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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 proceedings 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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PERFORMANCE OF BENTGRASS CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS, 2020

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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. There are three bentgrass species predominantly used for turf including creeping bentgrass (*Agrostis palustris* Huds.; synonym = *A. stolonifera* L.), colonial bentgrass (*A. tenuis* L. or *A. capillaris* L.), and velvet bentgrass (*A. canina* L.). Additionally, highland or dryland bentgrass (*A. castellana* Boiss. & Reut.) can be options for turf in stressful areas but tend to be less attractive than the more common species when a high quality turf is needed and therefore less commonly utilized. Due to their aggressive growth habits 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 U.S. Colonial bentgrass responds best to a slightly higher height of cut, therefore it is 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 U.S., 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 'Pennncross,' the first seeded synthetic variety of creeping bentgrass (Musser, 1959). Since that time, breeding efforts have markedly improved creeping bentgrasses to withstand the increasing demands of the game of golf including the need for better turf quality, darker green color,

improved shoot density, improved traffic tolerance and recuperative ability, as well as increased disease and stress tolerances compared to older varieties. Creeping bentgrasses are susceptible to a number of pathogens and pests. Dollar spot, caused by the fungus *Clarireedia jacksonii* (C. Salgado, L.A. Beirn, B.B. Clarke, & J.A. Crouch sp. nov.), is one of the main disease problems of close-cut creeping bentgrass. However, they can also be susceptible to brown patch (*Rhizoctonia solani*), copper spot (*Gloeocercospora sorghi*), anthracnose (*Colletotrichum cereale*), and *Pythium* spp.

Colonial bentgrass, also referred to as brown-top, 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. Colonial bentgrasses have a finer leaf texture and a more upright and less aggressive spreading growth habit than creeping bentgrass. Colonial bentgrass is generally better adapted for fairway or tee use in the warmer summer climates of the northern U.S. Colonial bentgrasses perform best in New Jersey when mowed no lower than 3/8 of an inch. Compared to creeping bentgrass, colonial bentgrass typically has a brighter green color and better color retention during cool weather. Colonial bentgrasses generally have better dollar spot resistance and better wear tolerance than creeping bentgrass. However, colonial bentgrass is much more susceptible to brown patch disease (caused by the fungus *Rhizoctonia solani* Kuhn) and does not spread through stolons. While not lethal, the playability of golf courses may be affected if brown patch is not controlled on colonial bentgrass. Current breeding efforts include improving tolerance of colonial bentgrasses to this disease and improved quality under fairway conditions.

Velvet bentgrass forms the finest-textured and densest turf of the bentgrasses and can nearly

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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 therefore become problematic if not maintained properly. Years of mismanagement and the subsequent poor turf quality has given velvet bentgrass a bad name, but research has shown that when managed properly, velvet bentgrass can create a superior turf (Brilman and Meyer, 2000). Velvet bentgrass can also be susceptible to red thread (*Laetisaria fuciformis* (McAlpine) Burdsall) and copper spot (*Gloeocercospora sorghi* Bain & Edgerton ex Deighton) diseases, but generally has good resistance to dollar spot and brown patch diseases. Seedlings of velvet bentgrasses are susceptible to *Pythium* (*Pythium* spp.) seedling root rot during establishment.

During colder weather, velvet bentgrass will turn a dark purple color and 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 U.S., as long as proper cultural management inputs are implemented. Some of the major breeding objectives for velvet bentgrass include copper spot resistance, *Pythium* resistance, and 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 other 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 2016 (Tables 1, and 2), 2017 (Tables 3 and 4), 2018 (Tables 5, 6, and 7), and 2019 (Tables 8 and 9). Trials were established on a modified Nixon loam. Plot size was 3 x 5 ft for all trials. Plots were hand-seeded at a rate of approximately 1.0 lb/1000 ft². 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 10. 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 50-80% 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 9), establishment (Tables 8 and 9), turf winter color (Tables 3 and 5), and disease were rated on a 1 to 9 scale, where 9 represented the most desirable turf characteristic. Disease ratings included dollar spot (Tables 1, 3, 5, and 7), brown patch (Tables 5 and 9), and copper spot (Tables 4 and 6). 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 7 are ranked according to their overall multi-year quality average. Tables 8 and 9 are ranked by the average turf quality for 2020 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, 3, 5, and 8), 007XL, 777, Match Play, Chinook, Coho, 007XL, and the experimental selections MGS Comp, DSF Comp, GMM Comp, EGC Comp, LES Comp, MCL Comp, and PST-Syn-oHR all performed very well, while Penncross, Southshore, SR 1119, and Putter were consistently among the poorest performers. At fairway height (Tables 2, 7, and 9), Chinook, Coho, TourPro, 007XL, Piranha and the experimental selections DSF Comp, LFC Comp, POR Comp, PPD Comp, GES Comp, LES Comp, and MCL Comp had excellent turf quality while some of the lowest scoring cultivars at fairway height were Penncross, Southshore, Penn A-4, Mariner, L-93, V8, and SR 1119.

Overall turf quality for velvet bentgrasses was evaluated in 2017 and 2018 trials (Tables 4 and 6) under greens height of cut. In those trials, the selections that exhibited acceptable turf quality were experimental entries such as DEM Comp, CMV Comp, DSM Comp, LSV Comp, FDK Comp, and VCE Comp. These experimental selections outperformed named cultivars such as SR 7200, Villa, and Legendary that displayed poor quality in these trials.

As mentioned previously, colonial bentgrasses perform better at fairway cutting height and typically have poorer performance under putting green conditions. Nevertheless, in the 2017 putting green trial (Table 3), there were several colonial entries that performed favorably to many creeping bentgrasses, exhibiting excellent turf quality at greens height including Musket, EFC Comp, EUC Comp, and SLC Comp. Under fairway conditions however (Tables 2, 7, and 9), experimental selections such as PST-9BP, PPG-AT 106, AT 12M2, LCC Comp, CCD Comp, DHS Comp, SLM Comp, WML Comp, MEM Comp, PCL Comp, and ECT Comp were the best performing colonial bentgrasses, while Tiger 2, SR 7150, Glory, and Highland generally exhibited the poorest performance under fairway cutting heights when included in trials.

