200400231

No.

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Seed Research of Oregon

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE [illegible]IGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR [illegible]ORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE [illegible] PURPOSE , OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE [illegible] OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT [illegible]BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BENTGRASS, CREEPING

'Sandhill'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-ninth day of September, in the year two thousand and six.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

[illegible]y of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions*

Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER: Seed Research of Oregon

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME: SRX 1BPAA

3. VARIETY NAME: Sandhill

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*: 27630 Llewellyn Rd. Corvallis, OR 97333

5. TELEPHONE *(include area code)*: 541-757-2663

6. FAX *(include area code)*: 541-758-5305

FOR OFFICIAL USE ONLY

PVPO NUMBER: 20040231

FILING DATE: May 24, 2004

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*: Research Seeds- Inc.

8. IF INCORPORATED, GIVE STATE OF INCORPORATION: MO

9. DATE OF INCORPORATION:

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Dr. Leah A. Brilman
Seed Research of Oregon
27630 Llewellyn Rd.
Corvallis, OR 97333

FEES RECEIVED

FILING AND EXAMINATION FEES: $ 3,652.00
DATE May 24, 2004

CERTIFICATION FEE: $ 768.00
DATE July 18, 2006

11. TELEPHONE *(Include area code)*: 541-758-9115

12. FAX *(Include area code)*: 541-752-2065

13. E-MAIL: srofarm@attglobal.net

14. CROP KIND *(Common Name)*: Creeping bentgrass

16. FAMILY NAME *(Botanical)*: Poacea

15. GENUS AND SPECIES NAME OF CROP: Agrostis stolonifera

17. IS THE VARIETY A FIRST GENERATION HYBRID? ☐ YES ☐ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (*OPTIONAL*)
☐ YES ☒ NO
IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERICALIZATION. _____

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)
a. ☒ Exhibit A. Origin and Breeding History of the Variety
b. ☒ Exhibit B. Statement of Distinctness
c. ☒ Exhibit C. Objective Description of Variety
d. ☒ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☒ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
g. ☒ Filing and Examination Fee ($3,652), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*
☐ YES *(If "yes", answer items 21 and 22 below)* ☒ NO *(If "no", go to item 23)*

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
☐ YES ☐ NO
IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U.S. OR OTHER COUNTRIES?
☐ YES ☒ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES ☒ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
Leah A. Brilman			
NAME *(Please print or type)*		NAME *(Please print or type)*	
Leah A. Brilman			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Research Director	5-19-04		

INSTRUCTIONS

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GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable *(in the sense that it will reproduce an entire plant)* tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for $3,652 ($432 filing fee and $3,220 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice.)* Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of $432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301) 504-5518
FAX: (301) 504-5291
Homepage: http://www.ams.usda.gov/science/pvpo/pvpindex.htm

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 http://www.ams.usda.gov/lsg/seed.htm.

ITEM

19a. Give:
(1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified

19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:

(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, *etc.*

19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

20. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of certified seed)*, the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. *(See Regulations and Rules of Practice, Section 97.103).*

23. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

24. *See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.*

22. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

23. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

24. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)*

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

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Exhibit A. 20040023 1

Origin and Breeding History of Sandhill Creeping Bentgrass

Sandhill (SRX 1BPAA) creeping bentgrass (*Agrostis stolonifera*) was developed from selected germplasm for brown patch resistance, high heat and drought tolerance, early maturity, high seed yield and high turf quality. This variety is a composite of open pollinated progeny of thirteen plants, eight plants derived from early and later generations of plants related to SR 1119, two plants derived from a plant selected from Providence through multiple cycles of selection and three plants derived from a plant that traces back to a population derived from a plant collected in Houston, Texas. Two of the plants selected from the SR 1119 germplasm, O27-12 and O7-28, were originally because they were earlier than the rest of the population but the progeny had superior turf quality and high seed yields. A plant was selected from Providence based on early maturity and high seed yield in the original PVP nursery and later demonstrated good progeny turf quality. The Houston germplasm traces back through multiple generations to a creeping bentgrass plant collected from a green in Houston, Texas where it was out competing hybrid bermudagrass. The exact course or green was not specified in the records of Seed Research and the population was present on the research farm in 1989. The progeny of these and other plants were evaluated in a low maintenance fairway trial at Rutgers University. Superior plants with reduced disease along with good turf quality were selected and the progeny planted at Old Farm of Seed Research of Oregon, Corvallis, Oregon in 1989.

Seeds of these selected plants plus seed from additional clones used to develop SR 1119, Brighton and other germplasm, were sent to the University of Missouri, Columbia, MO to establish a mown space plant progeny trial for brown patch resistance and heat and drought tolerance in 1992. The space plants were inoculated with six strains of *Rhizoctonia solani* while subjected to low mowing heigh and high heat and drought for two years. After two years, twenty-four plants with high turf quality, brown patch resistance and heat and drought tolerance were selected and sent back to the Research Farm of Seed Research of Oregon, south of Corvallis, OR in 1995. Seventeen plants were selected from the nursery based on matching color, early maturity and high seed yield.

Polycross progeny from these seventeen plants were established in turf trials at Rutgers University in 1996. Two of the plants were derived directly from the plant designated P-18 used in the development of SR 1119 and one from the plant designated P-64, also used in the development of SR 1119. Polycross progeny of the thirteen plants designated below were selected based on turf performance and were planted in a breeder block in 1997 in rows of 35 plants with four rows of progeny of BPCRB P40-35, two rows of BPCRB P38-32 and 35 plants of each additional clone. The breeder block was rouged for uniformity of color, early maturity, growth habit, disease resistance and high seed yield. After evaluation, the following number of progeny remained in the breeder block. And were used to produce the breeder seed.

Selected plants	Number of progeny	Numberremained at at harvest
BPCRB P40-35 (Houston Blue, M15-8)	140	91
BPCRB P42-32 (SR 1119, O27-12)	35	22
BPCRB P38-34 (Providence, K4-28)	35	28
BPCRB P38-32 (Providence, K4-28)	70	51
BPCRB P41-32 (SR 1119, O27-12)	35	27
BPCRB P39-32 (SR 1119, O27-12)	35	28
BPCRB P40-32 (SR 1119, 1119-P64)	35	30
BPCRB P39-33 (SR 1119, 1119-P18)	35	30
BPCRB P43-32 (SR 1119, 1119-P18)	35	30
BPCRB P40-34 (SR 1119, O27-12)	35	22
BPCRB P42-33 (SR 1119, O7-28)	35	23
BPCRB P43-33 (Houston Blue, M15-8)	35	20
BPCRB P43-35 (Houston Blue, M15-8)	35	18
Total	595	420 (71%)

Fifty percent of the plants trace back to plants related to SR 1119 through various cycles of selection, thirty–one percent to the plant selected from the Houston germplasm and nineteen percent to the plant selected from Providence.

Sandhill is a unique and stable early maturity creeping bentgrass variety and breeder seed has been produced from the composite of the above plants. The variety was entered as SRX 1BPAA in the 1998 National Bentgrass trial for greens and fairways. A foundation field was established in 2000. Sandhill has been observed for two generations of reproduction and is stable and uniform. No variant were observed. Sandhill is approved for three generations of increase, foundation, registered and certified. Breeder seed was first produced in 1998 and the breeder block is maintained until sufficient breeder seed is produced. Breeder seed has been placed in cold storage.

EXHIBIT B.

NOVELTY STATEMENT FOR 'SANDHILL CREEPING BENTGRASS

'Sandhill' creeping bentgrass most closely resembles SR 1119 creeping bentgrass but can be distinguished from it by a combination of the following characteristics:

1) Sandhill has a significantly earlier heading date then SR 1119 (Tables 1 and 2).

2) Sandhill has a significantly earlier anthesis date than SR 1119 (Tables 1 and 2).

3) Sandhill has a lighter green color than SR 1119 when examined on individual leaves of spaced plants with a color of 6.2 vs. 6.9 in 1999 and 4.8 vs. 6.0 in 2000 (Table 27). In addition, a greater proportion of SR 1119 plants are on the 7.5 GY Munsell plant Chart . SR 1119 had 21% in this category in 1999 vs. 5% for Sandhi and in 2000 53% of SR 1119 plants were on this cahrt with 15% of Sandhill. The hue angle is the difference between these two color charts.

Table 1. Heading and anthesis dates of creeping bentgrass varieties in 1999 near Corvallis, OR. Plants of each variety were established in the fall of 1998 in 2 reps of 35 plants. A plant was considered headed when 3 heads had emerged from the boot. The number of plants that produced at least 3 heads is shown as number headed. Anthesis date is established as the date when 3 heads on a plant have flowers at anthesis. Varieties with different letters are significantly different at the 0.05 level. The spring of 1999 had cool, wet weather. Anthesis tended to occur in flushes with significant number of plants all starting anthesis on the occassional sunny, warm days.

Variety	Number Headed	Heading Date	(S.E.)	50% Heading Date	Number at Anthesis	Anthesis Date	(S.E.)	50%Anthesis Date
Sandhill	**66**	**151.0a**	**(0.6)**	**152**	**66**	**166.6a**	**(0.5)**	**166**
Crenshaw	68	151.3 a	(0.6)	152	68	167.3 ab	(0.5)	166
Penn A-1	60	152.5 ab	(0.8)	152	61	166.5 a	(0.5)	165
Penn G-6	61	152.7 ab	(0.9)	152	61	168.4 bcd	(0.7)	166
Seaside II	68	153.0 ab	(0.7)	152	68	167.5 abc	(0.5)	165
Brighton	67	154.4 bc	(0.6)	154	66	169.4 de	(0.5)	169
SR 1119	69	155.2 cd	(0.6)	154	69	169.8 de	(0.5)	169
L-93	67	155.1 cd	(0.7)	155	66	169.2 de	(0.6)	169
Penn A-4	62	155.2 cd	(1.0)	154	61	168.9 cde	(0.6)	169
Cobra	66	155.9 cd	(0.7)	155	66	172.5 gh	(0.5)	172
Southshore	68	158.4 ef	(0.5)	158	68	171.5 fg	(0.5)	172
Providence	66	159.3 fg	(0.6)	158	66	172.0 g	(0.5)	172
SR 1020	68	159.4 fg	(0.7)	158	68	172.0 g	(0.6)	172
Penncross	66	160.6 gh	(0.8)	160	67	173.5 h	(0.6)	173
Seaside	69	162.0 h	(0.7)	162	68	175.3 i	(0.7)	174

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Table 2. Heading and anthesis dates of creeping bentgrass varieties in 2000 near Corvallis, OR. Plants of each variety were established in the fall of 1998 in 2 reps of 35 plants. The same plants were utilized as in 1999. A plant was considered headed when 3 heads had emerged from the boot. The number of plants that produced at least 3 heads is shown as number headed. Anthesis date is established as the date when 3 heads on a plant have flowers at anthesis. Varieties with different letters are significantly different at the 0.05 level. The spring and summer of 2000 had cool weather. Anthesis tended to occur in flushes with significant number of plants all starting anthesis on the occassional sunny, warm days. We had one week inearly summer that was hot that affected maturity. All of the Penn varieties except Penncross had approximately 10% more plants flowering in 2000 than in 1999. On these plants in 1999 often those that were counted as flowering (3 heads) had significantly less heads than the other varieties.

Variety	Number Headed	Heading Date	(S.E.)	50% Heading Date	Number at Anthesis	Anthesis Date	(S.E.)	50%Anthesis Date
Sandhill	**66**	**149.2a**	**(0.6)**	**150**	**66**	**166.5ab**	**(0.5)**	**167**
Penn A-1	66	150.3ab	(0.6)	150	66	165.9 a	(0.4)	167
Crenshaw	67	150.7 ab	(0.8)	151	68	167.3 bc	(0.5)	167
Penn A-4	69	152.0 bc	(0.7)	150	61	168.0 cde	(0.5)	167
Seaside II	64	152.6 cd	(0.7)	153	68	167.2 bc	(0.4)	167
Penn G-6	66	152.7 cd	(0.8)	153	61	168.6 def	(0.5)	171
Brighton	67	153.4 cde	(0.6)	153	66	169.2 efg	(0.4)	171
SR 1119	68	154.7 ef	(0.6)	156	69	168.9 defg	(0.4)	171
Cobra	65	155.0 efg	(0.6)	156	66	169.2 defg	(0.4)	171
L-93	66	155.8 fgh	(0.7)	156	66	169.5 fgh	(0.3)	171
Southshore	69	156.7 ghi	(0.7)	156	68	169.5 fgh	(0.4)	171
Providence	70	156.9 hi	(0.6)	156	66	170.5 hi	(0.3)	171
SR 1020	67	158.4 i	(0.6)	158	68	170.7 i	(0.5)	171
Penncross	69	158.4 i	(0.6)	158	67	171.1 i	(0.4)	171
Seaside	67	162.4 i	(0.7)	164	68	172.8 j	(0.4)	172

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REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0581-0055

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY PROGRAM
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(BENTGRASS)

OBJECTIVE DESCRIPTION OF VARIETY
BENTGRASS
(*Agrostis* spp.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
Seed Research of Oregon	SRX 1BPAA	Sandhill

ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)
27630 Llewellyn Rd.
Corvallis, OR 97333

FOR OFFICIAL USE ONLY
PVPO NUMBER
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Place the appropriate number that describes the varietal characteristics of this variety in the boxes below. Use leading zeroes when necessary (e.g. 089). Descriptions of characters should represent those that are typical for the variety. Ranges may be given also. Measured data should be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all pertinent comparative trial and evaluation data. The symbol "." indicates decimal.

COMPARISON VARIETIES FOR USE BELOW

1 = Astoria
2 = Exeter
3 = Highland
4 = Seaside
5 = Penncross
6 = Kingstown
7 = Astra
8 = Other (Please Specify): SR 1119

1. SPECIES

[2] 1 = Colonial (browntop) *A. tenuis*
2 = Creeping *A. stolonifera* (*A. palustris*)
3 = Velvet *A. canina* ssp. *canina*
4 = Brown Bent *A. canina* ssp. *montana*
5 = Red Top *A. gigantea*

2. ADAPTATION (0 = Not Tested, 1 = Not Adapted, 2 = Adapted)

[2] Northeast [2] Southeast [2] North Central [2] Pacific N. W.

[ ] Other (Please Specify): _____

3. MATURITY (At first anthesis): Use comparison varieties

[0 6] Days earlier than ..... [5] COMPARISON VARIETY

Maturity the same as ..... [ ] COMPARISON VARIETY Penn A-1

[ ] Days later than ..... [ ] COMPARISON VARIETY

4. HEIGHT (Average of longest 10 shoots from soil surface to top of head)

[3 5 . 6] cm Height (at maturity)

[7 . 8] cm Shorter than ..... [ ] COMPARISON VARIETY Cobra

Height the same as ..... [ ] COMPARISON VARIETY Southshore

[3 . 4] cm Taller than ..... [5] COMPARISON VARIETY

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5. GROWTH HABIT

[ ][ ][ ] % Prostrate [ ][ ][5] % Decumbent [ ][6][2] % Geniculate [ ][3][3] % Erect

6. VEGETATIVE REPRODUCTION

Rhizomes: [1] 1 = Absent [ ] 2 = Present

Stolons: [2] 1= Absent [ ] 2 = Present

[ ][ ][ ] % Rhizomes [1][0][0] % Stolons

7. LEAF BLADE

Color: [5]
1 = Yellowish Green (Cohansey)
2 = Light Green (Washington)
3 = Green (Exeter)
4 = Dark Green (Kingstown, Tracenta)
5 = Bluish Green (Highland)
6 = Other (Please Specify): _____

Texture: (fineness) [2]
1 = Very Fine (Kingstown)
2 = Fine (Exeter)
3 = Medium Fine (Astoria)
4 = Medium (Seaside)
5 = Medium Coarse (Virgina)
6 = Coarse (Vermont)

[ ][ ][ ][ ] Stomatal density of upper leaf surface

Lower Surface: [ ][8][0] % Smooth [ ][2][0] % Rough

Upper Surface: [ ][4][5] % Smooth [ ][5][5] % Rough

Margins: [ ][2][5] % Smooth [ ][7][5] % Rough

[3][3] mm Width (Average of 10) [0][4] mm Narrower than ..... [4] COMPARISON VARIETY

Width same as .....L-93.. [ ] COMPARISON VARIETY

[0][7] mm Wider than ..... [5] COMPARISON VARIETY

[3][2] mm Width (Flag Leaves) [4][3] cm Length (Flag Leaves)

8. LEAF SHEATH

Anthocyanin: [ ] 1 = Absent 2 = Present [ ][ ][ ] % Red Sheaths

9. LIGULE (lower and middle leaves)

Shape at Apex: [ ][2][3] % Acute [ ][3][8] % Rounded [ ][2][3] % Truncate

[ ][1][6] % Other (Please Specify): jagged

Pubescence: [ ][5][7] % Glabrous [ ][4][3] % Pubescent

Margins: [ ][7][2] % Entire [ ][2][8] % Toothed

[ ][ ][ ] % Other (Please Specify): _____

[1][6] mm Length

10. LEMMA

Shape: [ ][ ][ ] % Lanceolate [ ][3][6] % Ovate

[ ][ ][2] % Obovate [ ][4][4] % Elliptic

10

20040023 1

10. LEMMA (*Continued*)

13 % Oblong 5 % Other (Please Specify): oval

03 mm Width 08 mm Length (Exclusive of awn)

Color: 73 % Buff 27 % Silvery
___ % Other (Please Specify): _____

Surface: 82 % Glossy 18 % Dull

Texture: 13 % Smooth 87 % Punctate

Pubescence: 13 % Glabrous 31 % Sparse
56 % Copious

Basal Hairs: ___ % Absent 55 % Few
45 % Many 42 % Short
58 % Long 82 % Appressed
12 % Ascending 6 % Spreading

Awns: 96 % Absent 4 % Few
___ % Many 4 % Awn-pointed
38 % Short Knob 4 % Long
29 % Straight 11 % Geniculate

Awn Insertion on Lemma: ___ % Basal 40 % Middle
2 % Distal

11. PANICLE

Type (in anthesis): 22 % Open 78 % Compact

Anthocyanin: 30 % Absent 70 % Present

Branches in Anthesis: 0 % Appressed 78 % Ascending
22 % Spreading

Branches in Fruit: 48 % Appressed 52 % Ascending
0 % Spreading

Branch Surface: 98 % Smooth 2 % Scabrous

12. SEED

08 Grams per 1000 seed

13. SPRING GREEN UP

1 1 = Early (Exeter) 2 = Medium (Astoria) 3 = Late (Kingstown)

14. ENVIRONMENTAL RESISTANCE (0 = Not Tested, 1 = Susceptible, 4 = Resistant)

20040023 1

[3] Cold [4] Heat [3] Drought [0] Shade [ ] Other (Please Specify): _____

15. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 4 = Resistant)

- [ ] Red Leaf Spot (*Drechslera erythrospila*)
- [ ] Melting Out (Drechslera poae (*Helminthosporium vagans*))
- [3] Pythium Blight (*P. aphanidermatum*)
- [ ] Fusarium Blight (*F. roseum*)
- [3] Fusarium Patch (Pink Snow Mold) (*F. nivale*)
- [3] Ophiobolus Patch (*O. gramnis*) (Take-all)
- [ ] Copper Spot (*Gloeocercospora sorghi*)
- [ ] Red Thread (*Corticium fuciforme*)
- [ ] Stem Rust (*Puccinia graminis*)
- [ ] Leaf Rust (*P. poae-nemoralis*)
- [4] Helminthosporium Leaf Spot (*Bipolaris sorokiniana*)
- [4] Dollar Spot (*Sclerotinia homoecarpa*)
- [ ] Pythium Blight (*P. ultimum*)
- [ ] Fusarium Blight (*F. tricinctum*)
- [ ] Powdery Mildew (*Erysiphe graminis*)
- [ ] Stripe Smut (*Ustilago striiformis*)
- [ ] Typhula Blight (Snow Scald) (*T. incarnata*)
- [4] Brown Patch (*Rhizoctonia solani*)
- [ ] Crown Rust (*P. coronata*)
- [3] Other (Please Specify): Gray Snow Mold

16. INSECT RESISTANCE (0 = Not Tested, 1 = Susceptible, 4= Resistant)

- [ ] European Chafer (*Amphimallon solstitialis*)
- [ ] Chinch Bug (*Blissus insularis*)
- [4] Armyworm (Cutworm) (*Pseudoletia unipuncta*)
- [ ] Garden Chafer (*Phyllopertha horticola*)
- [ ] Webworm (*Crambus* spp.)
- [ ] Other (Please Specify): _____

17. GIVE VARIETY(S) THAT MOST CLOSELY RESEMBLE THE SUBMITTED VARIETY: For the following characteristics indicate the degree of resemblance (D.R.) with one of the following numbers: 1 = submitted variety is less than, lighter, or inferior to similar variety, 2 = Same as, 3 = More than, darker or superior, etc.

Character	Similar Variety	D.R.	Character	Similar Variety	D.R.
Growth Habit	SR 1119	3	Leaf Color	SR 1119	1
Awn Length	SR 1119	1	Panicle Type	SR 1119	3(spreading)
Seed Weight	SR 1119	3	Turf Fineness	SR 1119	2
Cold Resistance	SR 1119	2	Heat Resistance	SR 1119	2
Drought Resistance	SR 1119	2	Shade Resistance		
Brown Patch	SR 1119	3			

18. COMMENTS

EXHIBIT D.

ADDITIONAL DESCRIPTION OF THE VARIETY

Alternate Exhibit C. Form developed by TBA
Supporting Tables.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
BELTSVILLE, MARYLAND 20705

OBJECTIVE DESCRIPTION OF CULTIVARS
BENTGRASSES
(*Agrostis. spp.*)

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
Seed Research of Oregon	Sandhill
ADDRESS (Street and No., or R.F.D. No., City State, and ZIP Code) 27630 Llewellyn Rd. Corvallis, OR 97333	FOR OFFICIAL USE ONLY PVPO NUMBER 20040023 1

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. 0/8/9/ or 0/9/) when number is either 99 or less or 9 or less. Descriptions of characters should represent those that are typical for the variety. Ranges may be given also. Measured data must be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all pertinent comparative trial and evaluation data. The symbol "Δ" indicates decimal.

Cultural Conditions

All measurements must be on spaced plants with a minimum of (30 cm) between plants. A minimum of 30 plants and 60 data points must be used for all measurements. Plants must be established no later than the previous fall for spring and summer measurements. Trials should be irrigated if necessary. Cultural conditions must be stated in comment section and plant number / data points shown in all tables. Specify growing conditions and experimental desigr

1. **SPECIES**

/1/ 1 = *A. stolonifera* (*A.palustris*, Creeping) 2 = *A. capillaris* (*A. tenuis*, Colonial)

3 = *A. canina* (Velvet) 4 = *A. gigantea* (Redtop)

5 = *A. castellana* (Dryland)

7 = OTHER (Specify) _____

2. **PLOIDY**

/2/ 1 = DIPLOID 2 = TETRAPLOID 3= HEXAPLOID 4 = OCTOPLOID

/ / CHROMOSOME NUMBER

3. **ADAPTATION** (0 = NOT TESTED 1 = NOT ADAPTED 2= ADAPTED)

/2/NORTHEAST /2/ SOUTHEAST /2/ NORTHCENTRAL

/2/PACIFIC N.W. /2/ SOUTHWEST

/ /OTHER (Specify) _____

STANDARD CULTIVARS - Choose cultivars from same species and ploidy level.

A. stolonifera	A. capillaris	A. canina	A. gigantea	A. castellana	A. _____
11 = PENNCROSS 12 = SR 1020 13 =SOUTHSHORE 14 =PROVIDENCE 15 = COBRA 16 = PENNLINKS	21= BARDOT 22 = SR 7100	31 = SR 7200	41= STREAKER 42 = RETON	51 = HIGHLAND	61 = _____ 62 = _____

71 = Penn A-1 (Specify Species)

14

4. **MATURITY**

3 / **MATURITY CLASS** (1 - 9) 1 = Very Early 2 = Early (Highland) 3 = Medium Early 4 = 5 = Medium 6 = 7 = Late 8 = 9 = Very Late

HEADING DATE (When 50% of plants in the variety have at least 3 panicles emerged from boot.)

