No. 7700033

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## University of Alaska 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, 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.)

GLAUCOUS BLUEGRASS

'Tundra'

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* 26th *day of* July *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<br>TUNDRA | 2. KIND NAME<br>Greenland or Glaucous bluegrass | FOR OFFICIAL USE ONLY<br>PV NUMBER<br>7700033 |
| 3. GENUS AND SPECIES NAME<br>POA GLAUCA | 4. FAMILY NAME *(Botanical)*<br>GRAMINEAE | FILING DATE 1-27-77 / TIME 2:00 A.M. (P.M.) |
| | 5. DATE OF DETERMINATION<br>June 1974 (SEE ADDENDUM) | FEE RECEIVED $ 250.00 / $ 250.00 / $ 250.00<br>BALANCE DUE $ — / $ — / $ |
| 6. NAME OF APPLICANT(S)<br>UNIVERSITY OF ALASKA AGRICULTURAL EXPERIMENT STATION | 7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*<br>BOX AE<br>PALMER, AK. 99645 | 8. TELEPHONE AREA CODE AND NUMBER<br>907/745-3257 |
| 9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*<br>PUBLIC INSTITUTION | 10. STATE OF INCORPORATION | 11. DATE OF INCORPORATION |

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

Dr. Wm. W. Mitchell
Agricultural Experiment Station
Box AE
Palmer, Alaska 99645

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

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 [X] 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.

17 January 1977
(DATE)

Wm. W. Mitchell Prof of Agronomy & Breeder
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT) 00001

# ADDENDUM TO APPLICATION

Chronology of Events:

With regard to item 5 on the application (Form GR-470), June 1974 must be considered a tentative date of determination. At that time preliminary judgments had been made on the arctic trials of bulk, unselected seed lots from increases of IAS 231 (see Exhibit A). Confirmation still had to be obtained, however, on the performance of material from IAS 305, the selections made in 1973 that eventually formed the basis for the variety. Also, performance data had to be obtained on seed production. I decided, therefore, to increase seed of IAS 305 and established what constituted a foundation seed planting in June 1974. A small amount of seed was obtained in 1974 from this planting, a good amount was harvested in 1975, and a negligible amount in 1976. Another foundation seed planting was established in 1975 and an excellent harvest was obtained in 1976. Results of the Prudhoe Bay trials with the selected material, IAS 305, were consistent with the previous results. Thus with the arctic trials showing strong growth in early 1976, their third season of growth, and seed production stands at Palmer providing adequate yields for 1-2 years, at least, it was decided in June 1976 to release the variety for commercial production. Foundation seed lots were provided two growers in June and July for 1976 plantings. Neither grower harvested any seed in 1976, however. In a further trial of seed production methods we planted nearly an acre of foundation seed in 1976 and harvested about 100 lbs of certifiable seed. The Notice of Release of 'Tundra' is enclosed.

EXHIBIT A

Origin and Breeding History of the Variety:

1. Tundra bluegrass originated from seed collections made in 1969 and 1970 from native plants of Poa glauca in the vicinity of an oil exploration staging area called Sagwon along the Sagavanirktok River in arctic Alaska. The seed lots from these collections were designated IAS 231. 'Tundra' resulted from selections of individual plants out of a spaced planting of IAS 231.

2. About 500 individual plants were established in a spaced-plant nursery at Palmer, Alaska, in 1971. Growth habits manifest in the nursery ranged from extremely prostrate types to a semi erect type. The plants also varied in their tolerance to the relatively southern, boreal conditions at Palmer (for plants of arctic origin). Fortunately the most erect type also was the most durable. Eighty-four of these plants very similar in form, were selected in 1973. Seed from the 84 selections comprised the original breeder seed of the variety and was used for production of foundation class seed. This material was designated IAS 305. In 1975 the number of selections for the breeder's stock was reduced to 23 plants that are being propagated vegetatively. Because of the difficulty of maintaining this arctic material under boreal conditions, however, small lots of seed from the individual breeder plants are being maintained to reconstitute lost plants if necessary.