Dollar Spot Disease

Clariireedia jacksonii, the causal agent of this widespread turfgrass disease, causes silver-dollar shaped spots of dead turf which can converge causing larger damaged areas (Salgado-Salazar et al., 2018). 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 fungus' prevalence. Also becoming more prevalent is the pathogen's resistance to fungicides, particularly DMI fungicides (Smiley et al., 2005). Additionally, 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 bentgrass, however the results from recent trials (Tables 1, 2, 3, 4, 5, 6, and 7) indicate that significant improvements in creeping bentgrass have been made, and some creeping bentgrasses may perform comparably to colonial bentgrasses, as seen in Tables 2, 3, 5, 6, and 7. More recent cultivars such as Coho, TourPro, L93-XD, Piranha, 007XL and Chinook offer strong tolerance to dollar spot that is comparable or surpassing that of older cultivars like Declaration, V-8, and Memorial. Recent experimental entries such as MGS Comp, DSF Comp, LSG Comp, GMM Comp and MMM Comp all show improved tolerance to this disease, while Alpha, Ninety-Six Two, Southshore, Pure Distinction, Mariner, PST-0RBS, and SR 1119 were very susceptible to dollar spot disease.

Brown Patch Disease

Velvet bentgrass typically exhibits the greatest tolerance to brown patch disease (*Rhizoctonia solani*) 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 5 and 9. In 2020, creeping bentgrasses displayed varying levels of acceptable tolerance to this disease. At greens height (Table 5), few significant differences among the creeping bentgrasses were observed, in which new experimental entries TFT Comp, TGT Comp, AGT Comp, MCL Comp, PST-Syn-0HR, PST-R0DS19 and RH93 exhibited high brown patch tolerance while Focus, Cobra 2, CY-2, and AU Victory exhibited less than acceptable brown patch disease levels compared to

other creeping bentgrass cultivars. At fairway height (Table 9) nearly all creeping bentgrass entries exhibited acceptable brown patch tolerance, with the exception of PC2.0. Cultivars Piranha and Luminary, and the experimental selections MCL Comp, GES Comp, LES Comp, AGS Comp, PST-R0DS19, PSY-Syn-0HR, PST-Syn-0CC provided exemplary brown tolerance.

Over the past few years, a significant amount of research has been spent on improving brown patch resistance in colonial bentgrass. In the 2019 fairway trial (Table 9), enhanced disease tolerance is evident. The cultivar Puritan, and the experimental selections PCC Comp, CLS Comp, and PST-9BP exhibited significantly improved brown patch resistance over older entries such as Capri, Musket, and Tiger 2.

Copper Spot Disease

This disease is becoming an increasing concern in the Northeast during the summer due to the warm wet conditions when limited DMI (De-Methylation Inhibitors) fungicides are used. The causal agent of this disease, *Gloeocercospora sorghi*, is a fungus that produces 1-3 inch, salmon-copper colored patches on the turf (Smiley et al., 2005). Currently, one of the major drawbacks in the use of velvet bentgrass continues to be the high susceptibility to copper spot disease. Therefore, selection of velvet bentgrass for resistance to copper spot is a major goal of the Rutgers Turfgrass Breeding Program. During the 2020 growing season, copper spot disease was assessed on the 2017 and 2018 velvet greens trials (Tables 4 and 6). When differences within the velvet bentgrass selections were evident VCE Comp, FDV Comp, CMV Comp, DEM Comp, and DMD Comp stood out as highly tolerant to disease when compared to cultivars such as Villa, Legendary, and Greenwich which were consistently susceptible.

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Table 1. Performance of creeping and velvet bentgrass cultivars in a putting green trial established in September 2016 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----					Dollar Spot ²
	2017-20	2017	2018	2019	2020	Jul. 2020
CREEPING BENTGRASS						
1 007XL	7.3	7.9	6.7	7.5	7.0	7.0
2 MGS Comp	7.0	7.0	7.2	7.3	6.7	6.7
3 DSF Comp	6.9	6.9	6.5	7.9	6.5	7.7
4 EFB Comp	6.8	6.6	6.8	7.5	6.1	6.3
5 LSG Comp	6.7	7.2	7.1	6.8	5.7	8.0
6 LFC Comp	6.6	6.9	6.1	6.9	6.5	6.7
7 Piranha	6.4	6.7	6.3	6.5	6.0	6.3
8 Match Play	6.4	6.4	6.7	6.4	5.9	6.0
9 Coho	6.3	6.8	6.7	6.3	5.3	6.3
10 777	6.2	6.6	6.4	5.8	5.8	4.7
11 Chinook	6.0	6.2	6.1	6.2	5.6	6.7
12 PLC Comp	5.9	7.1	5.7	6.1	4.8	7.0
13 Macdonald	5.8	6.5	5.2	6.3	5.3	5.7
14 L-93XD	5.8	6.6	5.4	5.9	5.1	5.7
15 Pin Up 2	5.7	5.8	5.7	5.7	5.4	6.3
16 TourPro	5.5	5.5	5.1	5.8	5.4	6.3
17 All Pro Fwy Blend X	5.2	5.4	5.3	5.3	5.0	4.7
18 Pure Distinction	5.2	6.1	4.7	4.4	5.7	4.0
19 Luminary	5.2	5.4	5.0	5.2	5.2	4.7
20 RH 93	5.1	5.3	5.1	5.0	5.0	4.3
21 Barracuda	5.0	5.4	5.1	5.0	4.7	6.0
22 Declaration	5.0	5.0	5.2	5.4	4.4	5.7
23 Center Cut 2	5.0	4.6	4.8	5.1	5.5	5.0
24 Pure Select	4.9	5.3	4.1	4.7	5.5	6.7
25 Flagstick	4.9	4.9	4.9	4.9	4.7	5.3
26 Shark	4.6	4.6	4.7	4.7	4.2	4.3
27 Benchmark DSR	4.5	4.1	4.3	4.6	5.1	5.0
28 Center Cut 3	4.5	3.4	4.1	5.1	5.5	6.0
29 CY-2	4.4	3.3	4.4	5.0	4.9	5.0
30 Pin Up	4.3	4.4	4.4	4.6	4.0	5.7
31 Proclamation	4.3	4.7	4.3	4.1	4.0	5.7
32 Focus	4.3	3.8	4.2	4.2	4.7	5.3
33 Independence	4.2	5.0	4.7	3.6	3.5	4.0
34 PC2.0	3.8	4.4	4.2	3.5	3.3	5.0
35 Penn A-1	3.5	3.5	3.1	3.8	3.7	6.7

