No. 7500036

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Soils and Crops Department
New Jersey Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED 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 seventeen 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 RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS PART OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CREEPING RED FESCUE

'Fortress'

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 *this* 24th *day of* August *in the year of our Lord one thousand nine hundred and* seventy-seven

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

FORM GR-470
(12-15-72)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1. VARIETY NAME OR TEMPORARY DESIGNATION 'Fortress' (Ru-6S)	2. KIND NAME Creeping Red Fescue	FOR OFFICIAL USE ONLY PV NUMBER 7500036
3. GENUS AND SPECIES NAME Festuca rubra L. subsp. rubra (Guad). Hack	4. FAMILY NAME *(Botanical)* Gramineae	FILING DATE 11.13.74 / TIME 11:00 A.M.
	5. DATE OF DETERMINATION January 1970	FEE RECEIVED $250.00 $250.00 $250.00 / BALANCE DUE $ 11-13-74 $ 11-16-76 $ 7-25-77
6. NAME OF APPLICANT(S) SOILS AND CROPS DEPARTMENT ~~Robert W. Duell~~ NEW JERSEY AGRICULTURAL EXPERIMENT STATION ~~Richard M. Schmit~~ 8/23/77	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)* Sunset Ave., R.D. 1-401, Princeton, N. J. 08540 1483 Huron Rd., North Brunswick, N.J. 08902	8. TELEPHONE AREA CODE AND NUMBER (201) 932-9872 (201) 932-9458
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)* Rutgers University	10. STATE OF INCORPORATION New Jersey	11. DATE OF INCORPORATION

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Robert W. Duell
P. O. Box 231
Lipman Hall
Cook College
New Brunswick, N. J. 08903

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

[X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*

[X] 13B. Exhibit B, Botanical Description of the Variety

[X] 13C. Exhibit C, Objective Description of the Variety

[X] 13D. Exhibit D, Data Indicative of Novelty

[X] 13E. Exhibit E, Statement of the Basis of Applicant's Ownership 7/12/78 RW

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? [X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

The applicant declares that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) of this sexually-reproduced novel plant variety believes that the variety is distinct, uniform, and stable as required in Section 41 and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant is informed that false representation herein can jeopardize protection and result in penalties.

Nov 1, 74 (DATE) — Robert W. Duell (SIGNATURE OF APPLICANT)

(DATE) — (SIGNATURE OF APPLICANT)

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Exhibit A - Origin and Breeding History of Fortress

Fortress is a strongly rhizomatous variety produced in New Jersey in 1970. The original source material consisted of clones selected from old turf areas of the Northeastern United States and from crosses made at Rutgers. This material was subjected to evaluation and selection under intensive turf culture. Six vigorous, strongly rhizomatous parents of diverse origin and similar maturity were selected based on phenotypic performance and polycross progeny trials to produce Fortress.

Syn_2 seed of Fortress was increased in Oregon and is in testing in turf trials throughout the United States, in Canada and in Europe. Data from these tests show the distinctiveness of the variety in turf performance and morphological characteristics.

Parental clones are retained by the applicants to insure the stability of the variety and enable further production of Breeders seed. Syn_1 and Syn_2 seed of Fortress has produced turf of very similar quality and uniformity.

Exhibit B - Botanical Description of 'Fortress'

Fortress (2n = 8x = 56) is a strongly rhizomatous dark green perennial, tolerant of close mowing 3/4 inch, twice weekly, or minimum mowing. The variety retains dark green color during cold as well as warm stress periods.