3. Progeny are very similar to each other and to the parents, indicating a high degree of selfing or possibly apomixis. The particular mode of reproduction has not been determined as yet.

4. The few generations observed to date indicate a high degree of stability. However, seed production stands at the Palmer latitude become seriously depleted after their second or third year because of disease or poor adaptability. Nevertheless, fair to excellent seed production is possible for 2 years.



Arctic, restricting it to the Aleutian Islands and southern coast of Alaska. The variety agrees sufficiently well with the descriptions of P. glauca in Hulten, Polunin (Polunin, N. 1959. Circumpolar arctic flora. Oxford at the Clarendon Press), and Welsh (Welsh, S.L. 1974. Anderson's flora of Alaska. Brigham Young University Press).

FORM GR-470-18
(1-15-73)

FORM APPROVED. OMB NO. 40-R3712

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

EXHIBIT C
(Bluegrass)

# OBJECTIVE DESCRIPTION OF VARIETY
## BLUEGRASS *(POA SPP.)*

NAME OF APPLICANT(S)
UNIVERSITY OF ALASKA AGRICULTURAL EXPERIMENT STATION

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
BOX AE
PALMER, AK. 99645

FOR OFFICIAL USE ONLY
PVPO NUMBER 7700033
VARIETY NAME OR TEMPORARY DESIGNATION TUNDRA

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.

**1. KIND:**

[4] 1 = POA COMPRESSA 2 = P. PRATENSIS 3 = P. TRIVIALIS 4 = OTHER (Specify) P. GLAUCA

**2. REGION OF BEST ADAPTATION:**

[5] 1 = NORTHEAST 2 = TRANSITIONAL ZONE 3 = NORTH CENTRAL 4 = PACIFIC N.W. 5 = OTHER (Specify) ARCTIC

**3. MATURITY (At First Anthesis):**

[1] 1 = EARLY (Delta) 2 = MEDIUM EARLY (Fylking) 3 = MEDIUM (Newport) 4 = LATE (Merion)
mid to late June

[ ][ ] NUMBER OF DAYS EARLIER THAN ..... [ ]
[ ][ ] NUMBER OF DAYS LATER THAN ..... [ ]
1 = NUGGET 2 = FYLKING 3 = DELTA 4 = MERION 5 = NEWPORT 6 = BARON

**4. PLANT HEIGHT (Longest Shoot from Soil Surface to Top of Head):**

[0][5][0] CM. HEIGHT

[ ][ ] CM. SHORTER THAN ..... [ ]
[ ][ ] CM. TALLER THAN ..... [ ]
1 = NUGGET 2 = FYLKING 3 = DELTA 4 = MERION 5 = NEWPORT 6 = BARON

**5. HABIT:**

[2] 1 = PROSTRATE (Fylking) 2 = SEMI-PROSTRATE (Marion) 3 = ERECT (Delta)

**6. VEGETATIVE REPRODUCTION (1 = Absent; 2 = Present):**

[1] RHIZOMES [1] STOLONS

**7. LEAF BLADE:**

[1-2] Color: 1 = LIGHT GREEN (Rough Bluegrass) 2 = BLUE GREEN (Canada Bluegrass) 3 = MODERATELY DARK GREEN (Merion) 4 = DARK GREEN (Adelphi) 5 = OTHER (Specify) _____

[ ] Upper Surface: 1 = SHINY 2 = DULL

[ ] Lower Surface: 1 = SHINY 2 = DULL

[0][2] MM. WIDTH

[6][3] MM. LENGTH

**8. LEAF SHEATH (Base):** Upper: 140 mm

[1] Seedling Color: 1 = GREEN 2 = RED [ ][ ] MM. LENGTH

[1] Keel: 1 = NOT KEELED 2 = KEELED

**Surface:**

[1] 1 = GLABROUS 2 = PUBESCENT [1] 1 = SMOOTH 2 = ROUGH

[ ] 1 = NON-GLAUCOUS 2 = GLAUCOUS

**9. LEAFINESS (At First Anthesis):**

[1] Number of leaves per tiller or shoot: 1 = FEW (1 - 3) 2 = INTERMEDIATE ( 4 - 6 ) 3 = MANY ( More than 6 )

**10. PANICLE:**

[1][0][0] MM. LENGTH

[ ][ ][ ] MM. LONGER THAN ..... [ ]
[ ][ ][ ] MM. SHORTER THAN ..... [ ]
1 = NUGGET 2 = FYLKING 3 = DELTA 4 = MERION 5 = NEWPORT 6 = BARON

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EXHIBIT D 7700033

Data Indicative of Novelty:

To our knowledge 'Tundra' is the first cultivar named for the species *Poa glauca*.