(Continued)

Table 1. Performance of creeping and velvet bentgrass cultivars in a putting green trial established in September 2016 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----					Dollar Spot ²	
	2017-20	2017	2018	2019	2020	Jul. 2020	
CREEPING BENTGRASS (continued)							
36	Memorial	3.5	3.3	3.1	3.8	3.7	6.0
37	V8	3.4	3.0	3.5	3.6	3.4	6.0
38	13M	3.4	3.0	3.2	3.5	3.7	5.0
39	Penn A-4	3.3	2.1	3.1	3.7	4.3	6.0
40	T-1	3.2	3.3	2.9	3.2	3.5	6.3
41	Crystal BlueLinks	3.2	3.1	3.3	3.3	3.1	6.7
42	Century	3.1	3.0	3.1	2.7	3.8	3.7
43	Center Cut	3.1	2.8	3.3	3.1	3.3	7.0
44	Kingpin	3.0	2.9	2.8	3.1	3.3	7.3
45	L-93	2.9	2.2	2.9	3.2	3.3	4.7
46	Alpha	2.6	2.5	2.5	2.3	3.1	5.7
47	Putter	2.4	2.5	2.4	2.1	2.4	4.7
48	Southshore	2.2	1.6	2.2	2.5	2.6	4.3
49	Penncross	1.7	1.1	1.7	1.9	2.1	7.0
LSD at 5%= <hr/>		0.7	0.9	1.0	0.9	0.9	2.1
VELVET BENTGRASS							
1	SCL Comp	5.8	7.0	6.0	5.8	4.3	
2	SSL Comp	5.7	6.9	5.9	5.7	4.4	
3	MLC Comp	5.6	6.4	6.2	5.6	4.3	
4	SCM Comp	5.3	6.6	5.3	5.2	4.1	
5	SCE Comp	5.2	6.6	5.5	5.0	3.6	
6	Greenwich	4.1	3.9	5.0	4.6	2.9	
7	Legendary	3.9	4.3	4.6	4.1	2.7	
8	Villa	3.4	3.1	4.1	4.2	2.1	
9	SR 7200	1.9	1.5	1.9	2.4	1.9	
LSD at 5%= <hr/>		0.6	1.2	1.2	0.8	0.8	

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Dollar Spot disease rated on a 1 to 9 scale, where 9 = best disease resistance
Disease not assessed on velvet bentgrass entries

Table 2. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in September 2016 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				
	2017-20	2017	2018	2019	2020
CREEPING BENTGRASS					
1 007XL	7.5	7.8	7.9	7.2	7.0
2 DSF Comp	7.3	7.3	7.8	7.7	6.5
3 LFC Comp	7.2	6.7	7.8	8.0	6.3
4 LSG Comp	7.1	6.8	7.9	7.6	6.2
5 TourPro	6.9	6.8	7.4	7.3	6.0
6 EFB Comp	6.9	6.5	7.7	6.7	6.6
7 MGS Comp	6.9	7.2	7.6	6.8	5.9
8 Match Play	6.9	6.8	7.6	7.1	5.9
9 Coho	6.7	6.3	7.7	7.4	5.3
10 777	6.3	6.7	5.9	6.8	5.9
11 Chinook	6.3	6.5	6.4	6.3	6.0
12 L-93XD	6.2	6.3	6.9	6.9	4.7
13 PLC Comp	6.0	6.8	5.9	6.1	5.1
14 Piranha	6.0	6.0	5.8	6.5	5.6
15 Barracuda	5.9	5.7	6.0	6.5	5.5
16 007	5.4	4.9	5.2	6.5	5.1
17 Declaration	5.2	5.2	5.3	5.5	4.8
18 All Pro Fwy Blend X	5.1	5.7	4.6	5.1	4.9
19 RH 93	5.0	4.6	4.4	5.2	5.8
20 Pin Up	5.0	5.3	4.9	5.3	4.6
21 Runner	4.9	5.8	4.5	4.9	4.6
22 Flagstick	4.9	4.9	4.9	4.9	5.1
23 Shark	4.9	4.9	5.1	5.2	4.4
24 Proclamation	4.7	4.4	4.3	4.9	5.3
25 Luminary	4.6	5.1	4.8	4.4	4.2
26 Focus	4.6	4.7	4.5	4.7	4.3
27 Benchmark DSR	4.6	2.9	4.7	5.0	5.6
28 CY-2	4.5	3.9	4.3	5.1	4.8
29 Pure Distinction	4.2	5.9	3.5	3.7	3.8
30 Pure Select	4.2	5.2	3.9	3.7	4.0
31 Independence	4.1	4.1	3.2	4.4	4.9
32 Cobra 2	4.1	3.9	4.6	3.7	4.3
33 Penn A-1	4.0	4.4	3.9	3.9	3.9
34 Memorial	3.9	3.2	4.3	4.2	3.9
35 13M	3.8	3.4	4.2	3.8	3.8

(Continued)