Seventy plants of 'Fortress' were grown for botanical description at the Soils and Crops Research Farm at Adelphia, New Jersey in a spaced plant nursery. Plants were grown from seed and were transplanted to the field in peat pots in three foot cultivated rows on two foot centers. Plants were small in spring 1973 and measurements for taxonomic description was delayed until plants had developed mature characteristics. Based on these measurements 'Fortress' can be described as follows:

Culms of Fortress are moderately erect, averaging 80.5 cm (s = 17.2, C.V. = 3%) with medium basal leaves and typically two noded stems. Leaves are dark green with open sheaths. Panicles are short, averaging 13 cm (s = 2.1) in length, rather compact and moderately light in weight of seed, averaging 0.1 g seed per panicle (s = .01). Spikelets are oblong with 7-9 florets, bearing lemmas which range from 6-8 mm ($\bar{x}$ = 7.2) and paleas 5.0-6.2 mm ($\bar{x}$ = 5.7) long. Lemma awns are moderately stout and 1.2-1.9 mm ($\bar{x}$ = 1.6 mm) long. The retained portion of the rachis 1.0-1.5 mm ($\bar{x}$ = 1.2 mm) long.

Fortress is characterized by a high density of rhizomes in spaced plants, (average 15.8 g dry weight per plant), which are coarse and long (averaging 21.3 cm for indeterminant rhizomes). It is also characterized by many nodes per rhizome (averaging 14.8 nodes). See Table 1 and Figures 1 and 2.

Exhibit D - Novelty of Fortress

'Fortress' most closely resembles 'Ruby' except that it has darker green color and retains better turf quality under close mowing (Table 1). It also develops taller and heavier seedlings (Table 2), and taller and broader crowns in a spaced nursery (Table 3).

Previously submitted data on rhizome characteristics and Figures 2 and 3 illustrate that Fortress is characterized by long stout rhizomes with many nodes.

Table 1. Performance of Fortress and Ruby under close (3/4") twice weekly mowing at New Brunswick.

	5/4 '72 Q	5/17 '72 Q	6/26 '72 Q	8/1 '72 Q	11/3 '72 Q	12/7 '72 C	1/23 '73 C	3/26 '73 C	4/16 '73 C
Fortress	4.0	5.3	4.0	4.7	7.5	7.7	8.0	8.5	8.7
Ruby	4.7	5.0	5.3	4.0	5.3	6.3	7.0	7.0	5.0

	8/7 '73 Q	9/4 '73 Q	10/2 '73 Q	12/6 '73 Q	Average color quality 1972-1973
Fortress	4.7	4.7	5.7	7.5	6.2
Ruby	2.7	1.5	3.0	2.7	4.6

The test was sown in September 1971, and fertilized with ammonium nitrate and 10-6-4 applied in split application in spring and fall. Ratings were made for color (C) and turf quality (Q) on a 0 to 9 basis. 9 = highest quality, or best green color. 0 = loss of stand, or no green grass.

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Table 2. Vigor of 'Fortress' and 'Ruby' seedlings sampled at two locations, Allentown and New Brunswick, N. J.

	Allentown		New Brunswick	
	Weight, mg/ seedlings 10/8/71	Height, cm 11/17/71	Weight, mg/ seedlings 10/13/71	Height, cm 10/19/71
Fortress	4.7	9.2	4.7	9.2
Ruby	3.7	7.7	4.5	7.5
LSD .05	0.9	1.5	1.4	1.4

Seedling vigor was assessed by taking dry weights of 10 seedlings from each of four replications and by measuring the heights of seedlings on the plots. Fortress was significantly different from Ruby in seedling weight at Allentown and significantly different (at 5% level of probability) for seedling height at both locations.

Table 3. Characteristics of spaced plants of 'Fortress' and 'Ruby' grown in a nursery at Adelphia.

	Fortress		Ruby	
Plant height, cm[1]	83.4	s = 2.2	74.8	s = 6.0 **
Crown area, sq.cm[1]	890	s = 122	748	s = 172 *
Panicle length, cm[1]	13.0	s = 2.1	14.3	s = 2.2 N.S.
Weight of 10 panicles, g	1.32	s = .18	1.88	s = .67 **
Weight of threshed seed, g[2]	1.07	s = .105	1.36	s = .44 **
Weight of pure seed, g[3]	0.99	s = .11	1.24	s = .41 **
Weight of 100 seeds, g	1.18	s = .24	0.99	s = .27 N.S.

1/ Means of 60 plants
2/ From 10 panicles
3/ Seed of 10 panicles blown clean with "General" blower.

*,** - differences between cultivars significant at the .05 and .01 levels of probability.

