



# RUTGERS

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## **Turfgrass Proceedings**

***The New Jersey Turfgrass Association***

In Cooperation with  
Rutgers Center for Turfgrass Science  
Rutgers Cooperative Extension

# **2021 RUTGERS TURFGRASS PROCEEDINGS**

**of the**

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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 2021 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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Deborah Spinella, Proceedings Layout Editor  
Dr. James A. Murphy, Coordinator

# PERFORMANCE OF PERENNIAL RYEGRASS CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS, 2021

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## INTRODUCTION

Perennial ryegrass (*Lolium perenne* L.) is a cool-season, bunch-type perennial grass native to mild climates in Asia, North Africa, and Europe (Beard 1973; Terrell, 1968). It rapidly germinates, establishes quickly, and grows best in moist, well-drained soils with a pH near 6.5 (Beard, 1973; Funk and Clarke, 1989; Thorogood, 2003). Perennial ryegrass performs well as a permanent turfgrass in parks, golf course fairways and roughs, athletic fields, racetracks, and home lawns in mild climates (Beard 1973; Beard and Beard, 2005; Thorogood, 2003). In warmer climates, it is used to overseed warm-season grasses during winter dormancy (Beard and Beard, 2005; Thorogood, 2003; Turgeon, 2008). It can also be used for roadsides for quick soil stabilization (Beard and Beard, 2005). Perennial ryegrass is susceptible to several fungal and oomycete diseases, but the Rutgers University Turfgrass Breeding program selects for improvements in turf quality, disease resistance, seed yield, and increased tolerance against environmental stress factors (Bonos and Huff, 2013; Thorogood, 2003).

The Rutgers Turfgrass Breeding program began in 1961, released its landmark perennial ryegrass cultivar, 'Manhattan', in 1967, and became one of the largest cool-season turfgrass breeding programs releasing more than 400 cultivars by 2010 (Funk et al., 1969; Funk and Meyer, 2001; Honig, 2011). The breeding program started out small, having only limited worldwide resources of perennial ryegrass germplasm, but began diversifying and improving the germplasm in 1996 by collecting from countries throughout Europe and Asia (Thorogood, 2003; Bonos et al., 2004; Honig, 2011). These collections have been useful sources of disease resistance that are introduced into elite NJAES perennial ryegrass to develop better cultivars with improved resistance to important diseases affecting perennial ryegrass.

Turfgrass breeding efforts at NJAES are focused on identifying resistance to several fungal and oomycete diseases such as gray leaf spot (*Pyricularia oryzae*), stem rust (*Puccinia graminis* subsp. *graminicola*), crown rust (*Puccinia coronata*), and dollar spot (*Clarireedia jacksonii*) (Bonos and Huff, 2013; Bonos et al., 2006; Salgado-Salazar et al., 2018). Additional diseases include brown patch (*Rhizoctonia solani*), pythium (*Pythium* spp.), and red thread (*Laetisaria fuciformis*) (Bonos et al., 2006; Smiley et al., 2005).

## PROCEDURES

One perennial ryegrass trial was established for each of the following years: 2016 (Table 1), 2018 (Table 2), 2019 (Table 3) and 2020 (Table 4). All trials were hand sown with 0.88 oz of seed into 3ft x 5ft plots (3.7 lb seed/1000 ft<sup>2</sup>) and arranged in a randomized complete block design with three replications. A 6-inch unseeded border was included around each plot to limit contamination. The annual rate of nitrogen and mowing height for each trial are represented in Table 5. Single fertilizer applications did not exceed 1.0 lbs N/1000 ft<sup>2</sup>. The trials were maintained to encourage biotic and abiotic stresses but were irrigated to avoid drought stress. Turf plots were mowed regularly to 1.5-inch height.

Dimension (dithiopyr) was used on all perennial ryegrass trials for preemergent control of annual grass and broadleaf weeds in April, June, August, and October. Topeka (dicamba, dimethylamine salt), Weedar 64 (2,4-D) and Lontrel (clopyralid) were used to control broadleaf weeds. Merit (imidacloprid) was used to control grubs in June. Segway (cyazofamid) and Tenacity (mesotrione) were used in August to control pythium disease and grassy weeds, respectively.

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Perennial ryegrass trials were evaluated monthly during the growing season for turf quality, and when present for dollar spot, red thread, color, and stemminess. All turf plots were rated by multiple evaluators to limit personal biases toward characteristics. Ratings were based on a 1 to 9 scale, with 9 representing the most desirable turf traits. Data were summarized and subjected to an analysis of variance (ANOVA), and means were separated using Fisher's protected least significant difference (LSD) mean separation test.

## RESULTS AND DISCUSSION

Results for the perennial ryegrass trials established from 2016-2020 were ranked by overall turf quality. High turf quality averages indicate good disease resistance, dark-green color, high shoot density and uniformity, fine leaf texture, good mowing quality, and minimal damage from insects. Trials were further ranked using additional parameters (ie., establishment, color, disease rating, etc.) to distinguish cultivars or selections that were equally ranked based on turf quality ratings.

### Turf Quality

Since the release of the first turf-type cultivars in the 1960s, improvements have been made to overall turf quality (Huff, 1997). In the 2016 NTEP perennial ryegrass test (Table 1), Furlong, Mystique, PPG\_PR 421, DLFPS-236/3546, Slugger 3GL, SR 4700 and Alloy ranked best for turf quality while Fireball, DLFPS-238/3014, BAR LP 6162, Brightstar SLT and Linn scored poorly. In the 2018 perennial ryegrass test (Table 2), PPG-PR 436, GR4 Comp, PDS3 Comp, and PPG-PR 476 exhibited the best turf quality, while Replicator, Evening Shade, ORPRG 16-6, Laredo II, Tetra Grain and PST-2TETS scored lowest in turf quality. In the 2019 perennial ryegrass test (Table 3), Siletz, PPG-PR 530, SGS4 Comp, CJP2 Comp, and SGP2 Comp had the best turf quality while Cutter II, Replay, Prominent and Barbados had the worst turf quality. In the 2020 perennial ryegrass test (Table 4), 20PR07 Comp, Mystique, 20PR06 Comp, Zoom 2, 20PR03 Comp and Paradox ranked best in turf quality while Majesty II, Double Time, Sun and Infusion ranked poorly for turf quality.

### Dollar Spot

Dollar spot is a persistent disease in warm- and cool-season turfgrasses throughout the world. Leaves develop lesions that become chlorotic and

water-soaked turning into a straw-color lesion the size of a silver dollar. The disease develops into small, circular white patches about 5 cm in diameter and may coalesce to form large areas of blighted turf in severe cases. Dollar spot can be spread by leaf debris from mowers, foot traffic, moisture, and wind. In the 2018 perennial ryegrass test (Table 2), PDS2 Comp, PDS3 Comp, PDS1 Comp, and PPG-PRG-331 were most tolerant to dollar spot while Sox Fan, Brea, OFPRG16-3, OFPRG16-4, OFPRG16-6, Prelude IV, Barbados, PST-2CARD Bulk, and Line-drive II were most susceptible to dollar spot. In the 2019 perennial ryegrass test (Table 3), CJP1 Comp, SGP3 Comp, SGP4 Comp, SGU3 Comp and SGU1 Comp were most tolerant to dollar spot while Torsion, Sun, Spyglass, Greenville 4, Mighty, Palmer III, SR 4660ST, Sox Fan, Intense and Panther GLS were highly susceptible to dollar spot.

### Red Thread

Red thread is prevalent during the spring and autumn during periods of cool and humid weather. Perennial ryegrass is especially susceptible when there is low nitrogen fertility. Symptoms include patches of straw-brown to tan colored leaves 5-60cm in diameter. During periods of high humidity, the patches may develop red thread-like sclerotia that can be spread mechanically and remain dormant in the thatch. In the 2019 perennial ryegrass test (Table 3), Double Time GLS, PRC3 Comp, SGU Comp, PPG-PR 536, Silver Sport, Slugger 3GL, PPG-PR 539, PST-2WHB, Apple 3GL, Ivy, SR 4650, Top Gun II and Spike GLS were most resistant to red thread while LNTS1, LNTS3, PPG-PR 515, Rio Vista and PRG-19DH were moderately susceptible to red thread.

### Wear

Wear is a major traffic stress to recreational turf stands because of abrasion and tearing from foot and vehicular traffic. This physical injury can result in discoloration, thinning, leaf shredding and can expand to large areas of non-uniform turf and a decline in shoot density. In the 2016 NTEP perennial ryegrass test (Table 1), SR 4700, DLFPS-236/3546, Mach Two, Mystique, and Furlong were most tolerant of wear while Fireball, ASP0218, BAR LP 6162, Linn and Paragon 2 GLR were least tolerant.

## SUMMARY

Turf-type perennial ryegrass is very versatile with its high traffic tolerance, rapid establishment, improved disease resistance, and dark green color. These traits continue to make perennial ryegrass a dominant perennial grass in the turfgrass seed industry. Plant breeding has improved perennial ryegrass cultivars, but more research is necessary to increase heat, drought and salt tolerance, cold hardiness, resistance to crown rust and gray leaf spot, and its ability to survive under ice sheets for long periods.

## ACKNOWLEDGEMENTS

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## REFERENCES

- Beard, J.B. 1973. *Turfgrass: Science and Culture*. Prentice Hall, Englewood Cliffs, NJ.
- Beard J.B., and H.J. Beard. 2005. *Beard's Turfgrass Encyclopedia for Golf Courses, Grounds, Lawns, Sports Fields*. Michigan State University Press.
- Bonos, S.A., and D.R. Huff. 2013. Cool-season grasses: biology and breeding. In: J.C. Stier, B.P. Horgan, and S.A. Bonos, editors, *Turfgrass: Biology, use and management*. SAS, CSSA, and SSSA, Madison, WI. P. 591-660.
- Bonos, S.A., B.B. Clarke, and W.A. Meyer. 2006. Breeding for disease resistance in the major cool-season turfgrasses. *Annu. Rev. Phytopathol.* 44:213-234.
- Bonos, S.A., C. Kubik, B.B. Clarke, and W.A. Meyer. 2004. Breeding perennial ryegrass for resistance to grayleaf spot. *Crop Sci.* 44:575-580.
- Funk, C.R., and W.A. Meyer. 2001. 70 years of turfgrass improvement at the New Jersey Agricultural Experiment Station: The Garden State's Rutgers University has long been in the forefront of turfgrass development. *USGA Green Section Record*. 39:19-23.
- Funk., C.R., R.E. Engel, and P.M. Halisky. 1969. Registration of 'Manhattan' perennial ryegrass. *Crop Sci.* 9:679-680.
- Honig, J.A. 2011. The use of molecular genetic tools to compliment a traditional field-based turfgrass breeding program. Doctoral dissertation, Rutgers, The State Univ. of New Jersey-New Brunswick.
- Huff, D.R. 1997. RAPD characterization of heterogeneous perennial ryegrass cultivars. *Crop Science*. 37:557-564.
- Salgado-Salazar, C., Beirn, L.A., Ismaiel, A., Boehm, M.J., Carbone, I., Putman, A.I., Tredway, L.P., Clark, B.B., Crouch J.A. 2018. *Clarireedia*; A new fungal genus comprising four pathogenic species responsible for dollar spot of turfgrass. *Fungal Biology*. <https://doi.org/10.1016/j.funbio.2018.04.004>.
- Smiley, R.W., Derdoeden, P.H., Clark, B.B. 2005. *Compendium of Turfgrass Diseases*. St. Paul, MN: Am. Phytopathol. Soc. 3rd ed. 167pp.
- Terrell, E.E. 1968. A taxonomic revision of the genus *Lolium*. Technical Bulletin No. 1392. United States Department of Agriculture, Washington, D.C.
- Thorogood, D. 2003. Perennial Ryegrass (*Lolium perenne* L.), p. 75-105. In: M.D. Casler and R.R. Duncan, editors, *Turfgrass biology, genetics, and breeding*. John Wiley and Sons, Hoboken, NJ.
- Turgeon, A.J. 2008. *Turfgrass management*, Eighth Edition. Pearson Prentice Hall, Upper Saddle River, NJ.

Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2016 in Adelphia, NJ. Includes all entries from the 2016 National Turfgrass Evaluation Program (NTEP) test.

Cultivar or Selection	Turf Quality <sup>1</sup>						Gray Leaf Spot <sup>2</sup>	Crown Rust <sup>3</sup>	Color <sup>4</sup>				Wear <sup>5</sup>			Worn % Green Cover	Unworn % poa
	2017-21	2017	2018	2019	2020	2021	Oct 10 2016	Sep 29 2017	Sep 26 2017	Nov 8 2018	Oct 16 2019	Oct 15 2020	2021	Jun 25 2021	Jul 26 2021	Aug 2 2021	Dec 2 2021
	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
1 Furlong	7.0	7.3	6.6	7.2	7.2	6.8	7.7	8.3	9.0	7.0	7.7	6.7	4.0	4.7	3.3	40.0	0.0
2 Mystique	6.6	6.5	5.9	6.7	7.0	6.7	7.7	8.0	9.0	6.7	8.3	7.3	4.0	4.3	3.7	35.0	0.0
3 PPG-PR 421	6.4	6.4	5.9	6.6	7.0	6.2	8.3	4.7	7.0	6.0	7.0	6.7	2.8	3.7	2.0	30.0	0.0
4 DLFPS-236/3546	6.4	6.5	6.0	6.1	6.5	6.9	8.0	7.0	9.0	6.7	8.0	6.7	4.2	5.0	3.3	41.7	0.0
5 Slugger 3GL	6.4	6.4	6.0	6.8	6.5	6.3	8.7	6.3	9.0	5.7	8.3	7.3	3.2	4.0	2.3	36.7	1.7
6 SR 4700	6.4	6.3	5.9	6.6	6.9	6.2	7.0	3.7	7.0	6.3	6.3	6.0	4.2	4.0	4.3	38.3	1.7
7 Alloy	6.4	6.4	6.2	6.4	6.8	6.1	7.3	4.3	8.0	7.0	8.3	7.7	3.2	3.7	2.7	33.3	1.7
8 AllStar Fore	6.3	6.6	6.4	6.3	6.6	5.8	7.3	5.0	7.0	7.0	8.0	6.3	3.8	4.3	3.3	40.0	1.7
9 Stellar 4GL	6.3	6.8	5.4	5.9	7.0	6.6	7.7	7.7	8.0	5.0	7.7	6.3	2.8	3.0	2.7	36.7	0.0
10 NP-2	6.3	7.0	5.9	6.1	6.8	5.7	8.3	6.7	7.0	6.0	7.7	7.0	3.2	3.7	2.7	38.3	1.7
11 JR-197	6.3	6.2	5.6	6.8	6.4	6.4	8.7	6.3	8.0	6.3	7.7	7.0	2.8	3.0	2.7	38.3	1.7
12 PPG-PR 423	6.2	6.5	6.1	6.4	6.5	5.8	8.7	6.0	9.0	6.7	8.3	7.7	3.0	3.7	2.3	31.7	3.3
13 023	6.1	6.6	5.8	5.5	6.4	6.3	7.7	7.0	9.0	5.0	7.0	6.3	3.5	3.7	2.7	40.0	3.3
14 Fiesta Cinco	6.1	5.9	5.8	6.2	6.5	6.2	5.7	3.7	8.0	6.3	6.7	6.3	3.2	4.0	3.0	40.0	1.7
15 Peridot	6.1	6.1	6.0	6.2	6.1	6.1	7.7	7.0	7.7	5.7	7.3	7.0	3.0	3.7	2.3	33.3	0.0
16 Sunburst	6.1	5.9	5.8	6.1	6.4	6.3	8.0	6.0	8.0	5.0	7.3	7.0	3.0	3.7	2.3	35.0	1.7
17 PPG-PR 372	6.1	6.2	5.9	6.2	6.4	5.8	7.7	4.7	8.0	6.3	8.0	7.3	2.8	3.0	2.7	33.3	6.7
18 Zoom 2	6.0	6.1	5.6	6.0	6.5	6.1	8.3	7.3	9.0	7.0	8.0	7.3	3.5	4.0	3.0	36.7	3.3
19 PPG-PR 371	6.0	6.5	5.8	5.7	6.3	5.7	7.3	6.0	8.0	5.7	8.3	6.3	2.7	3.3	2.0	28.3	1.7
20 NP-3	6.0	6.5	4.8	5.9	6.8	5.8	8.7	6.0	9.0	6.0	7.7	7.0	3.5	4.0	3.0	40.0	3.3

(Continued)

Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2016 in Adelphia, NJ. Includes all entries from the 2016 National Turfgrass Evaluation Program (NTEP) test.

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		2017-21	2017	2018	2019	2020	2021	Oct 10	Sep 29	Sep 26	Nov 8	Oct 16	Oct 15		Jun 25	Jul 26	Aug 2	Dec 2
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
95	21 Mightier	6.0	6.4	5.7	6.0	6.2	5.5	8.3	4.3	8.0	6.0	7.7	7.3	4.0	3.3	3.0	41.7	3.3
	22 Mach Two	6.0	6.4	5.2	5.6	6.3	6.5	8.0	5.7	7.0	5.0	7.3	6.7	3.5	4.7	3.3	46.7	3.3
	23 PPG-PR 360	6.0	6.4	5.8	6.0	6.1	5.7	7.7	5.3	8.0	6.3	8.0	7.7	3.2	4.0	1.7	35.0	0.0
	24 Xcelerator	6.0	6.2	5.2	6.0	6.5	5.9	7.7	6.7	7.0	6.3	8.3	6.7	2.8	3.0	2.3	43.3	5.0
	25 021	6.0	6.1	5.6	5.4	6.3	6.4	8.0	6.3	7.0	5.0	6.7	6.0	2.7	4.0	3.0	38.3	5.0
	26 DLFPS-236/3548	5.9	6.2	5.5	5.4	6.1	6.1	6.0	4.3	8.0	5.3	6.7	6.7	3.3	4.0	2.7	48.3	3.3
	27 Intense	5.9	6.2	5.9	5.8	5.9	5.5	7.0	4.7	7.0	7.0	8.0	7.0	2.5	2.3	2.3	28.3	8.3
	28 Fastball 3GL	5.9	6.2	5.6	5.8	6.2	5.6	8.0	7.3	9.0	6.7	7.3	7.3	2.3	2.7	2.3	30.0	1.7
	29 Superstar GL	5.8	6.4	5.4	5.8	6.0	5.7	7.7	4.7	7.0	5.3	7.3	6.3	2.8	2.7	2.0	30.0	3.3
	30 Shield	5.8	5.7	5.5	5.7	6.1	6.1	5.7	7.0	8.0	5.3	7.7	6.3	2.5	3.7	2.0	30.0	1.7
	31 Umpqua	5.8	5.6	5.2	5.9	6.3	6.3	6.3	7.7	9.0	5.3	5.7	6.7	2.3	3.0	2.0	25.0	6.7
	32 Palace II	5.8	6.1	5.8	6.1	5.8	5.2	8.3	5.7	8.0	7.0	8.7	6.7	2.8	3.3	2.3	30.0	3.3
	33 Roundabout	5.8	5.6	5.7	6.0	6.1	5.8	6.7	2.7	8.0	7.0	6.3	6.0	2.8	3.7	2.0	33.3	1.7
	34 Derby Nova	5.8	5.8	5.4	6.4	6.3	5.2	8.7	7.0	9.0	5.7	6.7	6.7	2.8	2.7	2.0	26.7	3.3
	35 Spike GLS	5.8	5.9	5.6	5.9	6.0	5.6	7.3	7.0	9.0	5.7	7.7	7.0	2.3	3.3	2.3	28.3	3.3
	36 Overdrive 5G	5.8	6.2	5.3	6.1	5.9	5.5	7.7	5.7	6.0	7.0	8.3	7.0	3.0	3.0	2.7	41.7	13.3
	37 Silver Sport	5.8	6.5	5.7	5.9	6.0	5.0	8.0	7.7	9.0	6.7	7.7	6.3	2.8	2.3	2.0	25.0	6.7
	38 Gray Wolf	5.8	6.1	5.6	5.8	5.8	5.5	8.3	5.3	8.0	6.3	7.7	7.0	2.2	4.0	2.0	23.3	5.0
	39 Pillar II	5.7	6.0	5.7	5.5	5.9	5.5	7.3	7.7	9.0	6.3	7.3	6.3	2.7	3.0	2.3	36.7	6.7
	40 PPG-PR 370	5.7	6.0	5.4	5.7	5.9	5.7	7.7	4.7	9.0	6.3	7.3	7.0	2.7	3.3	2.0	33.3	6.7

(Continued)