Table 2. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in September 2016 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				
	2017-20	2017	2018	2019	2020
CREEPING BENTGRASS (continued)					
36 V8	3.7	3.3	3.3	3.9	4.3
37 PC2.0	3.7	4.7	3.3	3.9	2.7
38 Ninety-Six Two	3.7	4.5	2.8	3.7	3.7
39 Century	3.5	3.4	2.4	3.9	4.1
40 Mackenzie	3.4	3.6	3.5	3.5	3.2
41 Crystal BlueLinks	3.4	4.1	3.0	3.0	3.4
42 Alpha	3.3	3.7	2.8	3.3	3.6
43 Kingpin	3.3	3.1	3.3	3.3	3.6
44 Tye	3.2	3.8	3.0	3.0	3.2
45 L-93	3.2	2.9	3.1	3.5	3.4
46 T-1	3.1	3.0	2.9	3.2	3.3
47 SR 1150	3.0	2.7	2.9	2.9	3.7
48 Penncross	3.0	2.8	2.7	3.4	3.3
49 Southshore	2.8	2.8	2.4	2.7	3.3
50 Putter	2.8	3.1	2.3	2.5	3.2
51 SR 1119	2.6	2.8	1.9	2.7	2.9
52 Penn A-4	2.5	1.9	2.2	3.0	2.9
53 Mariner	2.4	2.8	2.2	2.4	2.5
LSD at 5%= ²	0.7	0.9	1.1	1.2	1.2
COLONIAL BENTGRASS					
1 LCC Comp	6.2	6.4	6.3	6.2	5.9
2 CCD Comp	6.2	7.0	6.7	5.9	5.2
3 AT 12 M2	6.1	6.5	7.0	5.5	5.3
4 DHS Comp	6.0	6.5	6.2	5.6	5.5
5 SFC Comp	5.8	6.3	5.8	5.4	5.9
6 PDM Comp	5.8	5.9	5.4	6.1	5.8
7 MTC Comp	5.6	6.0	5.7	5.2	5.7
8 DEC Comp	5.4	5.9	5.0	5.3	5.7
9 FDH Comp	5.4	6.0	5.3	5.6	4.7
10 LMF Comp	5.3	5.6	4.9	5.3	5.5

(Continued)

Table 2. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in September 2016 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				
	2017-20	2017	2018	2019	2020
COLONIAL BENTGRASS (continued)					
11 AT 15	5.3	6.2	5.4	4.7	4.8
12 Puritan	5.2	6.1	5.7	4.4	4.8
13 Musket	5.0	5.8	4.5	4.8	4.8
14 Heritage	4.7	5.3	4.7	4.3	4.4
15 Capri	4.6	4.8	4.4	4.6	4.4
16 FT12	4.3	5.4	4.6	3.8	3.3
17 AT 10	4.2	4.9	4.6	3.7	3.6
18 Greentime	3.9	4.4	4.4	3.6	3.2
19 Tiger 2	3.9	4.1	4.2	3.5	3.6
20 SR 7100	3.8	3.2	4.3	3.7	4.1
21 Glory	3.4	3.7	3.1	3.3	3.3
22 SR 7150	3.0	2.7	2.5	3.0	3.7
23 Highland	3.0	1.8	3.3	3.2	3.6
LSD at 5%=	0.6	0.8	1.0	0.9	1.0

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

Table 3. Performance of creeping and colonial bentgrass cultivars in a putting green trial established in September 2017 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				Winter	Dollar
	2018-20	2018	2019	2020	Color ² Mar. 2020	Spot ³ 2020
CREEPING BENTGRASS						
1 GMM Comp	7.6	7.7	7.3	7.8	3.3	7.4
2 EGC Comp	7.4	7.9	7.1	7.1	2.3	7.0
3 BEF Comp	7.2	7.6	6.9	7.0	3.3	6.9
4 DLG Comp	7.1	7.1	6.9	7.5	2.7	6.6
5 MFC Comp	7.1	7.2	6.9	7.3	4.3	5.8
6 Coho	7.1	7.1	7.6	6.7	2.0	7.7
7 EF2 Comp	6.9	7.3	6.7	6.7	1.7	6.0
8 Match Play	6.5	6.9	6.2	6.3	3.0	5.7
9 Chinook	6.2	6.4	6.1	6.2	2.7	5.7
10 LTNS Bent Blend 1	6.1	6.7	5.8	5.8	3.7	5.6
11 L-93XD	6.0	6.9	5.3	5.9	2.7	5.0
12 TourPro	6.0	6.8	5.6	5.5	2.3	5.1
13 Piranha	5.6	6.3	5.0	5.5	3.7	4.7
14 PST-ROPS	5.3	6.7	4.7	4.5	1.7	3.6
15 All Pro Fwy Blend X	5.3	6.1	4.7	5.1	3.7	4.7
16 Luminary	5.1	6.2	4.8	4.4	3.0	4.1
17 Macdonald	5.1	6.0	4.5	4.7	3.7	4.4
18 Declaration	4.9	5.1	5.1	4.6	4.0	5.0
19 CenterCut 3	4.9	5.4	4.7	4.6	3.3	4.3
20 007	4.9	5.8	4.2	4.6	1.7	3.9
21 RH 93	4.8	6.2	4.0	4.3	2.7	3.4
22 777	4.8	5.7	3.9	4.8	2.7	3.7
23 Barracuda	4.7	5.3	4.2	4.7	3.3	4.2
24 CenterCut 2	4.7	4.9	4.3	4.9	4.0	4.1
25 Proclamation	4.4	5.5	3.7	4.0	1.0	3.7
26 Flagstick	4.2	4.4	4.1	4.2	1.0	3.8
27 Pure Distinction	4.2	5.3	3.4	4.0	3.0	3.1
28 PST-0CV6	4.2	5.1	3.6	4.0	1.7	3.6
29 Memorial	4.1	4.0	4.2	4.1	1.0	6.3
30 CenterCut	4.1	4.5	4.1	3.7	1.3	4.7
31 Shark	4.1	4.9	3.6	3.8	1.3	3.3
32 PST-0RBS	4.0	5.2	3.6	3.2	1.0	2.9
33 CY-2	4.0	3.4	4.2	4.3	4.7	4.2
34 A-1	4.0	4.5	3.7	3.8	1.0	3.2
35 Pure Select	3.9	4.9	3.3	3.4	1.0	3.4

