No. 8700168

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

The Board of Regents,
The University of Nebraska

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 eighteen 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.)

(*Waived, except that this waiver shall not apply to breeder seed, foundation seed, labeling requirements, and blending limitations.)

WHEAT

'Redland'

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* 31st *day of* January *in the year of our Lord one thousand nine hundred and eighty-nine.*

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Clayton Yeutter
Secretary of Agriculture

APPROVAL EXPIRES 4-30-85

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION

FORM APPROVED: OMB NO. 0581-0055

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).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S)
Board of Regents, Univ. of Nebraska and USDA/ARS

2. TEMPORARY DESIGNATION
NE851182

3. VARIETY NAME
Redland

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
Lincoln, NE 68583-0745
Washington, D.C. 20250

5. PHONE *(Include area code)*
402-472-7211
202-447-3656

FOR OFFICIAL USE ONLY

PVPO NUMBER
8700168

6. GENUS AND SPECIES NAME
Triticum aestivum L.

7. FAMILY NAME *(Botanical)*
Graminae

FILING
DATE July 30, 1987
TIME 1:30 ☐ A.M. ☑ P.M.

8. KIND NAME
Hard Red Winter Wheat

9. DATE OF DETERMINATION
a) July, 1983
b) July, 1985

FEES RECEIVED
AMOUNT FOR FILING $ 1800.00
DATE July 2, 1987
AMOUNT FOR CERTIFICATE $ 200.00
DATE Nov. 21, 1988

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation and U.S. Goverment Agency

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Nebraska and D.C.

12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

Dr. I. T. Omtvedt, Dean and Director
Agricultural Research Div., IANR-UNL
Lincoln, NE 68583-0704
Telephone: 402-472-2045

Dr. T. B. Kinney, Jr., Administrator
USDA/ARS, Administration Bldg., Room 302A
Washington, D.C. 20250

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

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

b. [X] Exhibit B, Novelty Statement

c. [X] Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*

d. [X] Exhibit D, Additional Description of the Variety

e. Statement of Applicant's Ownership

15. 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) of the Plant Variety Protection Act.)*
[X] Yes *(If "Yes," answer items 16 and 17 below)* ☐ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
[X] Yes ☐ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
[X] Foundation [X] Registered [XX] Certified

18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ Yes *(If "Yes," give date)*
[XX] No

19. HAS THE VARIETY BEEN OFFERED FOR SALE OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
[XX] Yes *(If "Yes," give names of countries and dates)*
U.S., September, 1986
☐ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) 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(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT Irvin T. Omtvedt, Director, Nebr. Ag. Research Div. DATE 6/15/87
Irvin T. Omtvedt

SIGNATURE OF APPLICANT T. B. Kinney DATE JUL 28 1987

FORM LMGS-470 (8-83) (Edition of 9-81 is obsolete)

Exhibit A

Origin and Breeding History of Redland
Hard Red Winter Wheat

Pedigree: 'Redland' (P.I.502907),(NE851182) originated as a composite of 24 lines selected from the 'Brule' cultivar on the basis of resistance to Hessian fly (Great Plains biotype) and a homogeneous stem rust reaction via stem rust resistance gene SR6.

History: The breeding history of Redland is summarized in Table 1. The decision to release NE851182 as Redland was made by the Nebraska Agricultural Research Division, IANR-UNL on July 24, 1985. Public release of information on Redland as a cultivar occurred on June 15, 1986 (release statement attached). The release was cooperative with the Agricultural Research Service, U.S. Department of Agriculture.

The initial allocation of Foundation seed to certified seed producers was made in September, 1986.

Redland appears uniform and stable during seed increase. Less than 1% of the plants were rogued from Foundation and Breeder seed fields in 1986. Less than 0.05% (1:2000) variant plants (taller height or red-chaffed heads) may be encountered in subsequent generations.

