown patch is not controlled on colonial bentgrass turfs. Current breeding efforts include improving the tolerance of colonial bentgrasses to this disease and improved quality under fairway conditions.

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Velvet bentgrass forms the finest-textured and densest turf of the bentgrasses and can nearly resemble green velvet when managed properly. It spreads mainly through profuse production of erect tillers with short stolons. This grass can tolerate very close mowing, heat, cold, and shade, and is one of the most drought tolerant of the bentgrasses used for turf (Skogley, 1973). Due to the density and vigor of this turf, even under very low mowing conditions, it has been shown to be extremely effective at preventing the encroachment of the most prolific weed on a golf course, *Poa annua*. The spread of velvet bentgrass via stolons is more aggressive than colonial bentgrass, but not as strong as creeping bentgrass.

Velvet bentgrass can form excessive thatch, especially at high fertility rates, increased irrigation, and higher cutting heights, and can thus become problematic if not maintained properly. Years of mismanagement and subsequent poor turf quality has given velvet bentgrass a poor reputation, but recent research showed that when managed properly, velvet bentgrass can create a superior turf (Brilman and Meyer, 2000). Velvet bentgrass can be susceptible to red thread (caused by *Laetisaria fuciformis*) and copper spot, but generally has good resistance to dollar spot and brown patch. Seedlings of velvet bentgrasses are susceptible to Pythium seedling root rot during establishment.

During colder weather, velvet bentgrass will turn a dark purple color and will take longer than the other bentgrass species to “green-up” in the spring. Velvet bentgrass has not been used extensively for high maintenance turf, largely because its range of adaptation has not been well characterized. Selections of velvet bentgrass have persisted for many years in trials under New Jersey growing conditions. Recent research at Rutgers indicates that the species may one day serve as a viable alternative to creeping bentgrass for use on golf course greens in the northeastern United States as long as proper cultural management inputs are implemented. Some of the major breeding objectives for velvet bentgrass include resistance to copper spot and Pythium diseases, and better wear tolerance.

The New Jersey Agricultural Experiment Station participates in the National Turfgrass Evaluation Program (NTEP), which evaluates many species of turfgrass including bentgrasses at various locations throughout the United States. The Rutgers turfgrass breeding program conducts extensive field evaluations of collections and new material developed in the improvement program, many of which are a result of recent collection trips within the United States and throughout Europe and Asia. Collections from the British Isles, Norway, Sweden, Spain, Portugal, France, Finland, Switzerland, Scotland, Italy, Greece, Poland, Holland, Hungary, Bulgaria, Romania, Croatia, China, and the Slovak Republic serve to enhance the genetic diversity of the germplasm used in this breeding program. The Rutgers turfgrass breeding program focuses on improving turfgrasses for overall quality, color, density, uniformity, texture, disease resistance, salt tolerance, traffic tolerance, and many traits that improve the usefulness of turfgrasses throughout the world.

PROCEDURES

Bentgrass evaluation trials were established at the Rutgers Horticultural Research Farm II in North Brunswick, NJ in the fall of 2013 (Table 1), 2014 (Tables 2 to 5), 2015 (Tables 6 to 8) and 2016 (Tables 9 and 10). Trials were established on a modified Nixon loam. Plot size was 3 x 5 ft for all trials except for the NTEP Greens Trial (Table 2), where plot size was 4 x 6 ft, and the NTEP Fairway Trial (Table 3), where plot size was 8 x 6 ft. Plots were hand-seeded at a rate of approximately 1.0 lb per 1000 ft^2. All tests were arranged in a randomized complete block design with three replications.

All sites were well drained and openly exposed to both sunlight and air circulation. The annual rate of nitrogen applied, mowing height, cultivation/topdressing practices, and pesticide applications for each test are presented in Table 11. The putting green tests were mowed five to six times per week during periods of active growth with a triplex or walk-behind reel mower equipped to collect clippings. The fairway tests were mowed three times per week with a triplex reel mower and clippings were removed during periods of active growth. Soil pH was maintained in the range of 5.4 to 6.8 with agricultural limestone. Most tests were irrigated to 50 to 70% ET replacement during the growing season to avoid drought stress.

Plots were evaluated frequently during the growing season for overall turf quality (i.e. turf density, texture, uniformity, color, growth habit) and presence of disease, insect, or herbicide damage. Turf quality (Tables 1 through 10), establishment (Tables 9 and 10), spring green-up (Tables 2, 3, 6, 7, and 9), and disease were rated on a 1 to 9 scale, where 9 represented the most desirable turf characteristic.

Disease ratings included dollar spot (Tables 3 to 10), brown patch (Tables 8 to 10), anthracnose (Tables 2, 3, 9, and 10), copper spot (Table 7), and red leaf spot (caused by *Dreschlera erythrospila* (≡*Helminthosporium erythrospilum*) (teleomorph: *Pyrenophora erythrospila*) (Table 7). All data were subjected to analysis of variance. Means were separated using Fisher's protected least significant difference (LSD) means separation test.

RESULTS AND DISCUSSION

Turf Quality Evaluations

Entries in Tables 1 through 8 are ranked according to their overall multi-year quality average. Tables 9 and 10 are ranked by the average turf quality for 2017 only. Throughout all of the years that turf quality was assessed, a few varieties in each bentgrass species stood out as better performing entries.

For creeping bentgrasses maintained at a putting green height of cut (Tables 1, 2, 4, 6, 7, and 9), 777, L-93XD, Piranha, Coho, and the experimental selections PPG-AP 102 (B & D), PPS Comp, DPG Comp, DLFPS-AP/3018, 4759-7,8,10,12, 4738-7-12, KAC Comp, MMM Comp, MGH Comp, LSG Comp, and PLC Comp all performed very well, while Penncross, Southshore, Putter, Alpha, Crenshaw, Penn A-4, and SR1119 were consistently among the poorest performers. At fairway height (Tables 3, 5, 8, and 10), Piranha, LNS, Chinook, Coho, TourPro, and the experimental selections LSC Comp, KAC Comp, MMM Comp, MSP Comp, MGC Comp, MGH Comp, DSF Comp, and MGS Comp had excellent turf quality while the lowest scoring cultivars consisted of Penncross, Southshore, Crenshaw, Alpha, Penn A-4, and Kingpin.

Overall turf quality for velvet bentgrasses was evaluated in 2014, 2015, and 2016 trials (Tables 4, 7, and 9) under greens height of cut. The experimental entries PPG-AC 101, PST-Syn-VH9, LVP Comp, SFV Comp, EVP Comp, CCV Comp, SCL Comp, SSL Comp, SCE Comp, and SCM Comp outperformed named cultivars such as SR 7200, Villa, and Greenwich, which displayed poor quality in these trials under these greens-type management conditions.

As mentioned previously, colonial bentgrasses perform better at fairway cutting height and typically have poorer performance under putting green conditions. Nevertheless, there were several experimental colonials in putting green trials (Tables 1 and 6) that performed favorably to many creeping bentgrasses, exhibiting excellent turf quality at greens height including PDC Comp (Table 1) and EDC Comp, AT 12 B, ELC Comp, MDF Comp, SHC Comp, as well as the cultivar Puritan (Table 6). Under fairway conditions however (Tables 3, 5, 8, and 10), Puritan, Musket, Capri, and the experimental selections DML, DLFPS-AT/3026, WLC Comp, WEC Comp, WMC Comp, HLT Comp, ECS Comp, SHC Comp, CCD Comp, DHS Comp, LCC Comp, and SFC Comp were the best performing colonial bentgrasses, while SR 7150, Glory, Tiger 2, and Alister generally exhibited the poorest performance under fairway cutting heights when included in trials.