'Tundra' has been developed for revegetation applications in arctic Alaska and possibly neighboring areas. In trials in the Prudhoe Bay area 'Tundra' was a superior performer in most situations tested. Other collections of *P. glauca* from Alaskan locations were also tested and found to be far inferior. They were insufficiently winter hardy and failed to maintain adequate coverage beyond 2 years. Other bluegrasses in the species *P. pratensis* were also tested and only 'Nugget' survived to any extent. It was marginal in hardiness, however. To our knowledge 'Tundra' is the first material of arctic origin to be made commercially available for use in the Arctic. There is an urgent demand for adapted materials in connection with oil and gas exploration, production, and distribution activities in this region of severe climatic conditions.

University of Alaska, Fairbanks

May 13, 1977

Agricultural Experiment Station
Palmer Research Center
Box AE
Palmer, Alaska 99645

Mr. Joseph J. Higgins
Examiner, Plant Variety Protection Office
USDA Agricultural Marketing Service
Grain and Seed Division
National Agricultural Library Building
Beltsville, Maryland 20705

Dear Mr. Higgins:

Regarding the small seed lots being maintained to reconstitute lost breeder plants of "Tundra," these seed lots include those of the original 84 plants. This is necessary because of the difficulty in maintaining the breeding stock by vegetative means through transplanting from year to year. In the event that seed of any of the breeder plants is lost or consumed, I want other sources of the same type to rely on. No separate designation was given to the 23 plants.

Superior performance in the arctic trials, the arctic origin of the material, and selection for manageable agronomic traits comprise the basis for constituting the variety. It can be distinguished morphologically from some but not all of the other members of the species. The species is highly variable. It was far superior in growth vigor and frost hardiness to other entries of Poa glauca included in the arctic trials. So in that regard, it is the best material available of the species for the purpose recommended. Apart from the infraspecific comparisons, it appears to be the best of anything currently available for arctic use, and therefore is extremely valuable to the arctic rehabilitation requirements.

We did not intend that the name of the applicant be withheld in the announcement of the application. You have our permission to publish the University of Alaska Agricultural Experiment Station as the applicant.

Sincerely,

Wm. W. Mitchell

Wm. W. Mitchell
Head Agronomist

km

RECEIVED
MAY 19 1977
U. S. DEPARTMENT OF AGRICULTURE
AMS, GRAIN DIV.
PVPO

00009

EXHIBIT E

7700033

Statement of Applicant's Ownership:

The University of Alaska Agricultural Experiment Station, Palmer, Alaska, believes it is the sole, original, and first breeder of 'Tundra', a variety of *Poa glauca*, for which it solicits a certificate of protection.

May 5, 1987 letter to Brewer
Poa glauca?

Appendix 2.--Title V varieties (those listed under the certification option Title V as of September 30, 1983)

Alfalfa

Baker
Honeoye
Magnum
Multileaf
Oneida
Riley
Saranac AR
Victoria

Barley

Bold
Georgie
Gus
Kombar
Lud
Maris Mink
Menuet
Maravian 111
Paoli
Pike
Reliance
Summit
Wapana
Washonupana

Bentgrass

Penneagle

Bluegrass, Glaucantha

Tundra

P. glauca

Bluegrass, Ky

Barbie
Barblue
Enmundi
Harmony
Mystic
Pacific
Ram 1
Scenic
Welcome

Bluegrass, Rough

Po-Lis

Canarygrass, Reed

Vantage

Clover, Red

Kenstar
Redland
Ruby
Tristan

Clover, White

Star

Fescue, Chewings

Banner
Jade
Jamestown

Fescue, Hard

Silvana

Fescue, Meadow

Beaumont

Fescue, Red

Fortress
Menuet
Merlin

Fescue, Tall

Barcel
Kenhy
Missouri-96

Foxtail, Creeping

Retain

Oat

Allen
Benson
Brooks
Coker 227
Coker 716
Dal
Firecracker
Four twenty two
Goodland
7630
Big Mac
Mesquite
Noble
Southern States 76-30
Stout
Wright