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		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
99	41 APR2616	5.7	6.1	5.8	5.0	6.3	5.5	7.0	4.0	7.0	5.0	7.7	7.3	2.5	3.0	2.0	26.7	8.3
	42 02BS1	5.7	6.1	5.9	5.7	5.9	5.1	8.7	5.3	7.0	7.0	8.0	6.7	2.5	2.7	2.3	26.7	5.0
	43 Signet	5.7	6.3	5.9	5.8	5.6	5.1	8.3	5.0	8.0	5.7	7.0	6.7	2.2	2.3	2.0	26.7	5.0
	44 Swift	5.7	6.0	5.5	5.7	6.0	5.3	7.7	5.7	8.0	6.7	8.0	6.7	2.7	3.0	2.3	36.7	10.0
	45 Paragon 2 GLR	5.7	6.2	5.6	5.5	6.1	5.1	8.3	6.3	9.0	7.0	8.7	7.3	0.3	3.3	1.3	25.0	6.7
	46 Apple 3GL	5.7	5.8	5.9	5.5	5.6	5.7	8.0	4.3	8.0	6.0	7.7	7.0	2.8	4.0	1.7	26.7	5.0
	47 Homerun LS	5.7	6.1	5.1	5.2	6.1	5.7	6.7	7.7	9.0	5.3	6.7	7.0	2.5	3.0	2.0	31.7	3.3
	48 Man O'War	5.6	5.7	5.0	5.1	5.8	6.4	6.7	6.7	7.0	6.7	7.7	7.3	3.0	3.3	2.7	30.0	8.3
	49 Gator Fore	5.5	5.7	5.5	5.4	5.8	5.2	8.0	6.7	8.7	6.3	8.3	7.7	2.8	2.3	2.3	21.7	6.7
	50 Seabiscuit	5.5	5.5	5.6	5.2	5.5	5.7	6.7	5.7	7.0	6.3	7.0	6.3	2.8	3.3	2.3	30.0	5.0
	51 Grand Slam GLD	5.5	5.3	5.5	5.4	6.0	5.4	4.7	4.0	9.0	7.0	7.0	6.0	2.3	3.3	2.3	33.3	3.3
	52 Primary II	5.5	5.6	5.0	5.6	5.7	5.4	7.3	3.7	5.7	6.0	6.3	6.0	2.5	2.3	2.3	31.7	10.0
	53 Process	5.5	6.0	4.7	5.7	5.9	5.2	8.3	5.7	9.0	6.3	8.0	6.7	2.3	3.0	2.0	23.3	3.3
	54 DLFPS-236/3540	5.5	6.1	5.6	5.4	5.6	4.8	5.7	4.3	8.0	6.3	7.3	6.7	3.8	2.7	2.0	33.3	8.3
	55 Helios	5.5	5.6	4.6	5.5	5.5	6.0	7.7	3.3	7.0	4.0	5.7	6.3	2.5	4.7	3.0	51.7	6.7
	56 PPG-PR 385	5.5	5.7	5.4	5.3	5.8	5.1	6.3	6.0	7.0	4.7	7.0	6.3	2.3	2.7	2.3	26.7	6.7
	57 Pharaoh	5.4	6.0	4.9	5.2	5.5	5.7	7.7	5.7	8.0	6.3	8.3	7.7	3.2	3.7	2.7	31.7	6.7
	58 Ivy	5.4	5.5	5.4	5.2	5.7	5.3	7.3	3.7	8.0	6.3	7.0	6.0	2.3	2.7	2.0	31.7	1.7
	59 SR 4650	5.4	5.7	5.1	5.2	5.1	5.6	7.0	6.3	8.0	5.0	7.0	6.3	2.5	2.7	2.3	33.3	6.7
	60 DLFPS-236/3550	5.3	5.8	5.1	5.2	5.2	5.4	6.3	3.7	8.0	6.0	6.3	6.7	2.7	3.3	2.0	36.7	6.7

(Continued)



Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2016 in Adelphia, NJ. Includes all entries from the 2016 National Turfgrass Evaluation Program (NTEP) test.

	Cultivar or Selection	Turf Quality <sup>1</sup>						Gray Leaf Spot <sup>2</sup>	Crown Rust <sup>3</sup>	Color <sup>4</sup>				Wear <sup>5</sup>			Worn % Green Cover	Unworn % poa
		2017-21	2017	2018	2019	2020	2021	Oct 10	Sep 29	Sep 26	Nov 8	Oct 16	Oct 15		Jun 25	Jul 26	Aug 2	Dec 2
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
97	61 Paradox GLR	5.3	6.2	4.9	4.7	5.6	5.2	7.3	4.3	7.0	5.0	6.7	7.0	2.7	3.0	2.3	25.0	5.0
	62 Slider LS	5.3	6.1	5.3	5.0	5.5	4.4	7.0	4.7	8.0	6.0	7.0	6.3	2.3	2.7	2.0	23.3	5.0
	63 PPG-PR 367	5.3	5.6	5.4	5.5	5.4	4.4	8.3	7.0	9.0	6.3	7.7	7.3	1.5	2.0	1.0	20.0	11.7
	64 PST-2MAY	5.2	5.7	5.6	5.0	4.7	4.9	6.0	4.3	8.0	6.0	6.0	6.3	2.2	2.7	1.7	25.0	11.7
	65 Starbright GLX	5.1	5.4	5.4	5.1	5.3	4.6	6.0	3.7	8.0	5.7	8.3	6.7	2.2	2.7	1.7	26.7	13.3
	66 Gray Hawk	5.1	5.2	5.6	4.9	5.4	4.6	5.3	3.7	7.0	5.7	7.3	6.3	2.2	2.7	1.7	25.0	8.3
	67 PST-2PDA	5.1	5.4	5.1	5.1	5.1	5.1	7.7	2.7	7.0	6.0	6.3	5.0	2.2	2.3	2.0	31.7	8.3
	68 PST-2FOXY	5.1	5.4	5.3	4.8	5.3	4.6	6.3	4.7	8.0	7.3	7.7	6.7	2.0	2.0	1.7	28.3	10.0
	69 Karma	5.1	5.9	4.4	5.0	5.3	4.8	9.0	5.0	8.0	4.7	5.0	6.3	1.8	2.0	2.0	23.3	16.7
	70 ASP0118GL	5.0	5.1	5.2	4.9	5.1	4.7	5.0	2.7	8.0	6.7	7.3	7.7	2.5	3.3	1.7	23.3	15.0
	71 JR-123	5.0	5.9	5.2	4.8	4.7	4.5	8.0	5.0	7.3	6.3	7.3	6.0	2.2	3.0	1.3	26.7	16.7
	72 BAR LP 6233	5.0	4.5	4.7	4.8	5.5	5.4	4.0	6.3	7.0	3.7	3.7	4.3	2.7	3.0	2.3	38.3	10.0
	73 APR3060	5.0	4.7	5.3	4.7	5.3	4.9	4.0	4.0	7.3	4.0	6.3	5.0	2.5	2.7	2.0	26.7	15.0
	74 APR2612	5.0	4.9	4.6	5.1	5.2	5.2	7.3	4.7	7.0	6.3	7.0	7.0	2.3	2.7	2.3	26.7	10.0
	75 ASP0117	4.9	4.9	5.1	5.0	5.1	4.5	4.7	3.7	8.0	6.0	8.0	7.3	2.3	2.7	1.7	21.7	11.7
	76 PST-2EGAD	4.9	4.9	5.0	4.6	5.1	4.8	7.0	2.7	7.0	5.3	6.3	6.3	2.2	3.0	1.7	21.7	5.0
	77 Derby Xtreme	4.7	5.2	5.0	4.5	4.8	4.0	6.0	2.3	7.0	6.0	7.3	6.7	2.0	2.3	1.7	35.0	16.7
	78 MRSL-PR15	4.6	4.3	4.7	4.4	4.7	4.9	4.7	2.3	7.0	6.3	8.3	7.0	2.2	2.3	2.0	28.3	8.3
	79 RAD-PR 112	4.6	5.0	4.5	4.1	4.8	4.6	5.7	2.7	6.0	8.0	8.7	7.0	2.3	3.0	1.7	21.7	6.7
	80 Tee-Me-Up	4.5	4.3	4.5	4.2	5.2	4.4	3.3	2.0	8.0	7.0	8.0	8.0	2.5	2.3	1.7	23.3	8.3

(Continued)

Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2016 in Adelphia, NJ. Includes all entries from the 2016 National Turfgrass Evaluation Program (NTEP) test.

	Cultivar or Selection	Turf Quality <sup>1</sup>						Gray Leaf Spot <sup>2</sup>	Crown Rust <sup>3</sup>	Color <sup>4</sup>				Wear <sup>5</sup>			Worn % Green Cover	Unworn % poa
		2017-21	2017	2018	2019	2020	2021	Oct 10 2016	Sep 29 2017	Sep 26 2017	Nov 8 2018	Oct 16 2019	Oct 15 2020	2021	Jun 25 2021	Jul 26 2021	Aug 2 2021	Dec 2 2021
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
88	81 BAR LP 6158	4.5	4.4	4.5	4.4	4.6	4.7	5.0	3.0	6.0	3.3	4.7	4.7	2.2	3.3	1.7	30.0	18.3
	82 Allstar III	4.5	4.8	4.4	4.2	4.9	4.2	4.3	2.3	7.0	6.3	8.0	7.0	2.0	3.0	1.3	23.3	23.3
	83 Mensa	4.5	4.5	3.5	4.8	4.7	4.9	2.7	5.0	8.0	5.0	8.3	6.3	3.2	3.3	3.0	36.7	15.0
	84 MRSL-PR16	4.5	4.6	5.0	4.5	4.6	3.9	4.0	3.0	7.0	7.7	8.7	7.0	1.8	2.3	1.3	15.0	18.3
	85 BAR LP 6164	4.5	4.7	4.4	4.6	4.8	4.1	4.7	3.7	7.0	3.3	5.3	5.0	2.2	2.7	1.7	26.7	11.7
	86 BAR LP 6117	4.4	4.2	4.4	4.2	4.9	4.6	3.7	1.3	6.0	3.7	6.3	6.3	2.8	3.7	1.3	30.0	15.0
	87 LPB-SD-102	4.4	4.1	3.8	4.6	4.8	4.8	2.7	3.0	7.0	6.0	6.7	6.3	2.5	2.7	3.0	40.0	15.0
	88 BAR LP 6159	4.4	4.3	4.6	3.9	4.7	4.4	3.7	2.7	6.0	4.0	5.3	5.0	2.5	2.3	2.0	26.7	10.0
	89 LPB-SD-104	4.4	4.3	3.6	4.7	5.0	4.6	3.3	3.7	8.0	4.7	7.0	4.7	2.2	2.7	2.3	41.7	20.0
	90 BAR LP 6165	4.4	3.7	3.5	4.7	4.2	5.7	2.3	6.3	2.3	1.0	2.3	3.0	3.5	3.7	3.3	60.0	15.0
	91 CS-6	4.3	4.5	4.7	4.1	4.5	3.9	4.7	2.3	8.0	8.0	8.3	7.0	2.3	2.7	1.3	21.7	16.7
	92 Saguaro	4.3	4.3	3.9	4.2	4.9	4.1	2.3	3.0	8.0	4.7	7.0	5.7	2.0	2.0	2.0	33.3	16.7
	93 Pepper II	4.3	5.1	4.5	3.7	4.3	4.1	4.7	2.3	6.0	7.7	7.0	6.7	2.0	2.3	1.3	25.0	11.7
	94 Evolve	4.3	4.4	4.2	4.5	4.3	4.0	4.7	2.3	4.7	4.7	7.3	5.7	1.8	2.7	2.0	28.3	28.3
	95 LPB-SD-103	4.2	4.3	3.7	4.4	4.3	4.4	3.7	3.0	8.0	5.0	7.3	6.3	2.0	2.7	1.3	38.3	26.7
	96 Belize 2	4.1	4.5	4.6	4.0	4.0	3.5	5.3	2.3	7.0	4.7	6.7	5.7	3.3	2.3	1.0	11.7	25.0
	97 JR-888	4.1	4.0	3.4	4.1	4.4	5.0	2.0	4.0	6.0	2.7	4.3	4.3	1.7	3.7	3.0	46.7	20.0
	98 ASP0218	4.1	4.7	4.6	3.7	4.3	3.2	4.7	2.7	8.0	6.3	8.3	7.0	2.2	1.7	1.0	16.7	25.0
	99 Hatrick	4.1	4.0	4.3	3.9	4.3	4.1	2.7	3.0	9.0	8.3	7.3	8.0	1.3	2.3	2.0	23.3	16.7
	100 ASP0116EXT	4.1	4.2	4.7	3.9	4.1	3.6	2.7	2.0	9.0	9.0	9.0	8.7	3.7	2.3	2.0	20.0	13.3

(Continued)

Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2016 in Adelphia, NJ. Includes all entries from the 2016 National Turfgrass Evaluation Program (NTEP) test.

