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

EXHIBIT C

OBJECTIVE DESCRIPTION OF VARIETY
SMOOTH BROMEGRASS (*Bromus inermis* Leyss.)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME

ADDRESS *(Street and No. or RD No., City, State, Zip Code, and Country)*	FOR OFFICIAL USE ONLY
	PVPO NUMBER

Place the appropriate number that describes the varietal character of this variety in the spaces below. Fill unused spaces with zeros (e.g. 0 9 9) when number is 99). In comparisons to standard varieties, the value 0 0 should only be use to indicate that the varieties are equal. Characteristics described, including numerical measurements, should represent those which are TYPICAL for the variety. See EXPLANATORY NOTES at the end of form for characters marked with an asterisk (*). Measured data should be for SPACED PLANTS. Any recognized color fan, e.g., National Bureau of Standards Circular 553 Supplement, may be used to determine plant colors; designate system used:_____. Ranges of values may be included with additional description elsewhere in the application.

NOTE: For single plant data a minimum of 100 plants is suggested.

1. STRAIN TYPE

___ 1 = Souther Type 2 = Intermediate 3 = Northern Type

STANDARD COMPARISION VARIETIES

1 = Lincoln (Southern) 2 = Manchar (Intermediate) 3 = Carlton (Northern)

2. MATURITY

Heading date (50% of plants emerged from boot)……..	___ ___ Days Earlier Than ..... ___	Standard Variety
	___ ___ Days Later Than ..... ___	Standard Variety
Seed Ripening (panicle browning)……	___ ___ Days Earlier Than ..... ___	Standard Variety
	___ ___ Days Later Than ..... ___	Standard Variety

3. JUVENILE HABIT

___ 1 = Prostrate Rosette 2 = Erect Tillers

4. ADULT HABIT

___ Spread: 1 = Noncreep (Parkland) 2 = Spreading (Lincoln)

___ ___ ___ CM Width (Diameter of 2nd year plant)…… { ___ ___ CM Narrower Than ..... ___ Standard Variety / ___ ___ CM Wider Than..... ___ Standard Variety }

___ Attitude of Outer Culms: 1 = Prostrate (Rebound) 2 = Ascending (Achenbach) 3 = Erect (Saratoga)

Proportin of mature culm types* (STERILE vs. FERTILE CULMS): Enter the number of plants out of 100 (frequency) which show the indicate range of STERILE CULMS. Do not include immature culms.

	> 50% Sterile Culms	30-50% Sterile Culms	<30% Sterile Culms
Application Variety ……..	___ ___ ___ % Plants	___ ___ ___ % Plants	___ ___ ___ % Plants
Standard Variety ___ ……..	___ ___ ___ % Plants	___ ___ ___ % Plants	___ ___ ___ % Plants

5. STERILE CULMS* (Same plants as FERTILE CULMS – at seed ripe stage)

___ ___ ___ CM Height* (From soil to mean level of uppermost leaf tips) …….. { ___ ___ CM Shorter Than ..... ___ Standard Variety / ___ ___ CM Taller Than ..... ___ Standard Variety }

___ ___ ___ CM Leaf Elevation* (Stem length from soil to lingules of uppermost leaves …… { ___ ___ CM Lower Than ..... ___ Standard Variety / ___ ___ CM Higher Than ..... ___ Standard Variety }

___ ___ Number of Leaves/Culm* (Between expanded internodes)

6. FERTILE CULMS* (Same plants as STERILE CULMS – at seed ripe stage)

___ Diameter: 1 = Fine (Carlton) 2 = Medium (Lincoln) 3 = Coarse (Sac)

___ ___ ___ CM Height* (From soil to mean level of panicle tips) …….. { ___ ___ CM Shorter Than ..... ___ Standard Variety / ___ ___ CM Taller Than ..... ___ Standard Variety }

___ ___ ___ CM Length of Internode Below flag leaves …….. …… { ___ ___ CM Shorter Than ..... ___ Standard Variety / ___ ___ CM Longer Than..... ___ Standard Variety }

Pubescence at Nodes: ___ ___ ___ % Plants Glabrous ___ ___ ___ % Plants Pubescent

___ ___ ___ CM Leaf Elevation* (Stem length from soil to lingules of flag leaves …….. { ___ ___ CM Lower Than ..... ___ Standard Variety / ___ ___ CM Higher Than ..... ___ Standard Variety }

7. LEAF (Leaf below flag leaf – on FERTILE CULM at heading date)

___ Attitude: 1 = Drooping (Carlton) 2 = Ascending ( )

___ Color: 1 = Light Green (Mandan 404) 2 = Medium Green (Saratoga) 3 = Dark Green (Achenbach)

___ Anthocyanin Formation: 1 = Absent 2 = Slight 3 = Strong

___ Waxy Bloom: 1 = Absent 2 = Slight 3 = Strong

Leaf Pubescence: (Indicate percentage of PLANTS with each type)