Exhibit A

Breeding History of Redland Hard Red Winter Wheat

Year	Status	Disposition
1981	100 head selected from preliminary increase planting of NE75414 (later named Brule).	Seeded as head-rows in a stem rust nursery.
1982	Head-row nursery. Stem rust resistant lines harvested.	Harvested lines advanced to single plot observation nursery.
1983	Selected lines in single plot observation nursery.	25 lines selected for seed increase.
1984	25 lines in drill strip increases.	24 lines harvested and composited as "Brule Composite" for breeder seed increase.
1985	Breeder seed increase of Brule Composite. Tested as NE851182 in state-wide tests.	To Foundation Seed Division for seed increase. Milling and baking quality tests.
1986	State-wide tests and in Northern and Southern Regional Performance Nursery.	Named and released as Redland on June 15, 1986. P.I. 502907 assigned.

Exhibit B

Novelty Statement

Redland is most similar to the hard red winter wheat cultivar Brule, but it can be distinguished by the following characteristics:

1. Redland is homogeneous for SR6, a major stem rust resistance gene, based on seedling tests, including the 1986 SRPN and NRPN (see attached Tables 2 and 3). Brule is described (Crop Science, Vol 23, pg 1223) as being heterogeneous for SR6.

2. Redland's beak length is classified as short to moderately short. Average beak length is distinctly shorter and less variable than for Brule, according to measurements from spikelets from the central 1/3 of the heads, when grown under similar conditions (see Table 4, Statistical Data).

3. Redland's mature plant height is classified as medium. Average plant height is distinctly shorter and height is less variable than for Brule, when grown under similar conditions.

Variety	Mean	Confidence Limit (99%)	Range
Redland	93.6 cm	±2.9 cm	81.5 to 110.4 cm
Brule	97.9 cm	±3.9 cm	81.3 to 120.6 cm

Table 2. Reaction of the 1986 Uniform Southern Regional Hard Red Winter Wheat Nursery to selected isolates of Puccinia graminis f. sp. tritici. (By D. V. McVey, USDA, ARS, U. of MN., St. Paul, MN.)

		Reaction produced by isolates								
		70-44-68A	72-00-1370C	69-21-399	71-21-584B	72-25-639C	72-00-53A	75-32-1622A	72-01-4A	74-21-1409A
		29	151			11-32-113			15B-2	
No.	Entry	HJCS	QFBS	QSHS	RHRS	RKQS	RTQQ	RTQS	TNMH	TNMK
1.	Kharkof	S	S	S	S	S	S	S	S	S
2.	Scout 66	S	S	S	S	S	;1N	S	0;	S
3.	Tam 105	2	2	2	2	2	2	2	S	S
4.	KS82H4	2=	2=	2-	2-	2-	2=	2=	2=	2+
5.	KS82H144	2	2	2	2-	2-	2	S	S	S
6.	KS831957	S	S	S	2,S	S	S	S	S	S
7.	KS831374	2-	2=	2	2=	2-	2-	2=	S	S
8.	KS831203	2=,S	2	2	2=	2	2	2-	S	S
9.	KS82C2009	2-	2	2	2=	2	;	2+	;	2+
10.	OK81322	2=	1	2-	2=	;1-	0;	;1-	2	2-
11.	OK83396	0	2=	2=	2=	2=	2=	2=	2-	2-
12.	OK83398	0	2=	2=	2=	2=	2=	2=	2-	2-
13.	OK83201	0	1	2=	1	2=	0;	2+	0;	S
14.	OK82377	2=	2=	2=	2=	2=	2=	2=	2-	2-
15.	TX81V6180	0	2=	2=	2=	2=	2=	2=	2-	2=
16.	TX81V6183	0	2=	2=	2	2	S	-	2-,S	2-,S
17.	TX81V6187	0	0	2=	2-	S	2;S	S,2=	2-	2-,S
18.	TX80A4135-6	2	2	2	S	2-,S	S	23	S	S
19.	TX78A3345-V42	2-	S	2-	2	2-	S	DEAD	S	S
20.	TX80A5172-4	2	S	S	S	2	S	S	S	S
21.	TX78V2430-36	2=	2=	2=	2=	2-	2=	2-	2	2
22.	TX81V5581	2=	0;	2=	2=	2=	2=	2-	0;	;
23.	TX80A5901-1	2=	2=	2=	2=	2=	2-	2	2	2
24.	TX84V1227	0	0	2=	2=	2=	2-	2=	0;	0;
25.	TX84A7608	2-	S	2,S	2;S	2=	;1	S	0;	S
26.	CO820026	0	S	S	S	S	S	S	S	S
27.	CO810010	0	0	2	;1-	2=	2CN	2CN	0;	0;
28.	NE851182 Redland	0	0	S	S	S	;	S	0;	0;
29.	NE77465	0	0	2	2=	2=	0;	2	0;	0;
30.	NE78488	0	0	2	2=	2-	0;	2	0;	2
31.	AGC 101	S	S	S	S	S	S,2CN	S	S	S
32.	AGC 102	S	0,S	S	S	S	S,;1N	S,2	S	S
33.	AGC 106	0	2	S	2=	S	S	S	2	2-
34.	AGC 110	S	2	S	S	2	S	S,2	S	S
35.	RH845202	0	2	S	S	2	S	S,2	5,0;	S
36.	RH855001	0,2	0	2	2+	1N	1N	2=	0;	;1-
37.	RH855002	0	;	S	S	S	S	S	23CN	23CN
38.	NA-HW81-170	0	2=	2=	2=	2=	;	2-	0;	2
39.	NA-81-362-5	0	1	2-	2=	2=	2-	2-	2	2
40.	NA-81-171-14	2=	2-	2-	2	2-	;	2	0;	2
41.	SDG-1001	0	S	S	S	S	S	23	S	S
42.	BOUNTY-205	0	0;	S	2	S	S	S	;	;
43.	BOUNTY-301	0	2-	2	2-	2-	;1-	2	0;	2
44.	XH216A	S	0;	S	S	S	S	S	0;	;1N
45.	XH551	;1,S	S	S	S	S	S	S	23CN	23CN