Dollar Spot

Sclerotinia homoeocarpa, the causal agent of this widespread turfgrass disease, causes silver-dollar shaped spots of dead turf which can converge to form larger damaged areas (Belanger et al., 2005). While potentially one of the more damaging turf diseases on golf courses in the northeast, dollar spot can be easily controlled with the use of fungicides; however this can be expensive due to the prevalence of the fungus. Also becoming more prevalent is the pathogen's resistance to fungicides, particularly DMI fungicides (Smiley et al., 2005). In addition, increased fungicide use is not beneficial to the environment.

Breeding for dollar spot resistance in bentgrass is an important objective of the Rutgers breeding program. Typically, velvet and colonial bentgrasses have better resistance to dollar spot than creeping bentgrasses, however the results from recent trials (Tables 3 to 10) indicate that significant improvements in creeping bentgrass have been made, and many creeping bentgrasses outperform colonial bentgrasses, as seen in Tables 3, 5, 6, and 10. More recent cultivars such as LNS, Coho, Chinook, and Piranha offer strong disease resistance or tolerance (comparable to older cultivars like Declaration, 13M, and Memorial), and experimental entries 4739-7-12, 4738-7-12, 4759-7,8,10,12, MMM Comp, KAC Comp, GSM Comp, FGL Comp, PYR Comp, WFC Comp, MMM Comp, MGC Comp, MGH Comp, LSG Comp, and MGS Comp showed improved tolerance to dollar spot, while Independence, Ninety-Six Two, Crenshaw, Southshore, Pure Select, Pure Distinction, and PC2.0 were very susceptible.

Brown Patch

Velvet bentgrass typically exhibits the greatest tolerance to brown patch among the bentgrass species used for turf, while colonial bentgrass is the most susceptible. In recent years, dramatic improvements have been made in breeding colonial and creeping bentgrasses for improved brown patch resistance. Brown patch data is reported in Tables 8 to 10. In 2017, creeping bentgrasses generally displayed acceptable tolerance to this disease, exhibiting little significant separation between entries (Table 8). However, in Tables 9 and 10, significant differences among the creeping bentgrasses were observed, in which cultivars such as Memorial, T-1, 13M, Alpha, L-93, Penn A-4, and Southshore exhibited higher brown patch disease levels than other creeping bentgrass cultivars.

Over the past few years, significant research has focused on improving brown patch resistance in colonial bentgrass. In the 2015 and 2016 fairway trials (Tables 8 and 10), enhanced disease tolerance is evident. The cultivars Heritage, Musket, DML and the experimental selections EDC Comp, ECS Comp, SHC Comp, CCD Comp, and LCC Comp exhibited significantly improved brown patch resistance compared to older entries such as Glory and Tiger 2.

Anthracnose

Anthracnose is typically a major problem on close-cut *Poa annua* putting greens, although recently the fungus has also been shown to cause disease on bentgrasses (Bonos et al., 2009). Creeping bentgrass is typically more susceptible to infection when compared to colonial bentgrass and velvet bentgrass. Susceptibility to this disease was evaluated on 2014 and 2016 bentgrass trials (Tables 2, 3, 9, and 10). In 2017, the velvet bentgrasses generally exhibited strong to excellent resistance (Table 9), whereas creeping bentgrasses displayed a wider range of tolerance (excellent to poor). The creeping bentgrass cultivars Piranha, L-93XD, Chinook, and LNS and the experimental entries MGH Comp, PLC Comp, DSF Comp, and MGS Comp had the least disease, but Penncross, Penn A-1, Penn A-4, Declaration, Memorial, 13M, and T-1 proved to be highly susceptible

Spring Green-Up

Spring green-up data was collected on trials from 2014 (Tables 2 and 3), 2015 (Tables 6 and 7), and 2016 (Table 9). In general, velvet bentgrass typically has the poorest spring green-up compared to colonial and creeping bentgrass and can even exhibit a purplish color during cold winter months and into the spring. In 2017, there was no statistical difference between velvet bentgrass entries in the 2016 greens trial (Table 9), although in the 2015 velvet putting green trial (Table 7) in which there was a statistical difference, Villa and the experimental entries LVP Comp and PST-VR01 outperformed all other entries.

Creeping bentgrasses (Tables 2, 3, 6, and 9) showed a wide range of variability, with entries like Luminary, Barracuda, Piranha, and Chinook and experimental entries WFC Comp, MSP Comp, MMM Comp, and MGH Comp receiving the highest ratings for spring green-up, while Penncross, Armor, Nightlife, Kingdom, Southshore, and Penn A-1 were the slowest to green up.

There were fewer differences among colonial bentgrasses in 2017. While no statistical differences were observed in the NTEP Fairway trial (Table 3), in the 2015 putting green trial (Table 6), colonial cultivars Aberroyal, SR 7100, and SR 7150 were some of the poorest entries to green-up, while the cultivars Puritan, Arrowtown, and experimental entries SHC Comp, EDC Comp, and ELC Comp were fastest to green-up

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Table 1. Performance of creeping and colonial bentgrass cultivars and selections in a putting green trial seeded in September 2013 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2014-2017 Avg.	2014 Avg.	2015 Avg.	2016 Avg.	2017 Avg.
	CREEPING BENTGRASS					
1	PPG-AP 102D	6.2	6.3	6.7	5.7	6.1
2	PPS Comp	6.1	6.2	6.8	5.7	5.7
3	PPG-AP 102B	5.9	6.4	5.9	5.4	6.1
4	DPG Comp	5.9	5.6	6.3	5.7	5.9
5	777	5.8	6.6	6.6	5.1	5.2
6	PGT Comp	5.6	5.7	5.6	5.6	5.7
7	L93XD	5.6	5.3	6.4	5.4	5.4
8	Barracuda	5.5	6.1	5.8	4.7	5.6
9	FWT Comp	5.5	5.6	6.1	4.5	5.6
10	Luminary	5.4	6.2	5.8	4.7	5.1
11	Pure Distinction	5.3	6.0	5.8	4.3	5.3
12	AP 23	5.3	5.9	5.6	4.8	5.2
13	AST-1-12-3023	5.3	6.3	5.6	4.5	4.9
14	Pin Up 2	5.3	5.5	5.7	4.1	5.9
15	Flagstick	5.2	4.9	5.2	4.8	6.1
16	Flagstick + OO7	5.2	5.2	5.5	4.2	6.0
17	FSM Comp	5.1	5.3	5.5	5.1	4.6
18	OO7	5.1	5.5	5.5	4.5	4.9
19	AP 16	5.1	5.9	5.2	4.3	5.0
20	AST-1-12-3010A	5.1	5.6	4.8	4.5	5.5
21	Declaration	5.1	5.8	5.4	4.2	5.0
22	Pure Select	5.0	5.9	4.9	3.9	5.2
23	AST-1-12-3008A	4.9	5.9	5.1	4.3	4.4
24	Benchmark DSR	4.9	4.8	4.5	4.9	5.6
25	Focus	4.9	5.4	5.1	4.5	4.6
26	Shark	4.9	5.7	5.5	3.7	4.5
27	Authority	4.9	5.2	5.3	4.3	4.7
28	Proclamation	4.8	4.7	4.9	4.0	5.8
29	FTP Comp	4.8	5.2	5.6	3.8	4.8
30	V-8	4.7	5.3	4.2	4.0	5.3
31	AP 18	4.7	5.2	5.0	3.5	5.1
32	Pin Up	4.7	5.2	5.3	3.4	4.8
33	AST-1-12-3004A	4.6	5.0	5.0	3.7	4.9
34	AST-1-12-8001A	4.6	5.8	4.5	3.2	4.9
35	Runner	4.5	5.0	4.4	3.6	5.2

(Continued)

Table 1. Creeping and colonial bentgrass putting green trial, 2017 (continued).