Orchardgrass

Dolcea

Rye

Wheeler

Ryegrass, Annual

Aubade
Deltonic
Deltop
Maris Ledger

Ryegrass, Hybridium

Augusta

# Understanding the Plant Variety Protecti

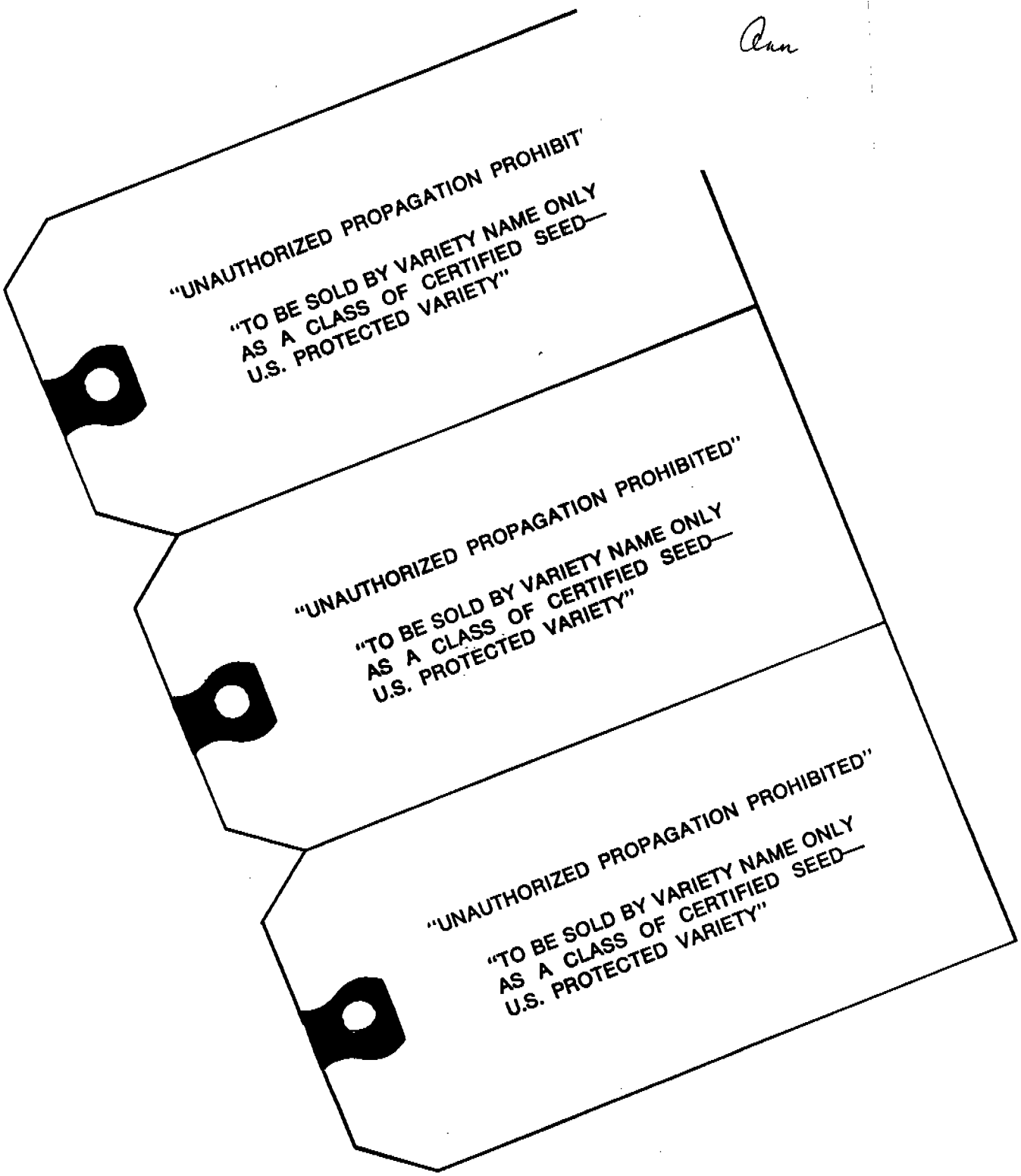
5-5

Dr. Evans –
should this be checked for accuracy?