8700168

Table 34. Reaction of the 1986 Uniform Northern Regional Hard Red Winter Wheat Nursery to selected isolates of *Puccinia graminis* f. sp. *tritici*. (By D. V. McVey, USDA, ARS, U. of MN., St. Paul, MN.)

		Reaction produced by isolates								
		70-44-68A	72-00-1370C	69-21-399	71-21-584B	72-25-639C	72-00-53A	75-32-1622A	72-01-4A	74-21-1409A
		29	151			11-32-113			15B-2	
No.	Entry	HJCS	QFBS	QSHS	RHRS	RKQS	RTQQ	RTQS	TNMH	TNMK
1.	Kharkof	S	S	S	S	S	S	S	S	S
2.	Warrior	S	S	S	S	S	S	S	S	S
3.	Colt	2=	0;	2	2	2=	;	2=	0;	0;
4.	SD82195	2	2	23	23	2	;	S	S	S
5.	SD82102	2+	2	2	2	S	S	S	S	S
6.	SD76598-7	2=	0;	2-	2=	1	;	2=	0;	0;
7.	SD2144	2+	0	S	2	S	;,S	S	0;	0;
8.	SD76463-16	2=	S	2	2=	23	;	S	0;	S
9.	SD791117	2	S	23	23	2;S	S	S	S	S
10.	SD82114	0,S	S	S	S	S	S	S	0;,S	S
11.	SD79892	0,S	S	S	S	S	S	2	0;,S	S
12.	NE82651	0	0;	S	S	S	;	S	0;	0;
13.	NE82652	0	0;	S	S	S	;	S	0;	0;
14.	NE82656	2-	0	2	2-	2	0	2-	0;	;
15.	NE82658	2	0	23CN	2,S	2	;	2	0;	;
16.	NE851182 Redland	0,2	0	S	S	S	;	S	0;	;
17.	ND8002	0	0	S	2	0	S	S	0;	;
18.	ND8061	S	2	S	S	S	S	S	S	S
19.	NE8095	0	2-	0	S	S	S	S	S	S
20.	RH846835 Hybrid	2=	2=	2	2	2=	2=	2=	2	2-
21.	RH852515 Hybrid	;1	0;,2=	2-	2=	2=	;	2-	0;	;1
22.	RH853514 Hybrid	0	2=	2	2=	2=	2=	2=	1	2-
23.	NA-HW81-459	0	2=	2-	2=	2=	1	2=	2-	2+
24.	XNH1228 Hybrid	S	2,S	S	S	S	S	S	S	S
25.	XNH1337 Hybrid	S,2	2	2	S	2-,S	2-,S	2-,S	2,S	2,S
26.	XNH1342 Hybrid	2+	2+	2	2-	2	23	23	2	S
27.	MT7877 Norwin	0	S	S	S	S	S	S	0;	S
28.	MT8030	0	0;	S	S	S	;	S	S	0;
29.	MT8039	0	0	S	S	S	S	S	S	0;
30.	MT80112	0	S	S	S	S	S	S	S	S