	Cultivar or Selection	Turf Quality[1] 2014-2017 Avg.	2014 Avg.	2015 Avg.	2016 Avg.	2017 Avg.
	CREEPING BENTGRASS (continued)					
36	AST-1-12-3001A	4.5	5.0	4.5	3.3	5.1
37	TPD Comp	4.4	5.1	4.3	3.6	4.6
38	Flagstick + Tyee	4.3	5.0	4.2	3.9	4.3
39	AST-1-12-3007A	4.3	5.1	4.3	3.6	4.4
40	MCT Comp	4.3	5.1	5.0	2.8	4.5
41	PST-0CVR Bulk	4.3	4.9	4.3	3.2	4.7
42	AST-1-12-3006A	4.3	5.3	4.1	3.7	4.0
43	AST-1-12-3024	4.3	4.5	4.4	3.8	4.3
44	AST-1-12-3026	4.2	4.6	4.3	3.6	4.6
45	Tyee	4.2	4.7	4.2	3.6	4.1
46	Flagstick + Mackenzie	4.2	4.3	4.1	3.7	4.6
47	T-1	4.1	4.7	3.8	3.3	4.9
48	13M	4.1	4.4	4.1	3.8	4.1
49	MCC Comp	4.0	5.2	4.2	2.4	4.6
50	Focus + Mackenzie	4.0	4.2	4.1	3.3	4.4
51	PC2.0	4.0	4.8	3.8	3.2	4.2
52	Mackenzie	4.0	3.9	3.2	3.3	5.6
53	AP 15	4.0	4.6	4.1	3.3	3.9
54	Focus + 96-2	3.9	4.8	4.1	3.0	3.8
55	Mackenzie + Tyee	3.9	4.4	3.6	3.1	4.4
56	Independence	3.9	4.5	4.2	2.8	4.0
57	96-2	3.8	4.9	3.4	2.5	4.4
58	SR 1150	3.8	4.7	3.8	3.0	3.5
59	Alpha	3.7	3.7	3.0	3.7	4.4
60	PST-0COL	3.6	4.2	2.2	3.5	4.6
61	L-93	3.5	3.7	3.2	3.4	4.0
62	Kingpin	3.4	3.6	3.4	3.0	3.9
63	Memorial	3.4	3.5	3.0	3.8	3.4
64	AST-1-12-3009A	3.4	4.2	3.0	2.9	3.7
65	Penn A-4	3.3	3.7	2.8	3.2	3.6
66	Penn G-2	3.3	2.4	3.2	3.2	4.3
67	Crenshaw	3.1	3.5	3.2	2.1	3.8
68	Century	3.1	2.6	3.5	2.9	3.3
69	Putter	3.1	3.7	2.6	2.7	3.4
70	Imperial	2.9	3.5	2.7	2.2	3.2

(Continued)

Table 1. Creeping and colonial bentgrass putting green trial, 2017 (continued).

	Cultivar or Selection	Turf Quality[1] 2014-2017 Avg.	2014 Avg.	2015 Avg.	2016 Avg.	2017 Avg.
	CREEPING BENTGRASS (continued)					
71	Southshore	2.9	2.9	2.5	2.2	4.0
72	SR 1119	2.8	2.0	2.7	3.1	3.4
73	Penncross	2.8	3.0	2.2	2.6	3.3
	COLONIAL BENTGRASS					
1	PDC Comp	5.1	5.8	4.6	5.4	4.3
2	SDR Comp	4.7	5.1	4.6	4.8	4.1
3	PSY Comp	4.4	5.3	4.6	4.4	3.5
4	DTO Comp	4.3	4.8	4.2	4.2	4.1
5	DTT Comp	4.3	4.4	4.7	4.0	4.0
6	Capri	4.2	5.3	3.3	4.0	4.2
7	FT12	3.9	5.1	3.5	3.2	4.0
8	EBM	3.6	4.9	3.4	3.0	3.2
9	Greentime	3.3	4.0	3.4	2.4	3.1
10	Tiger 2	3.1	4.7	3.0	2.4	2.7
11	SR 7100	2.8	3.1	2.1	2.4	3.6
12	Glory	2.8	3.9	2.3	2.2	2.9
	LSD at 5% =	0.8	0.9	1.2	1.2	1.7

[1]9 = best turf quality

Table 2. Performance of creeping bentgrass cultivars in a putting green trial established in September 2014 at North Brunswick, NJ. Includes all entries from the 2014 National Bentgrass Greens Test (NTEP).

		Turf Quality[1]				Spring Green-up[2]	Anthrac-nose[3]	Turf Density[4]	Leaf Texture[5]
	Cultivar or Selection	2015-2017 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	March 2017	May 2017	Nov. 2017	Nov. 2017
1	L-93XD	7.1	7.6	7.1	6.7	4.3	7.3	6.7	7.3
2	Piranha	6.6	6.9	6.5	6.7	5.7	7.3	7.0	6.3
3	777	6.4	7.6	6.2	5.3	4.3	7.7	6.7	7.0
4	DLFPS-AP/3018	6.3	6.7	6.2	6.2	6.3	6.7	7.3	7.3
5	Luminary	6.0	6.0	6.1	6.0	6.3	6.7	5.3	5.7
6	DLFPS-AP/3058	5.9	6.8	6.0	4.8	4.7	5.3	6.0	5.7
7	V-8	5.8	6.0	5.7	5.8	6.0	6.0	6.0	6.0
8	PST-ROPS	5.8	6.6	5.9	4.9	4.0	6.0	5.3	5.3
9	TourPro	5.7	6.5	5.9	4.9	4.3	5.0	6.0	6.0
10	DLFPS-AP/3056	5.7	6.3	5.7	5.1	6.0	6.3	5.7	6.0
11	Pure Select	5.5	6.0	5.8	4.6	2.0	6.3	6.0	5.7
12	Shark	5.5	6.2	5.7	4.5	4.3	5.0	5.7	6.3
13	Barracuda	5.4	5.6	5.8	5.0	4.7	4.7	5.0	6.3
14	Declaration	5.2	4.7	4.6	6.2	7.7	7.0	5.7	6.0
15	Nightlife	5.1	5.7	4.3	5.1	1.7	8.0	5.0	5.3
16	Kingdom	4.9	5.6	4.4	4.8	1.3	7.7	4.0	4.7
17	DLFPS-AP/3059	4.8	4.9	4.5	5.1	4.7	5.7	5.7	5.7
18	Armor	4.3	4.9	4.1	3.9	1.0	7.7	4.3	4.0
19	Penn A-1	3.9	4.0	4.1	3.6	2.0	4.7	3.0	3.0
20	Penncross	1.6	2.2	1.1	1.4	1.3	1.3	2.0	1.0

(Continued)

Table 2. Creeping bentgrass putting green trial, 2014 (NTEP) (continued).

Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Spring Green-up[2] March 2017	Anthrac-nose[3] May 2017	Turf Density[4] Nov. 2017	Leaf Texture[5] Nov. 2017
LSD at 5% =	0.5	0.8	0.7	1.0	1.5	2.4	1.8	1.8

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease
[4]9 = highest shoot density
[5]9 = finest leaf texture

Table 3. Performance of bentgrass cultivars and selections in a fairway trial established in September 2014 at North Brunswick, NJ. Includes all entries of the 2014 National Bentgrass Fairway Test (NTEP).

	Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Spring Green-up[2] March 2017	Dollar Spot[3] May 2017	Anthrac-nose[3] July 2017	Genetic Color[4] Nov. 2017	Turf Density[5] Nov. 2017	Leaf Texture[6] Nov. 2017
	CREEPING BENTGRASS										
1	Piranha	7.8	7.6	8.1	7.7	8.0	9.0	7.0	8.0	7.3	8.0
2	L-93XD	7.0	7.1	7.5	6.2	6.7	7.0	8.7	6.7	6.0	6.7
3	Chinook	6.9	6.1	7.3	7.2	6.7	9.0	7.3	8.0	6.7	6.3
4	OO7	6.7	6.9	7.0	6.4	5.7	7.3	6.3	7.3	6.3	6.7
5	V-8	6.5	6.1	6.9	6.6	5.7	7.3	8.7	6.3	5.7	6.3
6	Barracuda	6.4	6.4	6.5	6.5	6.0	6.7	6.7	6.0	6.3	7.0
7	Shark	6.2	5.8	6.5	6.4	4.3	5.3	8.0	5.3	5.3	5.7
8	Luminary	5.8	6.3	5.8	5.3	7.0	6.0	7.7	6.0	5.7	5.0
9	Crystal BlueLinks	5.5	5.5	5.6	5.3	7.0	5.7	4.3	5.0	4.7	5.0
10	Declaration	5.2	5.5	5.4	4.7	6.3	7.3	1.3	4.7	5.0	5.3
11	Nightlife	5.1	5.4	5.5	4.4	3.7	4.7	6.7	5.0	5.0	5.0
12	PC2.0	5.0	5.4	5.3	4.3	5.3	1.7	9.0	4.7	4.0	4.7
13	PST-ORBS	4.9	5.1	5.4	4.2	4.0	1.3	5.3	4.7	4.7	5.7
14	Kingdom	4.4	4.6	4.4	4.2	4.0	5.3	6.0	5.7	5.7	5.0
15	Armor	4.2	4.3	4.5	3.7	4.0	1.7	7.3	5.7	5.7	5.7
16	Penncross	3.0	3.0	2.6	3.5	4.0	2.3	3.3	3.7	4.0	3.7

(Continued)

Table 3. Bentgrass fairway trial, 2014 (NTEP) (continued).

	Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Spring Green-up[2] March 2017	Dollar Spot[3] May 2017	Anthracnose[3] July 2017	Genetic Color[4] Nov. 2017	Turf Density[5] Nov. 2017	Leaf Texture[6] Nov. 2017
	COLONIAL BENTGRASS										
1	Puritan	6.5	6.0	6.8	6.7	2.7	5.3	9.0	3.3	6.0	7.0
2	DLFPS-AT/3026	6.2	5.8	6.2	6.6	3.7	8.0	9.0	3.7	6.7	7.0
3	Musket	5.7	5.0	5.5	6.4	4.7	8.3	9.0	3.0	5.7	7.3
4	Greentime	4.9	4.7	4.8	5.1	5.7	4.7	9.0	3.7	4.7	5.0
	LSD at 5% =	0.8	0.8	1.1	1.1	2.3	2.1	2.0	1.4	1.2	1.2

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease
[4]9 = darkest green color
[5]9 = highest shoot density
[6]9 = finest leaf texture

Table 4. Performance of creeping and velvet bentgrass cultivars and selections in a putting green trial seeded in September 2014 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Dollar Spot[2] Oct. 2017
	CREEPING BENTGRASS					
1	4738-7-12	6.6	6.9	6.3	6.7	7.7
2	4759-7,8,10,12	6.5	7.0	6.6	5.8	7.7
3	KAC Comp	6.4	5.6	6.2	7.3	7.7
4	GSM Comp	6.3	6.6	6.4	5.7	8.0
5	LSC Comp	6.1	6.1	5.9	6.4	7.3
6	PYR Comp	6.1	6.1	5.8	6.5	8.0
7	4733-7-9,11	6.1	5.8	6.0	6.5	7.7
8	4741-8,10,12	6.0	6.0	5.6	6.6	7.7
9	Coho	6.0	6.3	5.9	5.7	8.0
10	PDM Comp	5.9	5.7	5.9	6.3	6.7
11	TLP Comp	5.9	5.7	5.7	6.4	7.3
12	4739-7-12	5.9	6.1	6.0	5.9	7.7
13	Piranha	5.9	6.0	5.4	6.2	6.7
14	4749-7-10,12	5.8	5.9	5.6	6.1	7.7
15	4756-7-9,12	5.8	5.8	6.1	5.5	7.3
16	4779-1-6	5.8	5.5	5.3	6.6	6.0
17	FGL Comp	5.7	4.6	6.2	6.3	8.0
18	4757-8-12	5.7	6.2	6.4	4.6	7.3
19	4782-3-6	5.7	5.5	5.1	6.4	5.3
20	4740-1-6	5.6	6.5	5.9	4.5	7.7
21	4726-1-4	5.6	5.6	5.6	5.6	7.7
22	4767-2-6	5.6	5.7	5.3	5.7	6.0
23	4760-1-6	5.5	5.7	6.1	4.7	7.0
24	Pin-Up	5.5	6.1	4.7	5.5	5.3
25	4787-4-6	5.4	5.8	4.9	5.4	5.3
26	4744-1-6	5.3	5.0	5.0	5.7	7.0
27	4764-1-5	5.3	5.6	5.5	4.8	7.0
28	PST-ROPS	5.1	5.9	4.4	5.0	4.3
29	Luminary	5.1	5.7	5.0	4.7	6.7
30	Pure Select	5.1	5.6	4.5	5.0	5.7
31	Barracuda	5.0	5.3	4.7	5.0	6.7
32	Proclamation	4.9	5.9	4.2	4.6	6.3
33	Pin-Up 2	4.8	5.3	4.1	5.1	7.3
34	DSC Comp	4.8	4.7	4.6	4.9	6.3
35	Pure Distinction	4.7	5.2	3.7	5.3	5.0

(Continued)

Table 4. Creeping and velvet bentgrass putting green trial, 2014 (continued).

	Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Dollar Spot[2] Oct. 2017
	CREEPING BENTGRASS (continued)					
36	AP-18	4.6	4.5	4.6	4.5	6.7
37	Centercut 3	4.5	4.8	4.7	4.1	6.3
38	Shark	4.5	5.3	4.1	4.2	4.3
39	V-8	4.5	5.1	4.3	4.0	6.0
40	Pureformance	4.5	5.2	3.2	5.0	4.7
41	OO7	4.5	4.9	4.5	4.1	5.0
42	Declaration	4.4	4.9	4.0	4.4	7.0
43	Authority	4.4	4.8	3.9	4.7	4.3
44	Memorial	4.4	4.9	4.6	3.6	7.3
45	Benchmark DSR	4.2	4.2	3.7	4.7	4.3
46	A-1/A-4	4.2	4.7	3.7	4.2	4.0
47	Independence	4.1	4.9	3.0	4.5	4.3
48	PST-0RBS	4.1	4.6	3.3	4.5	3.3
49	King Pin	3.8	3.8	3.6	3.9	5.3
50	13M	3.7	4.0	3.8	3.4	6.0
51	Crystal BlueLinks	3.6	3.9	3.1	3.9	5.0
52	PC2.0	3.5	4.0	2.8	3.5	4.3
53	PST-Syn-0CBX	3.4	4.2	2.7	3.4	3.7
54	T-1	3.2	3.8	2.9	3.0	5.3
55	Alpha	2.9	3.1	2.8	2.9	4.3
56	Southshore	2.8	2.7	2.1	3.4	3.7
57	L-93	2.7	2.7	2.8	2.5	5.3
58	Crenshaw	2.6	2.7	2.0	3.1	4.0
59	Penncross	2.3	2.2	1.9	2.8	4.7
	VELVET BENTGRASS					
1	PPG-AC 101	5.0	6.0	4.9	4.1	5.7
2	PST-Syn-VH9	4.5	4.7	4.5	4.3	6.3
3	Greenwich	4.0	4.0	4.1	3.7	5.7
4	Legendary	3.8	4.5	3.7	3.3	6.0
5	Villa	3.8	4.6	3.8	3.0	5.3
6	PST-VR01	3.4	3.5	3.9	2.9	5.3
7	SR 7200	2.3	2.6	2.1	2.3	5.3

(Continued)

Table 4. Creeping and velvet bentgrass putting green trial, 2014 (continued).

Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Dollar Spot[2] Oct. 2017
LSD at 5% =	0.6	1.0	0.9	1.1	1.6

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

Table 5. Performance of creeping and colonial bentgrass cultivars and selections in a fairway trial seeded in September 2014 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Dollar Spot[2] 2017
	CREEPING BENTGRASS					
1	KAC Comp	6.6	5.8	6.6	7.4	7.8
2	GSM Comp	6.3	5.8	6.5	6.7	7.0
3	LSC Comp	6.3	6.1	6.4	6.5	7.0
4	Coho	6.3	6.5	6.5	6.0	7.7
5	FGL Comp	6.3	5.5	6.4	7.1	8.0
6	PYR Comp	6.2	5.9	6.2	6.7	7.3
7	DSC Comp	6.2	5.8	6.0	6.6	7.3
8	Piranha	6.1	6.3	5.7	6.4	7.5
9	777	5.6	5.7	5.0	6.2	5.8
10	Proclamation	5.6	5.4	5.2	6.1	6.2
11	PDM Comp	5.5	5.7	5.7	5.0	6.8
12	Barracuda	5.5	5.8	5.3	5.3	6.3
13	TLP Comp	5.5	5.4	5.4	5.6	5.7
14	Pin-Up	5.3	5.7	4.5	5.8	4.7
15	Declaration	5.1	5.1	5.7	4.5	7.2
16	OO7	5.1	5.5	4.7	4.9	4.7
17	Luminary	4.9	5.2	4.5	5.1	5.5
18	Authority	4.9	4.8	4.8	5.1	5.0
19	Pin-Up 2	4.8	5.1	4.0	5.3	4.8
20	Shark	4.8	4.9	4.0	5.3	3.8
21	PST-Syn-0ERP	4.6	4.7	4.6	4.4	4.5
22	Memorial	4.5	4.6	4.5	4.5	5.3
23	PST-R0PS	4.5	4.8	4.4	4.2	5.0
24	13M	4.4	4.7	4.4	4.3	6.5
25	Pureformance	4.3	5.1	3.4	4.3	4.2
26	King Pin	4.2	4.5	4.1	4.0	5.8
27	Pure Distinction	4.1	4.4	3.8	4.1	3.5
28	T-1	4.0	4.8	3.4	3.7	4.8
29	V-8	4.0	4.5	3.7	3.8	4.3
30	Pure Select	4.0	4.4	3.6	3.9	4.7
31	Benchmark DSR	3.9	3.7	4.2	3.6	4.5
32	A-1/A-4	3.9	4.1	3.9	3.6	4.5
33	AP-18	3.8	3.4	3.9	4.1	5.5
34	PST-Syn-0CBX	3.8	3.7	3.8	3.9	4.7
35	Crystal BlueLinks	3.7	4.2	3.6	3.3	5.3

(Continued)

Table 5. Creeping and colonial bentgrass fairway trial, 2014 (continued).

	Cultivar or Selection	Turf Quality[1] 2015-2017 Avg.	Turf Quality[1] 2015 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Dollar Spot[2] 2017
	CREEPING BENTGRASS (continued)					
36	PST-0RBS	3.6	4.4	3.1	3.3	3.7
37	Independence	3.6	4.5	3.2	3.1	2.3
38	L-93	3.4	3.4	3.6	3.2	4.5
39	PC2.0	3.3	4.5	2.7	2.7	2.8
40	Alpha	3.2	4.0	2.7	3.0	3.8
41	Crenshaw	3.0	3.3	2.7	3.0	2.7
42	Penncross	2.9	2.8	2.7	3.2	5.0
43	Penn A-4	2.8	2.8	2.6	2.9	3.7
44	Southshore	2.5	2.9	2.3	2.4	4.0
	COLONIAL BENTGRASS					
1	WLC Comp	6.9	6.2	7.0	7.4	5.8
2	WEC Comp	6.6	5.8	7.1	6.9	6.7
3	DML	6.2	5.8	6.0	6.9	5.5
4	WMC Comp	6.2	5.8	6.4	6.2	5.8
5	Capri	5.8	5.5	6.0	5.8	6.0
6	Musket	5.7	5.5	5.5	6.0	6.2
7	FT12	5.5	5.5	5.7	5.3	6.2
8	Puritan	5.3	5.7	5.0	5.3	3.0
9	SR 7100	5.0	3.8	7.5	3.6	3.7
10	PST-Syn-9DR5	4.4	4.5	4.6	4.1	5.3
11	PST-9FR10 Bulk	4.3	4.1	4.8	4.0	5.0
12	Tiger 2	4.2	4.8	4.0	3.7	3.7
13	PST-9HID Bulk	4.1	4.1	4.2	4.0	4.3
14	SR 7150	4.1	3.3	4.7	4.2	4.3
15	Glory	3.8	4.0	4.2	3.4	3.3
16	PST-Syn-9EFR	3.8	3.6	4.3	3.5	4.8
17	Alister	3.4	2.5	3.5	4.2	4.2
	LSD at 5% =	0.9	0.9	1.6	1.3	1.3

[1]9 = best turf quality
[2]9 = least disease; data is an average of two rating dates

Table 6. Performance of creeping and colonial bentgrass cultivars and selections in a putting green trial seeded in September 2015 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2016-2017 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Spring Green-up[2] April 2017	Dollar Spot[3] 2017
	CREEPING BENTGRASS					
1	MMM Comp	6.4	6.4	6.5	7.0	7.8
2	Piranha	6.0	6.3	5.6	6.3	5.8
3	Chinook	5.9	6.0	5.8	7.3	6.5
4	WFC Comp	5.8	5.5	6.1	8.0	6.9
5	MSP Comp	5.8	6.0	5.6	7.3	6.6
6	LNS	5.8	6.2	5.3	6.7	5.4
7	CBP Comp	5.7	6.0	5.4	6.7	5.1
8	Pin Up	5.4	5.6	5.1	6.3	4.1
9	TourPro	5.2	5.3	5.2	6.3	5.9
10	MGC Comp	5.2	6.1	4.3	5.0	4.6
11	MFC Comp	5.2	4.9	5.4	6.7	6.9
12	Barracuda	5.1	5.4	4.8	4.3	5.0
13	PST-Syn-R0PR	4.9	5.6	4.2	3.7	2.6
14	LFW Comp	4.8	4.7	5.0	6.3	6.3
15	Shark	4.8	5.1	4.4	5.3	3.4
16	PST-R0PS	4.8	5.8	3.8	6.0	1.7
17	Centercut 2	4.7	5.0	4.4	6.0	4.9
18	Luminary	4.6	4.9	4.2	7.0	3.9
19	EBC Comp	4.6	4.6	4.5	5.7	6.1
20	Pure Distinction	4.5	5.0	4.0	5.3	2.8
21	PC2.0	4.3	4.7	3.9	5.7	3.3
22	Pure Select	4.1	4.8	3.5	5.0	2.4
23	Centercut 3	4.1	4.5	3.8	5.0	6.2
24	PST-0RBS	4.0	4.3	3.8	4.0	3.2
25	Memorial	3.9	4.3	3.6	4.3	7.5
26	Penn A-1	3.7	3.7	3.7	3.3	4.0
27	Crystal BlueLinks	3.7	3.8	3.5	4.0	6.5
28	Centercut	3.6	4.0	3.2	5.7	7.1
29	Kingpin	3.5	3.5	3.5	5.7	5.9
30	13M	3.5	3.9	3.1	4.7	7.1

(Continued)

Table 6. Creeping and colonial bentgrass putting green trial, 2015 (continued).