INSTRUCTIONS

Color: Nickerson's or any recognized color fan may be used to determine plant colors of the described variety.

Fortress may be characterized as to color on the Munsell color reference scale as 2.5 G 3/4. In contrast, the variety, 'Ruby' is more yellow-green or 2.5 GY 4/4 on the Munsell color scale. Color determinations were made on October 31, 1974 under natural daylight, under uniform overcast sky. Turf had been maintained at a 3/4 inch cut for two years with fertilization at approximately 1 lb/thousand ft^2 three times/year.

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Exhibit E - Statement of the Applicants Ownership of 'Fortress'

The applicants, Robert W. Duell and Richard M. Schmit are the sole, original and first breeders and owners of Fortress. Applicants shared jointly in the selection and breeding of Fortress. Furthermore, original clones and breeders seed are produced as required by the applicants to insure the stability and uniformity of Fortress.

Ownership is given in Allowance fee letter of June 20, 1977 signed July 12, 1977 showing that ownership was transferred to the "Soils & Crops Dept. N.J. Agricultural Expt. Station". The Transfer is shown by a document dated August 30, 1974 which is before this application was filed. Recorded 8/22/77 DJB.

AGREEMENT

This agreement was made and entered into by and between New Jersey Agricultural Experiment Station, Rutgers University, the State University of New Jersey, New Brunswick, New Jersey, 08903; Robert W. Duell, Sunset Avenue, R. D. 1-401, Princeton, New Jersey, 08540; Cyril R. Funk, Jr., 4 Delaware Drive, East Brunswick, New Jersey 08816; and Richard M. Schmit, 1483 Huron Road, North Brunswick, New Jersey, 08902.

WHEREAS, the above named individuals, being employed by New Jersey Agricultural Experiment Station, have together developed a Chewings fescue variety identified with the experimental number RU45-C, and a spreading fescue variety identified with the experimental number RU6-S, and have full ownership of these varieties under the provisions of the patent policy of the New Jersey Agricultural Experiment Station and Rutgers University,

NOW THEREFORE, IT IS AGREED AS FOLLOWS:

The above named individuals do hereby donate the above varieties to the Soils and Crops Department of the New Jersey Agricultural Experiment Station, which donation is hereby acknowledged. For purposes of crediting contributions of individuals we agree to the following ratios:

Robert W. Duell, 60;
Cyril R. Funk, Jr., 5; and
Richard M. Schmit, 35.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed and seals affixed the 30th day of March 1974.

RUTGERS UNIVERSITY

By [signature]
Title, Director, N.J. Ag. Expt. Sta.

[signature]
Title, Chairman, Soils & Crops Dept.

Robert W. Duell [signature]

Cyril R. Funk, Jr. Cyril R. Funk Jr.

Richard M. Schmit [signature]

FORM GR-470-37
(3-76)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF VARIETY
FESCUE
(Festuca spp.)

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
Robert W. Duell	Fortress
ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)	FOR OFFICIAL USE ONLY
Soils & Crops Dept., Box 231, Cook College Rutgers University, New Brunswick, NJ 08903	PVPO NUMBER 7500036

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (e.g. [0|8|9] or [0|9]) when number is either 99 or less or 9 or less. Characteristics described, including numerical measurements, should represent those that are typical for the variety. Ranges may be given also. Measured data should be for SPACED PLANTS. Royal Horticultural Society or any recognized color fan may be used to determine plant colors; designate system used: Munsell. Describe location of test area Adelphia, N.J.
All questions need not be answered, however, completeness should be striven for in order to establish the most adequate Variety Identification.

1. SPECIES: (With comparison varieties for use below - use varieties within species of application variety)

[4]
1 = F. ARUNDINACEA (TALL) 11 = ALTA 12 = FAWN 13 = GOAR 14 = KENTUCKY 31
2 = F. PRATENSIS (MEADOW) 21 = ENSIGN 22 = TRADER
3 = F. RUBRA SSP. COMMUTATA (CHEWINGS) 31 = CASCADE 32 = HIGHLIGHT 33 = JAMESTOWN
4 = F. RUBRA SSP. RUBRA (RED) 41 = BOREAL 42 = PENNLAWN 43 = DAWSON
5 = F. OVINA VAR. OVINA (SHEEP)
6 = F. LONGIFOLIA (HARD) 61 = DURAR 62 = BILJART (C-26) 63 = SCALDIS
7 = OTHER (SPECIFY) F.