1 / 5 / 1 / CALENDAR DAY.

___ / 9 / DAYS EARLIER THAN . . . . . 1 / 1 /

___ / ___ / SAME AS . . . . . 7 / 1 / Comparison Variety.

___ / ___ / DAYS LATER THAN . . . . . ___ / ___ /

ANTHESIS DATE (When 50% of plants in the variety have started anthesis.)
(Anthesis date is when 3 heads of a plant have started anthesis.)

1 / 6 / 6 / CALENDAR DAY.

___ / 6 / DAYS EARLIER THAN . . . . . 1 / 1 /

___ / ___ / SAME AS . . . . . 7 / 1 / Comparison Variety.

___ / ___ / DAYS LATER THAN . . . . . ___ / ___ /

---

5. **PLANT HEIGHT** (Post - Anthesis) Middle tiller. Not to include tallest 3 heads.

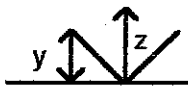
MATURE HEIGHT (Ground to top of panicle - straightened.)
(Do not pull stolons away from soil. (z) See diagram)

3 / 5 ▲ 6 /cm. HIGH

___ / 7 ▲ 8 / cm.SHORTER THAN . . . . . 1 / 5 /

___ / ___ / ___ / cm.SAME AS . . . . . 1 / 3 / Comparison Variety.

___ / 3 ▲ 4/cm.TALLER THAN . . . . . 1 / 1 /

6. **GROWTH HABIT** (Plant height without straightening (y) 

)

2 / 6 ▲ 7 /cm. HIGH

___ / 1 ▲ 2 /SHORTER THAN . . . . . 1 / 5 /

___ / ___ / ___ /SAME AS . . . . . 1 / 3 / Comparison Variety.

___ / 3 ▲ 5 /TALLER THAN . . . . . 1 / 1 /

PANICLE GROWTH ANGLE (Mature - Fully headed reproductive tillers.)
(Can be calculated from y and z or estimated.)

7 / 1 = Prostrate = 0° 4 = Decumbent Head (10°- 30° from ground.)

7 = _____ 9 = Upright (90°)

---

7. **INTERNODE LENGTH** (1st node on reproductive tillers to 2nd node.)

___ / ___ / ___ / cm. LENGTH (1 year spread)

___ / ___ / ___ / cm. LONGER THAN . . . . . ___ / ___ /

___ / ___ / ___ / cm. SAME AS . . . . . ___ / ___ / Comparison Variety.

___ / ___ / ___ / cm. SHORTER THAN . . . . . ___ / ___ /

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8. **VEGETATIVE REPRODUCTION**

__1__/ RHIZOMES

__7__/ STOLENS

1 = ABSENT 3 = WEAKLY CREEPING 5 = STRONGLY CREEPING

7 = VERY STRONGLY CREEPING 9 = _____

PLANT DIAMETER (Measure across plant in 2 directions.)

_____ age of plants _____ season planted _____ when measured

____/____/cm. diameter

____/____/cm. wider than . . . . . ____/____/Comparison Variety.

____/____/cm. narrower than . . . . . ____/____/Comparison Variety.

9. **REPRODUCTIVE TILLERS**

SUBTENDING LEAF (First leaf subtending flagleaf - after anthesis.) - Preferred Leaf.

____/__4▲9__/ cm. LENGTH (ligule to tip) __3▲1__/ mm. WIDTH (at 1 cm from collar)

____/__1▲4__/ cm. SHORTER THAN . . . __1__/__5__/ __0▲3__/ mm. NARROWER THAN . __1__/__4__/

____/____/____/ SAME AS . . . . . ____/____/ ____/____/ SAME AS . . . . . __7__/__1__/

____/____/____/ cm. LONGER THAN . . . . ____/____/ ____/____/ mm. WIDER THAN . . . . ____/____/

FLAG LEAF

____/__4▲3__/ cm. LENGTH (ligule to tip) __3▲2__/ mm. WIDTH (at 1 cm from collar)

____/__1▲4__/ cm. SHORTER THAN . . Crenshaw __0▲6__/ mm. NARROWER THAN . __1__/__1__/

____/____/____/ SAME AS . . . . . __1__/__1__/ ____/____/SAME AS . . . . . ____/____/

____/____/____/ cm. LONGER THAN . . . ____/____/ ____/____/ mm. WIDER THAN . . . . ____/____/

LIGULE

SUBTENDING LEAF

____/__2▲4__/mm. LENGTH

____/__0▲8__/ mm. SHORTER THAN . . . __1__/__5__/

____/____/____/ SAME AS . . . . . __7__/__1__/

____/____/____/ mm. LONGER THAN . . . . ____/____/

FLAG LEAF

__2▲8__/mm. LENGTH

__0▲5__/ mm. SHORTER THAN . . . __1__/__5__/

____/____/ SAME AS . . . . . __1__/__3__/

____/____/ mm. LONGER THAN . . . . ____/____/

LIGULE SHAPE AT APEX

__23__ % ACUTE __38__ % ROUNDED __23__ % TRUNCATE

__16__ % OTHER (Specify) jagged

RAD 10/29/05

MARGIN flag leaves

__52__ % ENTIRE __48__ % TOOTHED OTHER (Specify) _____

LEAF BLADE SURFACE - Percent plants with :

UPPER SURFACE	:	____/__5__/__5__/ ROUGH	____/__4__/__5__/ SMOOTH
LOWER SURFACE	:	____/__2__/__0__/ ROUGH	____/__8__/__0__/ SMOOTH
MARGINS	:	____/__7__/__5__/ ROUGH	____/__2__/__5__/ SMOOTH
LIGULE MARGINS	:	____/__7__/__2__/ ENTIRE	____/__2__/__8__/ TOOTHED
PUBESCENCE	:	____/__5__/__7__/ GLABROUS	____/__4__/__3__/ PUBESCENT
SHAPE	:	____/__1__/__3__/ ACUTE	____/__3__/__7__/ ROUNDED
		____/__2__/__7__/ TRUNCATE	____/__2__/__3__/ OTHER

10

LEAF SHEATH - Percent plants with :

ANTHOCYANIN (Seedling 3 - 8 tillers) : ___/___/ ABSENT ___/___/ PRESENT

20040023 1

GENETIC FOLIAGE COLOR (Summer Preferred)

Corvallis, OR LOCATION spaced SPACED PLANTS OR TURF PLOTS

summer, 1999 TIME OF YEAR irrigated, spaced plants at maturity GROWTH CONDITIONS

~~6 ▲ 2~~ GREEN LEAF COLOR 1 - 9

1 = LIGHT 3 = MEDIUM LIGHT 5 = MEDIUM 6 = MEDIUM DARK 9 = DARK GREEN

RAD 10/29/05 / 1 / OTHER COLOR / 1 / 0 / 0 / % PLANTS WITH

1 = BLUEGREEN 2 = GRAYGREEN 3 = BLUE 4 = POWDER BLUE 5 = SPECIFY _____

___/ 6 / 8 / % PLANTS WITH CHART NO. Munsell color chart 5GY 5/4 = 6

___/ 2 / 0 / % PLANTS WITH CHART NO. 5GY 4/4 = 7

___/ 1 / 2 / % PLANTS WITH CHART NO. (3% 7.5 GY 5/4, 3% 5GY 3/4, 6% other)

---

10. **PANICLE** (Post - Anthesis)

___/ 7 ▲ 6 / cm. PANICLE LENGTH (tip to bottom branch)

___/ 1 ▲ 3 /cm. SHORTER THAN . . 1 / 5 /

___/___/___/ SAME AS . . . . . 1 / 3 /

___/___/___/ cm. LONGER THAN . . . ___/___/

2 / 0 ▲ 7 /cm. PANICLE LENGTH (tip to node)

4 ▲ 1 /cm. SHORTER THAN . . 1 / 5 /

___/___/ SAME AS . . . . . 1 / 3 /

1 ▲ 8 /cm. LONGER THAN . . . 1 / 1 /

___/___/___/ NUMBER OF WHORLS PER PANICLE

1 / TYPE (anthesis) 1 = OPEN 2 = INTERMEDIATE 3 = COMPACT (Appressed)

BRANCH ATTITUDE 1 = SPREADING 2 = ASCENDING 3 = APPRESSED (Appressed)

AT ANTHESIS ___/ 2 / 2 / % SPREADING ___/ 7 / 8 / % ASCENDING ___/___/___/ % APPRESSED

AT FRUIT ___/___/___/ % SPREADING ___/ 5 / 2 / % ASCENDING ___/ 4 / 8 / % APPRESSED

PLANT CHARACTERISTICS (% plants with)

	AT ANTHESIS		AT FRUIT	
SHAPE :	___/___/___/	CONICAL	___/___/___/	CONICAL
	___/___/___/	OVATE	___/___/___/	OVATE
	___/___/___/	ENSIFORM	___/___/___/	ENSIFORM
	___/___/___/	OBLONG	___/___/___/	OBLONG
	___/___/___/	OVAL	___/___/___/	OVAL
	___/___/___/	LANCEOLATE	___/___/___/	LANCEOLATE

___/ 7 / 0 / ANTHOCYANIN

___/___/___/ PANICLES RETAINING GLUME

PERCENTAGE PLANTS WITH:

BRANCH PUBESCENCE :	___/ 9 / 8 /	% SMOOTH	___/___/ 2 /	% ROUGH
ANTHER COLOR (Pre-dehiscent) :	___/ 8 / 0 /	% YELLOWISH GREEN	___/___/___/	% GREEN
	___/ 2 / 0 /	% PURPLE	___/___/___/	% BLUISH GREEN
	___/___/___/	% REDDISH	___/___/___/	% OTHER (Specify)

_____

___/ 1 ▲ 2 / mm. ANTHER LENGTH

1 / 1 / SAME AS

200400231

11. **SEED** - From PVP nursery (not commercial sample). All seed just be processed similarly. Specify how data collected.

___/___/ 8 / 0 /mg. PER 1,000 SEED (Seed should be uniformly dried.)

___/___/___/___/mg. LESS THAN . . . . . ___/

___/___/___/ 5 /mg. MORE THAN . . . . . SR 1119 /

LEMMA

▲ 8 / 3 / mm. LEMMA LENGTH (average of 50) ▲ 3 / 2 / mm. LEMMA WIDTH (average of 50)

___/___/ mm. LESS THAN . . . . . ___/ ___/___/ mm. LESS THAN . . . . ___/

___/___/ SAME AS . . . . . ___/ ___/___/ SAME AS . . . . . ___/

___/___/ mm. MORE THAN . . . . . ___/ ___/___/ mm. MORE THAN . . . . ___/

TEXTURE (fig 2c)

___/ 1 / 3 / % SMOOTH (1) ___/ 3 / 1 / % PUNCTATE (2) ___/ 5 / 6 / % VERY PUNCTATE (3)

PUBESCENCE

RAD 10/29/05

___/ ~~2~~ 1 / ~~2~~ 3 / % GLABORUS (1) ___/ 3 / ~~2~~ 1 / % SPARSE (2) ___/ ~~4~~ 5 / ~~5~~ 6 / % COPIOUS (3)

___/___/___/ % LEMMAS DISTINCTLY EXCEEDING CARYOPSIS

LEMMA EXTENSIONS (Margins / Intermediate Nerves) (Fig. 2b)

___/ 4 / 9 / % TOOTHED ___/ 4 / 2 / % TOOTHED, BARBED ___/___/ 9 / % BARBED

SHAPE

___/___/___/ % LANCEOLATE (1) ___/ 3 / 6 / % OVATE (2) ___/___/ 2 / % OBOVATE (3)

SURFACE

___/ 4 / 4 / % ELLIPTIC (4) ___/ 1 / 3 / % OBLONG (5) ___/ • / 5 / % OTHER (6) oval

KEEL EXTENSIONS (Fig 2a)

AWNS (8, 9, 10, 11, 12, 15, 16, 17) KNOBS (2, 3, 4, 5, 6, 7, 13, 14) (under 0.1 mm.)

___/___/ 4 / % SEEDS WITH AWNS ___/ 3 / 8 / % SEEDS WITH KNOBS

▲ 1 / 5 / / % mm. AWN LENGTH (of those with awns - measured from base of awn)

PERCENT SEEDS WITH :

INSERTION

AWNS ___/___/___/ DISTAL (9) ___/___/___/ ALMOST DISTAL

___/___/ 4 / MIDDLE (8, 10, 12, 15, 17) ___/___/___/ BASAL (11, 16)

KNOBS ___/___/___/ DISTAL (7, 13) ___/___/ 2 / ALMOST DISTAL (3, 6)

___/ 3 / 6 / MIDDLE (2, 4, 5, 14) ___/___/___/ BASAL

ANGLE

AWNS ___/___/___/ STRAIGHT (8, 9, 15) ___/___/ 4 / GENICULATE (10,12,16,17)

KNOBS ___/ 2 / 9 / STRAIGHT (2,3,4,6,7,13) ___/___/ 7 / GENICULATE-APPRESSED (5,14)

BARBS

AWNS ___/___/___/ WITH BARBS (8,9,10,16,17) ___/___/ 4 / WITHOUT BARBS (11,12,15)

KNOBS ___/___/ 4 / WITH BARBS (4,5,6,7) ___/ 3 / 4 / WITHOUT BARBS (2,3,13,14)

AWNS

___/___/ 4 / % ROPE-LIKE-TWISTED (11,12,16,17) ___/___/___/ % NOT (8,9,10,15)

18

12. **DISEASE** (0 = NOT TESTED 1 = HIGHLY SUSCEPTIBLE 4 = MODERATELY SUSCEPTIBLE 6 = MODERATELY RESISTANT 9 = HIGHLY RESISTANT)

___/ LEAF RUST *Puccinia poae-nemoralis*

8 / BROWN PATCH *Rhizoctonia solani*

___/ MELTING-OUT *Drechslera poae*

___/ RED LEAF SPOT *D. erythrospila*

___/ FUSARIUM BLIGHT *Fusarium tricinctum, F. roseum*

6 / PYTHIUM BLIGHT *Pythium spp.*

___/ CROWN RUST *P. coronata*

___/ STRIPE SMUT *Ustilago striiformis*

7 / DOLLAR SPOT *Lanzia and Mollerdiscus spp.*

___/ STEM RUST *P. graminis*

___/ RED THREAD *Laetisaris fusciformis*

8 / LEAF SPOT *Bipolaris sorokiniana*

___/ POWDERY MILDEW *Erysiphe graminis*

7 / SNOW MOLD (Gray) *Typhula iotana*

4 / SNOW MOLD (Pink) *Gerlachia nivalis*

___/ COPPER SPOT *Gloeocercosporg sorghi*

12. **INSECT** (0 = NOT TESTED 1 = HIGHLY SUSCEPTIBLE 4 = MODERATELY SUSCEPTIBLE 6= MODERATELY RESISTANT 9 = HIGHLY RESISTANT)

___/ EUROPEAN CHAFER

___/ CHINCH BUG

8 / ARMY WORM (CUTWORM)

___/ GARDEN CHAFER

___/ WEBWORM

6 / OTHER Root Knot nematode

13. **STRESS TOLERANCES** (0 = NOT TESTED 1 - 9 , 9 = BEST) (Show where, when and type of test.

___/ HEAT

___/ SALT

6 / WINTER COLD SD, Fairway, KS, Green

___/ COLD

6 / DROUGHT AZ, VA Green, VA, Fairway

___/ HEAVY METAL

14. GIVE RESEMBLANCE VALUE IN LEFT COLUMN AND VARIETY CODE NUMBER IN RIGHT COLUMN FOR VARIETY WITH WHICH COMPARISON IS MADE (1 = LESS THAN 2 = SAME AS 3 = MORE ERECT, MORE RESISTANT, DENSER, MORE PERSISTENT, DARKER OR GREATER HEIGHT) USE STANDARD CULTIVARS LIST ABOVE.

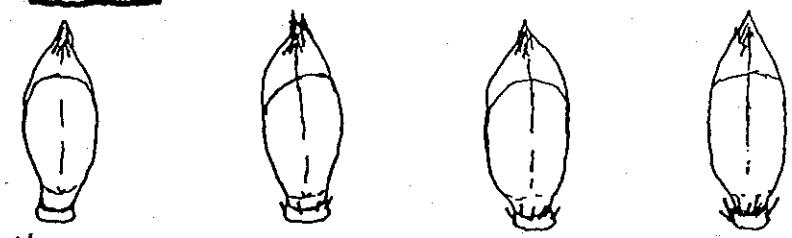
RESEMBLENCE	CHARACTER	SIMILAR VARIETY	WHERE
3 /	PLANT HABIT (erectness)	SR 1119 /	Corvallis, OR
1 /	AWN LENGTH	SR 1119 /	Corvallis, OR
2 /	LEAF COLOR	SR 1119 /	NTEP
3 /	PANICLE COLOR (red)	SR 1119 /	Corvallis, OR
3 /	WINTER COLOR	SR 1119 /	NTEP
___/	SHADE TOLERANCE	___/	
2 /	LEAF WIDTH (Turf Fineness)	SR 1119 /	
3 /	PANICLE SHAPE	SR 1119 /	Corvallis, OR
2 /	COLD INJURY	SR 1119 /	NTEP
2 /	HEAT Resistance	SR 1119 /	NTEP
2 /	DISEASE Brown Patch	SR 1119 /	NTEP
3 /	SEED WEIGHT	SR 1119 /	Corvallis, OR
2 /	SPRING GREEN UP	SR 1119 /	NTEP
2 /	MOISTURE STRESS	SR 1119 /	NTEP

15. GIVE AREA TEST RESULTS PRESENTED FROM Crovallis, OR. Spaced plants, 3 ft. spacing irrigated. NTEP sites are as specified in trials for 1998 Greens and Fairways test.

16. ADDITIONAL DESCRIPTION : (Use additional sheets as required.)
Describe all characteristics that cannot be adequately described in the form in Exhibit D. Comparitive varieties should be used as may be appropriate, such as for disease. Append all comparitive trial and evaluation data, including measured characteristics, environmental, and disease tests.

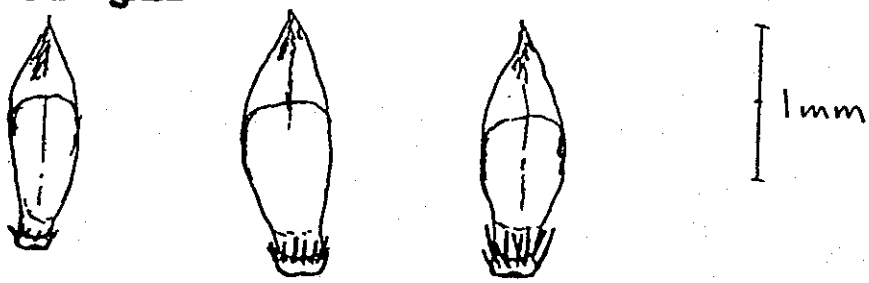
Figure 1. Appearance of basal hairs on bentgrass lemmas.

Number



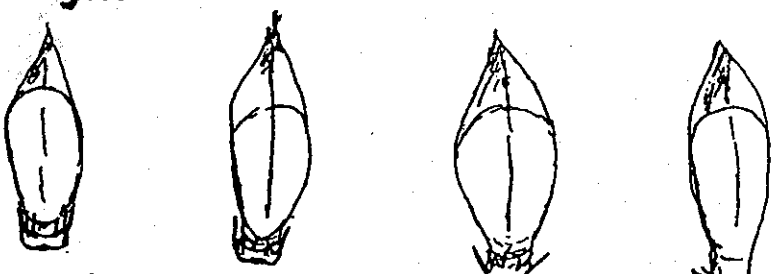
None (0) | Very few (1) | few (2) | many (3)

Length



Short (minute to 0.1mm) (1) | Long (0.11mm to 0.25mm) (2) | Very Long (0.26 to 0.40mm) (3)

Angle



Appressed (Against lemma sides) (1) | Appressed (In line with lemma sides) (2) | Ascending (Up to 45° angle with keel) (3) | Spreading (greater than 45° angle with keel) (4)

Figure 2. Lemma extensions on bentgrass lemmas.

a. Keel extensions

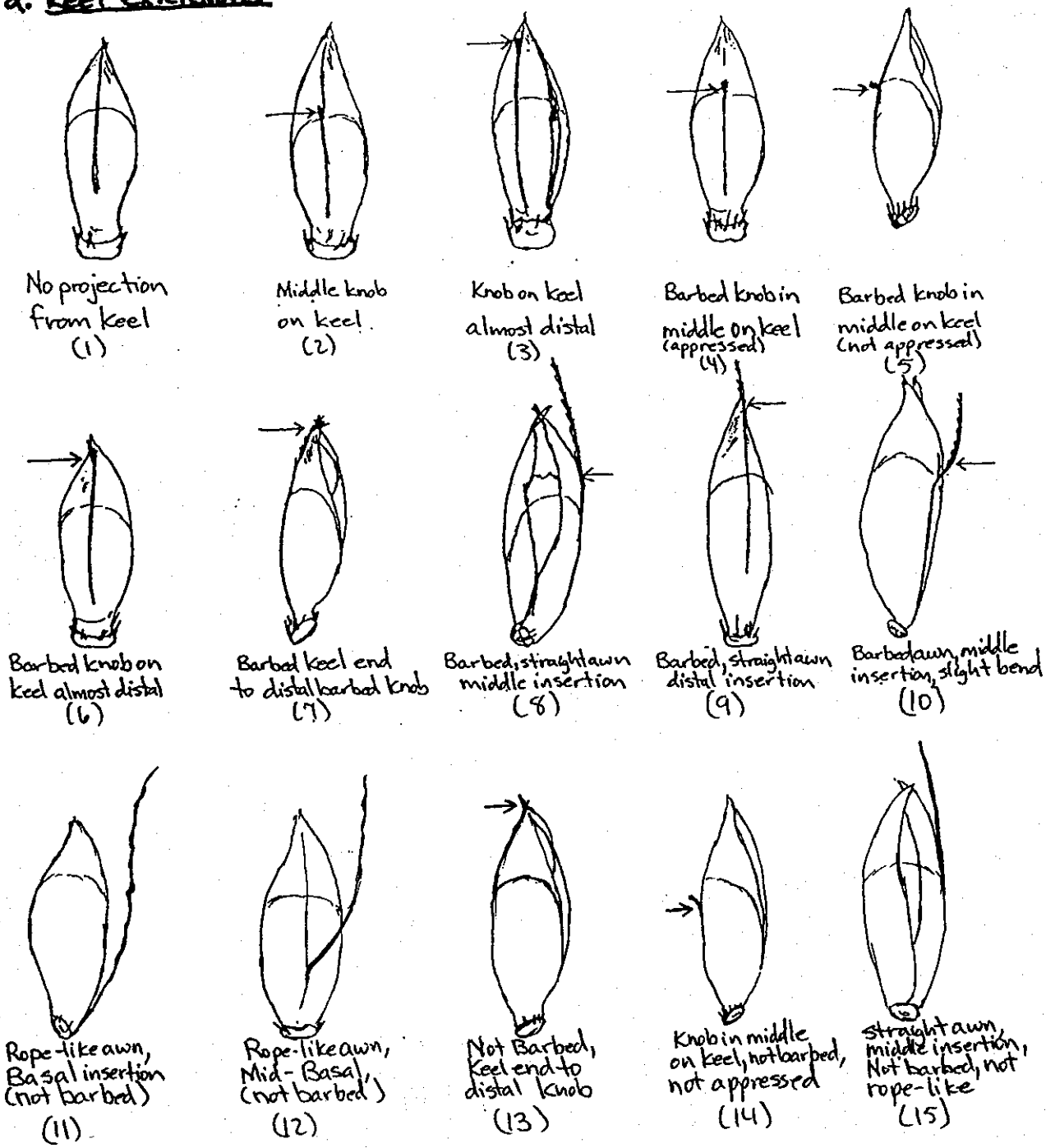
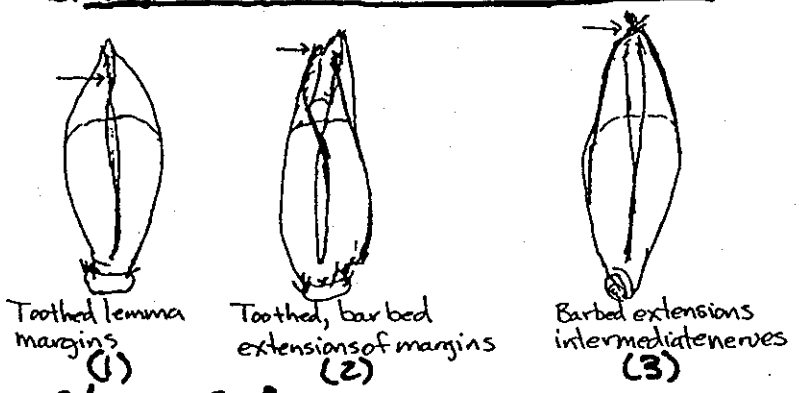


Figure 2. (cont.)

b. Margin and intermediate nerves extensions



c. Lemma surface

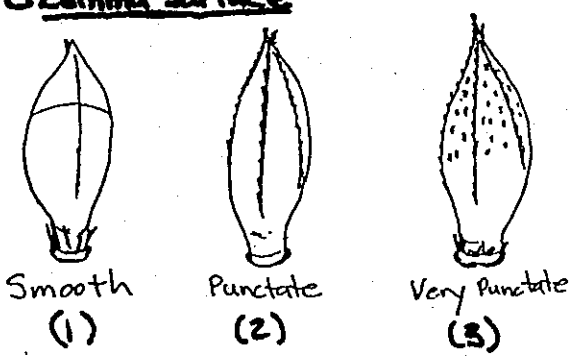


Table 3. Plant characteristics of creeping bentgrass varieties in 1999 near Corvallis, OR. Plants are those described in Table 1. Sixty panicles were measured per variety, thirty per each of the two reps. Since anthesis was completed on all varieties before measurements were started some plants had completed anthesis be fore panicle attitude at anthesis could be recorded. In both 1999 and 2000 plants were significantly shorter than the previous PVP performed on this same farm. The previous PVP was performed in more of an alluvial area, where flooding occurred. The new site was up on a ridge with a higher percentage gravel which may have influenced growth since the soil was thinner and dried out easier. Standard deviations are given in parenthsis. An ANOVA was performed followed by Fischer's Protected LSD if significant differences were found for each characteristic.