6

Table 4.

A.N.O.V.A. For Beak Length
Redland vs. Brule

Source	df	s.s.	m.s.
varieties	1	14.15	14.15
error	48	106.05	2.21
total	49	120.20	---

F test = 6.403*

Varieties	Mean	Confidence limit (99%)	Range
Redland	2.5 mm	± 0.69 mm	1.5 to 3.3 mm
Brule	3.6 mm	± 0.94 mm	2.0 to 9.0 mm

*The means for beak length are significantly different at the 5% alpha level.

FORM APPROVED: OMB NO. 0581-0056

EXHIBIT C
(Wheat)

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN AND SEED DIVISION
BELTSVILLE, MARYLAND 20785

OBJECTIVE DESCRIPTION OF VARIETY

WHEAT *(TRITICUM SPP.)*

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Board of Regents, Univ. of Nebraska and USDA/ARS

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
Lincoln, NE 68583-0745
Washington, D.C. 20250

FOR OFFICIAL USE ONLY

PVPO NUMBER 8700168

VARIETY NAME OR TEMPORARY DESIGNATION
Redland

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:

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

[2] 1 = SPRING 2 = WINTER 3 = OTHER *(Specify)* _____

[2] 1 = SOFT 2 = HARD 3 = OTHER *(Specify)* _____

[2] 1 = WHITE 2 = RED 3 = OTHER *(Specify)* _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO: N/A

[ ][ ][ ] FIRST FLOWERING [ ][ ][ ] LAST FLOWERING

4. MATURITY *(50% Flowering)*:

[ ][ ] NO. OF DAYS *EARLIER* THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[0][2] NO. OF DAYS *LATER* THAN (regional data) ..... [2] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT *(From soil level to top of head)*:

[0][8][4] CM. HIGH

[0][7] CM. TALLER THAN (1986 NRPN data) ..... [7] 7 = Colt

[0][8] CM. SHORTER THAN (1986 SRPN data) ..... [2] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING *(See reverse)*:

[3] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE

8. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom: 1 = ABSENT 2 = PRESENT

[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[0][5] NO. OF NODES *(Originating from node above ground)*

[2][7] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW (based on Nebr. data)

9. AURICLES:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER *(Specify)*: _____

[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[1][4] MM. LEAF WIDTH *(First leaf below flag leaf)*

[2][8] CM. LEAF LENGTH *(First leaf below flag leaf)*:

FORM LMGS 470-6 (6-82) (Formerly Form LPGS 470-6 (3-79), which may be used)

8

8700168

11. HEAD:

[3] Density: 1 = LAX 2 = DENSE 3 = mid-dense

average = 40.5 mm

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[1] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[0 8] CM. LENGTH (actual average = 8.3)

[1 1] MM. WIDTH (actual average = 10.9)

12. GLUMES AT MATURITY:

[1] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.) (actual ave. = 7.4)

[1] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.) (actual ave. = 3.2)

[4] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE (actual ave. length = 2.5 mm)

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[1] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[3] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1 ~~2~~] Brush: 1 = NOT COLLARED 2 = COLLARED

[ ] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[0 5] MM. LENGTH (actual = 5.4) [0 3] MM. WIDTH (actual = 2.9)

[2 8] GM. PER 1000 SEEDS

10/31/88

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3 = mod. susceptible, 4 = mod. resistant, 5 = tolera

[2] STEM RUST (Races) 29, 151, 15B-2 (regional data)

[3] LEAF RUST (Races) field races

[0] STRIPE RUST (Races) _____

[0] LOOSE SMUT

[4] POWDERY MILDEW

[0] BUNT

[ ] OTHER (Specify) 3 = soilborne mosaic virus ~~5 = wheat streak mosaic virus~~

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[0] APHID (Bydv.)

[0] GREEN BUG

[0] CEREAL LEAF BEETLE

[ ] OTHER (Specify) _____

HESSIAN FLY RACES:

[2] GP [0] A [0] B [0] C

[0] D [0] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Brule	Seed size	Brule
Leaf size	Brule	Seed shape	Brule
Leaf color	Brule	Coleoptile elongation	Brule
Leaf carriage	Brule	Seedling pigmentation	Brule

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

RECEIVED JUL 20 1987 Plant Variety Protection

Exhibit D

Additional Description of Redland

Redland is a hard red winter wheat tested as NE851182 and is the product of cooperative research of the Nebraska Agricultural Research Division, IANR-UNL and the USDA/ARS, North Central Region.

Redland is an awned, white-glumed, intermediate height cultivar. It is most similar to Brule, from which it was selected. When compared with Brule, Redland is slightly later in maturity, slightly shorter in height, similar in winterhardiness, lodging resistance and yield. In no instance is the deviation a significant change.

The milling and bread baking properties of Redland are very similar to those of Brule, with strong dough handling characteristics as measured by the mixograph. Tolerance to over-mixing is good. Brule and Redland are slimilar in grain protein content. Flour of Redland has the highest loaf volume per unit protein of any variety presently grown in Nebraska. See Table 5. Chemical, Milling, and Bread-Making Data from the 1986 SPRN and Table 6 for equivalent data from the 1986 NPRN.

Redland has moderately long, mid-dense heads, tapering to strap in shape. At maturity, glumes are short to moderately short, narrow to moderate and glabrous, slightly shorter and narrower than those of Brule. The glume shoulder is square to rounded. Beaks are acuminate, length is short to moderately short. Kernels of Redland are red, semihard to hard (like Brule), elliptical to ovate, and similar to those of Brule in length, width, and test weight. The kernels of Redland have a midsized germ, shallow crease, rounded cheeks, ~~short~~ MEDIUM brush and are not collared. See Table 7. Comparative spike and Kernel Measurements.

Table 7.
Comparative Spike and Kernel Measurements of Redland and Brule.

	----Spike----			----Glume----		Beak	---Kernel----	
	Length	Width	Density	Length	Width	Length	Length	Width
	cm	mm	mm	mm	mm	mm	mm	mm
Redland	8.3	10.9	40.5	7.4	3.2	2.5	5.4	2.9
Brule	8.4	11.3	42.7	7.8	3.4	3.6	5.4	2.8

Redland has performed well throughout Nebraska and the northern hard red winter wheat region, and is especially well-adapted to most rainfed or limited irrigation production environments. The combination of yield, disease and insect reaction, height, standability, tillering ability and winter-hardiness make this variety an attractive choice in the medium maturity range.

Table 5. Chemical, Milling, and Bread-making Data for the Northern Regional Performance Nursery Composites of Hard Winter Wheats Harvested in Idaho, Minnesota, Montana, Nebraska, New Mexico, North Dakota, and South Dakota in 1986. [a,b]