(Continued)

Table 3. Performance of creeping and colonial bentgrass cultivars in a putting green trial established in September 2017 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				Winter	Dollar
	2018-20	2018	2019	2020	Color ² Mar. 2020	Spot ³ 2020
CREEPING BENTGRASS (continued)						
36 Focus	3.7	4.4	3.3	3.4	1.0	4.1
37 V8	3.7	4.0	3.5	3.6	1.0	3.9
38 Crystal BlueLinks	3.6	4.7	3.2	2.8	1.3	3.6
39 Kingpin	3.5	3.7	3.5	3.3	2.3	3.8
40 PST-0COL	3.4	4.1	4.2	2.0	1.0	5.2
41 T-1	3.3	4.6	2.6	2.8	1.0	3.4
42 Tye	3.2	3.6	2.8	3.1	1.3	3.3
43 SR 1150	3.2	3.5	3.2	2.9	1.0	3.4
44 L-93	3.1	3.9	2.9	2.5	1.0	2.9
45 A-4	3.1	4.1	2.7	2.4	1.3	2.3
46 Alpha	3.0	3.9	2.7	2.3	1.0	3.1
47 Mackenzie	2.9	3.5	2.4	2.7	1.3	2.4
48 Ninety-Six Two	2.9	4.0	2.4	2.2	1.0	3.0
49 Putter	2.8	3.6	2.6	2.3	1.0	3.0
50 Seaside II	2.7	2.8	2.6	2.7	1.7	3.7
51 SR 1119	2.5	3.2	2.4	1.9	1.0	2.7
52 Southshore	2.4	3.0	2.1	2.3	1.0	3.0
53 Penncross	1.9	2.2	1.9	1.5	1.3	3.3
LSD at 5%=	0.5	0.7	0.7	0.8	1.1	1.0
COLONIAL BENTGRASS						
1 EFC Comp	6.0	6.6	5.8	5.6	2.0	8.3
2 EUC Comp	6.0	6.6	6.1	5.4	1.3	8.1
3 SLC Comp	5.9	6.6	5.9	5.2	1.0	8.7
4 Musket	5.5	5.6	5.8	5.1	1.3	7.8
5 DGM Comp	5.2	5.1	5.7	5.0	1.3	7.8
6 LLS Comp	4.8	5.5	4.6	4.4	1.0	8.3
7 LDC Comp	4.8	4.9	5.1	4.3	1.3	7.6
8 Puritan	4.5	5.4	4.4	3.8	1.3	7.0
9 Capri	4.1	4.4	4.4	3.5	1.0	6.9
10 FT12	4.1	5.0	4.4	2.8	1.0	6.4

(Continued)

Table 3. Performance of creeping and colonial bentgrass cultivars in a putting green trial established in September 2017 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				Winter Color ²	Dollar Spot ³
	2018-20	2018	2019	2020	Mar. 2020	2020
COLONIAL BENTGRASS (continued)						
11 Tiger 2	2.5	3.2	2.5	1.9	1.0	4.6
12 Glory	2.1	3.2	1.7	1.4	1.0	5.2
LSD at 5%= <hr/>	0.7	0.7	0.7	1.2	0.6	1.1

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Winter Color rated on a 1 to 9 scale, where 9 = brightest color

³Dollar Spot disease rated on a 1 to 9 scale, where 9 = best disease resistance

Data is an average of 3 rating dates

Table 4. Performance of velvet bentgrass cultivars in a putting green trial established in September 2017 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----				Copper Spot ² Jul. 2020
	2018-20	2018	2019	2020	
1 DEM Comp	6.3	7.0	6.5	5.4	7.7
2 CMV Comp	6.3	6.8	6.2	5.8	8.0
3 LSV Comp	6.2	6.5	6.5	5.7	7.0
4 MSV Comp	6.1	6.7	6.4	5.0	7.0
5 DMS Comp	6.0	6.8	6.0	5.2	7.0
6 DMD Comp	6.0	6.5	5.7	5.8	8.0
7 Vitagreen	4.8	5.4	4.6	4.5	6.0
8 Greenwich	4.3	5.4	3.6	3.7	6.0
9 Vesper	3.7	5.2	3.4	2.6	6.3
10 Legendary	3.4	4.2	3.2	2.9	6.7
11 Villa 2	2.5	2.8	2.5	2.3	6.7
12 Villa	1.9	2.2	1.8	1.7	5.3
13 SR 7200	1.9	2.1	1.8	1.7	5.7
LSD at 5%=	0.6	0.5	1.0	0.9	2.0

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Copper Spot disease rated on a 1 to 9 scale, where 9 = best disease resistance