2. CYTOLOGY

[5|6] 2n CHROMOSOME NUMBER

3. ADAPTATION: (O = Not Tested; 1 = Not Adapted; 2 = Adapted)

[2] NORTHEAST [0] SOUTHEAST [2] NORTH CENTRAL [2] PACIFIC N.W. [ ] OTHER (SPECIFY)

4. MATURITY: (50% Headed) Give Test Area Adelphia, N. J.

[0|2] DAYS EARLIER THAN . . . . . [|] Ruby
MATURITY SAME AS . . . . . [|] Rubin
[0|2] DAYS LATER THAN . . . . . [4|2]
COMPARISON VARIETY

5. PLANT HEIGHT: (At maturity to top of panicle)

[8|0|5] mm HEIGHT
[0|8] mm SHORTER THAN . . . . . [4|2]
HEIGHT SAME AS . . . . . [|]
[0|7] mm TALLER THAN . . . . . [|]
COMPARISON VARIETY Ruby

6. GROWTH HABIT (Mature)

[2] 1 = ERECT (KENTUCKY 31) 2 = SEMI-ERECT (HIGHLIGHT) 3 = PROSTRATE

7. RHIZOMES

[2|1|3] nursery plants mm LENGTH [0|8] mm WIDTH

[3] 0 = ABSENT 1 = WEAKLY CREEPING (DAWSON) 2 = STRONGLY CREEPING (BOREAL) 3 = OTHER more spreading than Boreal

8. LEAF BLADE:

[4] COLOR: 1 = LIGHT GREEN (GOLFROOD) 2 = MODERATELY LIGHT GREEN (HIGHLIGHT) 3 = MEDIUM GREEN (JAMESTOWN, KENTUCKY 31
4 = DARK GREEN (CASCADE) 5 = BLUEGREEN 6 = GRAYGREEN 7 = OTHER (SPECIFY)

PV 7500036 FORTRESS

8. LEAF BLADE:

[0] ANTHOCYANIN: 0 = ABSENT 1 = PRESENT [0] HAIRS (BASAL): 0 = ABSENT 1 = PRESENT [2] MARGINS: 1 = SMOOTH 2 = SEMI-ROUGH 3 = ROUGH

[ ] mm LENGTH (FIRST LEAF BELOW FLAG LEAF) [18] mm WIDTH

[ ] mm SHORTER THAN . . . . [ ] LENGTH SAME AS . . . . [ ] mm LONGER THAN . . . . [ ] COMPARISON VARIETY

[ ] mm NARROWER THAN . [ ] WIDTH SAME AS . . [ ] mm WIDER THAN . . [42] COMPARISON VARIETY

9. LEAF SHEATH (Plant Base):

[2] COLOR: 1 = WHITE (HIGHLIGHT) 2 = RED [ ] AURICLE HAIRINESS: 0 = ABSENT 1 = PRESENT

10. PANICLE (Mature plant)

[395] NUMBER OF PANICLES PER PLANT (FIRST YEAR OF PRODUCTION - FALL OR SPRING PLANTING SPECIFY Fall

[130] mm LENGTH [106] GRAMS OF SEED PER PANICLE

[13] mm SHORTER THAN . . . [ ] LENGTH SAME AS . . . [29] mm LONGER THAN . . . [42] Ruby COMPARISON VARIETY

[ ] GRAMS LESS SEED THAN [ ] WEIGHT SAME AS . . [ ] GRAMS MORE SEED THAN [ ] COMPARISON VARIETY

[3] SHAPE: 1 = NARROW-TAPERING 2 = EGG SHAPE 3 = OBLONG 4 = OTHER (SPECIFY) _____

[2] TYPE: 1 = OPEN 2 = INTERMEDIATE 3 = COMPACT

[2] HABIT: 1 = ERECT 2 = NODDING

[1] BRANCHES: 1 = SMOOTH 2 = ROUGH

[5] COLOR (At 50% flowering): 1 = YELLOWISH GREEN 2 = GREEN 3 = BLUISH GREEN 4 = PURPLISH 5 = REDDISH 6 = OTHER (SPECIFY) _____