		Turf Quality <sup>1</sup>						Gray Leaf Spot <sup>2</sup>	Crown Rust <sup>3</sup>	Color <sup>4</sup>				Wear <sup>5</sup>			Worn % Green Cover	Unworn % poa
		2017-21	2017	2018	2019	2020	2021	Oct 10 2016	Sep 29 2017	Sep 26 2017	Nov 8 2018	Oct 16 2019	Oct 15 2020	2021	Jun 25 2021	Jul 26 2021	Aug 2 2021	Dec 2 2021
Cultivar or Selection		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
66	101 Savant	4.1	3.6	3.2	4.3	4.3	4.9	1.3	3.7	6.0	3.3	4.7	4.3	2.2	4.3	3.0	56.7	23.3
	102 Nexus GT	4.1	4.4	4.7	3.5	4.0	3.7	4.3	2.0	8.0	7.7	7.3	6.7	1.7	2.3	1.0	18.3	21.7
	103 Green Supreme +	4.0	4.5	4.3	3.6	4.1	3.8	4.0	3.0	8.0	6.7	7.3	7.0	2.3	2.7	2.0	23.3	20.0
	104 JR-747	3.9	3.9	3.3	4.4	4.0	4.1	2.7	2.0	6.0	4.7	7.0	6.7	2.5	3.0	2.0	38.3	20.0
	105 McKenzie	3.9	3.9	4.0	3.8	4.0	3.8	3.3	1.7	7.0	6.7	7.3	6.7	1.8	2.3	1.3	21.7	23.3
	106 BAR LP 6131	3.8	2.9	3.7	3.4	4.2	4.7	1.7	3.3	7.0	4.7	4.3	4.7	2.7	3.3	2.0	28.3	13.3
	107 Cayman	3.7	4.1	4.5	3.2	3.5	3.3	3.7	2.0	7.0	7.0	7.0	5.3	1.7	2.3	1.0	15.0	30.0
	108 LPB-SD-101	3.5	3.5	2.9	3.9	3.7	3.9	1.7	2.7	7.0	3.3	3.3	4.7	1.8	2.0	1.7	31.7	28.3
	109 LPB-SD-105	3.5	3.4	2.7	3.8	4.1	3.7	1.3	3.7	8.0	4.0	6.3	4.7	2.0	2.7	1.3	33.3	25.0
	110 Fireball	3.3	3.5	3.7	3.2	3.2	3.1	1.7	2.3	9.0	8.0	8.0	7.3	2.0	1.7	1.0	16.7	25.0
	111 DLFPS-238/3014	3.3	3.0	3.5	3.2	3.5	3.3	2.3	5.0	7.0	4.0	6.7	3.7	1.3	2.3	1.7	25.0	25.0
	112 BAR LP 6162	3.2	2.7	3.6	3.1	3.4	3.1	2.3	4.0	9.0	6.7	7.7	3.7	1.3	1.7	1.0	13.3	33.3
	113 Brightstar SLT	3.1	3.0	3.2	3.2	2.9	3.0	1.7	2.7	7.0	4.0	5.0	4.3	1.7	2.3	1.0	13.3	36.7
	114 Linn	1.1	1.0	1.0	1.0	1.0	1.6	1.0	3.7	1.0	1.0	1.0	2.7	1.2	1.0	1.3	11.7	60.0
LSD at 5%=		0.6	0.7	0.9	0.9	0.8	1.0	1.5	1.9	0.2	1.3	1.4	1.4	0.9	1.2	0.9	12.4	9.1
CV=		7.3	7.9	11.2	10.8	9.5	11.9	15.8	25.5	1.9	13.5	12.2	13.9	21.52	25.4	27.7	26.2	53.2

<sup>1</sup>9 = Best turf quality

<sup>2</sup>9 = Least gray leaf spot

<sup>3</sup>9 = Least crown rust

<sup>4</sup>9 = Least wear

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

	Cultivar or Selection	----- Turf Quality <sup>1</sup> -----				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	---- Stemminess <sup>4</sup> ----		Bipolaris Leaf Spot <sup>5</sup>	----- Dollar Spot <sup>6</sup> -----		
		2019-21	2019	2020	2021	Sep	Sep	Jun 12	Jun 18	Jun 14	Aug 8	Jul 20	Aug 14
		Avg.	Avg.	Avg.	Avg.	2018 Avg.	2018 Avg.	2019 Avg.	2020 Avg.	2019 Avg.	2019 Avg.	2021 Avg.	2021 Avg.
100	1 PPG-PR 436	6.5	5.9	6.7	7.0	6.3	5.7	6.3	5.7	7.3	4.3	7.7	5.7
	2 GR4 Comp	6.5	6.8	6.5	6.3	7.3	5.0	4.3	5.0	7.3	4.3	8.0	4.7
	3 PDS3 Comp	6.5	6.3	6.8	6.3	7.7	5.3	4.7	6.0	7.7	5.0	8.3	7.3
	4 PPG-PR 476	6.5	5.7	6.7	7.0	5.7	4.7	6.0	6.3	7.7	5.0	7.3	6.0
	5 Principal II	6.3	6.6	6.3	6.2	7.7	8.0	6.3	6.0	7.3	5.7	7.3	5.3
	6 Homerun LS	6.3	6.5	5.9	6.4	7.3	7.7	4.3	5.0	6.3	5.0	7.3	4.3
	7 PPG-PR 473	6.3	6.0	6.3	6.6	6.0	5.3	4.3	5.0	6.7	6.0	7.3	6.0
	8 PST-Syn-2MEG	6.3	6.1	6.2	6.5	6.0	4.7	4.7	5.7	7.3	4.3	8.0	5.3
	9 PEM Comp	6.3	6.2	6.7	6.1	7.0	5.7	4.3	3.7	7.7	3.7	8.0	5.3
	10 PPG-PRG-331	6.2	6.1	6.2	6.3	7.3	7.3	5.3	5.0	7.0	6.0	8.0	5.7
	11 GR3 Comp	6.1	6.4	6.2	5.7	7.0	5.0	5.7	4.3	8.0	5.0	7.0	4.7
	12 PPG-PR 435	6.1	5.8	6.3	6.1	7.7	7.3	6.3	7.0	7.3	5.0	6.3	4.0
	13 PPG-PR 438	6.1	5.7	6.0	6.6	6.3	7.0	6.3	5.3	6.3	4.3	7.0	3.7
	14 Fastball 3GL	6.0	5.9	6.1	6.0	7.3	6.3	3.7	4.3	6.7	5.7	6.7	3.7
	15 GR8 Comp	6.0	6.1	6.4	5.6	6.0	4.3	4.3	4.3	7.0	3.7	7.7	4.0
	16 PDS1 Comp	6.0	5.9	6.1	6.3	7.0	5.3	4.0	4.0	6.7	4.3	8.3	6.3
	17 UEV Comp	6.0	5.9	6.2	5.8	7.0	6.7	4.3	4.0	7.7	3.7	5.7	3.7
	18 Apple 3GL	5.9	5.7	6.2	5.9	6.7	6.7	4.7	5.0	7.3	4.7	7.3	4.3
	19 Slugger 3GL	5.9	5.8	5.6	6.4	6.3	5.0	5.7	5.3	6.7	4.7	7.0	5.0
	20 PPG-PR 479	5.9	5.5	6.4	5.9	6.0	4.7	4.3	5.0	6.7	4.7	6.3	5.3

(Continued)

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

		Turf Quality <sup>1</sup>				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	Stemminess <sup>4</sup>		Bipolaris Leaf Spot <sup>5</sup>	Dollar Spot <sup>6</sup>		
		2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12 2019	Jun 18 2020	Jun 14 2019	Aug 8 2019	Jul 20 2021	Aug 14 2021
Cultivar or Selection		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
101	21 GR5 Comp	5.9	6.3	6.4	5.1	6.7	4.0	4.3	4.0	7.7	4.7	6.0	3.3
	22 PDS2 Comp	5.9	5.8	6.1	6.0	7.0	4.7	3.0	3.3	6.7	5.7	8.7	7.0
	23 PPG-PR 437	5.9	5.6	6.2	5.9	6.0	7.0	6.7	6.0	7.3	4.0	6.3	3.3
	24 GR6 Comp	5.9	6.1	6.2	5.3	7.3	5.0	3.0	4.7	7.0	4.0	6.7	3.7
	25 Process	5.9	5.9	6.1	5.8	8.0	6.3	5.3	5.0	7.0	3.3	5.7	3.0
	26 GR1 Comp	5.9	6.4	6.2	5.0	6.7	4.3	3.7	4.0	7.3	4.3	7.3	4.3
	27 PPG-PR 477	5.8	5.4	5.9	6.3	5.0	4.3	5.3	6.0	7.0	4.7	7.3	5.0
	28 PR-5-16	5.8	5.7	5.7	5.9	5.7	7.3	5.7	6.0	5.0	3.7	6.7	4.3
	29 Peridot	5.8	6.3	5.5	5.4	6.7	6.3	4.3	3.7	7.0	6.0	7.0	3.7
	30 PPG-PR 475	5.7	4.8	6.0	6.4	5.3	4.3	3.7	5.0	6.0	4.0	5.7	3.0
	31 PPG-PR 478	5.7	5.5	5.9	5.8	6.0	4.7	5.7	6.3	6.7	4.3	6.3	4.0
	32 PST-2EGY	5.7	5.7	6.0	5.6	6.0	4.0	5.0	4.7	6.7	3.0	6.3	3.3
	33 PPG-PR 434	5.7	6.1	5.9	5.2	7.3	7.0	4.0	4.7	7.0	4.3	5.3	2.3
	34 GR2 Comp	5.7	5.7	5.9	5.5	6.7	4.7	4.0	4.0	7.0	2.7	6.7	4.3
	35 Silver Sport	5.7	5.7	6.0	5.3	7.3	5.7	4.0	5.0	6.3	5.0	7.0	3.7
	36 021	5.7	6.3	5.7	5.1	8.0	7.0	3.7	4.7	6.0	4.7	6.7	2.3
	37 Xcelerator	5.6	6.0	5.6	5.3	6.7	7.0	4.0	5.0	6.3	5.0	6.7	4.3
	38 GR7 Comp	5.6	5.6	6.0	5.4	6.7	4.3	3.7	3.7	6.3	4.0	6.7	4.0
	39 PSL Comp	5.6	5.1	6.0	5.8	6.3	4.7	3.3	4.7	6.0	2.3	5.7	3.7
	40 PPG-PR 338	5.6	5.1	5.8	5.7	6.7	6.0	4.0	4.7	7.3	3.7	7.0	3.3