Variety	Plant Height (cm)=z	Plant Tip to Ground Height (cm)=y	Growth Angle Calculated y & z	Panicle Node to Tip (cm)	Panicle Branch to Tip (cm)	Panicle Attitude, 1=Spr., 9=Appr. Anthesis	Fruit
Penn A-1	30.46 (6.38)	21.87 (4.64)	47.20 (8.78)	19.00 (3.99)	7.41 (2.24)	5.1	6.7
Penn G-6	31.15 (7.41)	20.67 (4.79)	44.33 (12.60)	18.49 (4.20)	7.18 (1.66)	5.1	6.0
Penncross	32.23 (6.15)	23.16 (4.40)	48.07 (11.42)	18.88 (3.94)	7.21 (2.14)	4.8	6.3
Penn A-4	32.73 (7.63)	22.52 (4.90)	45.91 (11.35)	20.25 (4.01)	7.32 (1.69)	3.9	5.6
Southshore	34.51 (8.19)	26.59 (5.63)	53.28 (11.82)	21.31 (5.57)	7.55 (1.99)	5.2	7.0
Sandhill	35.63 (5.89)	26.68 (4.45)	51.45 (13.23)	20.72 (4.18)	7.58 (1.84)	6.9	4.1
L-93	36.23 (7.59)	25.03 (4.55)	45.90 (11.12)	22.72 (5.26)	7.98 (1.67)	5.7	7.7
Seaside II	36.87 (8.11)	27.62 (5.43)	51.39 (11.84)	22.32 (4.20)	7.47 (2.03)	4.3	6.3
SR 1119	38.10 (7.45)	25.84 (5.26)	44.36 (10.09)	23.04 (4.14)	8.13 (2.00)	4.6	7.2
Brighton	38.13 (7.12)	28.36 (5.05)	50.60 (11.66)	22.96 (4.48)	8.21 (2.44)	3.0	7.0
Providence	38.16 (8.37)	26.42 (5.59)	45.78 (10.81)	23.04 (5.70)	8.15 (2.03)	3.9	7.4
SR 1020	39.73 (9.12)	24.93 (5.42)	41.44 (11.74)	22.06 (5.88)	8.44 (1.97)	4.3	7.5
Crenshaw	40.01 (6.38)	27.02 (4.49)	44.24 (10.48)	24.45(5.04)	8.64 (2.07)	4.6	6.4
Cobra	43.36 (7.85)	27.87 (5.10)	41.73 (10.19)	24.79 (5.38)	8.88 (1.94)	4.9	7.6
Seaside	52.13(13.77)	35.56 (8.29)	46.49 (13.71)	29.90 (6.78)	10.89 (3.03)	6.4	8.0
LSD @ 5%	2.86	1.89	4.03	1.76	0.72	0.5	0.3

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Table 4. Leaf characteristics of creeping bentgrass varieties near Corvallis, OR in 1999. The plants and growth conditions are as in Table 1. Vegetative leaf width and ligule length were measured on non-reproductive tillers of the same plants used for other measurements.Standard deviations are given in parenthsis. An ANOVA was performed followed by Fischer's Protected LSD if significant differences were found for each characteristic.

	Flag Leaf			Subtending Leaf			Vegetative Leaf	
Variety	Length (cm)	Width (mm)	Ligule Length (mm)	Length (cm)	Width (mm)	Ligule Length (mm)	Width (mm)	Ligule Length (mm)
Southshore	3.77 (1.75)	3.30 (1.09)	2.74(0.65)	5.16 (1.88)	3.26 (1.13)	2.20(0.60)	2.80 (0.70)	1.45 (0.54)
Penncross	4.25 (1.54)	3.76 (1.05)	2.61 (0.65)	5.02 (1.50)	3.22 (1.09)	2.54(0.70)	2.61 (0.50)	1.18 (0.42)
Sandhill	4.31 (1.79)	3.20 (1.08)	2.80 (0.88)	4.90 (1.80)	3.09 (1.01)	2.38 (0.77)	3.28 (0.66)	1.55 (0.58)
SR 1020	4.36 (1.65)	4.29 (1.24)	2.94 (0.84)	6.05 (1.95)	3.61 (1.23)	2.64 (0.85)	3.65 (0.74)	1.92 (0.79)
Providence	4.37 (1.81)	4.07 (1.41)	2.78 (0.88)	5.69 (1.87)	3.52 (1.05)	2.69 (0.85)	3.47 (0.75)	1.79 (0.81)
Brighton	4.48 (1.73)	4.10 (1.24)	3.09 (1.01)	5.56 (1.84)	3.67 (1.11)	2.99 (0.90)	3.64 (0.99)	1.98 (0.71)
Penn G-6	4.50 (1.63)	3.14 (1.16)	2.73 (0.73)	5.27 (1.87)	2.80 (0.88)	2.29 (0.70)	2.73 (0.60)	1.58 (0.59)
Seaside II	4.63 (1.76)	4.04 (1.31)	3.30 (1.24)	5.34 (1.86)	3.65 (1.21)	3.01 (0.99)	3.37 (0.92)	1.79 (0.60)
Cobra	4.63 (1.75)	4.13 (1.21)	3.13 (1.11)	6.31 (2.20)	4.34 (1.33)	3.21(0.89)	3.65 (0.79)	1.77 (0.57)
SR 1119	4.73 (1.63)	3.77 (1.14)	2.68 (0.91)	5.62 (1.83)	3.36 (3.36)	2.30 (0.69)	3.34 (0.68)	1.38 (0.57)
L-93	4.76 (1.83)	3.82 (0.93)	2.86 (1.00)	5.55 (1.63)	3.41 (1.26)	2.54 (0.84)	3.12 (0.80)	1.71(0.54)
Penn A-1	4.86 (2.11)	3.44 (1.10)	2.57 (0.85)	5.57 (1.94)	3.01 (0.93)	2.19 (0.75)	2.93 (0.70)	1.70 (0.71)
Penn A-4	4.88 (1.77)	3.41 (1.35)	2.33 (0.86)	5.92 (2.02)	2.63 (0.88)	2.12(0.83)	2.93 (0.67)	1.54 (0.51)
Crenshaw	5.73 (2.09)	4.01 (0.95)	2.82 (0.91)	5.77 (2.08)	3.76 (1.12)	3.05 (1.13)	3.59 (0.85)	1.88 (1.18)
Seaside	6.48 (2.89)	5.02 (1.90)	4.26 (1.39)	7.74 (3.11)	4.96 (1.29)	4.18 (1.12)	3.73 (0.83)	2.44 (0.74)
LSD @ 5%	0.64	0.44	0.33	0.69	0.39	0.33	0.26	0.19

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Table 5 . Plant characteristics of creeping bentgrass varieties in 2000 near Corvallis, OR. Plants are those described in Table 2. Sixty panicles were measured per variety, thirty per each of the two reps. In both 1999 and 2000 plants were significantly shorter than the previous PVP performed on this same farm. The previous PVP was performed in more of an alluvial area, where flooding occurred. The new site was up on a ridge with a higher percentage gravel which may have influenced growth since the soil was thinner and dried out easier. Plant tip to ground height is the height of the end of the same panicle used to determine plant height before it is straightened. This is used to calculate the growth angle of that panicle. With fewer panicles on each plant, and thus less competition, the growth angle in 1999 on first year plants was often less than in 2000. Standard deviations are given in parenthsis. An ANOVA was performed followed by Fischer's Protected LSD if significant differences were found for each characteristic.

Variety	Plant Height (cm)=z	Plant Tip to Ground Height (cm)=y	Growth Angle Calculated y & z	Panicle Node to Tip (cm)	Panicle Branch to Tip (cm)
Penncross	36.19 (5.63)	31.53 (5.79)	61.86 (9.30)	21.91 (3.93)	8.08 (1.69)
Penn G-6	37.29 (7.42)	32.48 (6.77)	62.48 (9.42)	22.70 (4.67)	7.95 (1.77)
Penn A-4	37.92 (5.66)	32.51 (5.26)	60.91 (9.12)	22.75 (4.23)	7.92 (1.77)
Sandhill	37.95 (6.36)	32.51 (5.14)	61.02 (10.24)	23.39 (4.97)	8.29 (2.45)
Southshore	38.28 (7.23)	33.58 (7.21)	62.01(8.09)	23.18 (5.76)	8.67 (2.32)
SR 1119	38.41 (6.70)	31.97 (6.13)	58.09(10.37)	22.30 (4.20)	8.09 (1.83)
Brighton	38.58 (6.13)	31.87 (5.15)	57.59(10.53)	24.06 (4.33)	9.12 (1.75)
Penn A-1	38.77 (5.94)	33.60 (7.01)	62.30(12.79)	24.47 (5.17)	8.42 (1.66)
L-93	39.25 (7.02)	33.39 (6.67)	59.94(9.99)	24.66 (5.81)	8.59 (2.16)
SR 1020	39.76 (6.86)	32.40 (7.40)	56.66 (12.71)	22.84 (4.94)	8.49 (2.13)
Crenshaw	40.04 (6.46)	33.36 (5.74)	57.94 (9.44)	23.61 (4.83)	8.83 (1.95)
Providence	40.08 (8.18)	33.01 (7.66)	57.22 (11.05)	23.31 (6.18)	8.76 (2.34)
Seaside II	40.48 (6.85)	34.32 (6.03)	60.02 (10.36)	24.80 (4.32)	9.02 (1.87)
Cobra	44.00 (7.13)	37.37 (7.30)	59.10 (8.52)	25.68 (4.79)	9.58 (1.92)
Seaside	54.09 (9.12)	43.76(9.74)	56.32 (13.20)	31.74 (6.64)	11.48 (2.96)
LSD @ 5%	2.44	2.34	3.64	1.78	0.72

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Table 6. Leaf characteristics of creeping bentgrass varieties near Corvallis, OR in 2000. The plants and growth conditions are as in Table 2. Vegetative leaf width and ligule length were measured on non-reproductive tillers of the same plants used for other measurements. Standard deviations are given in parenthsis. An ANOVA was performed followed by Fischer's Protected LSD if significant differences were found for each characteristic.

	Flag Leaf			Subtending Leaf			Vegetative Leaf	
Variety	Length (cm)	Width (mm)	Ligule Length (mm)	Length (cm)	Width (mm)	Ligule Length (mm)	Width (mm)	Ligule Length (mm)
SR 1020	3.67 (1.35)	2.71 (0.94)	2.52 (0.71)	4.78 (1.30)	2.97 (0.94)	2.36 (0.74)	3.03 (0.67)	1.63 (0.59)
SR 1119	3.76 (1.75)	2.60 (1.12)	2.38 (0.66)	5.08 (1.90)	2.95 (0.76)	2.26 (0.71)	2.70 (0.56)	1.34 (0.47)
Penn G-6	3.77 (1.30)	2.35 (0.82)	2.35 (0.62)	4.91 (1.37)	3.03 (0.83)	2.25 (0.66)	2.65 (0.77)	1.36 (0.56)
Providence	3.77 (1.53)	2.69 (1.02)	2.80 (0.88)	4.87 (1.31)	3.12 (1.00)	2.58 (0.88)	2.95 (0.60)	1.84 (0.56)
Crenshaw	4.25 (1.57)	2.37 (1.04)	2.59 (0.90)	5.20 (1.66)	2.67 (0.90	2.33 (0.76)	2.84 (0.81)	1.68 (0.60)
Penn A-4	4.29 (1.42)	3.06 (0.84)	2.50 (0.65)	5.09 (1.47)	3.05 (0.83)	2.25 (0.65)	3.10 (0.51)	1.38 (0.56)
Southshore	4.31 (1.76)	3.25 (1.04)	2.60 (0.83)	5.47 (1.79)	3.25 (1.04)	2.38 (0.67)	2.94 (0.75)	1.39 (0.58)
L-93	4.37 (1.37)	2.84 (0.99)	2.66 (0.60)	5.30 (1.40)	3.26 (0.88)	2.51 (0.74)	3.14 (0.59)	1.55 (0.58)
Penncross	4.37 (2.32)	2.78 (0.84)	2.63 (0.68)	5.74 (2.30)	2.77 (0.84)	2.51 (0.74)	2.53 (0.59)	1.31 (0.54)
Brighton	4.51 (1.30)	2.86 (1.00)	2.91 (0.80)	5.63 (1.45)	3.10 (0.92)	2.76 (0.79)	2.96 (0.67)	1.78 (0.66)
Sandhill	4.54 (1.82)	2.76 (1.10)	2.53 ((0.80)	5.30 (1.76)	2.79 (0.96)	2.28 (0.67)	3.07(0.56)	1.35 (0.52)
Seaside II	4.58 (1.40)	2.53 (0.89)	3.02 (0.78)	5.50 (1.44)	3.09 (0.88)	2.89 (0.82)	3.09 (0.69)	1.91 (0.74)
Penn A-1	4.59 (1.47)	2.35 (0.79)	2.53 (0.71)	5.53 (1.51)	2.66 (0.70)	2.46 (0.66)	2.79 (0.57)	1.49 (0.50)
Cobra	5.19 (1.64)	3.29 (1.37)	3.24 (0.92)	6.48 (1.71)	3.66 (1.10)	3.21 (0.83)	3.18 (0.94)	1.80 (0.59)
Seaside	6.53 (1.98)	3.88 (1.09)	4.07 (1.09)	8.45 (2.56)	3.88 (1.09)	3.77 (1.10)	3.46 (0.92)	2.33 (0.86)
LSD@5%	0.57	0.35	0.28	0.69	0.33	0.27	0.26	0.21

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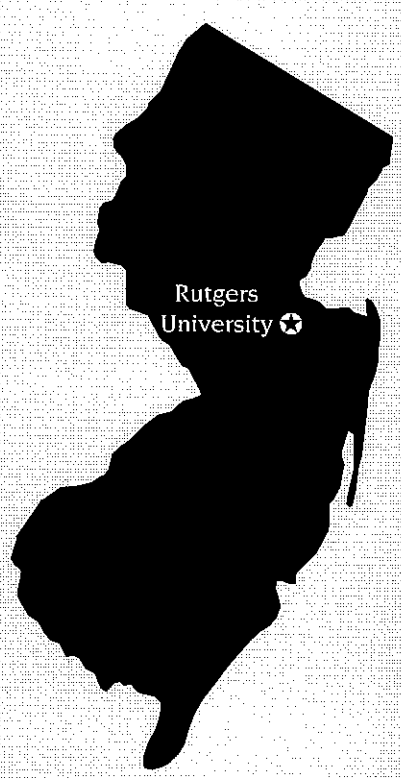

THE NEW JERSEY TURFGRASS ASSOCIATION

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2004 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, Cook College, Rutgers, The State University of New Jersey in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public.

This publication includes lecture notes of papers presented at the 2004 New Jersey Turfgrass Expo. Publication of these lectures provides a readily available source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

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

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

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

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PERFORMANCE OF BENTGRASS CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS

Eric N. Weibel, Stacy A. Bonos, William A. Meyer, James A. Murphy, Bruce B. Clarke, Dirk A. Smith, William K. Dickson, and Joseph B. Clark[1]

Bentgrass species are known to form very dense, uniform, and fine textured surfaces under extremely low height of cut. As a result, they are often used for specialized, high maintenance areas such as golf course fairways, tees, and putting greens. Some of the more popular species used for turf include creeping bentgrass (*Agrostis palustris* Huds.; synonym = *A. stolonifera* L.), colonial bentgrass (*A. tenuis* L. or *A. capillaris* L.), velvet bentgrass (*A. canina* L.), and less frequently, highland or dryland bentgrass (*A. castellana* Boiss. & Reut.).

Creeping and velvet bentgrasses are best conditioned for the very low cutting heights necessary for golf course greens in the United States and other regions of the world. Creeping bentgrasses spread easily through stolons and have a prostrate growth habit, which permits the grass to persist under very low mowing heights. Bentgrass is the most popular species for use on putting greens because it is highly adapted to both the cool temperate and warm humid regions of the United States and has a highly aggressive, spreading growth habit. In 1954, H. B. Musser released Penncross, the first seeded variety of creeping bentgrass (Musser, 1959). Since that time, breeding efforts have markedly improved creeping bentgrass varieties to withstand the increasing demands of the game of golf. Recent releases exhibit better turf quality, higher shoot density, improved traffic, and better disease and stress tolerance than older varieties.

Colonial bentgrass, also referred to as browntop, has traditionally been used as a lawn grass in areas of northern Europe and New Zealand that have mild (cool and humid) summers. Colonial bentgrass has a fine leaf texture and, compared to creeping bentgrass, has a more upright and less aggressive spreading growth habit and is generally better adapted for fairway or tee use in the warmer summer climates of the United States. Colonial bentgrass performs best in New Jersey when mowed no lower than 3/8th of an inch. Compared to creeping bentgrass, colonial bentgrass typically has a brighter green color and better color retention during cool weather. In addition, this group of grasses generally has better dollar spot resistance (caused by *Sclerotinia homoeocarpa*) and wear tolerance than creeping bentgrass. However, colonial bentgrass varieties are much more susceptible to brown patch (caused by *Rhizoctonia solani*). 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 brown patch disease tolerance of colonial bentgrasses.

Velvet bentgrass forms the finest-textured and most dense turf of the bentgrasses and can nearly resemble green velvet when managed properly. It spreads mainly through profuse production of erect tillers with short stolons. This grass can tolerate very close mowing, heat, cold, and shade, and is one of the most drought resistant of the bentgrasses used for turf (Skogley, 1973). The spread of velvet bentgrass via stolons is more aggressive than colonial bentgrass, but not as strong as with creeping bentgrass. Velvet bentgrass can form excessive thatch, especially at higher fertility rates and higher cutting heights, and can thus become problematic if not maintained properly. It is also susceptible to red thread (caused by *Laetisaria fuciformis*) and copper spot (caused by *Gloeocercospora sorghi*), but has good resistance to dollar spot and brown patch. Seedlings of velvet bentgrasses are susceptible to Pythium

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seedling rot during establishment. Velvet bentgrass has not been used extensively for high maintenance turf, largely because its range of adaptation has not been well recognized. Selections of velvet bentgrass have persisted for many years in trials under New Jersey growing conditions. It is believed that the species may one day serve as a viable alternative to creeping bentgrass for use on golf course greens, as recent research at Rutgers indicates and cultural management inputs become better known.

The New Jersey Agricultural Experiment Station participates in the National Turfgrass Evaluation Program (NTEP), which evaluates many species of turfgrass including bentgrasses 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 Norway, Spain, Portugal, France, Switzerland, Italy, Greece, Poland, Bulgaria, Romania, Croatia, China, and the Slovak Republic, which are the centers of origin for many turf species used in the United States, serve to enhance the genetic diversity of the germplasm used in this breeding program.

PROCEDURES

Bentgrass evaluation trials were established at the Rutgers Horticultural Research Farm II in North Brunswick, NJ in the fall of 2001 (Tables 1 through 3), 2002 (Tables 4 and 5), and 2003 (Tables 6 thru 9). Two of the trials planted in the fall of 2003 (Tables 6 and 8) included all entries of the 2003 National Bentgrass Test coordinated by NTEP. Trials were established on a modified Nixon loam, except the 2003 NTEP putting green trial (Table 6), which was seeded on a sand-peat root zone. Plot size was 3 X 5 ft for all trials, except the 2003 NTEP trials (greens and fairway/tee) which were 4 X 6 ft. Plots were hand-seeded at a rate of approximately 0.5 lb/1000 ft^2. All tests were arranged in a randomized complete block design with three replications.

All sites were well drained and openly exposed to both sunlight and air circulation (with the exception of the 2003 NTEP putting green trial, which had enclosed air circulation). The annual rate of nitrogen applied, mowing height, aerification/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 and clippings were removed three times per week with a triplex reel mower during periods of active growth. Soil pH was maintained in the range of 6.0 to 6.5 with agricultural limestone. All tests were irrigated 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 damage due to diseases and insects). Turf quality, spring green-up, color, density, and disease were rated on a 1 to 9 scale, where 9 represented the most desirable turf characteristic. Disease ratings included brown patch (Tables 1 and 4 to 9), dollar spot (Tables 4 to 6, 8, and 9), copper spot (Tables 6, 8, and 9), and Pythium blight (Table 9). 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 5 are ranked according to their overall multi-year quality average. Entries in Tables 6 to 9 are ranked according to their turf quality average in 2004. The best performing cultivars in the 2001 putting green trial (Table 1) were two experimental bentgrasses C953 and C952. Among velvet bentgrasses maintained under greens conditions (Table 2), the experimental cultivars PST EVU, EFD, CIS-AC1, and IVD comp, as well as the established variety Greenwich, performed the best. SR 7200 did not rank as high as the experimental selections under putting green mowing height (Table 2), but it was the top performer in the 2001 fairway trial, along with the experimental colonial bentgrass selection SRX 781-22 (Table 3). Older cultivars Penncross, Regent, Southshore, Providence, and Putter had the poorest turf quality in both the putting green (Table 1) and fairway (Table 3) trials.

In the 2002 putting green trial (Table 4), top ranking entries included the recently released creeping bentgrass cultivar Declaration, three experimental velvet bentgrasses (EFD, CIS-AC-1, and 00BAG), and the experimental creeping bentgrasses 007, 235050, C952, and C953. Older standard varieties such as Penncross, Pennlinks, and Providence were among the poorest performing entries in this study, along with Kromi and 18th Green. All velvet bentgrass selec-

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tions were among the top ranking entries. The 2002 fairway/tee trial (Table 5) had less separation among entries than the previously mentioned tests. SR 7200 and the experimental velvet bentgrass EFD topped the list of thirty entries that comprised the best performing group. Two creeping bentgrasses, 235050 and C953, and the experimental colonial bentgrass HCG comp were also among the best cultivars, while Providence, Viper, Penncross, and 18th Green creeping bentgrasses ranked poorly in turf quality.