___ ___ ___ % All Glabrous ___ ___ ___ % Only Lower Leaves Pubescent ___ ___ ___ % All Pubescent

___ ___ ___ MM Maximum Width …….. { ___ ___ MM Narrower Than..... ___ Standard Variety / ___ ___ MM Wider Than ..... ___ Standard Variety }

8. PANICLE (At seed ripe stage)

___ Shape*: 1 = Drooping (Lancaster) 2 = Spreading (Lincoln) 3 = Ascending* ( )

___ Density: 1 = lax ( ) 2 = Medium ( ) 3 = Compact ( )

___ ___ CM Rachis Length (From basal panicle node to tip of terminal spikelet) ……

- ___ ___ CM Shorter Than ..... ___ Standard Variety
- ___ ___ CM Taller Than ..... ___ Standard Variety

9. SEED (Lemma of freshly harvested mature seed)

___ Color: 1 = Green (Southland / Achenbach) 2 = Pale Purple (Carlton) 3 = Dark Purple (Manchar)

Lemma Pubescence: (Indicate percentage of each type): ___ ___ ___ % Glabrous ___ ___ ___ % Slightly Pubescent ___ ___ ___ % Strongly Pubescent

___ ___ ___ MM Lemma Length ……

- ___ ___ CM Shorter Than ..... ___ Standard Variety
- ___ ___ CM Longer Than..... ___ Standard Variety

Presence of Awns: (Small awnlets 2 – 4 mm in length. Indicate percentage of plants)

___ ___ ___ % Plants Totally Lacking Awns ___ ___ ___ % Plants with Awns

10. DESEASES AND PESTS (0 = Not Tested 1 = Susceptible 2 = Resistant)

___ Brown Spot (*Pyrenophora bromi*)
___ Leaf Spot (*Selenophoma bromigena*)
___ Scald (*Rhynchosporium Secalis*)
___ Ergot (*Claviceps purpurea*)
___ Root Rot (*Pythium graminicola*)
___ Other (Specify) _____

___ Chocolate Spot (*Pseudomonas coronafaciens* var. *atropurpurea*)
___ Leaf Blotch (*Stagonospora bromi*)
___ Powdery Mildew (*Erysiphe graminis*)
___ Root Rot (*Helminthosporium sorokinianum*)
___ Root Rot (*Rhizoctonia solani*)
___ Other (Specify) _____

11. INDICATE THE VARIETY THAT MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR THE FOLLOWING CHARACTERS

Character	Variety	Character	Variety
Leafiness		Leaf Color	
Spread		Tillering	
Persistence		Winter Hardiness	
Drought Tolerance		Summer Dormancy	
Seed Yield		Regrowth	

***EXPLANATORY NOTES**

Mature culms are referred to as STERILE (non-panicle-bearing) and FERTILE (seed stalks) to differentiate from immature “vegetative” culms which cannot be so distinguished. Strain types differ as to PROPORTION OF MATURE CULM TYPES, ratio of height of culm types, and mean distance between leaves. Componentes of these traits are measured at SEED RIPENING (panicle browning) so that mature sterile culms can be identified. HEIGHT TO MEAN LEVEL OF UPPERMOST CULM TIPS defines the “horizon” naturally formed by the tips of the culms, and can be measured without disturbing the plant. Some traits are morphological components of performance characters: STERILE CULMS produce no seed and more leaves. PROPORTION OF MATURE CULM TYPES is an important genetic trait known to be affected by environmental extremes. Do not submit results known to be atypical. Data are most reliable when compared to a check variety. NUMBER OF LEAVES/CULM and LEAF ELEVATION together indicate the mean distance between leaves. LEAF ELEVATION indicates availability of leaf for harvest and general plant “leafiness”. In some cases individual plants exhibit a trait which is not known to be typical of any variety totally; e.g., ASCENDING PANICLE SHAPE in the variety ‘magna’. Some example varieties (in parentheses) may be obsolete; we welcome the suggestion of replacements from any reliable source.

REFERENCE

Zerebina, Z. N. 1931. Essay of a botanikal-agronomical study of awnless brome grass (*Bromus inermis* Leyss.). Bulletin of Applied Botany (Leningrad) 25(2): 203-352.

OTHER

Lamp, H. F. 1952. Reproductive activity in *Bromus inermis* in relation to phases of tiller development. Bot. Gazette 113: 413-438.
Lowe, C. C., et al. 1960. A regional approach to breeding and evaluation of smooth bromegrass for use and adaptation in the northeast. Cornell Univ. Agric. Exp. Sta. Bull, 954.
Walton, P. D. and C. Murchison. 1979 A plant ideotype for *Bromus inermis* Leyss. In western Canada. Euphytica 28: 801-806

COMMENTS