(Continued)

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

Cultivar or Selection	Turf Quality <sup>1</sup>				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	Stemminess <sup>4</sup>		Bipolaris Leaf Spot <sup>5</sup>	Dollar Spot <sup>6</sup>		
	2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12 2019	Jun 18 2020	Jun 14 2019	Aug 8 2019	Jul 20 2021	Aug 14 2021
	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
41 Grandslam GLD	5.5	5.6	5.6	5.4	5.0	6.3	5.0	5.0	5.7	4.0	6.7	3.3
42 TEM Comp	5.5	4.9	5.9	5.9	4.7	5.3	3.0	4.7	6.7	2.0	7.0	3.0
43 Bandalore	5.5	6.2	5.3	5.1	6.3	6.7	5.3	5.3	6.3	5.7	5.3	2.7
44 Karma	5.5	5.9	5.4	5.3	7.3	7.3	5.0	6.0	6.0	6.0	7.0	4.0
45 PPG-PR 474	5.5	5.2	5.5	5.9	6.0	5.3	4.7	4.7	6.7	3.0	6.7	4.0
46 Paragon 2 GLR	5.5	5.1	5.8	5.7	7.0	5.3	3.0	4.3	4.7	4.0	7.7	4.7
47 PDS4 Comp	5.5	4.8	6.1	5.6	6.0	4.3	3.0	4.7	5.3	3.0	7.0	3.7
48 PR-6-15	5.5	5.7	5.5	5.2	7.3	7.0	6.0	5.3	7.7	4.0	6.7	3.3
49 PPG-PR 432	5.5	5.2	5.4	5.8	6.0	7.0	4.3	4.3	6.3	4.0	7.0	3.3
50 Alloy	5.5	5.0	5.7	5.6	5.7	6.0	3.7	4.7	7.0	4.0	6.3	4.3
51 Pharoah	5.4	5.6	5.5	5.1	6.3	7.0	3.7	4.7	7.0	4.3	5.0	2.3
52 Pillar II	5.4	5.7	5.2	5.3	7.3	8.0	3.7	3.7	5.3	4.0	6.3	3.0
53 Gray Hawk	5.3	6.2	5.3	4.6	7.0	8.0	4.7	5.3	6.7	4.3	6.0	4.0
54 PPG-PR 433	5.3	5.4	5.4	5.1	6.0	6.7	4.7	4.3	7.3	5.3	7.3	5.0
55 Stamina	5.3	5.4	5.4	5.1	6.0	6.3	5.0	5.0	6.3	4.0	5.3	3.0
56 Fastball RGL	5.3	5.2	5.2	5.4	5.3	6.7	4.3	5.7	6.7	4.0	6.0	2.7
57 Sideways	5.2	4.9	5.2	5.6	6.0	5.7	2.7	3.7	5.7	4.3	7.0	3.7
58 PPG-PR 376	5.2	5.6	5.1	5.0	7.3	7.3	5.0	4.3	6.7	5.3	6.7	3.3
59 Premium	5.2	5.2	5.3	5.1	6.7	7.0	3.7	4.3	6.3	4.3	7.7	3.7
60 ULS Comp	5.2	4.4	5.5	5.7	5.7	4.0	3.7	4.7	6.0	2.7	4.7	2.0

(Continued)

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

		Turf Quality <sup>1</sup>				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	Stemminess <sup>4</sup>		Bipolaris Leaf Spot <sup>5</sup>	Dollar Spot <sup>6</sup>		
		2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12 2019	Jun 18 2020	Jun 14 2019	Aug 8 2019	Jul 20 2021	Aug 14 2021
Cultivar or Selection		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
103	61 Greenland	5.2	5.4	5.2	4.8	6.0	5.7	6.3	5.0	7.7	3.7	6.7	3.3
	62 Stellar 3GL	5.2	5.7	4.9	5.0	7.7	7.0	4.0	5.0	7.0	4.0	7.7	3.7
	63 Intense	5.1	5.4	5.1	4.9	6.0	7.3	3.7	5.3	6.0	4.7	5.7	3.3
	64 SR 4650	5.1	5.4	5.3	4.6	7.3	6.7	3.3	3.0	6.3	5.7	8.0	4.7
	65 Slider LS	5.1	5.0	5.1	5.2	6.0	5.3	4.7	5.3	5.7	3.0	5.3	2.7
	66 PPG-PR 471	5.1	4.4	5.2	5.6	4.3	4.7	5.0	5.0	6.3	3.7	6.7	4.0
	67 PST-Syn-2LOME	5.1	5.0	5.3	4.8	4.7	4.3	3.0	3.3	6.0	4.7	5.7	3.7
	68 Banfield	5.0	5.4	5.1	4.5	5.7	6.0	5.7	5.7	7.3	4.3	7.3	2.7
	69 Apple SGL	5.0	5.2	5.0	5.0	5.3	6.7	3.7	4.7	7.0	4.3	5.7	3.3
	70 Thrive	5.0	5.4	5.3	4.3	5.0	6.3	5.3	5.3	6.7	3.7	8.0	3.3
	71 Provost	4.9	4.4	5.2	5.1	5.7	5.0	4.0	4.3	6.7	3.3	7.3	3.7
	72 Vision	4.9	5.0	5.0	4.7	6.7	6.3	2.7	3.3	5.7	3.3	6.0	3.3
	73 Spark	4.9	4.8	4.8	5.1	6.0	7.7	2.7	4.0	5.7	3.3	6.0	4.0
	74 Diligent	4.8	4.7	5.0	4.7	7.0	6.3	4.0	4.3	4.3	4.3	7.0	4.0
	75 EUS Comp	4.8	4.5	5.4	4.7	5.3	6.3	3.7	5.0	6.7	2.3	4.7	2.0
	76 Aspire	4.7	5.0	4.8	4.5	6.3	7.3	3.3	3.3	4.7	3.0	7.3	3.3
	77 Ruckus	4.7	4.7	4.8	4.7	6.3	7.0	4.7	7.3	6.0	5.3	6.7	3.3
	78 Benchmark	4.7	5.1	4.6	4.5	4.7	7.0	4.0	5.3	6.3	4.7	6.0	3.0
	79 PPG-PR 480	4.7	4.4	5.0	4.8	4.7	3.3	3.3	5.0	7.0	3.3	7.7	3.7
	80 PPG-PR 483	4.7	4.3	4.6	5.2	5.0	4.7	3.0	5.0	4.7	3.0	6.7	3.7

(Continued)

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

Cultivar or Selection		----- Turf Quality <sup>1</sup> -----				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	--- Stemminess <sup>4</sup> ---		Bipolaris Leaf Spot <sup>5</sup>	----- Dollar Spot <sup>6</sup> -----		
		2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12	Jun 18	Jun 14	Aug 8	Jul 20	Aug 14
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
81	Sox Fan	4.5	4.7	4.8	4.2	5.0	7.3	3.0	4.7	6.7	4.0	4.3	1.3
82	Big League	4.5	4.8	4.3	4.4	4.0	6.7	3.3	3.0	5.7	4.3	6.0	3.0
83	PPG-PR 472	4.5	4.5	4.5	4.4	5.0	5.0	3.7	4.3	5.3	3.7	6.3	2.3
84	Linedrive II	4.5	4.6	4.4	4.4	4.7	7.3	3.7	3.7	5.0	3.3	3.7	1.3
85	Expedite	4.4	4.8	4.1	4.3	4.7	6.3	3.3	4.0	4.0	4.7	5.0	2.7
86	Pennant H2O	4.4	4.9	4.3	4.1	5.0	7.3	3.7	3.3	5.0	4.3	6.7	2.3
87	Defender	4.4	4.4	4.6	4.3	4.3	6.7	2.7	3.3	5.3	5.3	7.3	3.3
88	Wicked	4.4	4.3	4.6	4.4	4.0	5.7	3.3	4.3	6.0	3.3	6.0	2.3
89	Virte	4.3	4.1	4.2	4.4	4.0	6.3	3.3	2.3	4.3	5.0	8.3	5.3
90	Dasher 3	4.2	4.1	4.6	3.9	4.7	6.0	3.7	4.0	5.0	2.7	5.3	1.7
91	Presidio II	4.2	3.9	4.3	4.3	3.0	7.3	2.7	3.0	4.7	3.3	6.7	3.7
92	Fiesta 4	4.2	4.0	4.3	4.1	4.7	5.0	2.7	3.3	4.0	3.0	6.3	3.0
93	Pistol	4.1	4.6	3.9	3.9	4.7	7.3	2.7	2.0	4.7	4.0	6.0	2.3
94	Ringles	4.0	3.8	4.3	4.1	4.0	5.3	2.7	4.7	4.3	3.3	5.3	2.0
95	SR 4660ST	4.0	3.2	4.4	4.4	4.0	6.3	2.3	4.0	4.0	2.3	6.0	2.7
96	Rinovo	3.9	3.5	4.1	4.2	4.7	5.0	3.0	4.3	4.3	3.0	4.3	2.7
97	Revenge-GLX	3.8	3.5	4.4	3.5	4.0	6.0	3.0	3.7	4.3	3.3	6.0	2.0
98	PST-2CARD Bulk	3.8	4.2	4.0	3.2	4.3	4.7	3.0	4.0	4.7	4.0	6.0	1.3
99	Primary	3.8	4.2	3.8	3.4	4.0	6.7	3.3	3.7	5.0	4.7	6.0	2.0
100	Homerun	3.8	4.1	4.0	3.2	3.7	6.7	4.0	3.7	6.3	3.7	6.3	2.3

(Continued)



Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

	Cultivar or Selection	----- Turf Quality <sup>1</sup> -----				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	---- Stemminess <sup>4</sup> ----		Bipolaris Leaf Spot <sup>5</sup>	----- Dollar Spot <sup>6</sup> -----		
		2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12 2019	Jun 18 2020	Jun 14 2019	Aug 8 2019	Jul 20 2021	Aug 14 2021
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
105	101 Torison	3.7	2.8	4.1	4.1	2.0	6.7	4.7	4.7	5.7	2.0	5.7	2.0
	102 Sun	3.6	3.1	3.8	3.8	3.7	6.3	3.3	3.7	4.3	1.7	6.7	2.3
	103 Silver Dollar	3.6	3.8	3.6	3.3	2.7	6.7	2.3	2.3	3.3	4.3	6.0	2.7
	104 Hancock	3.5	2.7	4.0	3.9	2.7	5.3	3.3	3.7	6.0	2.7	6.0	2.3
	105 Lover	3.5	3.0	3.6	3.8	3.3	5.0	3.3	3.3	4.7	2.7	5.0	1.7
	106 Black Pearl	3.4	3.6	3.5	3.2	3.0	6.0	2.7	2.3	4.3	4.0	6.3	2.0
	107 Brightstar SLT	3.4	3.3	3.5	3.4	2.3	7.3	2.0	3.0	2.0	2.7	4.3	1.7
	108 Zoom	3.4	3.1	3.8	3.3	4.0	7.7	3.0	3.7	4.7	2.3	4.7	1.7
	109 Double Time GLS	3.3	4.2	3.3	2.4	5.7	6.3	3.7	3.3	4.0	6.3	7.0	2.3
	110 Charger II	3.3	3.1	3.3	3.3	3.0	7.3	2.0	2.0	3.0	1.7	6.7	1.7
	111 MN-EPR18	3.2	2.7	3.6	3.4	2.7	3.3	6.3	5.3	5.0	2.0	6.3	2.3
	112 Tailgater	3.2	3.1	3.6	2.8	3.3	6.7	2.7	3.0	6.0	3.3	5.7	2.7
	113 Cascadia	3.1	3.2	3.5	2.5	2.7	6.0	2.7	1.7	4.0	3.3	6.7	2.7
	114 Fiji 2	3.0	2.8	3.3	2.9	2.3	7.0	2.3	2.7	4.0	2.7	5.3	2.3
	115 Continental II	3.0	2.7	3.4	2.8	2.7	7.7	2.7	1.3	5.0	2.7	5.0	2.7
106	116 Prominent	2.9	2.7	3.1	3.0	2.7	6.3	2.7	1.3	2.3	3.3	7.0	3.3
	117 LNSPRG1	2.9	2.4	3.3	3.1	2.0	6.3	2.0	2.7	3.7	3.0	6.7	3.3
	118 ORPRG16-2	2.8	2.1	3.5	2.8	2.7	5.0	2.3	2.7	4.3	1.7	6.7	3.0
	119 Brea	2.8	2.2	3.4	2.7	2.3	6.0	3.0	2.7	4.0	2.3	5.3	1.3
	120 Palmer III	2.8	1.9	3.4	2.9	1.3	6.7	3.3	3.0	3.7	3.0	5.0	2.7

(Continued)

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

Cultivar or Selection		Turf Quality <sup>1</sup>				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	Stemminess <sup>4</sup>		Bipolaris Leaf Spot <sup>5</sup>	Dollar Spot <sup>6</sup>		
		2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12	Jun 18	Jun 14	Aug 8	Jul 20	Aug 14
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
121	Tetradark	2.7	2.7	2.9	2.7	4.0	5.7	3.3	2.7	4.7	3.0	5.3	2.0
122	Express II	2.7	2.1	3.2	2.8	2.7	4.7	2.3	2.0	2.7	2.0	6.3	2.0
123	Mighty	2.7	1.7	3.2	3.1	2.0	5.3	2.7	3.0	4.3	2.0	4.3	2.3
124	Blazer 4	2.7	2.3	3.0	2.7	1.0	6.0	3.0	4.0	3.7	3.0	4.0	2.0
125	ORPRG16-3	2.6	1.9	3.1	2.7	1.3	4.3	2.7	3.0	3.7	2.0	4.3	1.3
126	Salinas II	2.5	2.2	2.9	2.6	3.0	5.3	3.3	5.3	5.3	1.7	5.0	2.3
127	Ringer II	2.5	2.0	3.0	2.6	2.3	5.7	3.0	3.0	3.7	1.7	4.7	1.7
128	Pinstripe II	2.5	1.7	2.8	3.0	1.7	6.7	2.3	3.3	4.3	1.0	5.0	2.0
129	Panther GLS	2.5	1.8	3.0	2.6	1.0	6.7	3.3	2.3	4.3	2.7	4.0	1.7
130	LNSPRG2	2.4	1.9	2.7	2.4	1.3	4.0	2.3	3.0	3.7	2.0	5.7	1.7
131	Majesty II	2.4	2.0	2.8	2.3	1.7	5.7	4.3	3.3	4.3	2.7	5.3	2.0
132	ORPRG16-4	2.3	1.7	2.5	2.7	1.3	4.0	3.0	1.3	3.3	1.7	5.7	1.3
133	Prelude IV	2.3	2.0	2.5	2.4	1.7	7.3	2.3	3.0	4.0	2.3	5.3	1.3
134	ORPRG16-1	2.3	1.7	2.5	2.5	1.7	4.3	2.7	3.0	4.0	1.7	6.0	2.0
135	Barbados	2.2	2.2	2.5	2.1	1.7	6.0	2.0	1.7	3.7	2.3	7.3	1.0
136	ORPRG16-5	2.2	1.5	2.5	2.8	2.3	4.3	2.7	2.3	4.7	1.7	5.3	1.3
137	ORPRG16-7	2.2	1.5	2.9	2.2	1.3	4.3	3.0	3.0	3.7	1.3	5.3	1.7
138	Cutter II	2.2	1.6	2.4	2.5	2.0	6.0	2.0	2.0	2.7	2.7	4.3	1.7
139	Replicator	2.0	1.6	2.4	2.1	1.3	3.0	5.3	2.7	5.3	1.0	4.3	1.7
140	Evening Shade	2.0	1.7	2.0	2.1	1.7	7.0	2.7	1.3	2.7	1.7	5.0	1.7

(Continued)

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2018 in Adelphia, NJ.

Cultivar or Selection		----- Turf Quality <sup>1</sup> -----				Gray Leaf Spot <sup>2</sup>	Establish- ment <sup>3</sup>	---- Stemminess <sup>4</sup> ----		Bipolaris Leaf Spot <sup>5</sup>	----- Dollar Spot <sup>6</sup> -----		
		2019-21	2019	2020	2021	Sep 2018	Sep 2018	Jun 12	Jun 18	Jun 14	Aug 8	Jul 20	Aug 14
		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
141	ORPRG16-6	1.9	1.1	2.0	2.6	1.3	4.3	2.5	2.0	4.7	1.3	6.0	1.3
142	Laredo II	1.7	1.3	1.8	2.0	1.3	5.7	2.7	1.3	3.3	2.0	5.3	2.0
143	Tetra Grain	1.3	1.2	1.2	1.6	1.0	6.0	4.5	1.0	4.3	2.7	5.3	1.7
144	PST-2TETS	1.2	1.6	1.2	1.1	3.0	5.7	5.0	1.0	4.3	2.7	6.3	1.7
LSD @ 5%=		0.6	0.9	0.7	0.9	1.4	1.6	1.5	1.4	1.7	1.5	2.2	2.0
CV		8.2	12.2	9.1	12.7	18.0	17.0	16.4	21.7	29.6	24.0	22.2	40.4

<sup>1</sup>9 = Best turf quality

<sup>2</sup>9 = Least gray leaf spot

<sup>3</sup>9 = Best establishment

<sup>4</sup>9 = Least stemminess

<sup>5</sup>9 = Least Bipolaris leaf spot

<sup>6</sup>9 = Least dollar spot

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

	Cultivar or Selection	----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----			Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>
		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
108	1 Siletz	7.0	6.8	6.9	8.5	8.3	8.7	7.3	5.7
	2 PPG-PR 530	6.6	6.7	6.5	8.2	9.0	7.3	8.3	4.0
	3 SGS4 Comp	6.6	6.4	6.7	8.7	9.0	8.3	8.0	5.3
	4 CJP2 Comp	6.6	6.8	6.4	8.7	9.0	8.3	8.3	5.0
	5 SGP4 Comp	6.6	6.9	6.1	8.5	8.7	8.3	8.3	6.0
	6 SGP2 Comp	6.6	6.4	6.4	8.2	9.0	7.3	5.7	4.7
	7 SGU3 Comp	6.4	6.2	6.6	8.5	9.0	8.0	8.3	6.0
	8 PPG-PR 524	6.4	6.6	6.2	8.8	9.0	8.7	8.7	3.0
	9 SGP3 Comp	6.4	6.4	6.2	8.3	8.3	8.3	8.3	6.3
	10 CJP1 Comp	6.4	6.4	6.2	8.0	8.3	7.7	7.0	6.7
	11 PPG-PR 531	6.3	6.9	5.9	8.0	8.3	7.7	8.7	2.3
	12 PRC3	6.3	6.3	6.3	8.7	9.0	8.3	9.0	5.3
	13 CJS Comp	6.3	6.1	6.3	8.2	8.7	7.7	8.0	4.7
	14 SGP1 Comp	6.2	7.0	5.4	8.2	8.3	8.0	6.7	3.7
	15 PST-214	6.2	6.8	5.7	8.7	9.0	8.3	8.7	5.0
	16 Furlong	6.2	6.3	6.0	7.8	8.3	7.3	8.0	4.0
	17 SGU1 Comp	6.2	6.0	6.2	8.7	9.0	8.3	8.3	6.0
	18 PPG-PR 528	6.2	6.6	5.9	8.2	8.3	8.0	8.7	3.3
	19 SGS3 Comp	6.2	5.8	6.4	8.5	8.7	8.3	8.3	5.7
	20 SGU2 Comp	6.1	6.3	5.9	8.3	8.7	8.0	9.0	3.7

(Continued)