Variety	C.I. or Sel. No.	Wheat: Wt. Per Bu.	Wheat: Ash	Wheat: Protein	Wheat: Flour Yield	Flour: Ash	Flour: Protein	Flour: Absorption	Dough Mix Time[c]: As Rec'd	Dough Mix Time[c]: Corrected to 12.0% Protein	Bread Crumb Grain	Loaf Volume: As Rec'd	Loaf Volume: Corrected to 12.0% Protein
		lbs	%	%	%	%	%	%	min	min		cc	cc
Kharkof	1442	58.8	1.70	12.7	74.1	0.45	11.7	57.4	3 1/8	3	Q-S	935	921
Warrior	13190	58.8	1.62	11.9	74.6	.45	11.0	56.8	3 1/2	3 1/8	S	898	933
Colt	PI476975	60.3	1.71	12.4	74.0	.41	11.4	55.7	3 1/2	3 1/4	S	905	912
Amigo/Ctk*2//SD74221	SD82195	61.2	1.58	12.3	73.7	.39	11.2	57.6	4 1/8	3 3/4	S	937	959
NE70545/NE70537// CO672135/CO662079	SD82102	60.4	1.57	12.5	73.3	.37	11.3	56.8	4 1/8	3 3/4	Q-S	873	886
CI15322//Agate/ 4*Scout 66/3/Ctk 78	SD76598-7	60.7	1.64	12.8	73.5	.43	11.5	58.1	5 1/8	4 7/8	Q	914	914
CI15322//Agate/4*Scout 66/3/Ctk 78/4/SD74221	SD82144	60.0	1.61	13.3	73.6	.40	12.3	60.0	4 1/8	-	Q-S	930	877
CI15322//3*(Agent/ 4*Scout 66)	SD76463-16	60.8	1.63	13.1	74.5	.42	12.1	58.6	3 1/8	-	S	939	898
SD75375/OK711248-1	SD791117	59.9	1.59	12.3	72.2	.41	11.3	58.1	4 5/8	4 1/4	S	893	906
SD74221*2/Lathrop	SD82114	60.5	1.63	13.3	73.8	.39	12.2	57.0	4 3/4	-	S	922	876
CI15322//4*(Agent/ 4*Scout 66)	SD79892	60.6	1.67	12.5	72.9	.40	11.5	57.5	4 5/8	4 3/8	S	908	908
Brule//Sentinel/Centurk	NE82651	61.1	1.57	12.5	74.8	.36	11.5	57.9	4 5/8	4 3/8	S	938	938
" " "	NE82652	59.1	1.65	12.2	73.1	.39	10.9	58.7	4 1/4	3 3/4	S	908	951
Brule/3/Pkr*4/Agent// Beloferkovskaia 198/Lancer	NE82656	60.0	1.67	13.1	75.1	.43	11.9	55.5	4 1/4	4 1/4	Q-S	900	874
" " " "	NE82658	60.0	1.63	12.9	73.1	.41	11.8	58.3	4 1/2	4 3/8	S	963	941
Brule Composite Redland	NE851182	58.6	1.61	11.9	73.2	.40	10.6	54.9	5	4 1/8	S	854	914
Ctk//Froid/7759-19	ND8002	58.9	1.62	12.0	74.2	.43	10.9	56.1	4 3/8	3 3/4	S	893	935
Wnk*2/II64-27	ND8061	59.9	1.61	12.2	73.6	.40	11.2	57.8	4 3/8	4	S	933	955
Wnk/Rrr	ND8095	60.4	1.72	12.4	74.6	.44	11.6	56.8	4 1/8	3 7/8	S	920	913
Winter Wheat Hybrid	RH846835	59.0	1.74	12.1	73.9	.43	11.3	60.2	4 1/4	3 7/8	S	957	972
" " "	RH852515	61.4	1.59	12.6	75.7	.44	11.6	57.6	4 5/8	4 3/8	S	920	913

8700168

Table I. (Continued)