Ann

Oregon State University Extension S

Special Report 724
February 1985



p.128



ly to apex. ♃ —Moist woods, Jersey to Michigan and Illinois, n to Florida and Texas.

. **Poa alpína** L. ALPINE BLUE-s. (Fig. 159.) Culms erect from a er thick vertical crown, rather , 10 to 30 cm. tall; blades short, 5 mm. wide, the uppermost about middle of the culm; panicle ovoid nort-pyramidal, rather compact, 8 cm. long, the lower branches reflexed; spikelets broad, purple urplish; glumes broad, abruptly e; lemmas 3 to 4 mm. long, gly villous on the keel and mar- nerves, pubescent on the inter- es below, the intermediate nerves . ♃ —Mountain meadows, ic regions of the Northern Hemi- re, extending south to Quebec, nern Michigan (Keweenaw t), and the alpine summits of rado, Utah, Washington, and on (Wallowa Mountains); Mex-

. **Poa stenántha** Trin. (Fig. 160.) as tufted, 30 to 50 cm. tall; ligule prominent, as much as 5 mm long; blades flat or loosely involute rather lax, mostly basal, 1 to 2 mm wide, the uppermost culm leaf below the middle of the culm; panicle nod d ng, 5 to 15 cm. long, the branche in twos or threes, arcuate-drooping naked below, with a few spikelets a the ends; spikelets 3- to 5-flowered, to 8 mm. long; lemmas about 5 mm long, pubescent on the lower part o keel and marginal nerves, sparsel pubescent on the internerves below ♃ —Moist open ground, Alaska Alberta, and British Columbia, ex tending into Montana, Colorad (White River Forest), Idaho, Wash ington (Nooksack River), and Orego (Crater Lake).

E 160.—*Poa stenantha*. Panicle, × 1; floret, × 10. (Blankinship, Mont.)

FIGURE 161.—*A*, *Poa glauca*. Panicle, × 1; floret, × 10. (Hitchcock 16053, N. H.) *B*, *P. glaucantha*. Panicle, × 1; floret, × 10. (Butters, Abbe, and Abbe 258, Minn.)

**47. Poa glaúca** Vahl. (Fig. 161, *A*.) Plants glaucous, in close or loose tufts; culms compressed, stiff, 10 to 30 cm. tall, sometimes taller, naked above, the uppermost leaf usually much below the middle, its ligule

p.129 Hitchcock



about 2 mm. long; blades mostly basal, 3 to 5 cm. long, 1 to 2 mm. wide; panicle 3 to 7 cm. long, narrow, sometimes rather compact, the branches erect or ascending, few-flowered; spikelets mostly 2- or 3-flowered, 5 to 6 mm. long; lemmas 3 to 4 mm. long, strongly pubescent on the lower half of the keel and marginal nerves and often slightly pubescent on the faint intermediate nerves. ♃ —Rocky slopes, Arctic regions south to the alpine summits of New Hampshire; Wisconsin; Minnesota; Colorado. Common in Greenland; Eurasia.