	Cultivar or Selection	Turf Quality[1] 2016-2017 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Spring Green-up[2] April 2017	Dollar Spot[3] 2017
	COLONIAL BENTGRASS					
1	EDC Comp	6.0	5.6	6.4	7.3	8.7
2	Puritan	6.0	6.1	5.8	7.0	8.6
3	AT 12 B	5.9	5.6	6.2	6.0	9.0
4	ELC Comp	5.7	5.9	5.6	7.3	8.5
5	MDF Comp	5.6	5.2	6.1	6.7	8.7
6	SHC Comp	5.6	5.2	6.0	7.7	8.6
7	ECS Comp	5.5	5.6	5.3	6.0	8.4
8	DDS Comp	5.4	5.3	5.5	7.0	8.7
9	AT 10	5.3	5.6	4.9	4.7	8.7
10	HLT Comp	5.2	5.0	5.3	6.3	8.7
11	AT 14	5.2	5.6	4.7	4.0	5.4
12	BPT Comp	5.0	4.5	5.5	5.7	8.9
13	LSF Comp	4.9	5.0	4.8	5.3	8.9
14	Arrowtown	4.2	4.2	4.2	7.3	7.1
15	Greentime	4.1	4.7	3.5	3.0	8.6
16	Aberroyal	2.7	3.3	2.1	3.3	8.4
17	SR 7100	2.5	2.6	2.5	2.7	8.2
18	SR 7150	1.6	1.3	2.0	2.0	7.9
	LSD at 5% =	0.9	1.0	1.4	1.9	1.1

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease; data is an average of three rating dates

Table 7. Performance of velvet bentgrass cultivars and selections in a putting green trial seeded in September 2015 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2016-2017 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Spring Green-up[2] April 2017	Red Leaf Spot[3] July 2017	Copper Spot[3] Aug. 2017	Dollar Spot[4] 2017
1	LVP Comp	6.6	6.6	6.6	7.0	8.7	7.7	7.0
2	EVP Comp	6.1	6.2	6.2	4.3	8.3	7.0	8.3
3	CCV Comp	5.9	6.1	5.9	4.7	8.7	6.3	7.3
4	SFV Comp	5.9	6.2	5.5	4.3	6.3	4.3	5.0
5	WBV Comp	5.8	6.0	5.6	4.3	8.7	4.7	6.7
6	LCT Comp	5.7	5.7	5.8	3.7	8.7	7.0	7.8
7	EVU Comp	5.5	5.2	5.8	5.0	8.7	3.3	8.0
8	WSE Comp	4.9	4.4	5.4	5.3	8.7	7.3	8.0
9	Villa	3.5	3.2	3.8	6.7	7.0	2.0	6.8
10	PST-VR01	3.0	2.9	3.3	5.3	7.3	6.0	6.0
11	SR 7200	2.1	2.0	2.3	4.3	6.3	4.0	6.3
	LSD at 5% =	0.9	1.0	1.0	1.9	1.8	1.2	1.1

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease
[4]9 = least disease; data is an average of two rating dates

Table 8. Performance of creeping and colonial bentgrass cultivars and selections in a fairway trial seeded in September 2015 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2016-2017 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Brown Patch[2] June 2017	Dollar Spot[2] Aug. 2017
	CREEPING BENTGRASS					
1	MMM Comp	6.8	6.4	7.1	8.3	7.7
2	LNS	6.7	6.4	7.0	8.3	6.3
3	MGC Comp	6.7	6.2	7.2	8.3	6.3
4	MSP Comp	6.6	6.2	7.0	8.3	7.0
5	LFW Comp	6.5	6.6	6.3	8.3	4.7
6	WFC Comp	6.4	6.0	6.9	7.7	6.3
7	Piranha	6.4	6.4	6.5	8.0	5.3
8	MFC Comp	6.3	5.9	6.6	8.0	5.7
9	Chinook	6.1	5.8	6.5	8.3	5.3
10	TourPro	6.1	5.9	6.3	8.3	5.3
11	CBP Comp	5.6	5.3	5.8	7.0	4.7
12	EBC Comp	5.1	4.7	5.6	7.3	4.7
13	Pin Up	4.8	4.6	4.9	7.0	4.7
14	Barracuda	4.6	4.6	4.7	8.3	4.0
15	Pure Distinction	4.2	4.3	4.1	6.3	3.0
16	PST-R0PS	4.1	4.5	3.7	7.7	4.0
17	Shark	4.0	4.2	3.8	7.3	4.0
18	Pure Select	3.8	3.8	3.9	7.0	3.7
19	PST-0RBS	3.7	3.9	3.6	7.3	2.7
20	PST-Syn-R0PR	3.7	3.6	3.8	8.3	2.7
21	Penn A-1	3.6	3.7	3.5	7.3	2.7
22	Crystal BlueLinks	3.5	3.7	3.3	6.0	4.0
23	PC2.0	3.4	3.8	3.0	7.0	2.3
24	Kingpin	2.9	2.6	3.1	6.3	4.7
	COLONIAL BENTGRASS					
1	HLT Comp	6.0	6.0	6.1	4.3	6.7
2	ECS Comp	6.0	6.5	5.6	6.7	7.7
3	SHC Comp	6.0	5.8	6.1	6.0	5.7
4	EDC Comp	5.9	6.5	5.3	7.0	7.0
5	DDS Comp	5.8	5.9	5.8	5.7	7.0
6	MDF Comp	5.8	6.1	5.4	6.0	6.3
7	BPT Comp	5.6	5.8	5.4	4.7	6.0
8	DML	5.5	5.6	5.4	6.7	6.3
9	LSF Comp	5.3	5.3	5.3	5.3	7.7
10	Capri	5.2	5.0	5.4	5.3	5.3

(Continued)

Table 8. Creeping and colonial bentgrass fairway trial, 2015 (continued).