The best performing entries in the 2003 NTEP putting green trial included five velvet bentgrasses (Legendary, Greenwich, Vesper, and the experimentals IS-AC 1 and EFD) (Table 6). The top ranking creeping bentgrasses included the experimental selections SRX 1GPD, CY-2, and the cultivars Declaration, Shark, and Penn G-2. In the 2003 putting green trials (Tables 6, 7), Penncross, King Pin, Crenhsaw, and Southshore were among those entries that exhibited poor turf quality. Top ranking cultivars in the 2003 NTEP fairway trial (Table 8) included SR 7200 velvet bentgrass and the creeping bentgrass cultivars Declaration, King Pin, and Benchmark DSR. Older creeping bentgrass cultivars Seaside, Crenshaw, and Penncross did not perform well. The three best ranking entries in the 2003 creeping bentgrass fairway/tee trial (Table 9) were Declaration, 235050, and Greenwich velvet bentgrass; creeping bentgrasses Penncross, Trueline, Regent, PennLinks II, and Barbella velvet bentgrass exhibited poor turf quality.

Dollar Spot

While potentially one of the more damaging turf diseases on golf courses in New Jersey, dollar spot can be easily controlled with the use of fungicides; this can be expensive, however, because the disease occurs frequently. In addition, resistance of the causal agent to fungicides is well documented. Breeding for dollar spot resistance in bentgrass is an important objective of the breeding program. Typically, velvet and colonial bentgrasses have better resistance to dollar spot than creeping bentgrass, however the results from recent trials indicate that improvements in creeping bentgrass are being made. For example, in the 2002 putting green trial (Table 4), velvet bentgrasses Greenwich, Vesper, and SR 7200, the experimental selections EFD and CIS-AC-1, and Tiger II colonial bentgrass had just as good resistance as the creeping bentgrass selections HTL comp, Declaration, and King Pin which were selected for improved resistance. Creeping bentgrasses 18th Green, Viper, Penncross, and the experimental SRX 1G56 exhibited poor dollar spot tolerance in 2002.

In the 2003 NTEP putting green trial (Table 6), the entries with the best dollar spot resistance included velvet bentgrasses (Legendary, Greenwich, SR 7200, EFD and IS-AC-1), Penn G-6, L-93, Pennlinks II, and King Pin (creeping bentgrasses), and the experimental creeping bentgrasses IS-AP 9 and A03-EDI. The 2003 NTEP fairway/tee trial (Table 8) consisted mainly of colonial and creeping bentgrass varieties. SR 7200, the only velvet bentgrass in the trial, maintained good tolerance to dollar spot, along with the colonial bentgrass cultivars Tiger II, Revere, SR 7150, Bardot, and the experimental selections IS-AT-7 and PST-9VN. Two creeping bentgrass cultivars, Declaration and Pennlinks, also showed good dollar spot disease tolerance. In both NTEP trials (Tables 6 and 8), the creeping bentgrass cultivars Crenshaw and Independence exhibited weak dollar spot resistance. Many of the entries that performed well in previous studies also performed well in the 2003 fairway/tee trial (Table 9). Creeping bentgrasses cultivars Declaration, King Pin, Benchmark DSR, Sandhill, and experimentals PST-OEX Bulk and PST-ORR Bulk as well as SR 7200 velvet bentgrass and many experimental (PST-9IR, PST-Syn-9NT, PST-Syn-9LSD, PST-9R3, PST-Syn-9PIN, SRX 781-21, and SRX 7EE) and older colonial bentgrasses (Heriot and SR 7100) exhibited high disease tolerance. The creeping bentgrass cultivar Penncross and experimental selections SRX 1NJH and Bar AS2 were among the most dollar spot-susceptible entries.

Brown Patch

Velvet bentgrasses exhibit the greatest tolerance to brown patch of the bentgrass species used for turf. Creeping bentgrass is typically stronger than colonial bentgrass against this disease. Both the 2002 putting green and fairway/tee study (Tables 4 and 5, respectively) exemplify this. In both tests, the top entries were either velvet or creeping bentgrasses. In both tests, SR 7200 velvet bentgrass, the experimental selection EFD velvet bentgrass, and the creeping bentgrasses Benchmark DSR and 235050 were among the top entries. Experimental selections PST-SynA1U and PST-9VL Bulk, and the cultivars Revere and Viter exhibited the greatest disease tolerance of the colonial bentgrass entries evaluated (Table 5).

Results from the 2003 NTEP putting green trial (Table 6) indicated that the velvet bentgrass Legendary, the experimental selections IS-AC 1 and EFD,

and one experimental creeping bentgrass, SRX 1GPD, exhibited the highest levels of resistance to brown patch. Penncross, Alpha, and Bengal showed low levels of brown patch disease resistance. All entries in the 2003 putting green trial (Table 7) were moderately tolerant of brown patch; Shark and Independence, however, performed the best. In the 2003 NTEP fairway/tee trial (Table 8), no colonial bentgrasses exhibited acceptable levels of tolerance to brown patch. Many of the creeping bentgrasses (Declaration, Shark, 235050, and Penneagle II and the experimental selections T-1, PST-OEB, SRX IPDH, and IS-AP-14), however, and the velvet bentgrass SR 7200 showed extremely high levels of brown patch resistance. Colonial bentgrass cultivars Tiger II (Tables 4, 5, and 8), Bardot, and SR 7150 (Table 8), experimental colonial bentgrass selections SRX 781-21 and SRX 7MOBB (Tables 4 and 9), and creeping bentgrass cultivars Regent (Tables 1 and 9), Penncross (Tables 1 and 6), and Trueline (Tables 4 and 9) were among those entries with poor resistance to this disease. It is interesting to note that Alpha had exhibited poor brown patch resistance under putting green maintenance, but was one of the most resistance creeping bentgrass cultivars in the fairway trial.

Spring Green-Up

Spring green-up data was collected for all 2001 and 2002 trials (Tables 1 to 5). In general, the colonial bentgrasses exhibit the best green-up quality when compared to both creeping and velvet bentgrasses. There were several creeping bentgrass entries that possessed early green-up qualities; these included cultivars Benchmark DSR (Tables 4, 5), Declaration (Table 4), 007 (Table 4), Penneagle and Pennlinks (Table 1), and experimental creeping bentgrass entries C952 (Tables 1, 3), SRX R1E2, SRX 1G44, SRX 1G32 (Table 1), and SRX 1GPinkD (Table 4). Creeping bentgrass cultivars Trueline, Brighton, and 18th Green (Tables 4, 5) were consistently poor ranking entries, as were experimental selections MS6, MS7, MS4, 7CMS4, and 7RMS4 (Table 1). In the 2001 fairway trial (Table 3), the experimental colonial bentgrass selections 9BNC-2001, 9ER Blk-5 Bulk, HCDR comp, and IBP comp exhibited the earliest green-up; and experimental colonial bentgrass selections SRX IDIN, SRX 765-11, SRX 767-7, and cultivar SR 7150 were among entries in this test that were poor in ranking. In the 2002 fairway trial (Table 5), the colonial bentgrass cultivar Glory and experimental selections HCG comp, HCF comp, and PST-9BNC were the top ranking entries. The best creeping bentgrasses in this trial were Benchmark DSR and King Pin. In the velvet bentgrass putting green trial (Table 2), SR 7200 and CIS-AC1 exhibited strong spring green-up, while IVM comp and IVD comp ranked lowest.

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Table 1. Performance of creeping bentgrass cultivars and selections in a putting green trial seeded in September 2001 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2002-2004 Avg.	2002 Avg.	2003 Avg.	2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004
1	C953	6.6	7.6	5.4	6.7	6.0	8.7
2	C952	6.5	7.2	6.0	6.2	7.0	7.3
3	C954	5.8	6.1	5.6	5.7	6.3	5.7
4	PST OEB	5.6	6.3	5.6	4.9	2.3	7.3
5	Syn ORO	5.5	5.5	6.0	5.1	6.7	5.3
6	Penn A-1	5.5	5.7	5.6	5.2	3.0	5.7
7	PST-OPNB	5.3	5.9	5.5	4.5	4.7	5.7
8	Penn A-2	5.3	5.7	5.2	4.9	4.3	5.0
9	Penn G-1	5.2	5.1	5.1	5.4	4.3	6.0
10	Penn A-4	5.2	5.5	5.1	4.8	4.7	6.0
11	CIS-AP9	5.2	5.7	5.2	4.5	3.0	6.0
12	SRX 1R1V1	5.1	5.5	4.9	5.0	6.3	6.3
13	Bengal	5.1	5.8	5.0	4.4	7.0	6.0
14	Nu-Penn Blend	5.0	5.4	5.0	4.7	4.7	5.0
15	SRX R1E2	5.0	5.4	4.5	5.0	7.0	6.0
16	Penn G-6	4.9	4.7	5.1	5.0	5.0	6.0
17	Seaside II	4.9	4.0	5.5	5.2	6.3	5.0
18	ORU-2001	4.9	5.8	4.7	4.2	5.7	5.3
19	Penneagle II	4.9	5.7	4.4	4.5	5.0	5.3
20	SRX 1G32	4.9	5.6	4.5	4.5	7.0	7.0
21	SRX 146-12	4.9	5.2	4.5	4.9	6.0	6.3
22	L-93	4.9	4.7	5.3	4.5	5.0	3.7
23	SRX 1G222	4.8	6.3	4.1	4.1	6.0	8.0
24	SRX 1G68	4.7	5.9	4.2	4.1	5.7	7.7
25	SRX 1G46	4.7	5.8	3.8	4.5	4.7	8.0
26	SRX 1G54	4.7	6.2	3.9	3.9	5.7	7.0
27	SRX W1CR1	4.7	5.1	4.7	4.3	5.7	7.0
28	PST ORM-1	4.6	4.4	5.1	4.2	5.3	2.7
29	SRX 1H Blue	4.5	4.8	4.4	4.3	5.0	7.0
30	Penneagle	4.5	4.2	4.8	4.3	7.0	4.3
31	Pennlinks II	4.4	4.7	5.2	3.4	4.3	2.0
32	Independence	4.4	5.8	3.8	3.7	5.7	7.0
33	SRX 1G57	4.4	4.9	3.8	4.3	6.7	7.0
34	SRX 1W1CR2	4.4	4.9	4.4	3.8	3.0	6.0
35	SRX 1COCR	4.4	4.8	4.3	4.0	6.3	5.7

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 2002-2004 Avg.	2002 Avg.	2003 Avg.	2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004
36	SRX 1H Pink	4.3	4.4	4.5	4.1	6.3	6.0
37	SRX 1G44	4.3	5.5	3.3	4.1	7.0	6.3
38	Pennway Blend	4.3	4.3	4.7	3.8	5.7	3.3
39	SRX 1W1CR3	4.2	5.2	3.5	3.9	3.0	6.7
40	SRX 1G56	4.2	5.0	3.4	4.2	6.7	7.0
41	SRX 1D1N	4.2	4.9	4.0	3.7	2.3	3.0
42	SR 1119	4.2	4.7	4.5	3.3	3.0	4.7
43	SRX 1NJ H	4.2	4.4	4.7	3.4	5.7	3.7
44	Brighton	4.1	4.6	4.5	3.2	3.7	3.3
45	Pick 01-3CB	4.1	4.1	4.6	3.6	3.7	5.7
46	Pick ECB	4.1	4.8	3.9	3.6	5.7	4.7
47	Pennlinks	4.0	3.7	4.4	4.0	7.0	2.0
48	Pick Syn 96-2	4.0	5.2	3.5	3.2	4.3	6.0
49	Cato	4.0	3.5	4.3	4.0	4.3	4.0
50	Sandhill	3.9	4.7	3.9	3.1	5.7	4.3
51	Pick CB13.94.98	3.9	3.9	4.4	3.4	4.3	5.0
52	Southshore	3.9	4.0	4.1	3.6	4.3	3.7
53	SRX H Silver	3.9	4.2	4.2	3.2	2.7	3.3
54	PST-ORE1	3.8	3.8	4.3	3.3	5.0	4.3
55	Putter	3.8	3.8	4.0	3.4	4.7	2.7
56	C951	3.7	4.0	4.2	2.9	4.3	3.7
57	Providence	3.6	3.3	4.2	3.1	6.3	3.0
58	7RMS4	3.6	4.9	3.2	2.6	1.3	2.3
59	7CMS4	3.6	5.1	3.4	2.1	1.0	2.0
60	01-4CB	3.5	4.2	3.6	2.6	4.7	2.0
61	MS4	3.4	4.8	3.3	2.2	1.0	2.7
62	SRX MOCR1	3.4	4.4	2.9	2.9	3.0	2.0
63	Regent	3.3	3.3	3.8	2.9	3.7	1.7
64	MS7	3.3	4.1	3.8	2.1	1.0	2.3
65	Penn Trio Blend	3.3	3.0	3.7	3.2	4.7	2.0
66	Penncross	3.2	3.0	3.8	2.9	4.0	2.3
67	MS5	3.2	4.4	3.4	1.9	2.0	2.3
68	Pick CB 4.94.01	3.1	2.8	3.6	2.8	2.7	2.7
69	MS6	2.9	4.0	2.8	1.8	1.0	2.0
70	Pick CB 6.94.01	2.8	2.8	3.2	2.4	4.7	1.7

(Continued)

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Table 1 (continued).

Cultivar or Selection	Turf Quality[1] 2002-2004 Avg.	Turf Quality[1] 2002 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004
LSD at 5% =	0.6	0.7	0.9	0.9	1.9	1.8

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease

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Table 2. Performance of velvet bentgrass cultivars and selections in a turf trial seeded in September 2001 at North Brunswick, NJ and maintained under putting green conditions.

	Cultivar or Selection	Turf Quality[1] 2002-2004 Avg.	2002 Avg.	2003 Avg.	2004 Avg.	Spring Green-up[2] April 2004
1	PST EVU	6.1	6.1	5.9	6.3	5.0
2	EFD	6.1	6.1	6.4	5.7	5.7
3	Greenwich	5.7	6.2	6.0	4.9	4.3
4	CIS-AC1	5.7	5.8	6.1	5.3	6.3
5	IVD comp	5.5	5.9	5.9	4.8	3.7
6	IVM comp	5.4	5.7	5.8	4.6	2.3
7	ISC comp	5.3	5.8	5.2	4.7	5.0
8	IVC comp	5.0	5.0	5.1	4.7	4.7
9	SR 7200	4.7	5.5	4.9	3.8	7.3
	LSD at 5% =	0.7	0.9	0.9	0.8	1.8

[1]9 = best turf quality
[2]9 = earliest spring green-up

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Table 3. Performance of bentgrass cultivars and selections in a fairway/tee trial seeded in September 2001 at North Brunswick, NJ.

	Cultivar or Selection	Species	Turf Quality[1] 2002-2004 Avg.	2002 Avg.	2003 Avg.	2004 Avg.	Spring Green-up[2] April 2004
1	SR 7200	Velvet	6.2	6.4	6.8	5.3	4.0
2	SRX 781-22	Colonial	5.9	6.2	5.7	5.8	5.7
3	9BNC-2001	Colonial	5.5	5.8	5.2	5.5	6.7
4	9ER Blk-5 Bulk	Colonial	5.3	5.3	5.3	5.2	7.7
5	Revere	Colonial	5.2	5.0	5.5	5.3	5.3
6	HCDR comp	Colonial	5.2	4.8	5.6	5.1	6.0
7	Glory	Colonial	5.0	5.0	4.9	5.0	5.7
8	Alister	Colonial	4.9	5.3	4.9	4.6	4.3
9	Tiger II	Colonial	4.9	6.1	4.7	4.0	3.3
10	SRX 7EE25	Colonial	4.9	5.1	5.1	4.4	5.3
11	SRX IG56	Creeping	4.9	6.0	3.9	4.8	3.0
12	SRX 7MOBB	Colonial	4.8	6.0	4.6	4.0	4.7
13	SRX IG57	Creeping	4.8	5.8	4.6	4.1	3.3
14	SRX IG32	Creeping	4.8	5.6	4.0	4.8	4.3
15	SRX 7CRCO	Colonial	4.8	6.2	4.6	3.5	5.3
16	SR 7150	Colonial	4.7	5.7	4.6	3.9	2.0
17	SRX IG44	Creeping	4.7	6.0	3.9	4.3	4.0
18	SRX IG222	Creeping	4.7	5.7	3.7	4.8	4.7
19	IBP comp	Colonial	4.6	4.0	4.9	4.9	6.3
20	SRX IG46	Creeping	4.6	5.9	4.0	3.9	2.7
21	SRX 1G68	Creeping	4.6	5.6	3.8	4.3	4.0
22	SRX 781-13	Colonial	4.6	5.3	4.2	4.2	2.0
23	Bardot	Colonial	4.5	4.5	4.9	4.2	4.3
24	SRX 7EE	Colonial	4.5	5.1	4.6	3.7	4.0
25	SRX 7EE20	Colonial	4.5	4.6	4.9	3.8	3.7
26	SRX 781-3	Colonial	4.5	5.2	4.9	3.4	2.7
27	SRX 7EE4	Colonial	4.5	5.7	4.5	3.1	2.7
28	SRX ICOCR	Creeping	4.5	5.6	3.9	3.8	3.3
29	Bengal	Creeping	4.5	6.1	3.6	3.7	4.3
30	L-93	Creeping	4.5	4.9	4.8	3.7	3.0
31	Heriot	Colonial	4.4	4.8	4.8	3.7	5.3
32	SRX IH Silver	Creeping	4.4	5.0	4.6	3.7	2.3
33	SRX IG54	Creeping	4.4	5.5	3.8	4.0	3.3
34	Independence	Creeping	4.4	6.2	3.6	3.4	3.0
35	SRX 7EE5	Colonial	4.4	5.7	4.4	3.0	4.7

(Continued)

Table 3 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2002-2004 Avg.	2002 Avg.	2003 Avg.	2004 Avg.	Spring Green-up[2] April 2004
36	SRX 767-7	Colonial	4.4	5.3	4.6	3.2	1.7
37	SRX 780-19	Colonial	4.3	4.5	4.7	3.6	4.3
38	SRX 765-11	Colonial	4.3	4.6	4.7	3.6	2.0
39	SRX IH Blue	Creeping	4.3	5.2	4.2	3.5	2.3
40	SR 7100	Colonial	4.2	5.1	4.0	3.6	3.0
41	SRX 786-6	Colonial	4.2	5.0	3.8	3.9	3.7
42	SRX IBPAA	Creeping	4.2	4.9	4.3	3.4	3.0
43	SRX IH Pink	Creeping	4.2	5.4	4.4	2.9	2.7
44	SRX IWJH	Creeping	4.2	4.8	4.0	3.7	3.0
45	Brighton	Creeping	4.1	4.9	4.2	3.3	2.0
46	SRX 765-5	Colonial	4.1	4.6	4.4	3.3	2.7
47	SRX 780-6	Colonial	4.1	4.6	4.4	3.4	4.0
48	SRX 146-12	Creeping	4.1	5.1	3.2	4.1	2.7
49	SR 1119	Creeping	4.1	5.4	3.8	3.1	3.0
50	Penn G-6	Creeping	4.1	4.6	4.3	3.4	3.7
51	SRX IDIN	Creeping	4.0	5.0	3.2	3.8	1.3
52	Providence	Creeping	4.0	4.7	4.1	3.1	2.3
53	Putter	Creeping	3.9	4.3	3.9	3.5	3.0
54	Regent	Creeping	3.9	4.5	4.1	3.1	3.3
55	SRX 781-21	Colonial	3.8	4.4	4.0	3.1	3.0
56	Southshore	Creeping	3.7	4.6	3.5	2.9	2.0
57	SRX 765-3	Colonial	3.6	4.5	3.8	2.6	2.3
58	PST-9ED	Colonial	3.0	2.5	3.5	3.1	4.0
59	AT-1	Colonial	3.0	2.6	3.4	3.0	2.3
	LSD at 5% =		0.6	0.8	0.9	0.9	2.3

[1]9 = best turf quality
[2]9 = earliest spring green-up

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Table 4. Performance of bentgrass cultivars and selections in a putting green trial seeded in September 2002 at North Brunswick, NJ.

	Cultivar or Selection	Species	Turf Quality[1] 2003-2004 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004	Dollar Spot[3] Oct. 2004	Dormancy[4] Nov. 2004
1	007	Creeping	7.0	7.0	7.0	7.0	7.3	7.7	5.0
2	EFD	Velvet	6.6	6.8	6.5	5.3	9.0	9.0	3.3
3	CIS-AC-1	Velvet	6.6	6.2	7.0	5.7	9.0	9.0	3.7
4	235050	Creeping	6.6	6.7	6.4	6.3	6.7	8.3	6.7
5	00BAG	Velvet	6.6	6.7	6.4	4.7	9.0	8.3	2.3
6	C952	Creeping	6.5	6.6	6.4	7.0	6.0	8.3	6.3
7	C953	Creeping	6.5	6.4	6.6	7.3	7.3	6.7	7.0
8	Declaration	Creeping	6.4	6.8	5.9	7.7	6.7	8.7	5.7
9	SRX1GD	Creeping	6.2	5.6	6.7	6.7	8.0	5.0	7.7
10	SRX1GPinkD	Creeping	6.2	6.0	6.4	7.3	7.7	5.0	7.0
11	Greenwich	Velvet	6.2	5.9	6.5	4.7	8.7	8.7	3.0
12	Vesper	Velvet	6.1	6.0	6.3	5.3	9.0	8.7	2.3
13	CIS-AP-9	Creeping	6.1	6.6	5.6	4.0	6.3	7.7	3.3
14	HTL Comp	Creeping	6.1	6.1	6.0	7.7	6.0	9.0	7.3
15	SRXG295D	Creeping	6.0	5.6	6.3	6.7	8.0	4.0	7.0
16	Benchmark DSR	Creeping	5.9	6.3	5.6	7.0	7.0	8.3	6.7
17	SRX19294D	Creeping	5.9	5.8	5.9	6.7	8.0	4.3	7.3
18	SR 7200	Velvet	5.9	6.3	5.3	4.7	7.7	8.7	3.0
19	SRX1TR3E	Creeping	5.7	5.6	5.8	5.7	6.7	4.3	5.0
20	SRX1SQZG	Creeping	5.6	5.6	5.5	3.3	5.7	4.7	2.3
21	CIS-AP-12	Creeping	5.6	5.6	5.5	6.7	5.3	6.0	7.0
22	SRXG299D	Creeping	5.5	5.2	5.8	6.0	6.7	4.0	7.3
23	SRX1BL2G	Creeping	5.5	5.6	5.4	3.0	5.3	5.3	4.3
24	King Pin	Creeping	5.5	5.6	5.4	6.3	5.7	9.0	6.7
25	13M	Creeping	5.5	5.5	5.4	4.7	5.0	7.7	6.0