**48. Poa glaucántha** Gaudin. (Fig. 161, *B*.) Plants mostly glaucous, culms compressed, in tufts, usually 30 to 70 cm. tall, leafy throughout; blades to 12 cm. long; panicle 6 to 16 cm. long, loose, but branches mostly ascending; spikelets 5 to 7 mm. long, 3- to 6-flowered; lemmas pubescent on keel and lateral nerves, sometimes with an obscure web at base. ♃ — Mountain meadows, slopes, and cliffs, Newfoundland to Quebec, Minnesota, Montana, and Wyoming; Europe. Resembles both *Poa nemoralis* and *P. interior*, distinguished from both by the florets without web at base or with very obscure web, from *P. nemoralis* by the flat culms, and from *P. interior* by the more strongly keeled sheaths and larger spikelets. A variable and puzzling species, apparently intermediate between *P. nemoralis* and *P. glauca*. *Poa scopulorum* Butters and ally slender lax fo

**49. Poa fernál** 162.) Plants in culms weak and sometimes 30 cm. about 1 mm. lo basal, lax, mostly panicle narrow t ered, 2 to 6 cm. lo cending, naked b 4-flowered, about mas 3 to 3.5 mm. on the lower ha marginal nerves, webbed at base. with *P. laxa* H species.) ♃ — foundland and summits of Mai Vermont, and Ne the upper cone ton.

FIGURE 162.—*Poa fernaldiana*. Panicle, × 1; floret, × 10. (Fernald, Maine.)

FIGURE 163.—*Poa pa* (Patt

**50. Poa patt** SON BLUEGRAS loosely tufted leaves, 10 to 2 ally folded, r than 10 cm. lo panicle narro

*stres*

ubescent.
nt and often rooting at base; keel of lemma
..... 23. P. TRIVIALIS.

pressed or ascending..... 24. P. MARCIDA.
er, naked below, spreading or drooping.
nches mostly in fours or fives.
25. P. ALSODES.
ranches mostly in twos or threes.
..... 26. P. LANGUIDA.
..... 27. P. SALTUENSIS.
nerves.
netimes faintly so). Culms usually stout, 40
d open, mostly more than 15 cm. long.
28. P. OCCIDENTALIS.

exed at maturity.
n 15 cm. long, the branches several (usually
..... 30. P. SYLVESTRIS.
n. long, the branches 1 to 3 together.
31. P. REFLEXA.

, 15 to 20 cm. long. Lemmas 4 mm. long,
es; webbed at base; New Mexico.
29. P. TRACYI.
nodding.
stinct..... 32. P. WOLFII.
oscure (distinct in *P. leptocoma*).
rs, elongate, capillary, bearing a few spikelets
lla joints short, hidden by the florets; sheaths
ts; alpine rocky slopes.
33. P. PAUCISPICULA.
oints slender, somewhat elongate, usually not
ths minutely roughened; culms solitary or in
a distinct; uppermost ligule acute, 3 to 4 mm.
below timber line..... 34. P. LEPTOCOMA.
a obscure; uppermost ligule truncate, 0.3 to
es region at low altitudes.
35. P. PALUDIGENA.
n more than 2, if only 2 not capillary and
bulblets with dark purple base; culms swollen
..... 36. P. BULBOSA.
like at base.
about as long as the first lemma; ligule very
..... 37. P. NEMORALIS.
rter than the first lemma; ligules rather prom-
leaves 1 to 3 mm. or more long.
; lemmas 4 mm. long.... 38. P. MACROCLADA.
g; lemmas 2.5 to 3 mm. long.
purplish base; panicle 10 to 30 cm. long, large
..... 39. P. PALUSTRIS.
or tawny base; panicle mostly less than 10 cm.
small and few-flowered..... 40. P. INTERIOR.

*nalopoae*

..... 41. P. CHAIXII.

*lpinae*

ewed from the side of sheath.
42. P. FENDLERIANA.