11. PALEA:

[~~3~~ 2] 6/13/77 HAIRS (ON KEELS): 0 = ABSENT 1 = SHORT (OLDS) 2 = LONG (RAINIER)

12. LEMMA:

[~~2~~ 1] 6/13/77 HAIRS: 0 = ABSENT 1 = PRESENT [1] TEXTURE: 1 = SMOOTH 2 = ROUGH

[56] mm LEMMA LENGTH [93] mm LEMMA WIDTH

[ ] mm SHORTER THAN . . . . [ ] LENGTH SAME AS . . . . [ ] mm LONGER THAN . . . . [ ] COMPARISON VARIETY

[ ] mm NARROWER THAN [ ] WIDTH SAME AS . . . [ ] mm WIDER THAN. . . [ ] COMPARISON VARIETY

[1] AWNS: 0 = ABSENT 1 = PRESENT

[16] mm AWN LENGTH

00005

PV 7500036 FORTRESS

12. LEMMA:

mm SHORTER THAN . . .

LENGTH SAME AS . . .

mm LONGER THAN . . .

COMPARISON VARIETY

13. SEED:

718 mm LENGTH

93 mm WIDTH

mm SHORTER THAN . . .

LENGTH SAME AS . . .

mm LONGER THAN . . .

COMPARISON VARIETY

mm. NARROWER THAN

WIDTH SAME AS . . .

mm WIDER THAN . . .

COMPARISON VARIETY

118 GRAMS PER 1000 SEED

GRAMS LESS THAN . .

WEIGHT SAME AS . .

GRAMS MORE THAN . .

COMPARISON VARIETY

14. DISEASE, INSECT, AND NEMATODE (O = Not Tested, 1 = Susceptible, 2 = Resistant):

0	HELMINTHOSPORIUM VAGANS	0	H. SOROKINIANUM	2	H. DICTYOIDES
0	RHIZOCTONIA SOLANI	2	ERYSIPHE GRAMINIS	0	USTILAGO STRIIFORMIS
0	FUSARIUM NIVALE	0	F. ROSEUM	0	TYPHULA IOTANA
0	PUCCINIA GRAMINIS	0	P. STRIIFORMIS	0	P. POAE-NEMORALIS
0	P. CORONATA	0	PYTHIUM ULTIMUM	1	CORTICIUM FUSCIFORME
0	SCLEROTINIA HOMEOCARPA	0	INSECT	0	NEMATODE
	OTHER		OTHER		OTHER

15. GIVE VARIETY OR VARIETIES THAT MOST CLOSELY RESEMBLE THE APPLICATION VARIETY. For the following characteristics indicate degree of resemblance (D.R.) by placing in the column marked, D.R., one of the following numbers:

1 = Application variety is less than comparison variety 2 = Same as

3 = More than, better, greater, darker, more disease resistant, etc.

CHARACTER	VARIETY	D.R.	CHARACTER	VARIETY	D. R.
RHIZOME LENGTH	Ruby	3	GROWTH HABIT	Ruby	2
LEAF WIDTH	"	2	LEAF COLOR	"	3
PANICLE COLOR	"	2	PANICLE SHAPE	"	2
WINTER COLOR	"	3	COLD INJURY	"	2
SHADE TOLERANCE	"	2	HEAT	"	3
DROUGHT	"	3	DISEASE*	"	2

*Specify each disease evaluated.

16. ADDITIONAL DESCRIPTION: (Use additional sheets as required)

Describe all characteristics that cannot be adequately described in the form above. Comparative varieties should be used as may be appropriate, such as for disease. Append all comparative trial and evaluation data, including measured characters, environmental, and disease tests.

See five pages for Exhibit C previously submitted.