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Table 4 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2003-2004 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004	Dollar Spot[3] Oct. 2004	Dormancy[4] Nov. 2004
26	PST OEB	Creeping	5.4	5.7	5.2	5.0	6.7	6.7	4.0
27	SRX1G68	Creeping	5.4	6.0	4.9	5.7	7.3	3.0	2.0
28	Penn G-2	Creeping	5.4	5.6	5.2	6.0	5.0	7.0	7.7
29	Penn A-1	Creeping	5.3	5.7	4.9	5.0	4.3	6.0	3.0
30	SRX1PDH	Creeping	5.2	5.4	5.2	4.3	7.0	6.3	3.7
31	NuPenn	Creeping	5.2	5.5	5.0	4.3	4.3	6.3	3.0
32	HTM Comp	Creeping	5.2	5.4	5.1	4.7	6.0	8.3	4.3
33	SRX1TRUG	Creeping	5.2	5.3	5.1	5.7	5.0	4.0	4.3
34	Penn G-6	Creeping	5.2	5.6	4.7	5.0	5.3	6.0	2.3
35	SRX1G32	Creeping	5.1	5.5	4.8	5.0	6.7	4.3	4.7
36	SRX1G57	Creeping	5.1	5.3	4.9	5.7	6.0	3.7	5.0
37	Penn G-1	Creeping	5.1	5.2	5.1	4.3	4.7	6.3	4.0
38	SRX1W1G	Creeping	5.1	5.4	4.8	4.0	6.0	4.0	3.3
39	SRX1G49	Creeping	5.1	5.0	5.1	6.0	6.7	3.7	6.3
40	SRXG222	Creeping	5.0	4.9	5.1	5.0	6.7	3.3	5.3
41	SRX1G56	Creeping	5.0	5.2	4.8	5.7	7.0	2.7	5.3
42	Penn A-2	Creeping	5.0	5.4	4.6	4.3	4.7	5.3	3.0
43	CIS-AP-13	Creeping	5.0	4.8	5.1	6.7	6.7	4.0	4.7
44	SRX1W1CR1G	Creeping	4.9	5.4	4.4	5.3	4.7	5.0	4.7
45	Penn A-4	Creeping	4.9	4.9	4.8	4.3	3.7	6.7	4.7
46	SRX1HPink	Creeping	4.9	5.4	4.3	4.3	4.7	6.7	3.0
47	SRX1HBlue	Creeping	4.9	5.1	4.6	4.3	5.3	6.3	4.0
48	SRX1BPAA	Creeping	4.8	5.4	4.2	3.7	4.7	8.0	4.3
49	Pennlinks II	Creeping	4.8	5.6	4.1	4.3	3.3	8.3	5.0
50	Bar As2	Creeping	4.8	5.2	4.5	4.7	4.3	4.7	7.0

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Table 4 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2003-2004 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004	Dollar Spot[3] Oct. 2004	Dormancy[4] Nov. 2004
51	SRX146-12	Creeping	4.8	4.9	4.7	4.7	6.0	3.3	4.7
52	Independence	Creeping	4.8	5.3	4.3	5.0	6.3	3.3	5.0
53	CBA-98	Creeping	4.8	5.4	4.1	3.0	5.0	3.7	2.7
54	CIS-AP-10	Creeping	4.8	5.1	4.4	4.0	5.0	5.0	3.0
55	SRX1BL3G	Creeping	4.7	5.1	4.3	3.7	5.3	3.0	3.3
56	Pick Syn96-2	Creeping	4.7	5.4	3.9	4.0	4.0	3.3	2.0
57	PST SynORO	Creeping	4.6	4.8	4.4	4.7	4.0	7.0	6.0
58	SRX1HSilver	Creeping	4.6	5.1	4.0	2.3	5.0	6.3	1.3
59	Penneagle	Creeping	4.5	4.8	4.2	4.7	4.3	5.3	4.7
60	Bengal	Creeping	4.5	4.7	4.3	4.0	4.3	5.0	6.0
61	Pick ECB	Creeping	4.5	4.9	4.0	4.7	4.3	3.7	5.7
62	SR 1119	Creeping	4.4	5.0	3.8	3.3	3.0	4.3	3.0
63	SRX1R1G1	Creeping	4.4	4.9	3.9	3.0	3.7	4.3	3.7
64	PST Syn ORM6	Creeping	4.4	4.8	4.0	3.3	3.3	8.7	3.7
65	Southshore	Creeping	4.4	4.6	4.2	4.3	4.7	6.3	3.3
66	Penn A-4	Creeping	4.3	4.7	4.0	2.7	2.3	4.3	4.7
67	SRX1LA1G	Creeping	4.3	4.6	3.9	5.0	4.7	5.7	2.0
68	Seaside II	Creeping	4.3	4.4	4.1	4.3	3.7	7.7	3.7
69	SRX1KOP1E	Creeping	4.2	4.3	4.1	3.3	5.0	2.7	4.7
70	SRX117-23	Creeping	4.2	4.6	3.7	4.0	2.7	4.7	4.0
71	CATO	Creeping	4.1	4.8	3.4	2.7	3.0	7.0	3.3
72	CBNGS02	Creeping	4.1	4.6	3.6	3.7	4.3	5.0	2.3
73	AZBC	Creeping	4.1	4.5	3.8	3.7	5.0	4.0	3.3
74	PST OX5Bulk	Creeping	4.0	4.2	3.8	3.7	3.3	5.7	6.0
75	L-93	Creeping	3.9	4.5	3.5	2.7	4.0	5.0	3.0

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Table 4 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2003-2004 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Brown Patch[3] June 2004	Dollar Spot[3] Oct. 2004	Dormancy[4] Nov. 2004
76	Backspin	Creeping	3.8	4.3	3.4	1.7	5.0	4.3	2.7
77	BGS94-96-02	Creeping	3.7	4.5	3.0	3.3	3.0	3.7	1.7
78	Pennway	Creeping	3.7	3.7	3.8	2.7	2.7	8.3	4.3
79	MBGC-02	Creeping	3.7	4.5	2.9	3.7	2.7	7.0	3.3
80	Brighton	Creeping	3.7	4.1	3.2	1.7	3.0	6.0	1.7
81	Tiger II	Colonial	3.6	4.6	2.6	3.0	1.0	9.0	2.0
82	Pennlinks	Creeping	3.6	4.0	3.2	3.0	3.3	8.3	5.0
83	Penn Trio	Creeping	3.6	3.8	3.3	3.7	3.0	7.0	2.7
84	Penncross	Creeping	3.5	4.1	2.9	2.7	2.7	7.0	3.7
85	Providence	Creeping	3.3	3.7	2.9	3.0	2.3	6.3	3.3
86	CBC-02	Creeping	3.2	3.4	3.0	3.7	4.7	7.7	4.0
87	Viper	Creeping	3.2	3.8	2.7	1.3	2.0	5.7	1.7
88	Trueline	Creeping	3.2	4.1	2.3	1.7	1.7	8.7	1.0
89	18th Green	Creeping	2.7	3.6	1.8	1.0	2.7	3.3	1.0
90	Kromi	Creeping	1.7	2.2	1.2	1.0	1.3	8.0	1.0
	LSD at 5% =		0.6	0.7	0.8	1.6	1.8	1.6	1.7

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease
[4]9 = less dormancy

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Table 5. Performance of bentgrass cultivars and selections in a fairway/tee trial seeded in September 2002 at North Brunswick, NJ.

	Cultivar or Selection	Species	Turf Quality[1] 2003-2004 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Dollar Spot[3] May 2004	Brown Patch[3] Avg.
1	SR 7200	Velvet	6.4	7.0	5.8	4.0	7.7	8.3
2	EFD	Velvet	6.2	7.2	5.2	3.3	5.7	8.8
3	235050	Creeping	5.9	6.2	5.5	3.0	6.0	8.5
4	C953	Creeping	5.8	6.2	5.3	3.3	5.7	8.8
5	HCG Comp	Colonial	5.8	5.8	5.7	7.0	5.7	5.7
6	C952	Creeping	5.6	6.1	5.0	3.7	7.0	7.8
7	Benchmark DSR	Creeping	5.4	6.6	4.1	5.0	8.3	8.2
8	HCF Comp	Colonial	5.3	5.0	5.6	6.0	5.0	5.3
9	Viter	Colonial	5.3	4.9	5.8	3.0	4.7	6.3
10	SRX 7CRCO	Colonial	5.2	5.6	4.8	4.7	9.0	5.0
11	PST-9BNC	Colonial	5.2	5.1	5.3	6.3	5.0	5.0
12	CIS AT-7	Colonial	5.2	5.6	4.7	2.7	5.3	6.0
13	PST-Syn-9LN	Colonial	5.1	5.3	5.1	5.3	7.7	4.8
14	SRX 7E	Colonial	5.1	5.2	5.0	3.7	8.3	6.0
15	Revere	Colonial	5.1	5.1	5.1	3.0	7.3	6.3
16	King Pin	Creeping	5.0	5.7	4.3	5.3	7.7	8.0
17	Sandhill	Creeping	5.0	5.4	4.6	2.3	7.3	7.5
18	PST-9VL Bulk	Colonial	5.0	5.5	4.4	2.5	8.0	6.5
19	SRX 7EE	Colonial	4.9	4.9	4.8	5.3	8.3	4.5
20	Glory	Colonial	4.8	4.6	5.1	6.0	4.7	5.3
21	Alister	Colonial	4.7	4.6	4.9	5.0	3.0	5.2
22	SRX 7EE4	Colonial	4.7	5.2	4.2	3.3	6.0	4.2
23	SRX 781-3	Colonial	4.7	4.9	4.4	3.0	6.7	4.0
24	PST-SynA1U	Colonial	4.7	5.3	4.0	1.7	6.0	7.2
25	CIS AP-10	Creeping	4.6	5.2	4.1	4.3	3.3	8.0
26	Tiger II	Colonial	4.6	5.0	4.3	2.3	4.0	4.2
27	CIS AT-6	Colonial	4.6	5.0	4.2	3.7	3.3	4.2
28	SRX 7MODD	Colonial	4.6	5.0	4.2	3.0	6.7	5.0
29	CIS AP-12	Creeping	4.6	5.1	4.1	4.0	4.7	8.0
30	SRX 7EE5	Colonial	4.6	5.0	4.2	4.7	7.0	5.2
31	PST-9VN Bulk	Colonial	4.5	4.6	4.3	2.0	7.7	6.8
32	SRX 1H Silver	Creeping	4.4	5.3	3.7	2.3	6.7	6.2
33	SRX 1G 57	Creeping	4.4	4.9	3.9	4.7	4.7	7.7
34	PST-Syn-9PY	Colonial	4.4	4.5	4.2	4.7	8.7	4.8
35	SRX 1G 32	Creeping	4.3	4.6	4.1	4.0	4.7	7.7

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Table 5 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2003-2004 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Spring Green-up[2] April 2004	Dollar Spot[3] May 2004	Brown Patch[3] Avg.
36	Penn A-4	Creeping	4.3	4.9	3.7	4.3	5.0	7.7
37	Trueline	Creeping	4.3	5.0	3.6	1.3	7.0	4.2
38	SRX 7MOBB	Colonial	4.3	4.7	3.9	3.7	6.0	3.3
39	SRX 1 Pink	Creeping	4.2	5.0	3.4	4.0	4.7	7.5
40	SRX 1G 56	Creeping	4.2	4.8	3.6	5.0	2.7	7.7
41	SRX 780-19	Colonial	4.1	4.1	4.1	4.3	7.0	4.0
42	SRX 1W1CR1G	Creeping	4.1	4.5	3.7	3.7	6.0	7.0
43	SRX 1G 49	Creeping	4.1	4.7	3.5	4.7	4.3	7.2
44	SRX 1G 68	Creeping	4.0	5.2	2.9	3.7	2.7	6.7
45	Brighton	Creeping	3.9	4.5	3.4	2.0	3.0	5.8
46	SR 1119	Creeping	3.9	4.7	3.1	4.0	4.7	7.0
47	SRX 117-23	Creeping	3.9	4.3	3.6	3.3	5.3	6.7
48	SRX 146-12	Creeping	3.8	4.5	3.2	2.7	2.7	7.3
49	Independence	Creeping	3.8	4.9	2.7	5.3	4.0	7.5
50	Providence	Creeping	3.8	4.2	3.4	3.0	4.3	6.7
51	Viper	Creeping	3.8	4.5	3.0	2.7	3.7	5.2
52	Backspin	Creeping	3.7	4.3	3.2	5.3	2.7	7.0
53	SRX 1H Blue	Creeping	3.7	4.7	2.8	4.0	3.7	7.7
54	SRX 781-21	Colonial	3.7	4.1	3.3	5.0	7.3	2.3
55	Penncross	Creeping	3.5	3.7	3.3	3.3	4.7	5.8
56	18th Green	Creeping	2.7	3.6	1.9	2.0	1.0	6.8
57	PST-Syn-9NE	Colonial	2.6	2.6	2.7	3.3	5.7	5.2
	LSD at 5% =		1.9	1.7	1.9	1.8	1.4	0.6

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease

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Table 6. Performance of bentgrass cultivars and selections in a putting green trial seeded in September 2003 at North Brunswick, NJ. (Includes all entries of the National Bentgrass Putting Green Test - NTEP.)

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Turf Cover (%) Oct. 2003	Copper Spot[2] Aug. 2004	Brown Patch[2] Aug. 2004	Dollar Spot[2] Oct. 2004	Genetic Color[3] Nov. 2004	Density[4] Nov. 2004	Leaf Texture[5] Nov. 2004
1	IS-AC 1	Velvet	7.9	70.0	5.3	7.3	9.0	8.0	6.7	9.0
2	Legendary	Velvet	7.7	71.7	5.3	7.7	8.3	7.3	4.3	8.0
3	Greenwich	Velvet	7.4	68.3	3.7	6.0	8.3	7.3	4.7	7.3
4	Vesper	Velvet	7.3	61.7	3.3	5.3	7.3	6.0	5.3	8.7
5	EFD	Velvet	7.2	58.3	4.3	7.7	9.0	8.0	4.0	7.7
6	SRX 1GPD	Creeping	7.2	55.0	7.3	8.7	5.0	6.0	8.0	7.3
7	CY-2	Creeping	6.7	63.3	5.0	7.0	5.3	4.7	6.7	5.0
8	Declaration	Creeping	6.7	66.7	5.7	6.3	7.3	5.7	6.0	6.0
9	Shark	Creeping	6.7	63.3	4.7	6.7	4.0	4.3	6.0	4.7
10	Penn G-2	Creeping	6.7	58.3	7.0	6.0	7.0	5.0	6.3	6.3
11	235050	Creeping	6.5	60.0	6.7	6.3	6.0	4.7	3.7	5.7
12	Penn G-6	Creeping	6.4	70.0	6.3	7.0	7.7	5.3	5.0	5.0
13	Independence	Creeping	6.4	63.3	6.7	6.3	4.7	4.0	4.3	4.0
14	SRX 1GPD	Creeping	6.3	55.0	5.7	6.7	6.0	4.7	6.3	7.0
15	LS-44	Creeping	6.2	60.0	6.0	5.7	5.3	2.7	4.7	5.0
16	Penn A-1	Creeping	6.1	66.7	6.3	5.7	5.7	5.3	5.7	5.3
17	Penn A-2	Creeping	6.1	68.3	6.3	5.7	6.0	5.3	5.3	6.7
18	T-1	Creeping	6.1	63.3	4.7	6.0	5.0	3.3	4.7	5.3
19	SR 7200	Velvet	6.0	38.3	3.0	6.0	9.0	7.0	5.3	7.3
20	DSB	Creeping	5.9	60.0	6.0	6.3	5.7	5.3	5.0	6.3
21	Penn A-4	Creeping	5.8	71.7	6.3	5.7	6.3	5.3	5.7	5.0
22	IS-AP 9	Creeping	5.6	56.7	6.0	6.0	8.0	3.7	3.3	4.3
23	A03-EDI	Creeping	5.5	61.7	5.0	4.7	8.3	3.3	4.3	3.7
24	Bengal	Creeping	5.5	65.0	4.0	3.7	5.3	3.0	5.3	4.3
25	Century	Creeping	5.4	71.7	5.0	5.0	4.7	5.7	4.3	6.0

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Table 6 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Turf Cover (%) Oct. 2003	Copper Spot[2] Aug. 2004	Brown Patch[2] Aug. 2004	Dollar Spot[2] Oct. 2004	Genetic Color[3] Nov. 2004	Density[4] Nov. 2004	Leaf Texture[5] Nov. 2004
26	SR 1119	Creeping	5.4	70.0	5.7	4.7	5.7	3.3	2.7	3.7
27	Alpha	Creeping	5.3	65.0	3.3	2.7	4.3	1.3	2.0	3.7
28	Southshore	Creeping	5.2	58.3	5.0	4.3	5.7	5.0	3.7	4.7
29	13-M	Creeping	5.2	61.7	4.7	5.3	7.7	4.3	4.0	3.3
30	HTM comp	Creeping	5.2	55.0	6.3	5.3	7.7	4.3	4.7	6.0
31	L-93	Creeping	5.0	70.0	5.7	5.0	8.3	5.3	6.7	4.7
32	Pennlinks II	Creeping	4.9	63.3	5.7	5.3	8.3	2.3	2.0	2.3
33	Imperial	Creeping	4.9	71.7	5.0	5.3	5.3	3.0	3.0	3.3
34	Penneagle	Creeping	4.8	68.3	6.0	4.7	5.3	3.3	2.7	4.0
35	Crenshaw	Creeping	4.6	58.3	5.7	5.7	3.0	5.0	4.0	3.3
36	King Pin	Creeping	4.6	48.3	5.3	6.0	8.0	1.7	2.7	4.0
37	Benchmark DSR	Creeping	4.2	48.3	3.7	4.0	7.0	2.3	1.7	3.3
38	Penncross	Creeping	3.4	66.7	3.7	3.0	7.3	1.7	1.0	1.7
	LSD at 5% =		0.7	6.8	1.5	1.6	1.6	2.0	2.2	2.1

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

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Table 7. Performance of creeping bentgrass cultivars and selections in a putting green trial seeded in October 2003 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 2004 Avg.	Establishment[2] Oct. 2004	Brown Patch[3] 2004 Avg.
1	Declaration	6.4	7.0	6.0
2	Shark	6.1	6.3	6.7
3	235050	5.6	5.7	5.8
4	Independence	5.3	6.7	6.2
5	Penn A-4	5.3	6.7	4.2
6	L-93	5.1	7.0	4.5
7	Southshore	4.1	5.7	3.5
8	Crenshaw	3.8	6.0	4.7
9	SR 1119	3.8	6.7	4.0
10	King Pin	3.4	5.3	4.2
	LSD at 5% =	0.7	0.9	1.4

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

Table 8. Performance of bentgrass cultivars and selections in a fairway/tee trial seeded in September 2003 at North Brunswick, NJ. (Includes all entries of the 2003 National Bentgrass Fairway Test - NTEP.)

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Turf Cover (%) Oct. 2003	Brown Patch[2] June 2004	Dollar Spot[2] 2004 Avg.	Copper Spot[2] Aug. 2004	Genetic Color[3] Nov. 2004	Density[4] Nov. 2004	Leaf Texture[5] Nov. 2004
1	SR 7200	Velvet	7.7	98.0	8.0	8.0	5.0	8.0	8.0	9.0
2	Declaration	Creeping	7.5	91.0	9.0	9.0	5.0	8.0	8.0	7.3
3	King Pin	Creeping	6.9	61.7	8.7	7.9	6.7	7.7	7.7	7.3
4	Benchmark DSR	Creeping	6.9	76.7	8.7	8.0	5.0	7.7	8.0	8.0
5	13-M	Creeping	6.5	88.3	7.3	8.1	5.0	7.0	7.7	7.3
6	235050	Creeping	6.5	85.0	9.0	6.3	2.7	7.0	5.3	6.7
7	IS-AT-7	Colonial	6.5	95.3	3.7	8.8	9.0	6.7	6.3	6.0
8	T-1	Creeping	6.4	76.7	9.0	5.3	8.0	7.0	6.3	6.3
9	PST-OEB	Creeping	6.2	95.0	9.0	7.1	4.7	7.0	7.0	6.7
10	SRX IGPD	Creeping	6.2	71.7	8.7	6.0	6.3	7.0	6.0	7.0
11	LS-44	Creeping	6.2	85.0	7.7	6.2	5.3	6.3	5.7	6.3
12	Pennlinks	Creeping	6.2	95.3	8.0	8.6	5.0	7.0	6.7	6.3
13	Alpha	Creeping	6.2	78.3	9.0	4.4	5.0	7.0	6.0	6.3
14	PST-9VN	Colonial	6.1	93.3	4.3	8.6	9.0	6.3	6.0	6.3
15	Shark	Creeping	6.1	88.3	9.0	6.0	4.0	6.3	5.0	6.3
16	Tiger II	Colonial	6.1	81.7	2.7	8.8	9.0	6.3	7.0	6.0
17	PST-9BNC	Colonial	6.1	90.0	3.7	8.1	9.0	6.3	6.0	6.0
18	Penneagle II	Creeping	6.1	91.7	9.0	6.0	6.3	6.3	6.0	6.7
19	Revere	Colonial	6.1	71.7	3.3	8.8	9.0	6.3	7.0	6.3
20	SR 1119	Creeping	6.0	51.7	7.7	4.4	6.7	6.3	4.7	6.0
21	SRX IPDH	Creeping	6.0	81.7	9.0	6.1	5.0	6.3	5.3	6.7
22	Alpha	Creeping	6.0	70.0	9.0	5.0	5.7	6.3	6.0	5.7
23	SR 7150	Colonial	5.9	94.3	1.3	8.8	9.0	6.7	6.0	5.7
24	IS-AP-14	Creeping	5.9	83.3	9.0	4.9	3.7	6.7	5.3	6.3
25	L-93	Creeping	5.8	81.7	5.7	7.1	6.7	7.0	7.0	6.3

(Continued)

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Table 8 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Turf Cover (%) Oct. 2003	Brown Patch[2] June 2004	Dollar Spot[2] 2004 Avg.	Copper Spot[2] Aug. 2004	Genetic Color[3] Nov. 2004	Density[4] Nov. 2004	Leaf Texture[5] Nov. 2004
26	Bardot	Colonial	5.8	55.0	3.3	8.8	9.0	6.3	6.3	6.7
27	Bengal	Creeping	5.7	60.0	7.7	5.1	5.0	5.7	5.3	6.3
28	Independence	Creeping	5.6	86.0	8.3	3.6	2.7	6.0	5.3	6.7
29	Southshore	Creeping	5.3	46.7	7.7	4.1	5.3	6.0	5.7	6.3
30	Imperial	Creeping	4.6	96.0	4.7	3.8	6.3	5.7	4.7	5.7
31	Princeville	Creeping	4.4	98.0	5.7	5.7	4.7	6.0	5.3	5.7
32	Crenshaw	Creeping	4.4	53.3	6.0	3.3	5.3	5.3	4.7	5.7
33	Penncross	Creeping	4.0	94.3	6.0	6.2	8.7	5.0	5.0	5.7
34	Seaside	Creeping	2.4	94.3	3.0	7.6	9.0	4.7	4.0	4.0
	LSD at 5% =		0.6	14.3	1.4	1.3	2.6	0.9	1.2	0.9

[1]9 = best turf quality
[2]9 = least disease
[3]9 = optimal turf color
[4]9 = highest shoot density
[5]9 = finest leaf texture

2004023 1

Table 9. Performance of bentgrass cultivars and selections in a fairway/tee trial seeded in October 2003 at North Brunswick, NJ.