Table 5. Performance of creeping bentgrass cultivars in a putting green trial established in September 2018 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----			Winter	Brown	Dollar
	2019-20	2019	2020	Color ² Mar. 2020	Patch ³ Jul. 2020	Spot ⁴ Jul. 2020
1 Macdonald	6.7	7.5	5.8	4.3	5.3	3.7
2 PPD Comp	6.4	6.8	6.0	3.0	4.7	7.3
3 POR Comp	6.4	6.9	5.9	4.0	4.7	7.3
4 777	6.4	6.8	5.9	3.7	4.3	5.3
5 SGT Comp	6.3	7.0	5.6	5.7	4.3	7.3
6 TFT Comp	6.3	6.5	6.1	3.7	6.3	8.7
7 TGT Comp	6.3	6.3	6.2	5.0	6.3	8.7
8 007	6.2	6.4	6.1	1.7	5.3	6.0
9 FSC Comp	6.1	6.4	5.9	4.3	5.0	8.7
10 AGT Comp	5.9	6.0	5.8	3.3	6.3	8.7
11 Tye	5.9	5.9	5.8	2.3	5.0	5.0
12 RH 93	5.7	6.1	5.3	2.3	6.3	4.0
13 Match Play	5.7	5.8	5.6	3.3	4.7	7.3
14 SFT Comp	5.7	6.1	5.2	3.0	5.0	8.3
15 Pure Eclipse	5.6	6.2	5.1	1.3	4.7	6.3
16 Luminary	5.6	5.8	5.5	3.3	6.0	7.0
17 Centercut 3	5.6	5.7	5.4	2.7	5.7	5.3
18 Chinook	5.5	6.0	5.0	2.7	4.0	7.0
19 Piranha	5.5	5.6	5.3	4.0	4.7	6.3
20 Runner	5.4	6.4	4.5	2.3	5.0	3.7
21 AP 23	5.4	5.6	5.2	3.0	5.0	6.7
22 Cobra 2	5.3	5.9	4.8	1.0	3.7	4.3
23 GSH Comp	5.3	5.4	5.3	2.3	6.0	7.3
24 PST-SYN-RODS	5.2	5.6	4.8	1.3	5.0	5.3
25 Focus	5.2	5.6	4.8	1.0	3.0	4.7
26 Pure Select	5.2	5.0	5.3	1.0	5.3	5.7
27 Barracuda	5.2	6.0	4.3	3.0	4.3	5.3
28 Flagstick	5.1	5.3	5.0	2.0	4.0	6.7
29 Centercut 2	5.1	5.2	5.0	2.3	5.0	6.7
30 TourPro	5.1	5.4	4.7	3.3	4.7	6.7
31 Shark	5.0	5.4	4.6	2.0	5.7	5.3
32 CY-2	4.8	5.6	4.1	4.0	3.0	5.3
33 PST-SYN-OCD	4.6	5.1	4.1	1.0	5.7	4.3
34 Declaration	4.5	4.9	4.1	2.3	4.0	7.0
35 SR 1150	4.4	4.9	4.0	1.7	4.0	4.7

(Continued)

Table 5. Performance of creeping bentgrass cultivars in a putting green trial established in September 2018 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----			Winter Color ²	Brown Patch ³	Dollar Spot ⁴
	2019-20	2019	2020	Mar. 2020	Jul. 2020	Jul. 2020
36 Proclamation	4.4	4.9	3.8	1.0	4.7	6.0
37 Ninety-Six Two	4.3	4.7	3.9	1.0	5.3	4.0
38 Memorial	4.2	4.2	4.3	2.0	6.0	8.0
39 Mackenzie	4.1	4.4	3.7	1.0	4.0	3.7
40 AU Victory	4.0	4.6	3.4	1.3	3.7	3.0
41 Centercut	4.0	4.3	3.6	1.0	5.0	7.3
42 Kingpin	3.6	3.8	3.4	1.7	5.0	6.7
43 SR 1119	3.6	3.7	3.5	1.3	4.3	5.0
44 Pin Up	3.0	2.0	4.0	2.3	5.0	6.3
45 Penncross	2.5	2.3	2.6	1.3	4.3	7.3
LSD at 5%=	1.0	1.0	1.3	1.2	2.8	1.9

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Winter Color rated on a 1 to 9 scale, where 9 = brightest color

³Brown Patch disease rated on a 1 to 9 scale, where 9 = best disease resistance

⁴Dollar Spot disease rated on a 1 to 9 scale, where 9 = best disease resistance

Table 6. Performance of velvet bentgrass cultivars in a putting green trial established in August 2018 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----			Copper Spot ²
	2019-20	2019	2020	Jul. 2020
1 FDK Comp	6.0	6.2	5.9	5.0
2 VCE Comp	6.0	6.2	5.7	5.3
3 FDV Comp	5.8	6.4	5.3	5.3
4 DSM Comp	5.6	6.6	4.7	4.0
5 Greenwich	3.3	4.5	2.1	3.3
6 Legendary	3.1	3.9	2.4	3.7
7 Villa	3.0	4.2	1.7	2.7
LSD at 5%=	0.6	0.8	0.8	1.5

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Copper Spot disease rated on a 1 to 9 scale, where 9 = best disease resistance

Table 7. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in October 2018 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----			Dollar	
	2019-20	2019	2020	Spot ²	
CREEPING BENTGRASS					
1	POR Comp	7.0	7.9	6.2	8.3
2	PPD Comp	6.6	7.9	5.3	8.0
3	TourPro	6.5	7.3	5.6	7.3
4	Piranha	6.5	7.8	5.2	7.7
5	SFT Comp	6.5	7.9	5.0	8.5
6	FSC Comp	6.4	7.2	5.6	8.0
7	TGT Comp	6.4	7.0	5.7	7.8
8	CenterCut III	6.4	7.9	4.9	6.8
9	TFT Comp	6.3	7.7	5.0	7.8
10	Chinook	6.3	6.9	5.7	7.8
11	AP 23	6.0	7.1	5.0	7.3
12	AGT Comp	6.0	7.3	4.6	8.5
13	Barracuda	5.9	6.7	5.1	6.8
14	SGT Comp	5.8	7.0	4.7	8.3
15	CenterCut II	5.7	6.8	4.6	7.0
16	Proclamation	5.6	6.7	4.5	6.0
17	777	5.5	6.5	4.5	5.7
18	Luminary	5.4	6.8	4.1	6.2
19	All Pro Fwy Blend X	5.4	6.2	4.5	6.3
20	PST-SYN-OMRN	5.3	6.9	3.8	5.5
21	Shark	5.3	6.1	4.4	6.3
22	Declaration	5.2	5.7	4.7	7.7
23	GSH Comp	5.2	6.1	4.3	6.8
24	Flagstick	5.0	5.7	4.3	6.2
25	PST-SYN-RODS	4.9	5.7	4.2	6.7
26	PST-SYN-OCD	4.8	6.0	3.5	4.7
27	Memorial	4.7	5.1	4.3	7.5
28	Focus	4.5	5.3	3.7	6.3
29	AU Victory	4.3	5.4	3.1	2.7
30	Penncross	2.6	3.2	2.1	4.3
LSD at 5%= ³		1.0	0.7	1.6	1.1