Ligule prominent, easily seen in side view, 5 to 7 mm. long..... 43. P. LONGILIGULA.
Blades flat or, if involute, rather lax or soft.
Panicle branches slender, spreading or drooping, the lower naked and simple for 3 to 4 cm. or more..... 44. P. AUTUMNALIS.
Panicle branches not long and spreading.
Panicle broadly pyramidal, condensed, about as broad as long, the lower branches spreading. Spikelets broad, subcordate..... 45. P. ALPINA.
Panicle longer than broad.
Panicle nodding, the lower branches slender, arcuate-drooping. 46. P. STENANTHA.
Panicle erect, the lower branches short (see also *P. gracillima*).
Panicle rather loose, lower branches naked below, ascending (see also *P. macrolada*).
Plants glaucous, culms flattened; panicle rather narrow.
Spikelets 2- or 3-flowered; panicle 3 to 7 cm. long..... 47. P. GLAUCA.
Spikelets 3- to 6-flowered; panicle 6 to 16 cm. long..... 48. P. GLAUCANTHA.
Plants not glaucous; culms terete, rather lax..... 49. P. FERNALDIANA.
Panicle narrow, condensed, the branches short (see also *P. unilateralis*).
Culms rather lax; ligule minute; glumes about 4 mm. long. 50. P. PATTERSONI.
Culms stiff, ligule about 1.5 mm. long, glumes about 3 mm. long. 51. P. RUPICOLA.

*6. Epiles*

Panicle open, 10 to 15 cm. long. Blades involute, slender..... 52. P. INVOLUTA.
Panicle contracted or, if open, less than 10 cm. long.
Blades scabrous, filiform, mostly basal.
Spikelets 7 to 9 mm. long; lemmas 4.5 to 6 mm. long, mostly smooth. 53. P. CUSICKII.
Spikelets 6 to 7 mm. long; lemmas about 4 mm. long, scabrous..... 54. P. NAPENSIS.
Blades glabrous.
Lemmas minutely pubescent at base..... 55. P. UNILATERALIS.
Lemmas glabrous.
Blades of the culm 2 to 3 mm. wide, flat, those of the innovations slender and filiform. 56. P. EPILIS.
Blades of the culm and innovations similar. Panicle few-flowered.
Panicle short, open, the capillary branches bearing 1 or 2 spikelets. Culms 10 to 20 cm. tall..... 57. P. VASEYOCHLOA.
Panicle narrow.
Lemmas 5 to 6 mm. long; panicle usually pale or silvery..... 58. P. PRINGLEI.
Lemmas less than 4 mm. long; panicle usually purple.
Glumes about as long as the first and second florets; panicle mostly not exceeding the short soft blades.
Glumes and lemmas smooth, the lemmas erose at summit. 59. P. LETTERMANI.
Glumes and lemmas scabrous, the lemmas acute, scarcely erose. 60. P. MONTEVANSI.
Glumes shorter than the first floret; panicle usually much longer than the usually stiff blades..... 61. P. LEIBERGII.

*7. Scabrellae*

Sheaths somewhat scabrous..... 62. P. SCABRELLA.
Sheaths glabrous.
Panicle rather open, the lower branches naked at base, ascending or somewhat spreading; culms usually decumbent at base..... 63. P. GRACILLIMA.
Panicle contracted, the branches appressed or at anthesis somewhat spreading.
Culms slender, on the average less than 30 cm. tall; numerous short innovations at base. Blades usually folded..... 64. P. SECUNDA.
Culms stouter, on the average more than 50 cm. tall; innovations usually not numerous. 65. P. CANBYI.

*8. Nevadenses*

Sheaths scaberulous. Ligule long, decurrent..... 66. P. NEVADENSIS.
Sheaths glabrous.
Ligule prominent; blades broad and short..... 67. P. CURTIFOLIA.
Ligule short; blades elongate.
Blades involute..... 68. P. JUNCIFOLIA.
Blades flat..... 69. P. AMPLA.

7900033 TUNDRA

FORM GR-470-18 (Reverse)

**10. PANICLE (Cont.):**

[ ][ ][ ] NUMBER OF PANICLES PER PLANT [ ][ ] MILLIGRAMS SEED PER PANICLE

[3] Branches LOWEST WHORL: 1 = DROOPING (Prato) 2 = HORIZONAL (Merion) 3 = OTHER (Specify) ASCENDING

[2] Panicle Habit: 1 = NODDING (Newport) 2 = UPRIGHT (Nugget) [7][5] MM. SPIKELET LENGTH

**11. LEMMA**

[3] KEEL
[3] LATERAL NERVES
} 1 = GLABROUS 2 = SLIGHTLY PUBESCENT 3 = PUBESCENT 4 = OTHER (Specify)