Variety	C.I. or Sel. No.	Wheat: Wt. Per Bu.	Wheat: Ash	Wheat: Protein	Wheat: Flour Yield	Flour: Ash	Flour: Protein	Flour: Absorption	Dough Mix Time[c]: As Rec'd	Dough Mix Time[c]: Corrected to 12.0% Protein	Bread Crumb Grain	Loaf Volume: As Rec'd	Loaf Volume: Corrected to 12.0% Protein
		lbs	%	%	%	%	%	%	min	min		cc	cc
Winter Wheat Hybrid	RH853514	60.9	1.55	13.1	74.4	0.41	12.0	61.2	3 3/4	-	S	945	911
Thunderbird (Bulk selection)	NA-HW81-459	61.5	1.72	13.3	76.2	.48	12.2	56.9	3 3/8	-	S	937	890
Winter Wheat Hybrid	XNH1228	57.1	1.78	12.1	71.8	.44	11.1	56.7	3 3/4	3 3/8	S	931	960
" " "	XNH1337	58.8	1.72	12.3	72.5	.44	11.3	57.8	4 3/8	4	S	890	903
" " "	XNH1342	58.0	1.70	12.4	72.1	.45	11.3	57.8	4 1/8	3 3/4	S	885	898
Norwin	MT7877	57.7	1.71	12.2	73.7	.44	11.4	57.1	4	3 3/4	S	910	917
TX65A268/Froid// YTO 117-20/Ctk	MT8030	60.4	1.65	12.7	73.2	.40	11.4	56.6	4	3 3/4	S	963	970
Lancota/Froid// NE69559/Wnk	MT8039	57.3	1.68	12.6	73.6	.45	11.8	59.6	4 3/8	4 1/4	S	950	929
NE63283/6*Cheyenne	MT80122	57.1	1.61	11.3	72.7	.40	10.5	56.8	4 7/8	4	S	863	932

[a]Data expressed on a 14% moisture basis.

[b]S, Q, and U = satisfactory, questionable, and unsatisfactory quality with respect to property in question. A satisfactory rating is inferred in the absence of a designated one. One unsatisfactory rating characterizes a variety as undesirable for hard winter wheat milling and breadmaking purposes.

[c]Mixing times for samples having less than 12% protein have been corrected to 12% protein by CT=0.12 PT-0.44T where CT=corrected mixing time, P=protein content, and T=as-received mixing time.