(Continued)

Table 7. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in October 2018 at North Brunswick, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----			Dollar Spot ²
	2019-20	2019	2020	2020
COLONIAL BENTGRASS				
1 SLM Comp	7.0	7.4	6.6	8.2
2 WML Comp	6.9	7.3	6.4	8.5
3 MEM Comp	6.7	7.1	6.4	8.0
4 ECC Comp	6.1	6.5	5.8	7.8
5 MGE Comp	6.1	6.3	6.0	8.3
6 FLS Comp	6.0	6.1	5.8	8.5
7 Musket	5.3	5.4	5.3	8.2
8 Puritan	5.1	5.5	4.7	6.7
9 Capri	4.9	5.2	4.7	7.5
10 Tiger 2	2.9	3.5	2.3	7.0
11 SR 7150	1.5	1.3	1.6	6.7
LSD at 5%=	1.0	1.1	1.0	1.3

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Dollar Spot disease rated on a 1 to 9 scale, where 9 = best disease resistance

Data is an average of two ratings dates

Table 8. Performance of creeping bentgrass cultivars in a putting green trial established in September 2019 at North Brunswick, NJ.

Cultivar or Selection	Turf Quality ¹ 2020	Establishment ² Sep. 2019
1 LES Comp	7.7	5.3
2 MCL Comp	7.6	6.0
3 GES Comp	7.5	5.7
4 COC Comp	7.4	6.3
5 MAG Comp	7.4	6.7
6 777	7.3	8.7
7 PST-Syn-0HR	7.2	6.3
8 AGS Comp	7.1	7.3
9 Coho	7.1	7.7
10 FDS Comp	7.0	6.3
11 AP 23	7.0	7.7
12 Pure Eclipse	7.0	8.0
13 Predator Blend Mix	6.7	7.3
14 Pure Select	6.7	8.0
15 Piranha	6.7	7.7
16 Match Play	6.6	8.7
17 Macdonald	6.6	8.3
18 Pure Distinction	6.6	8.7
19 Barracuda	6.5	8.7
20 L-93XD	6.4	8.3
21 OO7	6.3	7.7
22 Chinook	6.2	7.7
23 PST-R0DS19	6.2	7.0
24 Shark	6.1	8.0
25 Tour Pro	6.1	8.3
26 PST-Syn-0P9	6.0	6.3
27 Kingdom	6.0	7.3
28 PST-Syn-0CC	5.9	5.7
29 Luminary	5.9	7.7
30 Runner	5.5	4.7
31 PC2.0	5.4	8.3
32 Armor	5.3	8.3
33 Flagstick	4.9	7.0
34 Cobra 2	4.8	6.3
35 Declaration	4.7	8.3

(Continued)

Table 8. Performance of creeping bentgrass cultivars in a putting green trial established in September 2019 at North Brunswick, NJ.

Cultivar or Selection	Turf Quality ¹ 2020	Establishment ² Sep. 2019
36 Ninety-Six Two	4.7	7.7
37 Focus	4.7	7.7
38 CY-2	4.5	6.0
39 Mackenzie	4.5	7.7
40 Tye	4.5	8.3
41 T-1	4.2	7.7
42 Kingpin	3.9	5.0
43 Memorial	3.8	2.3
44 SR 1119	3.6	8.0
45 V8	3.3	7.3
46 Penncross	2.5	7.3
LSD at 5% =	0.8	1.2

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Turf Establishment rated on a 1 to 9 scale, where 9 = earliest establishment

Table 9. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in September 2019 at North Brunswick, NJ.

Cultivar or Selection	Turf Quality ¹ 2019	Turf Establishment ² Sep. 2019	Brown Patch ³ Jul. 2020
CREEPING BENTGRASS			
1 GES Comp	7.2	4.3	8.7
2 MAG Comp	7.0	5.7	8.3
3 LES Comp	6.9	4.7	8.7
4 FDS Comp	6.8	5.0	8.0
5 MCL Comp	6.8	5.0	9.0
6 AGS Comp	6.7	5.0	8.7
7 Pure Eclipse	6.7	7.0	8.3
8 PST-Syn-0HR	6.7	5.0	9.0
9 MatchPlay	6.6	7.3	8.3
10 Piranha	6.5	6.3	8.7
11 Coho	6.5	6.7	8.0
12 COC Comp	6.4	5.3	8.0
13 Barracuda	6.2	6.7	8.0
14 PST-R0DS19	6.2	6.7	9.0
15 OO7	6.2	5.7	7.3
16 TourPro	6.1	6.7	8.0
17 Pure Distinction	6.1	7.3	8.3
18 PST-Syn-0CC	6.1	5.3	8.7
19 Luminary	6.1	6.0	8.7
20 All Pro Fwy Blend	6.1	6.7	7.7
21 L-93XD	6.0	6.7	5.7
22 Pure Select	5.8	7.0	7.0
23 Chinook	5.7	6.0	8.0
24 PST-Syn-0P9	5.7	5.3	8.7
25 AP 23	5.7	6.3	7.3
26 Predator Blend Mix	5.7	6.3	7.7
27 Kingdom	5.1	6.0	8.3
28 Declaration	5.1	7.3	6.3
29 Focus	5.0	5.3	7.3
30 Armor	5.0	6.7	8.0
31 Shark	5.0	7.0	8.0
32 777	4.8	7.0	7.0
33 AU Victory	4.7	6.3	6.7
34 Memorial	4.5	5.0	5.3
35 PC2.0	4.2	7.7	4.0

(Continued)

Table 9. Performance of creeping and colonial bentgrass cultivars in a fairway trial established in September 2019 at North Brunswick, NJ.