[1] Intermediate Nerves: 1 = DISTINCT 2 = OBSCURE [2] Basal Webbing: 1 = NONE 2 = SCANT 3 = COPIOUS

**12. SEED:**

[ ] Apomictin Percentage: 1 = MORE THAN 95 2 = 85 TO 95 3 = LESS THAN 85

[ ] Phenol Reaction: 1 = NONE - LEMMA REMOVED (Merion) 2 = BEIGE (Cougar) 3 = BROWN (Windsor) 4 = BLACK (Delta - 2 hours) 5 = BLACK (Anheuser - 24 hours)

[0][6][0] MM. WIDTH [1][8][0] MM. LENGTH [3][4][0] GRAMS PER 10,000 SEEDS [ ][ ] CHROMOSOME NO. (2n)

**13. TURF DENSITY MAINTENANCE AT ONE INCH CUT:**

[ ] 1 = POOR 2 = MODERATE (Merion) 3 = SUPERIOR (Nugget) 4 = EXCELLENT

**14. VERTICAL GROWTH RATE:**

[ ] 1 = SLOW (Nugget) 2 = MEDIUM (Merion) 3 = FAST (Delta) 4 = OTHER (Specify relation to a standard)

**15. SPRING GREEN UP:**

[1] 1 = EARLY (Windsor) 2 = MEDIUM (Fylking) 3 = LATE (Nugget)

**16. FALL DORMANCY: (1 = Not Dormant; 2 = Intermediate; 3 = Dormant)**

[ ] NORTHERN (42° 30′ ± 30′ Lat.) [ ] INTERMEDIATE (40° ± 30′ Lat.) [ ] SOUTHERN (37° 30′ ± 30′ Lat.)

**17. SEEDLING VIGOR (Growth Rate):**

[3] Seedling: 1 = SLOW 2 = MEDIUM 3 = FAST

**18. ENVIRONMENTAL RESISTANCE: (0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

| | | | |
|---|---|---|---|
| [0] COOL TEMPERATURE (Winter color) | [2] COLD (Injury) | [0] HEAT | [2] DROUGHT |
| [0] SHADE | [2] POOR FERTILITY | [2] ACID SOIL | [2] ALKALINITY |
| [0] SALINITY | [0] SOIL COMPACTION | [1] POOR DRAINAGE | [0] AIR POLLUTION |
| [ ] OTHER (Specify) | | | |

**19. DISEASE, INSECTS, AND NEMATODE RESISTANCE: (0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

| | | | |
|---|---|---|---|
| [ ] HELMINTHOSPORIUM VAGANS | [ ] H. SOROKINIANUM | [ ] H. DICTYOIDES | [ ] RHIZOCTONIA SOLANI |
| [1] ERYSIPHE GRAMINIS | [ ] USTILAGO STRIIFORMIS | [ ] FUSARIUM NIVALE | [ ] F. ROSEUM |
| [ ] TYPHULA IOTANA | [ ] SCELEROTINIA HOMEOCARPA | [ ] PUCCINIA GRAMINIA | [ ] P. STRIIFORMIS |
| [ ] PYTHIUM ULTIMATUM | [ ] CRAMBUS BONIFATELLUNS | [ ] OTHER (Specify) | |

**REFERENCE**

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

JAN 27 1977

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LL/L2/1

## INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, 6525 Belcrest Road, Hyattsville, Maryland 20782. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Insert the date the applicant determined that he had a new variety based on the definition in Section 41 (a) of the Act and decision is made to increase the seed.

13a First, give the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method. Second, give the details of subsequent stages of selection and multiplication. Third, indicate the type and frequency of variants during reproduction and multiplication and state how these variants may be identified. Fourth, provide evidence on stability.

13b First, give any special characteristics of the seed and of the plant as it passes through the seedling stage, flowering stage and the fruiting stage. Second, describe the mature plant and compare it with a similar commercial variety grown under the same conditions, and indicate the differences.

13c A supplemental form will be furnished by the PVPO to describe in detail a variety for each kind of seed.

13d Provide complete data indicative of novelty. Seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty may be submitted. Seeds submitted may be sterile.

13e Indicate whether applicant is the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.