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Establish-ment[2] Oct. 2003	Pythium[3] 2003 Avg.	Brown Patch[3] June 2004	Dollar Spot[3] Avg. 2004	Copper Spot[3] Aug. 2004
1	Declaration	Creeping	7.3	7.3	4.5	8.7	8.7	5.0
2	235050	Creeping	6.6	7.0	4.5	8.3	7.1	4.0
3	Greenwich	Velvet	6.5	8.7	4.5	8.0	7.1	4.3
4	IS-AP	Creeping	6.4	7.7	4.5	7.3	6.8	4.0
5	SR 7200	Velvet	6.1	8.0	4.5	7.3	7.6	4.7
6	Shark	Creeping	6.1	5.7	4.5	8.3	6.2	5.0
7	King Pin	Creeping	6.1	5.7	4.5	8.0	7.8	6.3
8	PST-Syn-9BC3	Colonial	5.8	4.7	4.3	6.3	5.7	9.0
9	VE 3 Comp	Velvet	5.8	5.3	4.2	8.3	8.0	4.3
10	Penneagle II	Creeping	5.7	7.3	4.8	7.7	5.3	5.3
11	Benchmark DSR	Creeping	5.6	6.0	4.5	6.7	7.5	5.7
12	Penn A-1	Creeping	5.6	7.0	4.5	5.7	5.4	6.3
13	Penn G-6	Creeping	5.6	7.7	4.3	6.7	6.8	5.0
14	PST-OEB	Creeping	5.5	8.3	5.0	8.7	6.0	6.0
15	PST-Syn-9NCG	Colonial	5.5	4.0	4.2	7.7	6.8	8.7
16	SRX IGD	Creeping	5.5	5.0	4.0	8.3	5.6	5.7
17	SRX 7CRCO	Colonial	5.5	6.3	4.3	5.0	8.2	8.3
18	SRX IG68	Creeping	5.5	8.0	4.5	8.7	5.2	5.3
19	ORU	Creeping	5.4	7.7	4.5	7.3	5.5	3.7
20	IS-AP-14	Creeping	5.4	7.7	4.5	7.3	4.6	5.3
21	Sandhill	Creeping	5.4	7.0	4.5	5.7	7.7	5.7
22	PST-9NG-Bulk	Colonial	5.3	3.0	4.2	7.0	5.7	8.7
23	PST-VGG Bulk	Velvet	5.2	3.3	4.3	7.3	7.2	5.3
24	Penn A-2	Creeping	5.2	7.3	4.3	6.7	5.4	5.3
25	Penn G-1	Creeping	5.1	7.3	4.5	7.3	5.1	5.3
26	L-93	Creeping	5.1	7.3	4.7	4.7	6.1	6.3
27	SRX IPDH	Creeping	5.1	5.3	4.5	8.0	6.0	6.7
28	Alister	Colonial	5.1	8.3	4.8	4.0	7.0	7.3
29	SRX IG57	Creeping	5.1	7.3	4.8	8.0	4.8	5.3
30	SRX WICRIG	Creeping	5.0	7.7	5.5	6.3	5.0	6.7
31	Glory	Colonial	5.0	8.0	5.0	5.0	7.4	9.0
32	SRX ITR3E	Creeping	5.0	6.7	4.3	4.0	6.0	5.7
33	PST-020 Bulk	Creeping	5.0	5.3	4.3	6.3	7.3	6.0
34	SRX 7EE5	Colonial	5.0	6.0	4.5	4.7	7.8	8.7
35	SRX 1H Blue	Creeping	5.0	6.7	4.0	7.3	5.2	6.3

(Continued)

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Table 9 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Establish-ment[2] Oct. 2003	Pythium[3] 2003 Avg.	Brown Patch[3] June 2004	Dollar Spot[3] Avg. 2004	Copper Spot[3] Aug. 2004
36	SRX 7MOBB	Colonial	4.9	5.3	3.8	1.7	7.2	8.3
37	Penn A-4	Creeping	4.9	7.0	4.5	5.7	5.1	6.0
38	PST-9VN	Colonial	4.9	4.7	4.5	5.7	7.7	9.0
39	PST-OSF Bulk	Creeping	4.9	3.7	4.2	7.7	6.9	6.3
40	IS-AP-10	Creeping	4.8	7.7	4.5	5.7	5.9	6.0
41	PST-9R3	Colonial	4.8	4.7	4.8	2.7	8.2	8.7
42	Penneagle	Creeping	4.8	7.0	4.5	6.7	5.5	6.3
43	Independence	Creeping	4.8	7.0	4.7	7.3	3.7	5.3
44	SRX ISQ2G	Creeping	4.7	6.3	5.0	7.7	4.7	4.7
45	PST-OEX Bulk	Creeping	4.7	3.3	4.3	5.7	7.8	4.7
46	PST-Syn-9PIN	Colonial	4.6	3.0	4.2	6.7	8.0	8.7
47	SRX 7EE4	Colonial	4.6	5.7	4.5	3.0	7.4	8.7
48	SR 1119	Creeping	4.6	7.7	4.5	6.0	5.9	5.7
49	SRX 1NJH	Creeping	4.6	5.0	4.8	7.0	4.0	6.3
50	Bengal	Creeping	4.5	8.0	5.2	5.0	4.8	5.0
51	SRX 7EE	Colonial	4.5	5.7	4.3	2.0	8.1	8.3
52	PST-9x3 Bulk	Colonial	4.4	2.3	4.3	4.3	7.8	8.7
53	SR 7100	Colonial	4.4	6.3	4.0	3.0	7.8	8.3
54	Bar AS 2	Creeping	4.4	5.7	4.0	5.0	4.6	4.3
55	Southshore	Creeping	4.3	4.3	4.3	5.7	7.2	6.0
56	SRX 1HSilver	Creeping	4.3	3.3	3.7	6.0	6.2	7.7
57	Brighton	Creeping	4.2	3.3	4.3	6.3	5.8	4.0
58	Providence	Creeping	4.2	7.7	4.7	4.0	6.0	6.0
59	Seaside II	Creeping	4.1	7.3	4.5	3.3	6.8	5.7
60	PST-Syn-9NT	Colonial	4.0	2.7	4.0	4.0	7.9	8.3
61	Imperial	Creeping	4.0	7.7	4.8	5.3	5.8	5.7
62	SRX 1H Pink	Creeping	4.0	3.3	4.2	6.7	5.7	6.7
63	ORF-03	Creeping	4.0	6.7	4.7	2.0	5.9	5.0
64	PST-Syn-9LSD	Colonial	3.9	2.0	4.3	7.0	8.7	8.7
65	Crenshaw	Creeping	3.8	4.3	4.3	5.3	5.0	6.3
66	Century	Creeping	3.8	8.0	4.7	4.7	5.4	5.3
67	PennLinks II	Creeping	3.8	8.3	5.3	4.0	5.8	6.3
68	Regent	Creeping	3.8	8.3	5.0	2.3	7.2	6.3
69	Bardot	Colonial	3.7	5.7	3.7	3.0	8.0	8.7
70	PST-ORF	Creeping	3.7	7.0	4.0	2.3	6.7	4.0

(Continued)

Table 9 (continued).

	Cultivar or Selection	Species	Turf Quality[1] 2004 Avg.	Establish-ment[2] Oct. 2003	Pythium[3] 2003 Avg.	Brown Patch[3] June 2004	Dollar Spot[3] Avg. 2004	Copper Spot[3] Aug. 2004
71	PST-VE52 Bulk	Velvet	3.5	3.0	4.5	2.7	8.0	4.3
72	PST-9IR	Colonial	3.5	5.3	3.0	2.0	8.6	9.0
73	PST-ORR Bulk	Creeping	3.5	2.0	4.5	3.7	7.8	6.7
74	Heriot	Colonial	3.5	1.7	3.8	3.0	8.2	9.0
75	PST-OGE Bulk	Creeping	3.5	2.3	4.5	5.7	5.4	5.3
76	PST-9GBS-Bulk	Colonial	3.3	2.0	4.2	3.7	7.8	8.3
77	Barifera	Creeping	3.2	3.7	3.7	2.7	4.9	6.0
78	SRX 781-21	Colonial	3.1	6.7	3.8	1.0	8.3	8.0
79	Trueline	Creeping	3.0	7.3	4.3	1.0	7.0	4.7
80	Penncross	Creeping	3.0	8.3	4.7	3.0	4.0	5.7
81	Barbella	Velvet	2.6	1.0	4.5	3.3	7.8	3.7
	LSD at 5% =		0.8	1.5	0.7	1.7	1.4	1.9

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

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Table 10. Maintenance practices performed in 2004 on bentgrass trials at North Brunswick, NJ.

	Table/Test	Fertility[1]	Mowing Height (inches)	Aerification/Top Dress	Fungicides	Insecticides	Herbicides
1	2001 Greens	2.54	1/8	March/June/Oct.: 5/16-inch solid tine March to Aug./Oct.: topdressed sand	May: Banner Maxx June: Chipco 26GT July: Banner + Heritage Aug.: Daconil Ultrex Sept.: Daconil + Banner	July: Dursban Pro (for ants/earthworms) July: Merit 75WP (for grubs)	May: Dimension 1E (pre-emergence) weeds)
2	2001 Velvet Greens	2.54	1/8	March/June/Oct.: 5/16-inch solid tine March to Aug./Oct.: topdressed sand	May: Banner Maxx June: Chipco 26GT July: Banner + Heritage Aug.: Daconil Ultrex Sept.: Daconil + Banner	July: Dursban Pro (for ants/earthworms) July: Merit 75WP (for grubs)	May: Dimension 1E (pre-emergence weeds)
3	2001 Fairway	2.04	3/8	None	May: Daconil Ultrex Sept.: Daconil + Banner	July: Merit 75WP (for grubs)	May: Dimension 1E (pre-emergence weeds) Nov.: Trimec Bent (broadleaf weeds)
4	2002 Greens	1.62	1/8	June: microtine aerified March to Aug./Oct: topdressed sand	May to Aug: Curalan EG June to Aug: ProStar 70WP	July: Dursban Pro (for ants/earthworms) July: Merit 75WP (for grubs)	May: Dimension 1E (pre-emergence weeds)
5	2002 Fairway/Tee	1.51	3/8	June: microtined aerified	June: Daconil (Echo 990)	July: Merit 75WP (for grubs)	April: Lontrel (clover) May: Dimension 1E (pre-emergence weeds)
6	2003 NTEP Greens	2.47	1/8	March to Aug./Oct: topdressed sand	May/Sept./Oct.: Banner Maxx June: Chipco 26GT July/Sept./Oct.: Daconil Sept.: ProStar 70WP Nov.: Junction	May: Dursban Pro (for ants/earthworms) July: Merit 75WP (for (grubs)	None

(Continued)

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Table 10 (continued).

Table/Test	Fertility[1]	Mowing Height (inches)	Aerification/Top Dress	Fungicides	Insecticides	Herbicides
7 2003 Greens	2.47	1/8	March to Aug./Oct: topdressed sand	Sept.: ProStar 70WP Sept./Oct.: Daconil Ultrex/ Banner Maxx Nov.: Junction	May: Dursban Pro (for ants/earthworms) July: Merit 75WP (for grubs)	None
8 2003 NTEP Fairway	1.60	3/8	None	June: Chipco 26GT July: ProStar 70WP Aug./Sept.: Daconil Ultrex	July: Merit 75WP (for grubs)	May: Dimension 1E (pre-emergence weeds) Nov.: Trimec Bent (broadleaf weeds)
9 2003 Fairway/Tee	2.06	3/8	None	Sept.: Daconil Ultrex	July: Merit 75WP (for grubs)	May: Dimenson 1E (pre-emerg. weeds) Nov.: Trimec Bent (broadleaf weeds)

[1]Annual nitrogen applied (lb/1000 ft^2)

2004023.1

TABLE 7 LEAF SPOT RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
1999-2002 DATA

LEAF SPOT RATINGS 1-9; 9=NO DISEASE 2/ 3/

NAME	PA1
BAVARIA	9.0
ISI AP-5	8.0
SRX 1BPAA	8.0
SR 1119	7.7
PENNCROSS	7.3
BACKSPIN	7.0
SRX 1NJH	7.0
SYN 96-3	6.7
PENNLINKS	6.3
BRIGHTON (SRX 1120)	6.0
L-93	6.0
PICK CB 13-94	6.0
SYN 96-2	6.0
BENGAL (BAR AS 8FUS2)	5.7
PENN A-4	5.7
PENN G-6	5.7
SYN 96-1	5.3
PENN A-1	5.0
PENN A-2	5.0
PST-A2E	4.7
IMPERIAL	4.3
PENN G-1	4.0
PROVIDENCE	4.0
SR 7200	4.0
BAR CB 8US3	3.7
CENTURY	3.7
CRENSHAW	3.7
VESPER (PICK MVB)	3.7
ABT-CRB-1	2.3
LSD VALUE	1.8
C.V. (%)	20.0

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ LEAF SPOT RATED IN 2000 ONLY.

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TABLE 8. DOLLAR SPOT RATINGS OF BENTGRASS CULTIVARS
GROWN ON A FAIRWAY OR TEE 1/
2002 DATA

DOLLAR SPOT RATINGS 1-9; 9=NO DISEASE 2/ 3/

NAME	MI1	NJ1	PA1	VA1	WI1	MEAN
TIGER II (CIS AT-5)	8.0	8.7	8.7	5.7	8.3	7.9
SR 7100	8.0	8.0	8.3	4.3	8.0	7.3
GOLFSTAR	8.0	7.0	9.0	5.0	7.7	7.3
GLORY (PST-9HG)	8.0	6.0	8.0	6.0	8.3	7.3
SR 7150 (SRX 7MODD)	8.0	7.3	8.3	4.7	8.0	7.3
TIGER	8.0	8.0	8.7	3.3	8.0	7.2
PST-9PM	8.0	5.7	9.0	5.0	8.0	7.1
ABT-COL-2	8.0	7.3	8.7	3.7	7.7	7.1
SRX 7MOBB	5.7	8.0	8.3	4.0	8.0	6.8
PENNLINKS II (PST-OVN)	5.7	5.7	8.7	4.3	8.0	6.5
SRX 1BPAA	8.0	5.0	6.7	4.7	7.0	6.3
L-93	8.0	4.3	7.7	4.0	7.3	6.3
PENN G-6	8.0	5.0	7.7	3.0	7.0	6.1
SEASIDE II	8.0	5.0	7.0	3.0	7.7	6.1
TRUELINE	8.0	5.3	7.3	3.0	7.0	6.1
SEASIDE	8.0	5.0	7.7	3.0	6.7	6.1
PENNCROSS	8.0	4.3	7.0	3.3	7.0	5.9
PENNEAGLE	8.0	5.0	7.0	3.0	6.3	5.9
BRIGHTON (SRX 1120)	8.0	4.3	6.0	3.0	6.7	5.6
SR 1119	8.0	4.7	5.7	3.3	6.3	5.6
BACKSPIN	8.0	3.7	6.3	3.3	6.3	5.5
GRAND PRIX	8.0	4.0	5.7	3.7	6.0	5.5
PROVIDENCE	8.0	3.0	6.0	3.7	6.3	5.4
PRINCEVILLE	5.7	4.3	6.0	4.7	6.0	5.3
IMPERIAL	5.7	5.0	5.3	3.3	6.3	5.1
CENTURY	5.7	3.0	4.7	3.0	6.3	4.5
LSD VALUE	2.9	2.0	1.7	1.8	0.8	0.9
C.V. (%)	23.5	22.9	14.4	28.4	6.5	19.2

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ DOLLAR SPOT CAUSED BY SCLEROTINIA HOMOEOCARPA AT "NJ1", "PA1" AND "WI1".

2004023 1

TABLE 4. PERCENT DOLLAR SPOT RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/ 2/ 3/
1999-2002 DATA

NAME	AL1	KY1	NY1	MEAN
CENTURY	20.3	15.7	15.3	16.8
IMPERIAL	2.3	15.7	12.0	11.4
CRENSHAW	5.3	16.3	6.7	11.2
BAR CB 8US3	7.3	13.3	10.0	11.0
PENN A-4	23.3	6.0	5.3	10.2
ISI AP-5	13.3	10.3	6.0	10.0
PICK CB 13-94	5.3	11.0	10.3	9.4
BAVARIA	1.7	10.3	11.0	8.3
BACKSPIN	3.7	10.0	7.3	7.8
PENNCROSS	7.3	8.3	6.3	7.6
SYN 96-1	5.0	10.0	5.3	7.6
ABT-CRB-1	3.7	6.3	13.3	7.4
VESPER (PICK MVB)	4.0	5.3	13.0	6.9
SYN 96-2	2.3	10.0	4.7	6.8
PENN A-2	7.3	6.3	6.7	6.7
SRX 1NJH	10.3	5.0	6.0	6.6
SR 7200	0.3	5.7	13.7	6.3
SR 1119	3.7	8.7	3.7	6.2
L-93	7.3	1.3	12.3	5.6
SYN 96-3	2.3	6.3	4.3	4.8
PENN A-1	7.0	1.3	9.3	4.8
PST-A2E	8.7	2.3	5.7	4.8
BRIGHTON (SRX 1120)	7.0	4.7	2.3	4.7
PENNLINKS	3.7	5.7	2.7	4.4
BENGAL (BAR AS 8FUS2)	0.7	5.7	5.3	4.3
PENN G-1	1.0	3.7	6.7	3.8
PENN G-6	3.7	2.3	5.3	3.4
SRX 1BPAA	4.0	2.0	5.7	3.4
PROVIDENCE	0.7	3.0	5.3	3.0
LSD VALUE	13.7	8.0	10.2	8.3
C.V. (%)	142.7	68.1	82.8	89.2

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ PERCENT DOLLAR SPOT RATED AT "AL1" & "NY1" IN 2000, AND AT "KY1" IN 2002.

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TABLE 10. GRAY SNOW MOLD RATINGS OF BENTGRASS CULTIVARS GROWN ON A FAIRWAY OR TEE 1/ 2/
1999-2002 DATA

GRAY SNOW MOLD RATINGS 1-9; 9=NO DISEASE 3/ 4/

NAME	MI1	SD1	WI1	MEAN
TIGER II (CIS AT-5)	8.0	8.0	8.7	8.3
SR 7150 (SRX 7MODD)	8.0	7.7	8.7	8.3
GLORY (PST-9HG)	7.0	7.7	9.0	8.2
ABT-COL-2	8.0	7.3	8.7	8.2
PST-9PM	7.7	7.7	8.7	8.2
SRX 7MOBB	8.0	7.3	8.7	8.2
SR 7100	7.7	8.0	8.3	8.1
PENNEAGLE	8.0	4.3	9.0	7.6
PRINCEVILLE	8.0	4.3	9.0	7.6
TIGER	6.3	8.0	8.0	7.6
SRX 1BPAA	8.0	3.3	9.0	7.3
SR 1119	7.0	5.0	8.7	7.3
PENN G-6	8.0	3.0	9.0	7.3
PENNCROSS	7.0	4.0	9.0	7.3
SEASIDE	5.7	5.3	9.0	7.3
TRUELINE	7.3	3.7	9.0	7.3
BRIGHTON (SRX 1120)	8.0	2.7	8.7	7.0
BACKSPIN	6.0	4.3	8.3	6.8
IMPERIAL	6.0	3.7	8.7	6.8
PENNLINKS II (PST-OVN)	8.0	1.0	9.0	6.8
SEASIDE II	6.3	2.7	9.0	6.8
GOLFSTAR	4.3	8.0	7.0	6.6
L-93	7.0	2.0	8.7	6.6
CENTURY	6.0	3.3	8.0	6.3
GRAND PRIX	5.7	2.7	8.3	6.3
PROVIDENCE	6.0	2.3	8.3	6.3
LSD VALUE	2.3	1.9	0.8	1.2
C.V. (%)	20.6	24.6	5.7	14.0

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ GRAY SNOW MOLD RATED AT "MI1" & AT "SD1" IN 2001, AND AT "WI1" IN 2000.

4/ GRAY SNOW MOLD CAUSED BY TYPHULA INCARNATA AT "WI1".

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TABLE 11. PINK SNOW MOLD RATINGS OF BENTGRASS CULTIVARS GROWN ON A FAIRWAY OR TEE 1/
1999-2002 DATA

PINK SNOW MOLD RATINGS 1-9; 9=NO DISEASE 2/ 3/

NAME	UT1	WA1	WA4	MEAN
TIGER II (CIS AT-5)	3.3	7.0	6.3	6.5
GLORY (PST-9HG)	4.0	6.7	6.7	6.2
SR 7100	4.0	5.3	7.7	6.1
TIGER	3.3	6.7	6.3	6.1
SRX 7MOBB	5.0	6.2	6.0	5.9
PENN G-6	3.3	5.0	8.7	5.6
SR 7150 (SRX 7MODD)	3.3	5.5	6.3	5.4
PENNLINKS II (PST-OVN)	2.3	5.3	8.0	5.4
BACKSPIN	3.7	5.3	8.0	5.3
PENNEAGLE	4.7	3.8	8.7	5.2
ABT-COL-2	4.7	5.0	7.0	5.1
GOLFSTAR	4.3	4.0	7.7	4.8
PENNCROSS	3.7	4.3	8.0	4.7
PROVIDENCE	2.3	4.3	7.3	4.7
CENTURY	3.0	4.2	7.7	4.6
SR 1119	3.7	5.0	5.7	4.6
PST-9PM	3.3	3.7	7.7	4.5
SRX 1BPAA	3.0	4.2	6.0	4.4
L-93	3.7	4.5	7.7	4.4
PRINCEVILLE	3.0	3.3	7.7	4.2
GRAND PRIX	2.3	4.3	6.7	4.2
TRUELINE	3.0	4.0	7.7	4.1
BRIGHTON (SRX 1120)	2.7	3.5	8.3	4.0
IMPERIAL	3.0	3.8	7.3	3.8
SEASIDE	2.7	2.7	7.7	3.7
SEASIDE II	3.0	2.7	6.3	3.4
LSD VALUE	2.0	3.6	1.7	2.6
C.V. (%)	36.8	48.2	14.7	40.7

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ PINK SNOW MOLD RATED AT "UT1" & "WA4" IN 2001, AT "WA1" IN 2001-02.

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TABLE 12. MICRODOCHIUM PATCH RATINGS OF BENTGRASS CULTIVARS GROWN ON A FAIRWAY OR TEE 1/
1999-2002 DATA

MICRODOCHIUM PATCH RATINGS 1-9; 9=NO DISEASE 2/ 3/

NAME	MN1	WA1	WA4	MEAN
TIGER II (CIS AT-5)	9.0	6.3	3.7	6.3
SRX 7MOBB	8.3	5.7	4.7	6.2
SR 7150 (SRX 7MODD)	8.7	5.3	4.0	6.0
PST-9PM	8.3	5.7	3.0	5.7
GLORY (PST-9HG)	7.7	6.7	2.0	5.4
GOLFSTAR	7.3	6.0	2.7	5.3
TIGER	6.0	5.3	4.0	5.1
SR 7100	6.3	6.3	2.0	4.9
ABT-COL-2	5.3	5.0	3.3	4.6
SR 1119	6.0	5.0	2.3	4.4
SRX 1BPAA	4.7	5.0	3.0	4.2
TRUELINE	6.0	4.3	2.3	4.2
L-93	5.0	4.7	2.7	4.1
PENN G-6	4.3	5.7	2.0	4.0
PENNEAGLE	5.0	5.0	1.7	3.9
PRINCEVILLE	5.3	4.3	2.0	3.9
SEASIDE II	4.0	4.3	3.3	3.9
PENNLINKS II (PST-OVN)	4.3	3.7	3.3	3.8
BRIGHTON (SRX 1120)	3.7	5.0	2.7	3.8
CENTURY	3.3	5.3	2.3	3.7
PROVIDENCE	5.3	3.3	2.3	3.7
GRAND PRIX	4.0	4.3	2.7	3.7
BACKSPIN	4.7	4.3	1.7	3.6
PENNCROSS	3.3	4.7	2.7	3.6
SEASIDE	5.3	3.7	1.3	3.4
IMPERIAL	3.3	4.0	2.7	3.3
LSD VALUE	2.6	1.8	1.5	2.0
C.V. (%)	28.9	22.1	35.5	28.8

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ MICRODOCHIUM PATCH RATED AT "MN1" IN 2001, AT "WA1" IN 2000, AND AT "WA4" IN 1999.