Cultivar or Selection	Turf Quality ¹ 2019	Turf Establishment ² Sep. 2019	Brown Patch ³ Jul. 2020
CREEPING BENTGRASS (continued)			
36 Kingpin	3.9	4.7	6.7
37 T-1	3.7	5.7	6.7
38 Alpha	3.5	6.3	6.3
39 V8	2.9	5.0	6.3
40 L-93	2.9	6.7	6.3
41 Penncross	2.3	6.0	6.0
LSD at 5%= <hr/>	0.9	1.4	1.8
COLONIAL BENTGRASS			
1 PST-9BP	6.8	6.7	6.7
2 PPG-AT 106	6.3	5.0	4.3
3 PCL Comp	6.3	4.3	5.7
4 ECT Comp	6.3	4.0	6.0
5 CLS Comp	5.9	3.0	6.7
6 PCC Comp	5.7	3.0	7.3
7 Musket	5.7	7.0	4.0
8 Capri	5.4	5.0	2.3
9 Puritan	5.3	3.7	6.0
10 FT12	4.5	4.0	5.3
11 Tiger 2	4.0	5.0	4.3
LSD at 5%= <hr/>	0.7	1.2	2.3

¹Turf quality rated on a 1 to 9 scale, where 9 = best turf quality

²Turf Establishment rated on a 1 to 9 scale, where 9 = earliest establishment

³Brown Patch disease rated on a 1 to 9 scale, where 9 = best disease resistance

Table 10. Maintenance practices performed in 2020 bentgrass trials at North Brunswick, NJ.

Test (Table)	Fertility ¹	Mowing Ht (inches)	Cultivation/Top Dress	Fungicides	Insecticides	Herbicides
2016 Greens (Table 1)	2.35 N; 0.15 lb P ₂ O ₅ ; 0.35 K ₂ O; 4 fl.oz. Harrell's MAX Minors	0.110	May-Aug – Topdressed Apr, Jun, Jul – TriCure AD (wetting agent)	Jul – Segway; Insignia SC	None	Apr - Trimmit SC (Poa annua)
2016 Fwy (Table 2)	2.05 N; 0.15 lb P ₂ O ₅ ; 0.25 K ₂ O; 4 fl. oz. Harrell's MAX Minors	0.375	Apr, Jul – TriCure AD (wetting agent)	Jul – Curalan; Sigway; Insignia SC	None	Apr – Trimmit SC (Poa annua)
2017 Greens (Table 3)	4.15 N; 0.3 lb P ₂ O ₅ ; 0.5 K ₂ O; 6 fl. oz. Harrell's MAX Minors	0.110	Apr-Aug, Nov – Topdressed Apr, Jul, Sep, Oct – Tricure AD (wetting agent)	Jul – Segway Oct – Secure	Jul – Sevin SL (turf caterpillars) Aug – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua)
2017 Velvet Greens (Table 4)	3.95 N; 0.3 lb P ₂ O ₅ ; 0.3 K ₂ O; 10 fl. oz. Harrell's MAX Minors	0.110	Apr-Aug, Nov – Topdressed Apr, Jul, Sep-Nov – Tricure AD (wetting agent)	Jul - Daconil Ultrex + Heritage Action; Segway; Insignia SC	Jul – Sevin SL (turf caterpillars) Aug – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua)
2018 Greens (Table 5)	4.55 N; 0.25 lb P ₂ O ₅ ; 0.45 K ₂ O; 8 fl. oz. Harrell's MAX Minors	0.110	May-Aug – Topdressed Apr, Jun, Jul, Sep-Nov – Tricure AD (wetting agent)	Jul – Daconil Ultrex + Heritage Action; Segway; Insignia SC Signature + Secure; Pegasus 6L	Jul-Sep – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua)
2018 Velvet Greens (Table 6)	4.3 N; 0.3 lb P ₂ O ₅ ; 0.3 K ₂ O; 6 fl. oz. Harrell's MAX Minors	0.110	Jun-Aug, Nov – Topdressed Apr, Jun, Jul, Sep-Nov – Tricure AD (wetting agent)	Jul – Daconil Ultrex Aug – Heritage TL + Segway Sep – Insignia SC	Jul – Sevin SL (turf caterpillars) Aug – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua)

(Continued)

Table 10. Maintenance practices performed in 2020 bentgrass trials at North Brunswick, NJ.

Test (Table)	Fertility ¹	Mowing Ht (inches)	Cultivation/Top Dress	Fungicides	Insecticides	Herbicides
2018 Fairway (Table 7)	3.3 N; 0.2 lb P ₂ O ₅ ; 0.5 K ₂ O; 4 fl. oz. Harrell's MAX Minors	0.375	Apr, Oct – Tricure AD (wetting agent)	Jul – Daconil Ultrex; Segway; Insignia SC	Jun – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua) Sep – Acclaim Extra (post-crab-grass) Oct – Lontrel (post-emerge)
2019 Greens I (Table 8)	6.15 N; 0.35 lb P ₂ O ₅ ; 0.7 K ₂ O; 6 fl. oz. Harrell's MAX Minors	0.110	Apr-Sep, Nov – Topdressed Apr, Jul, Sep-Nov – Tricure AD (wetting agent) Aug – Verti-cut	Jul – Segway Aug – Insignia SC + Mirage Stressgard; Pegasus 6L + Signature + Heritage TL	Jul, Aug – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua)
2019 Fairway (Table 9)	3.55 N; 0.25 lb P ₂ O ₅ ; 0.35 K ₂ O; 4 fl. oz. Harrell's MAX Minors;	0.375	Apr, Jul, Sep-Nov – Tricure AD (wetting agent) Aug – Topdressed	Jul – Heritage Action; Segway Aug – Mirage Stressgard + Fame SC; Mirage Stressgard + Pegasus 6L	Jul – Acelepryn (turf caterpillars) Sep – Provaunt (turf caterpillars)	Apr – Trimmit SC (Poa annua) May – Razor Pro (post-emerge)

¹Annual nitrogen applied (lbs per 1000 ft²). Additional fertilizers as noted (per 1000 ft²).