8700168

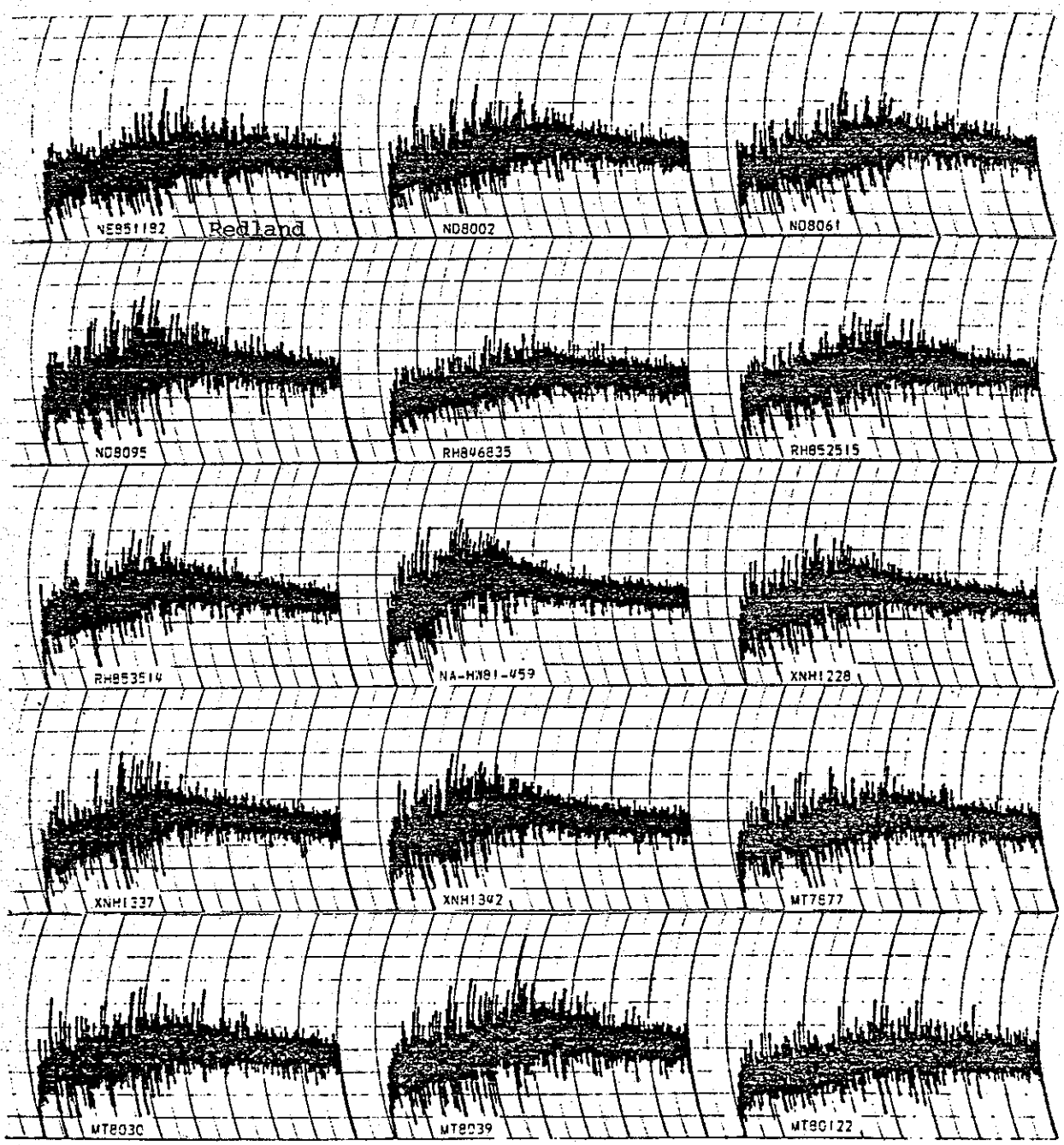

Table 6. Mixograms (10 g of flour) for the Northern Regional Performance Nursery composites of hard winter wheat varieties harvested in Idaho, Minnesota, Montana, Nebraska, New Mexico, North Dakota, and South Dakota in 1986. Mixing time is the time (min) to the peak (point of minimum mobility). Mixing tolerance is the slope and width after the peak and stability of mixogram height on either side of the peak. Major arcs are at 1-min intervals.

Exhibit E

Statement of the Basis of the Applicant's Ownership

The University of Nebraska and the USDA/ARS are the applicants for protection in the case of Redland hard red winter wheat being:

a) Redland is a product of the cooperative state-federal breeding program located in the Agricultural Research Division, University of Nebraska. Dr. John W. Schmidt and Dr. Virgil A. Johnson, regular employees of the Nebraska ARD (Department of Agronomy) and the USDA/ARS (stationed and functioning as a staff member in the Department of Agronomy) respectively, have bred the named cultivar for and within these incorporated institutions.

b) By established policy, release of the cultivars developed by the Nebraska ARD is the responsibility of the Nebraska ARD as the agency providing staff funds and facilities for the breeding program.

United States Department of Agriculture
Agricultural Marketing Service
Livestock and Seed Division
Plant Variety Protection Office
National Agricultural Library Building, Rm. 500
Beltsville, MD. 20705

PLANT VARIETY PROTECTION OFFICE

Gentlemen:

Subject: Application No. 8700168
Variety and Kind: Wheat, 'Redland'

As provided in section 83(a) of the Plant Variety Protection Act, 7 U.S.C. 2321, we request that the Certificate on the above variety be issued with a notation on the Certificate that the right to exclude others from selling, offering for sale, reproducing, importing or exporting the variety covered by this Certificate, or using it in producing a hybrid or different variety is waived, except that this waiver shall not apply to breeders seed, foundation seed, labeling requirements, and blending limitations.

It has been agreed that the Certificate should be issued in the name(s) of:

The Board of Regents, The University of Nebraska

9-16-87
(Date)

by (Signature)
John W. Goebel, Vice Chancellor for Business and Finance
The University of Nebraska - Lincoln