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TABLE 13. BROWN PATCH (WARM TEMPERATURE) RATINGS OF BENTGRASS CULTIVARS GROWN ON A FAIRWAY OR TEE 1/ 2/
1999-2002 DATA

BROWN PATCH RATINGS 1-9; 9=NO DISEASE 3/ 4/

NAME	MN1	NJ1	PA1	VA1	MEAN
PENNCROSS	8.0	9.0	8.8	8.0	8.5
PENN G-6	9.0	9.0	8.6	8.0	8.4
SRX 1BPAA	9.0	9.0	8.8	7.3	8.4
BACKSPIN	8.3	9.0	8.6	7.7	8.3
BRIGHTON (SRX 1120)	9.0	8.5	8.6	7.7	8.2
GRAND PRIX	9.0	8.3	8.6	7.7	8.2
CENTURY	9.0	9.0	8.6	7.0	8.2
L-93	8.0	9.0	8.4	7.7	8.2
IMPERIAL	8.0	8.7	8.7	7.0	8.1
SR 1119	7.3	9.0	8.6	6.7	7.9
TRUELINE	8.0	8.7	8.7	6.3	7.9
PROVIDENCE	9.0	7.7	8.7	6.7	7.8
PENNEAGLE	7.7	9.0	8.3	6.7	7.8
SEASIDE II	9.0	8.3	8.4	6.3	7.8
PRINCEVILLE	8.3	8.2	8.2	6.7	7.6
PENNLINKS II (PST-OVN)	7.3	9.0	8.6	5.0	7.6
SEASIDE	8.3	8.2	7.4	6.3	7.2
GOLFSTAR	8.7	6.0	7.0	6.3	6.6
TIGER II (CIS AT-5)	9.0	6.3	7.4	3.3	6.1
TIGER	8.0	3.2	5.8	6.3	5.4
GLORY (PST-9HG)	7.7	4.7	5.8	4.7	5.3
SR 7100	6.7	5.0	5.8	5.0	5.3
PST-9PM	9.0	5.7	5.7	3.7	5.2
SR 7150 (SRX 7MODD)	8.3	4.5	5.7	4.3	5.1
SRX 7MOBB	9.0	2.8	5.6	4.7	5.0
ABT-COL-2	7.0	3.2	4.8	6.0	4.8
LSD VALUE	1.9	1.9	1.0	2.3	1.4
C.V. (%)	14.3	16.3	8.3	22.4	15.1

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ BROWN PATCH (WARM TEMPERATURE) RATED AT "MN1" IN 2001, AT "NJ1" IN 2000-01, AT "PA1" IN 1999-2001, AND AT "VA1" IN 2002.

4/ BROWN PATCH CAUSED BY RHIZOCTONIA SOLANI AT "PA1" AND "NJ1" IN 2000-01.

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TABLE 14. BROWN PATCH (WARM TEMPERATURE) RATINGS OF BENTGRASS CULTIVARS GROWN ON A GREEN 1/
2000 DATA

BROWN PATCH RATINGS 1-9; 9=NO DISEASE 2/

NAME	NJ1	PA1	MEAN
SR 7200	8.3	9.0	8.7
VESPER (PICK MVB)	8.3	9.0	8.7
BAVARIA	7.3	9.0	8.2
PICK CB 13-94	6.3	9.0	7.7
SRX 1BPAA	6.3	9.0	7.7
SYN 96-2	6.3	9.0	7.7
SYN 96-3	6.3	8.7	7.5
ABT-CRB-1	6.0	8.7	7.3
SRX 1NJH	5.3	9.0	7.2
SYN 96-1	5.0	9.0	7.0
IMPERIAL	5.3	8.3	6.8
PENN G-6	5.7	8.0	6.8
CENTURY	5.0	8.7	6.8
SR 1119	5.0	8.7	6.8
CRENSHAW	5.0	8.3	6.7
PENNCROSS	4.7	8.7	6.7
PST-A2E	5.3	8.0	6.7
BRIGHTON (SRX 1120)	4.7	8.0	6.3
PENN A-2	4.3	8.3	6.3
PENN G-1	5.0	7.7	6.3
PENNLINKS	5.0	7.7	6.3
BAR CB 8US3	4.7	7.7	6.2
BACKSPIN	4.3	8.0	6.2
BENGAL (BAR AS 8FUS2)	5.0	7.0	6.0
L-93	4.0	8.0	6.0
PENN A-4	5.7	6.3	6.0
ISI AP-5	4.3	7.3	5.8
PROVIDENCE	3.0	7.0	5.0
PENN A-1	1.7	8.0	4.8
LSD VALUE	1.9	1.3	1.2
C.V. (%)	22.6	10.2	15.2

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

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TABLE 15 PERCENT PYTHIUM BLIGHT RATINGS OF BENTGRASS CULTIVARS 1/
GROWN ON A FAIRWAY OR TEE 2/ 3/
1999-2002 DATA

NAME	RI2
TIGER	91.7
ABT-COL-2	90.0
SR 7100	90.0
TIGER II (CIS-AT-5)	86.7
SRX 7MOBB	86.7
SR 7150 (SRX 7MODD)	83.3
GLORY (PST-9HG)	81.7
SEASIDE	80.0
PENN G-6	75.0
PENNCROSS	71.7
PRINCEVILLE	71.7
GOLFSTAR	63.3
PST-9PM	63.3
SEASIDE II	63.3
L-93	61.7
GRAND PRIX	58.3
TRUELINE	58.3
BACKSPIN	56.7
PROVIDENCE	56.7
IMPERIAL	55.0
PENNEAGLE	55.0
CENTURY	53.3
PENNLINKS II (PST-0VN)	51.7
SR 1119	51.7
SRX 1BPAA	35.0
BRIGHTON (SRX 1120)	31.7
LSD VALUE	18.3
C.V. (%)	17.1

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ PERCENT PYTHIUM BLIGHT RATED IN 1999 ONLY.

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TABLE 16 CUTWORM RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
1999-2002 DATA

CUTWORM RATINGS 1-9; 9=NO DAMAGE 2/ 3/

NAME	ME1
PENN A-1	9.0
SR 7200	9.0
BAVARIA	8.7
VESPER (PICK MVB)	8.7
PENNLINKS	8.3
PENN G-6	8.0
PENNCROSS	8.0
SRX 1BPAA	8.0
SYN 96-3	8.0
ABT-CRB-1	7.7
PENN G-1	7.7
SRX 1NJH	7.7
BENGAL (BAR AS 8FUS2)	7.3
PENN A-4	7.3
ISI AP-5	7.0
L-93	7.0
PROVIDENCE	7.0
SR 1119	7.0
BACKSPIN	6.7
CENTURY	6.7
SYN 96-2	6.7
PENN A-2	6.3
IMPERIAL	6.0
BRIGHTON (SRX 1120)	5.7
SYN 96-1	5.7
CRENSHAW	5.3
BAR CB 8US3	5.0
PICK CB 13-94	5.0
PST-A2E	5.0
LSD VALUE	2.8
C.V. (%)	24.6

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ CUTWORM RATED IN 2002 ONLY.

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TABLE 17 ROOT KNOT NEMATODE RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
1999-2002 DATA

ROOT KNOT NEMATODE RATINGS 1-9; 9=NONE 2/ 3/

NAME	MO1
SR 7200	8.3
BAVARIA	8.0
L-93	8.0
BAR CB 8US3	7.7
PENN G-1	7.3
PENNCROSS	7.3
PENNLINKS	7.3
BRIGHTON (SRX 1120)	7.0
PENN A-2	7.0
SR 1119	7.0
BACKSPIN	6.3
CRENSHAW	6.3
PENN G-6	6.3
PICK CB 13-94	6.3
PST-A2E	6.3
VESPER (PICK MVB)	6.3
PENN A-1	6.0
SRX 1BPAA	6.0
ISI AP-5	5.7
SRX 1NJH	5.3
SYN 96-1	5.3
BENGAL (BAR AS 8FUS2)	5.0
IMPERIAL	5.0
CENTURY	4.7
PENN A-4	4.7
PROVIDENCE	4.7
SYN 96-3	4.3
SYN 96-2	4.0
ABT-CRB-1	3.3
LSD VALUE	2.1
C.V. (%)	21.6

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ ROOT KNOT NEMATODE RATED IN 2000 ONLY.

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TABLE 18 PERCENT WINTER KILL RATINGS OF BENTGRASS CULTIVARS
GROWN ON A FAIRWAY OR TEE 1/
1999-2002 DATA

PERCENT WINTER KILL RATINGS: LOCATIONS 2/ 3/

NAME	SD1
SEASIDE II	62.5
PROVIDENCE	50.8
PENNLINKS II (PST-OVN)	45.0
BRIGHTON (SRX 1120)	42.5
L-93	42.5
PENN G-6	41.7
SR 7100	37.5
SRX 7MOBB	37.5
TIGER II (CIS AT-5)	36.7
CENTURY	35.8
SR 7150 (SRX 7MODD)	35.0
TRUELINE	34.2
SRX 1BPAA	32.5
SR 1119	31.7
BACKSPIN	31.7
IMPERIAL	31.7
PST-9PM	29.2
GRAND PRIX	28.3
GLORY (PST-9HG)	25.0
GOLFSTAR	25.0
ABT-COL-2	24.2
PENNCROSS	22.5
PENNEAGLE	20.8
PRINCEVILLE	15.8
TIGER	10.8
SEASIDE	5.8
LSD VALUE	27.1
C.V. (%)	51.8

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ PERCENT WINTER KILL RATED IN 2000 AND 2002.

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TABLE 19 WINTER KILL RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
2002 DATA

WINTER KILL RATINGS 1-9; 9=LEAST KILL 2/

NAME	KS1
L-93	7.0
SRX 1NJH	7.0
CRENSHAW	6.7
PENN G-6	6.3
PENNLINKS	6.3
CENTURY	6.0
PENNCROSS	6.0
SR 1119	6.0
SRX 1SPAA	6.0
BAR CB 8US3	5.7
BENGAL (BAR AS 8FUS2)	5.7
ISI AP-5	5.7
IMPERIAL	5.3
PENN G-1	5.3
PST-A2E	5.3
VESPER (PICK MVB)	5.3
BRIGHTON (SRX 1120)	5.0
SR 7200	5.0
SYN 96-3	5.0
BACKSPIN	4.7
PENN A-2	4.7
BAVARIA	4.3
PICK CB 13-94	4.3
SYN 96-1	4.0
SYN 96-2	4.0
PROVIDENCE	3.7
PENN A-4	3.3
PENN A-1	3.0
ABT-CRB-1	2.0
LSD VALUE	2.4
C.V. (%)	28.8

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

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TABLE 20 DROUGHT TOLERANCE (DORMANCY) RATINGS OF BENTGRASS CULTIVARS GROWN ON A GREEN 1/
2000 DATA

DROUGHT TOLERANCE (DORMANCY) RATINGS 1-9; 9=NO DORMANCY 2/

NAME	AZ1	VA1	MEAN
BAVARIA	2.7	9.0	5.8
PENNLINKS	4.7	6.0	5.3
SR 7200	1.7	8.3	5.0
ISI AP-5	3.0	6.7	4.8
VESPER (PICK MVB)	1.0	8.7	4.8
SRX 1BPAA	3.7	5.7	4.7
BRIGHTON (SRX 1120)	3.0	6.3	4.7
PENNCROSS	3.3	5.7	4.5
BENGAL (BAR AS 8FUS2)	3.7	5.0	4.3
SR 1119	2.3	6.0	4.2
PST-A2E	1.7	6.0	3.8
BACKSPIN	1.7	5.7	3.7
PROVIDENCE	1.7	5.3	3.5
L-93	1.7	5.0	3.3
PENN A-1	1.7	5.0	3.3
PICK CB 13-94	1.7	5.0	3.3
BAR CB 8US3	2.3	4.3	3.3
PENN G-1	2.3	4.0	3.2
ABT-CRB-1	1.0	5.0	3.0
CENTURY	1.0	5.0	3.0
IMPERIAL	1.0	5.0	3.0
PENN A-4	1.0	5.0	3.0
SYN 96-2	2.7	3.3	3.0
CRENSHAW	1.0	4.3	2.7
PENN G-6	1.0	4.0	2.5
SRX 1NJH	1.0	4.0	2.5
PENN A-2	1.0	3.7	2.3
SYN 96-1	1.0	3.7	2.3
SYN 96-3	1.0	3.7	2.3
LSD VALUE	2.5	3.3	2.0
C.V. (%)	79.6	38.0	49.6

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

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TABLE 21 DROUGHT TOLERANCE (RECOVERY) RATINGS OF BENTGRASS CULTIVARS GROWN ON A GREEN 1/
2000 DATA

DROUGHT TOLERANCE (RECOVERY) RATINGS 1-9; 9=COMPLETE RECOVERY 2/

NAME	AZ1	VA1	MEAN
ISI AP-5	9.0	7.3	8.2
BENGAL (BAR AS 8FUS2)	9.0	7.0	8.0
PENN G-1	8.7	6.7	7.7
PENNLINKS	9.0	6.3	7.7
PENN A-1	8.0	7.0	7.5
PENNCROSS	8.7	6.3	7.5
BAVARIA	7.0	7.7	7.3
BRIGHTON (SRX 1120)	8.0	6.7	7.3
IMPERIAL	7.7	7.0	7.3
PST-A2E	8.0	6.7	7.3
SRX 1BPAA	7.7	7.0	7.3
PENN G-6	7.3	7.3	7.3
BACKSPIN	7.7	6.7	7.2
PICK CB 13-94	8.3	6.0	7.2
SR 1119	7.7	6.7	7.2
PROVIDENCE	8.0	6.0	7.0
VESPER (PICK MVB)	5.0	9.0	7.0
CENTURY	7.0	6.7	6.8
PENN A-2	7.0	6.7	6.8
PENN A-4	8.3	5.3	6.8
SR 7200	6.0	7.7	6.8
L-93	7.7	5.7	6.7
BAR CB 8US3	8.0	5.3	6.7
SRX 1NJH	6.7	6.0	6.3
CRENSHAW	6.0	6.3	6.2
SYN 96-1	6.3	6.0	6.2
ABT-CRB-1	5.3	5.7	5.5
SYN 96-3	4.7	6.3	5.5
SYN 96-2	4.7	5.3	5.0
LSD VALUE	1.8	1.9	1.3
C.V. (%)	15.0	17.6	16.2

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

2004023 1

TABLE 22

GENETIC COLOR RATINGS OF BENTGRASS CULTIVARS
GROWN ON A FAIRWAY OR TEE 1/
1999-2002 DATA

GENETIC COLOR RATINGS 1-9; 9=DARK GREEN 2/

NAME	CO1	IA1	IL1	IN1	KS1	KY1	MA1	MI1	MN1	MO2	MT1	NE1	NJ1	NY1	PA1	QE1	RI1	RI2	SD1	UT1	VA1	WA1	WA3	WA4	WI1	MEAN
SR 7150 (SRX 7MODD)	7.0	6.8	6.3	6.9	8.0	8.2	6.3	7.4	6.6	6.0	7.0	7.0	6.5	7.3	7.8	7.2	8.7	7.3	7.6	4.5	7.2	8.4	8.3	7.3	7.3	7.1
GOLFSTAR	7.0	6.3	6.1	6.9	7.0	7.6	7.7	7.0	5.8	4.0	7.0	6.7	4.7	6.7	8.6	7.3	8.0	7.3	7.7	4.8	6.6	7.9	7.1	7.0	7.2	6.8
SRX 1BPAA	8.3	6.7	6.3	6.6	9.0	7.1	5.3	7.1	6.6	7.0	8.0	6.3	6.5	8.0	7.4	6.3	7.0	6.5	5.7	5.3	7.3	6.7	7.1	8.0	7.0	6.8
PENNLINKS II (PST-OVN)	8.3	6.9	6.3	6.3	8.7	7.2	5.7	7.6	6.8	7.0	7.7	7.7	5.5	7.0	7.9	6.3	6.7	6.3	5.9	5.2	7.0	6.9	7.1	7.7	6.8	6.7
TRUELINE	8.7	6.8	6.2	6.7	8.0	6.9	7.0	7.3	6.8	6.0	7.8	7.0	6.2	7.3	6.8	6.3	8.0	6.7	5.7	5.2	7.2	6.8	6.8	7.3	6.2	6.7
SRX 7MOBB	7.0	6.8	5.7	6.9	7.0	7.8	7.0	7.4	6.5	6.0	6.9	7.7	5.7	7.0	6.6	7.0	7.0	6.7	7.3	4.5	6.0	7.6	7.2	6.7	6.8	6.7
L-93	8.3	7.0	6.3	6.4	9.0	6.7	7.0	7.3	6.8	7.0	7.8	7.3	5.7	7.3	6.3	6.3	7.0	6.3	5.8	5.3	7.3	7.0	6.2	7.3	6.8	6.7
BRIGHTON (SRX 1120)	9.0	7.0	6.3	6.3	8.3	6.6	5.7	7.2	6.5	6.0	7.9	6.3	6.3	7.3	5.9	6.3	6.3	6.0	5.8	5.4	6.5	6.8	6.8	7.0	6.7	6.5
PST-9PM	7.0	6.5	6.1	6.4	7.0	7.4	5.3	7.2	6.0	4.0	6.8	6.7	4.5	6.0	6.8	7.2	8.3	7.3	7.2	4.8	6.7	7.6	7.0	7.0	6.8	6.5
TIGER	8.3	6.9	6.0	6.6	6.7	7.6	7.3	7.1	6.2	6.0	6.4	8.3	4.7	6.3	5.2	6.8	7.0	7.5	6.8	5.1	6.1	7.6	6.9	6.7	6.7	6.5
SR 1119	8.7	6.7	6.3	6.1	8.3	6.6	6.0	7.3	6.8	6.0	7.6	6.3	5.3	7.3	6.4	6.3	6.7	6.3	5.4	5.3	7.2	6.6	6.7	8.0	6.2	6.5
TIGER II (CIS AT-5)	7.0	6.6	5.7	6.4	7.7	6.4	4.3	7.1	6.3	6.7	6.2	6.7	5.2	6.7	5.4	6.8	7.3	6.7	6.9	4.6	6.4	7.6	6.6	6.0	6.9	6.4
GLORY (PST-9HG)	7.0	6.8	5.7	6.1	7.0	7.1	6.7	7.0	6.2	4.0	6.3	6.3	4.8	6.0	5.9	7.0	8.0	6.8	6.8	4.8	6.3	7.8	7.0	6.7	5.9	6.4
PENN G-6	8.0	6.8	6.0	6.1	8.0	6.7	7.0	7.4	6.3	6.7	7.2	7.0	5.2	6.7	5.9	6.0	6.3	5.8	5.8	5.5	6.6	6.7	6.2	6.3	6.0	6.4
PENNCROSS	6.3	6.6	6.1	6.0	8.7	7.0	6.7	7.2	6.3	7.0	7.0	6.0	4.5	6.3	6.2	6.3	6.3	6.7	5.5	5.3	6.7	6.7	6.3	6.3	6.4	6.3
GRAND PRIX	8.0	6.8	5.6	6.2	8.3	6.6	5.3	7.0	6.5	6.0	7.0	7.3	5.3	6.7	5.3	6.2	6.3	6.2	5.8	5.5	6.9	6.8	6.2	6.7	6.2	6.3
PROVIDENCE	8.7	6.3	6.5	6.2	8.0	6.7	6.7	6.8	6.5	7.0	7.3	6.3	4.2	6.7	5.8	6.2	6.0	6.5	5.8	5.0	6.8	6.7	6.3	6.7	6.1	6.3
IMPERIAL	8.3	7.3	5.9	6.3	8.3	6.6	6.0	7.2	6.7	6.0	7.1	6.7	5.3	7.3	5.4	6.3	5.3	5.7	5.3	5.3	6.4	6.8	5.9	6.3	6.1	6.3
CENTURY	8.7	7.2	5.8	6.0	8.0	6.7	6.3	7.2	6.5	5.0	7.1	7.0	4.3	7.3	5.2	6.1	5.0	5.8	5.6	5.2	6.5	6.4	6.3	6.0	5.9	6.2
BACKSPIN	8.3	7.1	5.6	6.0	7.7	6.2	6.7	7.0	6.6	4.0	7.3	6.0	4.3	6.7	4.8	6.3	6.0	5.7	5.2	5.7	6.3	6.4	5.9	6.3	6.3	6.1
SEASIDE II	8.0	6.8	5.9	6.1	7.7	6.2	6.3	7.2	6.3	6.0	6.9	7.3	5.2	7.0	5.1	6.1	6.3	6.3	5.0	5.0	6.4	6.4	5.8	6.0	5.2	6.1
PRINCEVILLE	8.0	6.5	5.8	6.2	8.0	6.1	6.3	7.1	6.6	6.0	6.8	6.7	3.8	6.7	4.9	5.8	6.7	5.8	5.3	5.2	6.5	6.7	6.1	6.0	5.3	6.1
ABT-COL-2	8.3	6.3	5.4	5.6	7.3	6.3	5.3	6.9	6.1	5.0	6.2	6.7	4.0	6.3	4.6	6.8	7.3	6.7	6.5	4.6	5.6	7.2	6.6	6.7	6.2	6.1
PENNEAGLE	6.3	6.8	5.8	5.9	7.3	6.1	6.3	6.8	6.0	6.0	7.0	7.0	3.8	6.3	5.3	6.1	6.7	6.2	5.3	5.2	6.5	6.2	6.3	6.3	5.7	6.0
SR 7100	9.0	6.8	5.2	5.9	7.3	6.2	7.3	7.2	5.7	6.0	6.0	6.0	3.2	5.7	4.4	6.3	6.7	6.3	6.6	4.8	5.2	6.7	6.1	5.3	5.2	5.9
SEASIDE	7.0	5.7	5.1	5.6	6.7	4.9	8.0	6.7	5.8	6.0	5.8	5.0	3.0	7.0	3.2	5.7	5.7	5.7	4.3	4.4	5.3	5.8	5.2	5.0	4.2	5.3
LSD VALUE	0.7	1.1	0.8	0.9	0.9	0.8	1.8	0.8	0.9	0.3	1.0	1.3	1.9	0.9	1.1	0.9	1.3	1.0	1.2	1.4	1.1	0.9	1.0	0.7	1.0	0.3
C.V. (%)	5.2	10.5	8.9	9.4	7.4	7.8	17.8	7.3	9.2	2.7	8.4	11.9	23.7	7.8	11.9	8.9	12.0	9.1	12.6	17.5	11.0	8.0	9.2	6.8	9.8	10.6