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

	Cultivar or Selection	----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----			Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>
		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
109	21 2CL4 Comp	6.1	6.6	5.4	9.0	9.0	9.0	8.0	3.0
	22 SGS1 Comp	6.1	6.3	5.9	8.3	8.3	8.3	7.7	3.0
	23 SGS5 Comp	6.1	6.2	5.9	8.3	8.7	8.0	7.7	4.7
	24 PPG-PR 525	6.1	6.2	5.9	8.7	8.7	8.7	8.3	2.0
	25 2CL1 Comp	6.0	6.5	5.4	8.8	9.0	8.7	6.7	3.7
	26 PPG-PR 519	6.0	6.4	5.7	8.3	8.7	8.0	8.0	3.0
	27 PPG-PR 535	6.0	6.5	5.6	8.0	8.3	7.7	8.7	2.7
	28 CJU Comp	6.0	6.1	5.8	8.3	8.7	8.0	7.7	3.7
	29 PPG-PR 527	6.0	6.5	5.4	8.3	8.0	8.7	8.3	1.3
	30 Gray Wolf	6.0	6.6	5.5	8.3	8.7	8.0	7.7	1.7
	31 PPG-PR 526	5.9	6.6	5.5	8.5	8.7	8.3	8.3	2.3
	32 PPG-PR 536	5.9	7.0	5.1	8.2	8.3	8.0	9.0	2.3
	33 2CL3 Comp	5.9	6.8	5.1	9.0	9.0	9.0	6.0	2.3
	34 UEV Comp	5.9	6.2	5.7	8.5	8.7	8.3	8.0	2.0
	35 Paradox GLR	5.9	6.4	5.5	7.7	8.0	7.3	8.3	1.7
	36 Fastball RGL	5.8	6.0	5.6	8.0	8.7	7.3	8.7	5.0
	37 Process	5.8	6.1	5.6	8.0	8.0	8.0	7.7	4.0
	38 Silver Sport	5.8	6.1	5.4	8.2	8.3	8.0	9.0	5.3
	39 SGS2 Comp	5.8	5.9	5.7	7.8	8.0	7.7	8.0	3.7
	40 PPG-PR 515	5.7	6.4	5.0	8.8	8.7	9.0	5.0	3.0

(Continued)

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

		----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----		Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>	
		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
Cultivar or Selection									
110	41 Spike GLS	5.7	5.6	5.8	7.8	8.3	7.3	9.0	4.3
	42 Intense	5.7	6.2	5.1	7.7	8.0	7.3	7.3	1.0
	43 Slugger 3GL	5.7	5.8	5.8	8.2	8.3	8.0	9.0	3.0
	44 PST-2E6	5.7	6.5	5.1	8.5	8.7	8.3	8.0	2.7
	45 Pangea GLR	5.7	5.7	5.6	8.0	8.3	7.7	8.0	3.3
	46 PPG-PR 529	5.6	6.3	4.9	8.0	8.0	8.0	9.0	1.3
	47 Homerun LS	5.6	5.8	5.6	7.3	7.7	7.0	8.3	2.3
	48 PPG-PR 499	5.6	6.3	4.9	8.2	8.3	8.0	7.0	3.3
	49 Paragon 2 GLR	5.6	5.8	5.4	8.5	8.7	8.3	8.7	2.0
	50 GLS plus	5.6	5.7	5.4	7.7	8.0	7.3	8.3	2.7
	51 PST-2MEG	5.5	5.8	5.3	8.2	9.0	7.3	8.7	2.7
	52 PST-2WHB	5.5	5.1	5.8	6.8	7.3	6.3	9.0	5.3
	53 MFPR	5.4	5.9	5.0	8.2	8.7	7.7	7.7	3.0
	54 PST-Syn-2AVS	5.4	6.5	4.8	8.3	8.7	8.0	9.0	2.0
	55 PST-Syn-2TTT	5.4	5.8	5.3	8.5	9.0	8.0	8.7	2.7
	56 Banfield	5.3	5.7	4.8	7.8	8.0	7.7	7.0	2.3
	57 Stamina	5.3	6.4	4.5	7.2	7.7	6.7	8.3	2.3
	58 Apple 3GL	5.3	5.6	5.0	7.3	8.0	6.7	9.0	2.3
	59 Ivy	5.3	5.9	4.9	8.0	8.7	7.3	9.0	1.7
	60 PST-2MAY	5.3	6.3	4.7	8.3	8.7	8.0	8.0	3.0

(Continued)

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

		----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----		Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>	
		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
Cultivar or Selection									
111	61 PST-2BAD	5.3	5.7	4.8	7.2	7.7	6.7	7.3	4.0
	62 SSE Comp	5.3	5.5	5.0	5.3	5.3	5.3	6.3	4.0
	63 SR 4650	5.2	5.4	5.0	7.0	8.0	6.0	9.0	3.0
	64 Wicked	5.2	5.5	5.1	6.3	6.7	6.0	8.0	4.7
	65 Xcelerator	5.2	5.9	4.7	7.8	8.0	7.7	7.0	1.7
	66 Stellar 3GL	5.2	5.3	5.1	7.7	8.3	7.0	8.3	2.3
	67 PPG-PR 489	5.2	6.0	4.5	8.7	9.0	8.3	7.0	2.3
	68 Sun Hawk	5.2	5.9	4.8	6.8	6.7	7.0	8.3	1.7
	69 Principal II	5.2	6.1	4.6	8.2	8.0	8.3	7.3	1.7
	70 PST-2BDT	5.2	6.0	4.5	7.7	8.0	7.3	7.3	2.0
	71 Thrive	5.1	5.9	4.4	8.0	8.0	8.0	8.7	2.0
	72 Blackstone	5.1	5.2	5.1	7.5	8.0	7.0	8.3	4.3
	73 Lateral spread PR	5.1	5.8	4.7	6.7	6.7	6.7	8.7	2.7
	74 PST-2BGL	5.1	5.6	4.7	7.8	8.0	7.7	7.7	2.0
	75 Evolution	5.1	5.4	5.0	8.5	8.7	8.3	7.7	3.0
	76 Premium	5.1	5.1	5.1	7.5	8.0	7.0	8.3	1.7
	77 PST-Syn-2MEGE	5.1	5.8	4.5	8.3	8.7	8.0	8.0	1.7
	78 Virte	5.1	5.0	5.0	6.3	7.0	5.7	8.0	4.7
	79 Karma	5.0	5.3	4.9	7.2	7.3	7.0	8.0	3.7
	80 Sideways	5.0	5.1	5.0	8.2	8.3	8.0	8.7	2.0

(Continued)

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

Cultivar or Selection		----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----			Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>
		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
81	Aspire	5.0	5.4	4.5	7.5	8.0	7.0	8.3	3.0
82	Spark	5.0	5.3	4.6	7.0	7.7	6.3	8.7	2.3
83	PST-2DRG	5.0	5.8	4.2	7.5	8.0	7.0	6.0	1.3
84	Diligent	4.9	5.3	4.7	8.0	8.0	8.0	8.7	2.7
85	Umatilla	4.9	5.6	4.4	7.8	8.0	7.7	6.0	3.0
86	PST-2FOXY-16	4.9	5.8	4.1	8.8	9.0	8.7	7.3	2.3
87	Rio Vista	4.9	5.7	4.0	7.7	8.0	7.3	4.7	3.7
88	Slider LS	4.8	5.7	4.3	7.3	8.3	6.3	8.3	2.3
89	Pillar II	4.8	4.9	4.7	7.7	8.0	7.3	7.7	1.3
90	Bandlore	4.8	5.2	4.3	8.0	8.3	7.7	8.3	2.0
91	Allstar 3	4.7	5.0	4.4	8.0	8.3	7.7	8.0	3.7
92	PPG-PR 513	4.7	5.1	4.3	7.0	7.0	7.0	6.7	3.0
93	Linedrive II	4.7	5.1	4.5	5.5	5.3	5.7	8.3	1.3
94	Apple SGL	4.7	5.2	4.4	7.2	7.3	7.0	8.3	1.3
95	Evolve	4.7	4.9	4.5	6.0	6.0	6.0	8.3	2.7
96	Sox Fan	4.6	5.2	4.1	7.0	7.3	6.7	7.7	1.0
97	Grandslam GLD	4.6	4.6	4.6	7.3	7.3	7.3	7.7	1.7
98	Greenland	4.6	5.0	4.3	7.5	8.3	6.7	8.0	2.7
99	Ringles	4.6	5.0	4.1	6.8	6.7	7.0	8.0	1.3
100	LNTS1	4.6	5.2	3.9	6.8	7.3	6.3	5.3	2.0

(Continued)



Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

		----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----		Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>	
Cultivar or Selection		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
113	101 Infusion	4.6	5.0	4.1	8.5	9.0	8.0	8.3	1.3
	102 Belize 2	4.5	4.9	4.2	6.5	6.7	6.3	8.7	3.7
	103 Provost	4.5	4.5	4.4	7.5	8.0	7.0	8.3	2.0
	104 Allsport 5	4.5	5.1	3.9	7.0	6.7	7.3	8.7	1.3
	105 Align II	4.5	4.4	4.5	6.7	7.0	6.3	7.3	3.7
	106 Proline ST	4.4	5.0	4.2	5.5	5.0	6.0	8.3	1.7
	107 Top Gun II	4.4	4.4	4.1	5.3	5.0	5.7	9.0	4.0
	108 Caddieshack II	4.3	4.3	4.3	5.0	5.3	4.7	8.3	4.0
	109 Big League	4.2	4.8	3.7	6.0	5.7	6.3	6.3	3.0
	110 Fastball 3GL	4.2	4.6	4.0	7.2	7.7	6.7	9.0	2.3
	111 Peridot	4.2	4.3	4.1	6.0	6.7	5.3	7.7	4.0
	112 Prosport 4	4.2	4.5	4.0	5.7	6.0	5.3	7.7	1.7
	113 SR 4660ST	4.2	5.2	3.6	6.7	6.7	6.7	8.0	1.0
	114 Rinovo	4.2	4.8	3.8	7.8	7.7	8.0	8.0	1.3
	115 McKenzie	4.2	4.6	3.8	5.2	5.3	5.0	9.0	1.7
	116 Expedite	4.2	4.5	4.0	6.7	7.7	5.7	7.0	2.0
	117 Belize	4.1	4.5	4.1	6.2	6.3	6.0	8.7	2.7
	118 Cayman	4.1	4.3	3.8	6.7	6.7	6.7	6.3	3.3
	119 Silver Sun	4.1	4.9	3.6	6.0	6.0	6.0	8.7	1.3
	120 Hawkeye 2	4.1	4.6	3.7	5.0	5.7	4.3	8.0	1.7

(Continued)

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

		----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----			Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>
Cultivar or Selection		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
114	121 Presidio II	4.0	3.9	4.0	6.5	6.7	6.3	6.0	4.0
	122 Fiesta 4	4.0	4.3	3.8	6.5	7.0	6.0	9.0	1.3
	123 Palmer III	4.0	4.4	3.7	5.0	6.0	4.0	8.3	1.0
	124 Benchmark	4.0	4.4	3.7	5.7	5.7	5.7	7.3	1.7
	125 Harrier	3.9	4.6	3.4	7.2	7.7	6.7	8.7	1.3
	126 Dasher 3	3.9	4.4	3.6	7.3	7.7	7.0	8.3	1.7
	127 Spyglass	3.9	4.3	3.6	4.7	4.7	4.7	7.3	1.0
	128 Torsion	3.8	4.1	3.8	3.0	3.0	3.0	8.0	1.0
	129 Double Time GLS	3.8	3.8	3.8	6.7	6.3	7.0	9.0	6.0
	130 Zoom	3.7	4.4	3.3	6.3	6.7	6.0	8.3	1.7
	131 Panther H2O	3.6	4.0	3.5	3.8	3.7	4.0	8.7	2.0
	132 Blazer 4	3.6	3.7	3.3	3.2	3.3	3.0	7.3	1.3
	133 Sun	3.6	4.0	3.2	5.5	5.3	5.7	9.0	1.0
	134 Hancock	3.5	4.0	3.0	5.8	6.3	5.3	8.7	2.0
	135 PST-2CARD Bulk	3.5	4.1	3.3	6.5	7.3	5.7	8.7	1.3
	136 Lover	3.5	3.8	3.3	4.5	4.7	4.3	8.7	1.7
	137 Black Pearl	3.5	3.5	3.4	5.3	5.0	5.7	8.7	2.0
	138 Accent II	3.5	3.4	3.7	2.8	2.7	3.0	8.7	1.7
	139 Greenville 4	3.3	3.5	3.2	3.7	3.3	4.0	8.0	1.0
	140 LNTS3	3.3	3.6	3.1	4.3	5.0	3.7	5.3	1.3

(Continued)

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in August 2019 at Adelphia, NJ.