	Cultivar or Selection	Turf Quality[1] 2016-2017 Avg.	Turf Quality[1] 2016 Avg.	Turf Quality[1] 2017 Avg.	Brown Patch[2] June 2017	Dollar Spot[2] Aug. 2017
	COLONIAL BENTGRASS (continued)					
11	Heritage	5.2	5.4	5.0	5.3	6.0
12	ELC Comp	5.1	5.3	4.8	5.0	7.0
13	Musket	4.9	5.5	4.3	6.3	6.0
14	FT12	4.7	4.8	4.5	4.3	7.0
15	Tiger 2	3.3	3.4	3.4	4.0	4.7
16	Glory	3.3	3.3	3.2	3.7	3.7
	LSD at 5% =	0.8	1.0	1.0	1.8	1.7

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

Table 9. Performance of creeping and velvet bentgrass cultivars and selections in a putting green trial seeded in September 2016 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2017	Turf Establishment[2] Sept. 2016	Spring Green-up[3] March 2017	Brown Patch[4] July 2017	Anthracnose[4] Sept. 2017	Dollar Spot[5] 2017
	CREEPING BENTGRASS						
1	MGH Comp	7.9	5.7	8.0	7.7	9.0	7.5
2	LSG Comp	7.2	5.0	6.0	7.0	8.7	6.7
3	PLC Comp	7.1	4.7	6.0	7.3	9.0	5.4
4	MGS Comp	7.0	6.3	6.0	8.7	8.7	6.1
5	DSF Comp	6.9	4.7	5.7	7.3	9.0	6.8
6	LFC Comp	6.8	4.3	5.7	7.7	8.3	6.5
7	Coho	6.8	5.0	5.7	7.0	9.0	7.6
8	Piranha	6.7	4.3	5.7	7.0	8.0	6.8
9	EFB Comp	6.6	4.7	4.7	7.0	8.7	7.2
10	L-93XD	6.6	5.0	5.3	7.3	7.3	6.1
11	LNS	6.4	6.0	5.3	7.0	8.3	6.2
12	Chinook	6.2	4.3	4.7	7.3	8.7	6.9
13	Pure Distinction	6.1	4.7	5.3	7.0	7.3	4.7
14	Pin Up 2	5.8	5.0	6.0	4.7	6.3	6.4
15	TourPro	5.5	5.7	5.0	6.0	4.7	6.8
16	Luminary	5.4	6.3	6.0	7.0	6.3	5.6
17	All Pro Fwy Blend X	5.4	5.3	5.7	5.0	5.3	6.5
18	Barracuda	5.4	6.0	6.3	3.7	5.7	6.2
19	Pure Select	5.3	6.0	3.3	5.3	5.3	5.7
20	Declaration	5.1	5.0	5.0	4.7	3.3	8.0

(Continued)

Table 9. Creeping and velvet bentgrass putting green trial, 2016 (continued).

	Cultivar or Selection	Turf Quality[1] 2017	Turf Establishment[2] Sept. 2016	Spring Green-up[3] March 2017	Brown Patch[4] July 2017	Anthracnose[4] Sept. 2017	Dollar Spot[5] 2017
	CREEPING BENTGRASS (continued)						
21	Independence	5.0	6.3	5.3	6.3	5.3	4.4
22	Proclamation	4.7	6.3	4.3	3.7	4.3	6.1
23	Shark	4.6	5.3	5.7	5.0	4.3	6.1
24	Center Cut 2	4.6	6.0	5.7	4.0	4.7	7.2
25	Pin Up	4.4	5.0	4.0	4.0	4.0	5.8
26	PC2.0	4.4	5.3	6.7	4.7	7.0	3.9
27	Benchmark DSR	4.1	4.3	5.3	4.0	3.7	6.0
28	Penn A-1	3.5	4.7	3.3	2.3	3.3	5.8
29	Center Cut 3	3.4	7.0	5.7	3.7	2.3	7.0
30	Memorial	3.3	4.7	5.7	2.3	1.3	8.4
31	T-1	3.3	5.0	3.3	2.3	1.7	5.1
32	Crystal BlueLinks	3.1	6.7	4.7	3.0	2.3	6.2
33	13M	3.0	6.0	6.7	1.7	1.7	7.9
34	V8	3.0	6.3	4.7	3.0	3.0	6.6
35	Century	2.9	5.7	5.0	3.3	2.7	3.2
36	Kingpin	2.8	4.3	3.7	3.3	1.7	7.3
37	Center Cut	2.8	7.3	5.7	2.3	1.3	8.1
38	Alpha	2.5	5.0	3.7	2.3	1.7	5.0
39	Putter	2.5	6.3	4.0	3.0	1.0	5.2
40	L-93	2.2	5.0	4.3	2.7	2.0	6.8
41	Penn A-4	2.0	2.3	4.0	2.0	1.7	5.0
42	Southshore	1.6	5.7	3.7	1.3	1.3	5.3
43	Penncross	1.1	7.0	3.0	1.0	1.0	6.7

(Continued)

Table 9. Creeping and velvet bentgrass putting green trial, 2016 (continued).

	Cultivar or Selection	Turf Quality[1] 2017	Turf Establishment[2] Sept. 2016	Spring Green-up[3] March 2017	Brown Patch[4] July 2017	Anthracnose[4] Sept. 2017	Dollar Spot[5] 2017
				VELVET BENTGRASS			
1	SCL Comp	7.0	4.7	4.3	8.7	9.0	7.9
2	SSL Comp	6.9	3.3	5.0	7.7	9.0	8.1
3	SCE Comp	6.6	5.7	3.7	7.7	9.0	8.4
4	SCM Comp	6.6	4.7	4.0	8.0	9.0	8.4
5	MLC Comp	6.4	4.7	4.3	7.7	9.0	8.3
6	Legendary	4.3	6.7	3.7	5.7	9.0	7.8
7	Greenwich	3.9	6.7	3.3	5.3	9.0	8.6
8	Villa	3.1	6.7	3.3	4.7	9.0	8.6
9	SR 7200	1.5	1.0	4.0	4.7	9.0	8.2
	LSD at 5% =	1.0	1.5	1.8	1.9	1.4	1.4

[1]9 = best turf quality
[2]9 = earliest establishment
[3]9 = earliest spring green-up
[4]9 = least disease
[5]9 = least disease; data is an average of two rating dates

Table 10. Performance of creeping and colonial bentgrass cultivars and selections in a fairway trial seeded in September 2016 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2017	Turf Establishment[2] Sept. 2016	Anthracnose[3] Sept. 2017	Dollar Spot[4] 2017	Brown Patch[5] 2017
	CREEPING BENTGRASS					
1	MMM Comp	6.8	6.4	7.1	8.3	7.7
1	MGH Comp	7.8	5.0	8.7	7.3	8.3
2	DSF Comp	7.3	4.7	8.7	7.7	8.0
3	MGS Comp	7.2	5.3	8.3	7.6	7.5
4	TourPro	6.8	5.7	7.3	8.0	6.2
5	LNS	6.8	5.7	7.3	7.8	7.0
6	PLC Comp	6.8	4.3	8.0	7.6	7.5
7	LSG Comp	6.8	4.3	8.0	7.5	6.2
8	LFC Comp	6.7	5.0	5.3	8.2	6.3
9	777	6.7	5.7	5.7	7.0	6.5
10	EFB Comp	6.5	4.7	7.3	8.4	7.3
11	Chinook	6.5	5.3	6.3	8.1	6.3
12	L-93XD	6.3	5.0	6.0	7.8	7.7
13	Coho	6.3	5.0	6.0	7.6	5.5
14	Piranha	6.0	4.0	5.7	7.5	6.5
15	Pure Distinction	5.9	3.3	7.3	7.0	6.7
16	All Pro Fwy Blend X	5.7	6.0	5.0	7.7	5.7
17	Barracuda	5.7	5.7	5.3	7.3	6.0
18	Pin Up	5.3	6.3	3.7	7.3	6.3
19	Declaration	5.2	5.7	2.0	8.6	5.5
20	Pure Select	5.2	5.0	3.0	7.2	6.5
21	Luminary	5.1	5.3	5.3	7.0	6.0
22	OO7	4.9	5.7	2.0	8.2	4.3
23	Shark	4.9	5.0	7.3	7.1	5.8
24	Focus	4.7	5.7	4.7	8.0	4.8
25	PC2.0	4.7	4.7	5.0	7.1	4.0
26	Proclamation	4.4	4.7	3.7	7.2	5.7
27	Penn A-1	4.4	4.7	4.7	7.1	4.8
28	Crystal BlueLinks	4.1	5.0	2.0	6.8	4.8
29	Independence	4.1	4.0	3.0	7.2	5.8
30	Alpha	3.7	5.0	1.3	6.8	3.3
31	13M	3.4	6.3	1.0	8.1	2.8
32	Century	3.4	4.3	2.7	6.1	3.8
33	V8	3.3	5.0	2.3	7.7	3.0
34	Memorial	3.2	4.7	1.0	8.3	3.2
35	Putter	3.1	4.7	1.7	6.3	3.2

(Continued)

Table 10. Creeping and colonial bentgrass fairway trial, 2016 (continued).