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

20040231

TABLE 23

GENETIC COLOR RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
2000 DATA

GENETIC COLOR RATINGS 1-9; 9=DARK GREEN 2/

NAME	AL1	AZ1	IA1	IL1	KS1	KY1	KY2	MA1	ME1	MI1	MO1	MT1	NE1	NJ1	NY1	OR1	PA1	RI1	RI2	SC2	TX1	UT1	VA1	WA3	WI2	MEAN
SYN 96-2	6.7	5.3	7.3	6.0	6.3	7.0	7.0	6.3	7.3	7.7	6.3	8.7	9.0	8.0	7.0	7.7	7.3	8.0	7.3	9.0	7.0	6.7	7.0	7.3	6.7	7.2
SRX 1NJH	7.0	6.0	5.3	5.7	6.3	8.3	8.7	5.0	8.7	7.7	6.0	7.7	8.7	7.0	7.0	8.0	7.7	8.0	7.3	8.7	6.7	6.7	7.0	7.3	6.7	7.2
PST-A2E	6.7	6.0	6.3	5.3	6.7	8.3	8.0	5.7	7.3	7.0	6.3	8.0	8.3	6.7	6.7	7.3	7.7	8.0	8.0	8.7	6.3	6.7	6.7	7.3	7.0	7.1
PENN A-2	6.3	6.7	5.7	4.7	6.7	8.7	8.7	7.7	7.3	7.3	6.3	8.0	8.7	6.0	7.0	8.0	7.7	7.0	6.7	8.7	6.3	6.3	6.3	6.0	7.0	7.0
L-93	7.0	5.7	5.7	6.3	7.0	7.7	8.3	8.3	7.7	7.0	6.7	8.0	9.0	5.7	7.3	7.3	6.3	7.7	6.7	8.7	5.7	6.0	6.7	6.0	7.0	7.0
PENN G-1	6.3	6.0	6.3	5.0	6.7	7.7	7.7	8.0	8.0	7.0	7.0	7.7	9.0	7.7	7.0	7.0	6.7	7.3	7.3	8.0	5.3	6.3	6.3	6.7	6.3	7.0
PENN A-1	6.7	5.0	7.0	6.0	7.3	7.3	7.7	7.3	7.0	7.0	6.3	8.3	9.0	7.7	6.7	6.7	6.3	7.7	7.3	8.3	6.3	6.3	5.7	6.7	6.7	7.0
ISI AP-5	6.3	6.0	6.0	5.7	6.7	6.7	7.0	8.3	8.7	7.0	6.3	7.3	9.0	4.7	6.7	7.3	7.3	7.0	7.7	8.3	6.7	6.7	6.3	7.0	6.3	6.9
PENN G-6	6.3	6.0	5.7	5.3	6.7	7.7	7.0	7.7	7.7	7.0	6.3	7.7	9.0	7.3	7.0	6.7	7.3	7.7	7.3	8.3	5.7	6.0	6.0	6.0	7.0	6.9
SRX 1BPAA	7.7	6.3	5.7	5.0	5.7	7.0	7.7	5.7	9.0	7.0	6.7	7.7	8.7	5.3	7.0	8.0	7.3	7.3	7.7	8.3	5.3	5.7	7.0	7.0	6.7	6.9
PENN A-4	6.7	6.3	6.3	5.0	6.3	7.7	7.3	7.3	8.0	7.0	6.7	8.0	9.0	6.3	7.0	7.0	6.0	7.3	7.0	8.3	6.3	6.0	6.0	6.3	6.7	6.9
SR 1119	6.3	6.0	5.7	6.0	7.0	7.7	7.7	7.3	7.7	7.0	6.3	8.0	9.0	4.7	7.0	7.0	7.0	7.7	7.7	8.3	6.7	5.0	6.7	6.3	6.0	6.9
BAR CB 8US3	6.3	6.0	6.0	6.7	6.3	7.0	7.0	7.3	7.7	7.0	7.0	7.7	9.0	4.7	6.7	7.3	6.7	7.3	7.7	8.3	6.0	6.0	7.0	6.0	6.0	6.8
BRIGHTON (SRX 1120)	7.3	5.7	5.7	4.7	6.7	7.3	8.0	7.3	7.7	7.0	6.3	7.7	9.0	5.3	7.0	7.0	6.3	7.0	7.7	8.3	5.7	5.0	6.7	6.0	6.7	6.8
CRENSHAW	6.3	6.0	6.7	5.0	5.7	6.3	6.7	7.3	7.7	7.0	6.7	8.0	9.0	6.0	6.7	7.3	6.3	7.7	8.0	8.3	5.3	5.3	6.3	6.3	6.7	6.7
PICK CB 13-94	6.7	6.0	6.0	5.0	6.0	5.7	6.3	6.7	7.3	7.3	6.3	7.7	9.0	4.7	7.0	8.0	6.3	7.7	7.3	8.7	5.3	6.7	7.0	6.7	7.0	6.7
ABT-CRB-1	5.7	5.3	7.3	3.7	6.0	5.7	6.7	5.7	8.0	7.0	6.0	7.7	9.0	5.7	6.7	7.0	6.3	7.7	8.0	8.7	6.7	6.3	7.0	6.7	6.7	6.7
PROVIDENCE	5.7	5.7	5.7	5.0	6.0	7.3	7.3	8.0	7.3	7.0	5.7	7.0	8.7	5.7	6.7	6.7	5.7	7.3	7.3	8.3	5.7	5.7	6.7	5.3	6.3	6.5
SYN 96-3	6.0	5.0	7.3	4.3	6.7	5.7	6.0	5.7	6.7	7.0	6.7	8.0	9.0	7.7	6.3	6.7	6.0	7.3	6.7	8.0	6.7	6.7	5.3	6.3	6.0	6.5
VESPER (PICK MVB)	5.0	5.3	6.3	3.0	6.3	8.3	8.7	6.0	9.0	6.0	5.0	7.7	4.3	6.7	6.3	7.0	5.7	9.0	9.0	9.0	3.7	5.7	5.7	8.0	7.0	6.5
BENGAL (BAR AS 8FUS2)	6.0	5.0	6.7	5.0	6.3	6.0	6.3	6.3	6.7	7.0	6.7	7.3	9.0	5.7	7.0	7.0	6.3	7.0	6.7	8.3	5.7	6.7	6.3	5.7	6.3	6.5
IMPERIAL	5.7	5.0	6.7	4.3	6.7	7.3	7.3	7.3	7.0	6.7	5.7	7.3	8.7	6.3	6.7	7.0	5.3	6.0	7.0	8.0	6.3	5.0	5.0	6.0	6.7	6.4
CENTURY	6.7	5.0	6.7	5.0	5.3	6.3	7.0	8.0	7.3	7.0	5.7	7.3	9.0	5.3	6.3	7.0	5.7	6.3	6.7	8.0	5.7	6.0	5.0	5.7	6.0	6.4
SYN 96-1	5.3	5.0	7.0	4.7	5.7	5.7	6.3	7.3	6.3	6.7	6.0	7.3	9.0	6.0	6.7	6.3	5.3	6.7	6.7	8.3	7.0	6.3	4.0	6.3	6.3	6.3
SR 7200	4.3	5.3	5.0	2.7	6.7	7.3	7.7	7.7	9.0	6.3	4.7	6.3	2.7	6.3	6.7	7.0	5.0	9.0	8.0	8.3	3.7	5.7	6.0	7.7	6.3	6.2
BACKSPIN	5.3	5.0	5.7	4.7	6.3	6.3	6.7	7.3	6.3	7.0	6.0	7.3	8.7	5.0	6.7	6.7	4.7	6.7	6.7	8.0	6.0	5.3	4.7	5.7	6.0	6.2
PENNLINKS	6.7	5.0	5.0	4.3	5.7	7.0	6.3	8.3	7.3	7.0	6.0	6.7	9.0	3.3	6.0	6.7	5.0	5.7	5.7	8.0	4.0	5.0	6.3	5.0	5.7	6.0
PENNCROSS	5.0	5.0	4.7	4.7	6.0	6.3	6.3	7.7	7.3	7.0	6.0	6.0	8.3	3.3	7.0	6.7	5.3	6.0	5.7	8.0	4.7	5.0	6.3	5.0	6.0	6.0
BAVARIA	3.7	5.0	4.3	4.3	6.3	7.3	7.7	7.0	5.0	7.0	6.7	5.0	4.3	2.0	5.0	5.7	3.0	6.3	5.7	8.0	3.3	4.3	4.7	6.0	5.3	5.3
LSD VALUE	1.3	0.6	1.0	2.0	1.3	1.9	2.2	1.4	1.0	0.5	0.9	0.9	1.2	2.2	0.8	0.7	1.0	0.9	0.9	0.8	1.2	1.2	1.6	0.9	0.8	0.3
C.V. (%)	12.7	6.9	10.3	24.6	12.6	16.4	19.1	12.5	8.4	4.9	8.8	7.6	9.1	24.3	7.8	5.9	9.8	7.6	7.5	5.6	12.6	12.7	16.5	8.6	8.0	11.8

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

2004023

TABLE 24 WINTER COLOR RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
2000 DATA

WINTER COLOR RATINGS 1-9; 9=COMPLETE COLOR RETENTION 2/

NAME	AZ1	OK1	VA1	MEAN
PENN A-4	7.3	6.0	6.0	6.4
SRX 1BPAA	6.7	5.7	6.7	6.3
SR 7200	5.3	5.7	7.7	6.2
BENGAL (BAR AS 8FUS2)	6.3	5.7	6.3	6.1
VESPER (PICK MVB)	6.0	5.0	7.3	6.1
ISI AP-5	6.7	5.7	5.3	5.9
PENN A-2	7.0	5.3	5.3	5.9
BAVARIA	5.7	5.0	6.7	5.8
L-93	5.3	5.7	6.3	5.8
BAR CB 8US3	5.7	5.7	5.7	5.7
CRENSHAW	6.3	4.7	5.7	5.6
SRX 1NJH	6.3	5.0	5.3	5.6
PENNCROSS	4.7	6.0	5.7	5.4
PENNLINKS	4.7	6.0	5.7	5.4
SYN 96-2	7.0	4.7	4.7	5.4
PENN A-1	6.0	5.0	5.3	5.4
PENN G-1	6.3	5.3	4.7	5.4
PENN G-6	6.3	5.0	5.0	5.4
CENTURY	5.7	5.0	5.3	5.3
PST-A2E	6.3	5.0	4.7	5.3
SR 1119	5.7	5.0	5.3	5.3
PICK CB 13-94	6.0	4.7	5.0	5.2
SYN 96-1	6.0	5.0	4.7	5.2
SYN 96-3	5.7	5.3	4.7	5.2
ABT-CRB-1	6.3	5.0	4.3	5.2
BRIGHTON (SRX 1120)	5.0	5.3	5.3	5.2
IMPERIAL	5.3	5.3	4.7	5.1
PROVIDENCE	5.3	5.3	4.7	5.1
BACKSPIN	5.3	5.0	4.0	4.8
LSD VALUE	1.0	0.7	1.3	0.6
C.V. (%)	10.6	7.9	15.4	11.7

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

200402

TABLE 25

LEAF TEXTURE RATINGS OF BENTGRASS CULTIVARS
GROWN ON A FAIRWAY OR TEE 1/
1999-2002 DATA

LEAF TEXTURE RATINGS 1-9; 9=VERY FINE 2/

NAME	IA1	KS1	KY1	MI1	MN1	MO2	MT1	NE1	NJ1	NY1	PA1	QE1	RI2	MEAN
SRX 7MOBB	7.0	6.3	8.3	6.8	7.2	6.7	6.3	8.3	6.8	6.5	9.0	7.6	6.3	7.1
SR 7150 (SRX 7MODD)	6.4	6.3	9.0	7.2	7.0	6.3	6.1	8.0	7.2	6.3	9.0	7.4	6.0	7.0
SR 7100	6.1	5.7	9.0	7.2	7.4	6.7	5.9	7.7	6.7	6.2	9.0	7.5	6.7	7.0
BRIGHTON (SRX 1120)	7.2	8.3	7.7	7.3	6.6	6.3	6.2	8.3	5.8	6.5	7.0	7.2	8.0	7.0
L-93	7.0	8.3	8.3	7.8	6.3	7.0	6.3	8.7	6.0	7.0	7.0	7.1	7.0	7.0
TIGER II (CIS AT-5)	6.0	6.0	8.7	7.3	7.4	6.7	5.8	8.3	6.8	6.5	8.7	7.3	6.3	7.0
GRAND PRIX	6.8	8.3	7.3	7.7	6.8	6.0	5.9	7.7	5.8	6.5	7.7	7.3	7.7	6.9
IMPERIAL	7.3	8.7	7.0	7.8	6.6	6.0	5.8	9.0	5.8	6.5	7.3	7.1	7.3	6.9
ABT-COL-2	6.4	7.0	7.7	7.2	7.1	6.0	5.8	8.7	6.8	6.3	9.0	7.3	6.3	6.9
SEASIDE II	6.8	8.0	7.3	7.6	7.0	6.0	5.9	7.7	5.0	6.7	7.7	7.0	6.7	6.8
CENTURY	7.2	9.0	8.0	7.0	6.7	6.0	5.6	8.7	5.0	6.8	8.0	7.2	7.7	6.8
SRX 1BPAA	6.6	8.7	7.7	7.3	6.4	6.7	5.8	8.3	5.5	6.7	7.0	7.3	7.0	6.8
TIGER	6.6	6.3	9.0	6.9	6.8	7.0	6.1	7.0	5.7	6.0	8.3	7.3	8.0	6.8
BACKSPIN	7.2	7.7	7.3	7.3	6.3	6.0	6.4	8.3	4.5	6.7	8.0	7.1	7.0	6.7
SR 1119	6.1	8.3	7.0	7.7	6.3	6.0	6.3	8.7	5.0	6.8	6.7	7.2	7.0	6.7
PROVIDENCE	6.3	8.0	7.3	7.1	6.9	7.0	6.1	8.3	4.5	6.2	7.3	7.1	7.3	6.7
PENNLINKS II (PST-OVN)	6.4	8.0	7.7	7.7	6.3	7.0	5.0	8.0	4.8	6.7	6.7	7.1	7.3	6.6
PST-9PM	5.4	5.3	8.0	7.2	7.1	6.0	6.0	7.7	5.0	6.5	8.0	7.1	6.3	6.6
TRUELINE	6.2	8.0	7.3	7.3	6.8	6.7	5.6	8.0	4.2	6.5	7.0	7.1	7.0	6.6
PENN G-6	7.0	8.0	8.3	7.3	5.8	6.7	5.4	7.7	5.3	6.3	7.0	7.0	7.7	6.6
GLORY (PST-9HG)	6.1	6.0	8.7	7.0	6.3	4.0	5.9	6.7	5.5	6.3	8.0	7.3	7.0	6.5
PRINCEVILLE	5.9	7.7	7.0	7.3	6.3	7.0	5.8	8.7	3.7	6.5	7.3	7.1	7.0	6.5
GOLFSTAR	5.3	4.7	8.7	7.3	6.0	4.0	5.6	7.7	4.5	6.7	7.3	7.4	6.7	6.3
PENNCROSS	6.2	7.7	7.7	7.2	5.4	7.0	5.4	7.7	2.5	6.0	5.0	7.3	7.3	6.2
PENNEAGLE	6.6	6.7	7.0	7.3	5.8	6.0	5.3	7.3	2.8	6.2	6.0	6.8	7.0	6.1
SEASIDE	5.2	4.3	5.0	7.0	5.4	4.0	4.9	6.3	1.5	5.3	3.3	6.4	6.3	5.3
LSD VALUE	1.4	1.4	0.7	0.8	1.1	0.8	1.4	1.3	1.6	0.8	0.7	0.8	0.8	0.5
C.V. (%)	13.5	12.1	5.8	6.8	10.3	7.6	15.5	10.4	19.0	7.6	5.7	7.1	6.9	10.5

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

2004023

TABLE 36

LEAF TEXTURE RATINGS OF BENTGRASS CULTIVARS
GROWN ON A GREEN 1/
2002 DATA

LEAF TEXTURE RATINGS 1-9; 9=VERY FINE 2/

NAME	AL1	AZ1	IA1	MI1	NJ1	NY1	OK1	TX1	MEAN
PENN A-1	7.7	7.7	7.7	8.0	8.3	7.0	7.7	8.0	7.8
PENN G-1	7.7	8.0	7.0	7.7	8.0	7.3	8.0	8.0	7.7
PENN A-4	7.3	8.3	7.3	7.0	8.0	7.0	8.0	8.0	7.6
VESPER (PICK MVB)	8.3	6.3	7.3	7.7	9.0	7.3	7.3	7.3	7.6
IMPERIAL	7.0	7.7	7.3	7.7	7.0	7.3	7.7	8.0	7.5
SR 7200	8.7	6.3	7.3	7.0	9.0	7.0	7.3	7.0	7.5
PENN A-2	7.7	7.3	7.0	7.7	7.0	7.0	7.7	8.0	7.4
SYN 96-1	6.3	7.7	8.0	7.0	7.3	7.3	8.0	7.7	7.4
SYN 96-3	6.7	6.7	7.3	8.0	7.7	7.0	7.7	7.7	7.3
PST-A2E	7.7	7.3	7.0	7.3	7.0	6.7	7.7	8.0	7.3
ABT-CRB-1	8.3	6.3	7.0	7.3	7.3	7.0	7.3	7.7	7.3
SYN 96-2	6.0	7.0	7.3	7.7	7.7	7.0	8.0	7.3	7.3
ISI AP-5	6.3	7.3	6.7	7.3	7.3	7.0	7.7	7.7	7.2
BAVARIA	8.3	6.3	6.3	7.3	.	6.7	8.0	7.0	7.1
PENN G-6	7.3	6.3	7.3	7.7	5.7	7.0	7.3	8.0	7.1
BENGAL (BAR AS 8FUS2)	7.0	7.7	7.7	7.0	5.3	7.0	7.3	7.3	7.0
BAR CB 8US3	7.0	7.0	6.7	7.0	6.0	8.0	7.0	7.3	7.0
CENTURY	7.0	7.0	7.0	7.3	6.7	7.0	7.0	7.0	7.0
SR 1119	6.3	7.0	7.0	8.0	6.0	7.0	7.0	7.0	6.9
PROVIDENCE	6.7	7.3	6.0	7.7	4.7	7.3	7.3	7.3	6.8
CRENSHAW	6.0	7.0	7.7	7.7	4.7	7.3	7.0	7.0	6.8
L-93	6.0	7.3	6.7	7.3	5.3	7.0	7.3	7.3	6.8
SRX 1BPAA	6.3	7.3	6.3	7.7	4.7	6.7	7.0	7.3	6.7
SRX 1NJH	6.0	6.0	6.7	7.7	6.0	6.3	7.0	7.7	6.7
BRIGHTON (SRX 1120)	6.3	6.7	6.3	7.3	5.0	7.0	7.7	7.0	6.7
BACKSPIN	6.7	6.7	6.7	7.3	4.3	7.0	7.0	7.3	6.6
PICK CB 13-94	6.0	7.0	6.0	7.3	4.0	7.0	7.3	7.7	6.5
PENNCROSS	5.3	6.3	5.3	7.7	3.0	6.7	7.0	7.3	6.1
PENNLINKS	6.3	6.3	5.3	7.3	2.3	6.7	6.3	7.0	6.0
LSD VALUE	1.4	1.0	1.0	0.9	1.5	0.8	0.8	0.7	0.4
C.V. (%)	12.8	9.2	8.8	7.9	14.6	7.5	6.3	5.5	9.2

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

2004023 1

20040023 1

Table 27. Leaf color of bentgrass varieties in 1999 and 2000. Leaf colr determined by using Munsell Plant Color Chart and matching colos. Each chip color was also assigned a number from 1 to 9 where 9 = dark green. Colors determined on spaced plants previously described after anthesis.

1999 Leaf Color

Variety	1-9, 9=dk gr	Munsell No.	No. Plants
Sandhill	6	5GY 5/4	41
	7	5GY 4/4	13
	8	5GY 3/4	2
	6	7.5GY 5/4	3
	3	5GY 6/4	1
Mean	**6.2**		60
SR 1119	6	5GY 5/4	3
	7	5GY4/4	39
	8	5GY 3/4	2
	6	5GY 4/6	3
	6	7.5GY 5/4	9
	8	7.5GY 3/4	4
Mean	**6.9**		60
LSD@5%	0.3		

2000 Leaf Color

Variety	1-9, 9=dk gr	Munsell No.	No. Plants
Sandhill	7	7.5GY 5/2	3
	6	5GY 5/4	24
	5	5GY 5/6	12
	4	7.5GY 6/6	6
	3	5GY 6/4	10
	2	5GY 7/8	3
Mean	**4.8**		60
SR 1119	9	7.5GY 3/4	1
	7	7.5GY 4/4	10
	6	7.5GY 5/4	11
	6	5GY 5/4	22
	5	7.5GY6/4	10
	5	5GY 5/6	6
Mean	**6.0**		60
LSD@5%	0.3		

TABLE 39.

QUALITY AND DOLLAR SPOT RATINGS OF BENTGRASS CULTIVARS
GROWN ON A FAIRWAY OR TEE AT NORTH BRUNSWICK, NJ 1/
1999-2002 DATA

20040231

TURFGRASS QUALITY AND DOLLAR SPOT RATINGS 1-9; 9=IDEAL TURF 2/ 3/ 4/

NAME	PREVENTATIVE FUNGICIDE USE DOLLAR SPOT RATINGS		REDUCED FUNGICIDE USE DOLLAR SPOT RATINGS			PREVENTATIVE FUNGICIDE USE QUALITY RATINGS		REDUCED FUNGICIDE USE QUALITY RATINGS		QUALITY MEAN
	SEPTEMBER	OCTOBER	AUGUST	SEPTEMBER	OCTOBER	AUGUST	SEPTEMBER	AUGUST	SEPTEMBER	
L-93	8.3	7.0	9.0	5.0	4.3	7.0	7.7	6.3	4.0	6.3
PENNLINKS II (PST-OVN)	8.0	6.0	8.7	4.7	3.0	7.0	7.0	6.3	3.7	6.0
SR 7150 (SRX 7MODD)	9.0	8.3	9.0	7.7	6.3	6.3	7.3	3.0	6.7	5.8
TIGER II (CIS AT-5)	9.0	9.0	9.0	8.0	7.0	5.3	8.3	3.7	5.3	5.7
ABT-COL-2	9.0	8.3	9.0	8.7	7.0	5.0	7.0	2.3	7.3	5.4
PENN G-6	6.7	5.0	7.7	3.3	3.3	7.0	6.0	5.3	3.3	5.4
SRX 7MOBB	9.0	8.3	9.0	8.7	6.7	5.7	7.3	2.3	5.3	5.2
SRX 1BPAA	7.0	5.3	8.0	2.3	2.3	6.7	6.3	4.7	2.7	5.1
GLORY (PST-9HG)	9.0	7.7	9.0	6.0	5.7	4.7	6.3	3.7	4.3	4.8
SEASIDE II	8.0	6.7	8.3	3.7	3.7	5.7	5.7	4.7	3.3	4.8
SR 7100	9.0	7.7	9.0	7.3	6.3	5.0	6.3	3.0	5.0	4.8
TIGER	9.0	8.0	9.0	7.7	6.0	5.3	6.0	3.3	4.7	4.8
GOLFSTAR	9.0	6.7	9.0	6.7	5.3	5.0	5.7	3.7	4.0	4.6
TRUELINE	6.7	4.7	7.7	3.0	2.0	5.7	5.3	4.3	3.0	4.6
IMPERIAL	4.3	3.3	6.7	3.3	3.7	6.7	4.0	4.3	3.0	4.5
PRINCEVILLE	6.0	4.0	9.0	3.0	2.7	5.3	5.0	5.0	2.7	4.5
BRIGHTON (SRX 1120)	5.3	4.3	8.3	1.3	1.3	6.0	5.0	4.7	1.7	4.3
PROVIDENCE	4.0	3.7	5.7	4.7	4.3	5.7	4.0	3.0	4.3	4.3
GRAND PRIX	3.7	3.7	6.7	2.3	3.7	6.7	3.7	4.0	2.3	4.2
PST-9PM	8.7	7.0	9.0	5.7	4.3	4.7	5.7	2.7	3.3	4.1
SR 1119	4.3	3.3	5.7	2.3	3.0	6.0	4.0	3.7	2.3	4.0
PENNEAGLE	7.7	5.0	8.3	4.0	3.3	4.0	4.7	3.0	3.0	3.7
BACKSPIN	3.0	2.3	6.0	3.0	4.3	5.7	2.7	3.3	2.3	3.5
CENTURY	2.3	3.0	3.3	2.7	3.0	5.3	2.3	2.3	2.0	3.0
PENNCROSS	4.7	3.3	8.3	2.0	1.7	3.7	3.0	3.0	1.0	2.7
SEASIDE	7.3	5.3	9.0	4.0	2.7	2.7	2.0	2.0	1.7	2.1
LSD VALUE	1.2	1.2	2.4	1.6	1.7	1.2	1.4	1.4	1.6	0.9
CC.V. (%)	12.1	14.4	17.3	22.6	26.5	13.5	17.6	23.0	28.9	12.8

1/ TO DETERMINE STATISTICAL DIFFERENCES AMONG ENTRIES, SUBTRACT ONE ENTRY'S MEAN FROM ANOTHER ENTRY'S MEAN. STATISTICAL DIFFERENCES OCCUR WHEN THIS VALUE IS LARGER THAN THE CORRESPONDING LSD VALUE (LSD 0.05).

2/ C.V. (COEFFICIENT OF VARIATION) INDICATES THE PERCENT VARIATION OF THE MEAN IN EACH COLUMN.

3/ QUALITY AND DOLLAR SPOT RATED IN 2000 ONLY.

4/ DOLLAR SPOT CAUSED BY SCLEROTINIA HOMOEOCARPA.

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REPRODUCE LOCALLY. Include form number and edition date on all reproductions. FORM APPROVED - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Seed Research of Oregon	SRX 1BPAA	Sandhill
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	5. TELEPHONE *(Include area code)*	6. FAX *(Include area code)*
27630 Llewellyn Rd.	541-757-2663	541-758-5305
	7. PVPO NUMBER 200400231	

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain.** [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **If no, give name of country.** [X] YES [ ] NO

10. Is the applicant the original owner? [X] YES [ ] NO **If no, please answer one of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
[ ] YES [ ] NO **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
[ ] YES [ ] NO **If no, give name of country**

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:
The variety was developed by a breeder working for the company that owns all rights.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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