		----- Turf Quality <sup>1</sup> -----			----- Gray Leaf Spot <sup>2</sup> -----		Red Thread <sup>3</sup>	Dollar Spot <sup>4</sup>	
Cultivar or Selection		2019-2021 Avg.	2019-20 Avg.	2021 Avg.	2019 Avg.	Oct 8 2019	Oct 21 2019	Jun 11 2021	Aug 14 2021
141	JS501	3.2	3.3	3.2	2.7	2.3	3.0	7.7	2.3
142	Mighty	3.2	3.3	3.1	3.8	4.3	3.3	7.7	1.0
143	Edge II	3.2	3.2	3.2	4.0	5.0	3.0	8.0	2.0
144	Prelude IV	3.2	3.5	3.2	2.5	2.7	2.3	7.7	1.7
145	Sunrise	3.1	3.2	2.9	4.7	5.0	4.3	7.7	2.0
146	Gator 3	3.0	3.3	2.9	2.8	3.7	2.0	8.7	2.0
147	LNTS2	2.9	2.9	2.9	4.0	4.3	3.7	7.7	2.0
148	Panther GLS	2.9	3.1	2.9	2.2	2.3	2.0	7.7	1.0
149	PRG-19DH	2.8	2.7	2.9	2.2	2.3	2.0	4.7	2.3
150	Express II	2.8	2.7	2.9	4.7	5.0	4.3	8.7	1.3
151	PHX-NZ	2.7	2.9	2.8	1.8	1.7	2.0	7.0	1.7
152	PRG-19MH	2.7	2.6	2.7	3.0	3.0	3.0	7.0	1.3
153	Cutter II	2.6	2.6	2.6	2.7	2.0	3.3	6.7	2.7
154	Replay	2.6	2.4	3.0	2.2	1.7	2.7	7.0	2.3
155	Prominent	2.4	2.5	2.4	4.3	4.7	4.0	8.7	2.3
156	Barbados	2.3	2.7	2.0	3.0	3.0	3.0	8.0	1.3
LSD @ 5% =		0.7	0.9	1.1	1.1	1.1	1.7	2.5	1.5
CV =		9.4	10.19655	15.0	10.0	9.7	15.6	19.4	34.3

<sup>1</sup>9 = Best turf quality

<sup>2</sup>9 = Least gray leaf spot

<sup>3</sup>9 = Least red thread

<sup>4</sup>9 = Least dollar spot

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in September 2020 at Adelphia, NJ.

Cultivar or Selection	-----Turf Quality <sup>1</sup> ----- 2021 Avg.
1 20PR07 Comp	7.3
2 Mystique	7.3
3 20PR06 Comp	7.3
4 Zoom 2	7.2
5 20PR03 Comp	7.2
6 Paradox	7.2
7 PPG-PR 571	7.1
8 20PR12 Comp	7.1
9 G89	7.1
10 Fiesta Cinco	7.0
11 PPG-PR 539	6.9
12 PPG-PR 543	6.9
13 CJS Comp	6.7
14 LP20GR8-S1	6.7
15 DLFPS-236/3546	6.7
16 Apple 3GL	6.7
17 PPG-PR 541	6.7
18 PPG-PR 546	6.7
19 Principal II	6.7
20 20PR01 Comp	6.7
21 20PR11 Comp	6.7
22 20PR14 Comp	6.7
23 Process	6.7
24 Portfolio	6.7
25 Mach Two	6.6
26 20PR04 Comp	6.6
27 Paragon 2 GLR	6.6
28 SR 4700	6.6
29 Wicked	6.6
30 Blackstone	6.6
31 20PR05 Comp	6.6
32 Siletz	6.6
33 PVF-GR4	6.6
34 20PR10 Comp	6.6
35 Paradox GLR	6.5

(Continued)

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in September 2020 at Adelphia, NJ.

Cultivar or Selection		-----Turf Quality <sup>1</sup> ----- 2021 Avg.
36	20PR02 Comp	6.5
37	2CL5-C1	6.5
38	PVF-PDS1	6.5
39	Primary II	6.5
40	Paragon 2	6.5
41	PR-6-16	6.4
42	Greenland	6.4
43	PST-2E6	6.4
44	Fastball 3GL	6.4
45	LP20GR3-S1	6.4
46	PPG-PR 566	6.4
47	PST-2BGL	6.4
48	Slugger 3GL	6.4
49	Xcelerator	6.4
50	CT7	6.4
51	PPG-PR 545	6.4
52	Gator Fore	6.3
53	Derby Nova	6.3
54	PPG-PR 536	6.3
55	PST-2MAY	6.3
56	PST-2HAF20	6.3
57	DLFPS-236/3548	6.2
58	DLFPS-236/3550	6.2
59	Homerun LS	6.2
60	Slider LS	6.2
61	NAI-20-66	6.2
62	Gray Hawk	6.2
63	Sun Hawk	6.2
64	Stellar 3GL	6.2
65	SR 4650	6.1
66	Premium	6.1
67	PST-2EGY	6.1
68	LP20RUC-S1	6.1
69	20PR08 Comp	6.1
70	Bandalore	6.0

(Continued)

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in September 2020 at Adelphia, NJ.

Cultivar or Selection		-----Turf Quality <sup>1</sup> ----- 2021 Avg.
71	Hancock	6.0
72	Spike GLS	6.0
73	Peridot	6.0
74	PR 653 B	6.0
75	Spark	6.0
76	Palace II	6.0
77	PPG-PR 538	5.9
78	PPG-PR 540	5.9
79	Provost	5.9
80	Karma	5.9
81	Sideways	5.8
82	Torsion	5.8
83	PST-2WHB	5.8
84	Roundabout	5.8
85	PST-2BAD	5.8
86	PST-2MEG	5.8
87	DLFPS-236/3540	5.7
88	JR-197	5.7
89	Primary II	5.7
90	Pangea	5.7
91	Thrive	5.6
92	Grandslam GLD	5.6
93	PPG-PR 498	5.6
94	PPG-PR 570	5.6
95	Peridot	5.6
96	Apple SGL	5.6
97	Pimlico	5.6
98	PPG-PR 544	5.6
99	Presidio II	5.5
100	Revenge GLX	5.5
101	Diligent	5.5
102	Monsieur	5.5
103	Riptide	5.5
104	PR 652 B	5.5
105	PST-2GDS	5.5

(Continued)

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in September 2020 at Adelphia, NJ.

Cultivar or Selection		-----Turf Quality <sup>1</sup> ----- 2021 Avg.
106	NAI-20-63	5.4
107	Stamina	5.4
108	NAI-20-44	5.4
109	UTH-PR-2020	5.4
110	Pillar II	5.4
111	Rinovo	5.4
112	Benchmark	5.4
113	Mightier	5.3
114	Palace II	5.3
115	Ringles	5.3
116	Pangea GLR	5.3
117	Mighty	5.3
118	NAI-20-80	5.3
119	Align II	5.3
120	Evolve	5.3
121	FCW	5.2
122	Alloy	5.2
123	Virte	5.2
124	Big League	5.1
125	Palmer III	5.1
126	Exacta II GLSR	5.1
127	Black Pearl	5.1
128	Silver Sport	5.1
129	Banfield	5.1
130	Expedite	5.1
131	Allstar Fore	5.0
132	Lover	4.9
133	Black Cat II	4.9
134	Provost	4.9
135	Pistol	4.9
136	Fastball RGL	4.9
137	Panther GLS	4.9
138	Vision	4.9
139	Fiesta 4	4.8
140	Preference	4.8

(Continued)

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial seeded in September 2020 at Adelphia, NJ.

Cultivar or Selection		-----Turf Quality <sup>1</sup> ----- 2021 Avg.
141	Commander ST	4.8
142	Silver Dollar	4.8
143	SR 4660ST	4.8
144	Oahu	4.8
145	Aspire	4.7
146	Allstar 3	4.6
147	Pennant H2O	4.6
148	McKenzie	4.6
149	Confetti III	4.6
150	GO-143	4.5
151	Barbados	4.5
152	LP20DH-S3	4.5
153	Helios	4.5
154	Proline ST	4.5
155	Linedrive II	4.4
156	Panther H2O	4.4
157	GO-142	4.3
158	Prominent	4.3
159	LP20MH-S3	4.3
160	Fiji II	4.2
161	Academy III	4.2
162	Double Time GLS	4.2
163	Majesty II	4.1
164	Double Time	3.8
165	Sun	2.7
166	Infusion	1.2
LSD @ 5% =		0.9
CV =		10.0

<sup>1</sup>9 = Best turf quality



Table 5. Yearly nitrogen (N) applied and mowing height (Ht) on perennial ryegrass trials established in Adelphia, NJ.

	----- 2016 -----		----- 2017 -----		----- 2018 -----		----- 2019 -----		----- 2020 -----		----- 2021 -----	
	N <sup>1</sup>	Ht <sup>2</sup>	N	Ht	N	Ht	N	Ht	N	Ht	N	Ht
Table 1 (2016 NTEP)	0.5	2.5	2.75	2.5	1	2.5	2.5	1.5	2.25	1.5	2.25	1.5
Table 2 (2018)	–	–	–	–	3.15	1.5	4.25	1.5	2.75	1.5	3	1.5
Table 3 (2019)	–	–	–	–	–	–	1.4	1.5	4.25	1.5	2.25	1.5
Table 4 (2020)	–	–	–	–	–	–	–	–	2	1.5	3.75	1.5

<sup>1</sup>Annual N applied (lb/1000 ft<sup>2</sup>)

<sup>2</sup>Mowing height (inches)