	Cultivar or Selection	Turf Quality[1] 2017	Turf Establishment[2] Sept. 2016	Anthracnose[3] Sept. 2017	Dollar Spot[4] 2017	Brown Patch[5] 2017
	CREEPING BENTGRASS (continued)					
36	Kingpin	3.1	5.3	1.3	7.9	4.8
37	T-1	3.0	4.3	1.0	7.3	3.5
38	Benchmark DSR	2.9	3.3	2.0	7.4	3.7
39	L-93	2.9	4.3	1.3	7.6	3.0
40	Southshore	2.8	4.7	2.7	6.7	4.3
41	Penncross	2.8	4.0	1.3	6.1	5.5
42	Penn A-4	1.9	1.3	4.7	6.5	3.3
	COLONIAL BENTGRASS					
1	CCD Comp	7.0	4.7	.	7.3	6.5
2	DHS Comp	6.5	4.7	.	6.3	5.4
3	LCC Comp	6.4	4.3	.	7.3	6.4
4	SFC Comp	6.3	4.3	.	6.7	5.7
5	MTC Comp	6.0	5.3	.	6.3	5.5
6	FDH Comp	6.0	2.0	.	6.0	6.8
7	PDM Comp	5.9	4.3	.	6.7	5.1
8	DEC Comp	5.9	5.0	.	6.3	5.3
9	Musket	5.8	7.3	.	6.7	5.2
10	LMF Comp	5.6	3.0	.	7.0	5.9
11	FT12	5.4	4.7	.	6.3	6.2
12	Heritage	5.3	4.0	.	5.7	5.8
13	Puritan	5.1	7.3	.	4.3	5.0
14	Capri	4.8	5.0	.	6.3	4.7
15	Glory	3.7	5.7	.	5.3	4.2
16	Tiger 2	3.4	5.3	.	6.3	4.0
17	SR 7150	1.5	1.0	.	5.7	6.3
	LSD at 5% =	0.9	1.2	2.3	1.5	2.0

[1]9 = best turf quality
[2]9 = earliest establishment
[3]9 = least disease; disease assessed only for creeping bentgrass entries
[4]9 = least disease; data is an average of two rating dates
[5]9 = least disease; data is an average of three rating dates for colonial bentgrass and two ratings for creeping bentgrass

Table 11. Maintenance practices performed in 2017 on bentgrass trials at North Brunswick, NJ.

Table	Test	Fertility[1]	Mowing Height (inches)	Cultivation/Top Dress	Fungicides	Insecticides	Herbicides
1	2013 Greens	2.8 N; 0.4 lb P_2O_5; 0.4 lb K_2O	0.110	May to Aug.–topdressed May–Bayonet aeration June to Aug.–Tricure AD (wetting agent)	None	July–Talstar P (sod webworm)	None
2	2014 Greens (NTEP)	6.7 N; 1.1 lb P_2O_5; 4 lb K_2O	0.110	April to Nov.–topdressed May to Sept., Nov.–Tricure AD (wetting agent)	May–Heritage TL + Torque June–Torque + ProStar 70WDG Aug.–Daconil Ultrex + Signature; Heritage TL Sept.–Banner MAXX; Daconil Ultrex + Signature; Briskway; Segway Nov.–Tartan + Interface	July–Talstar P (sod webworm)	April, June to Sept.–QuickSilver (moss)

(Continued)

Table 11. Bentgrass maintenance practices, 2017 (continued).

Table	Test	Fertility[1]	Mowing Height (inches)	Cultivation/Top Dress	Fungicides	Insecticides	Herbicides
3	2014 Fairway (NTEP)	2.0 N; 0 lb P_2O_5; 0.335 lb K_2O	0.375	None	June–Heritage TL; Curalan; Emerald + Heritage TL July–Curalan; Daconil Ultrex; Curalan + Heritage TL Aug.–Daconil Ultrex + Signature; Curalan + Heritage TL Nov.–Tartan + Interface	July–Talstar P (sod webworm)	April–Bensumec 4FL (pre-emergence) Aug.–Speed Zone (post-emergence)
4	2014 Greens	3.3 N; 8 fl oz Micrel Total 5-0-0; 0.6 lb P_2O_5; 0.6 lb K_2O; 4 fl oz Harrell's MAX Minors; 3 fl oz Magnesium 4%	0.110	May to Oct.–topdressed June to Aug., Nov.–Tricure AD (wetting agent)	None	July–Talstar P (sod webworm)	None
5	2014 Fairway	2.2 N; 0 lb P_2O_5; 0.4 lb K_2O	0.375	June–Tricure AD (wetting agent)	July–Daconil Ultrex Aug.–Emerald	July–Talstar P (sod webworm)	April–Bensumec 4FL (pre-emergence) Aug.–Speed Zone (clover)

(Continued)

Table 11. Bentgrass maintenance practices, 2017 (continued).

Table	Test	Fertility[1]	Mowing Height (inches)	Cultivation/Top Dress	Fungicides	Insecticides	Herbicides
6	2015 Greens	5.4 N; 8 fl oz Micrel Total 5-0-0; 1.09 lb P_2O_5; 2.9 lb K_2O	0.110	April to Sept., Nov–top-dressed May, Aug. Nov.–Tricure AD (wetting agent)	May–Daconil Ultrex Aug.–Emerald Sept.–Curalan	July–Talstar P (sod webworm)	June to Sept.–QuickSilver (moss)
7	2015 Velvet Greens	2.9 N; 0.76 lb P_2O_5; 1.1 lb K_2O	0.110	May to Sept., Nov.–top-dressed June, July, Nov.–Tricure AD (wetting agent) Nov.–aeration	None	July–Talstar P (sod webworm)	None
8	2015 Fairway	1.7 N; 0 lb P_2O_5; 0.23 lb K_2O	0.375	June–Tricure AD (wetting agent)	Aug.–ProStar 70WDG Sept.–Curalan	July–Talstar P (sod webworm)	April–Bensumec 4FL (pre-emergence) Aug.–Speed Zone (clover)
9	2016 Greens	2.9 (N); 4 fl oz Micrel Total 5-0-0; 0.74 lb P_2O_5; 0.7 lb K_2O; 4 fl oz Harrell's MAX Minors; 3 fl oz Magnesium 4%	0.110	May to Sept., Nov.–top dressed June, July, Nov.–Tricure AD (wetting agent) July–scarification	Aug.–ProStar 70WDG Oct.–Bayleton Flo	July–Talstar P (sod webworm)	None

(Continued)

Table 11. Bentgrass maintenance practices, 2017 (continued).

Table	Test	Fertility[1]	Mowing Height (inches)	Cultivation/Top Dress	Fungicides	Insecticides	Herbicides
10	2016 Fairway	2.6 N; 0 lb P_2O_5; 0.3 lb K_2O	0.375	June–Tricure AD (wetting agent)	Aug.–ProStar 70WDG	July–Talstar P (sod webworm)	None

[1]Annual nitrogen applied (lb/1000 ft^2). Additional fertilizers as noted (per 1000 ft^2)