No. 9900208

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

South Dakota Agricultural Experiment Station

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 RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Ingot'

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 twelfth day of September, in the year two thousand one.*

VARIETY PROTECTION OFFICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Attest:

Paul M. Jankowski

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary 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: South Dakota Agricultural Experiment Station

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME: SD3249

3. VARIETY NAME: Ingot

4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)
South Dakota State University
Ag Hall 129
Brookings SD 57007

5. TELEPHONE (include area code): 605-688-4149

6. FAX (include area code): 605-688-6065

FOR OFFICIAL USE ONLY

PVPO NUMBER: 9900208

FILING DATE: 2/26/99

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.): Agricultural Experiment Station

8. IF INCORPORATED, GIVE STATE OF INCORPORATION: N/A

9. DATE OF INCORPORATION: N/A

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION (First person listed will receive all papers)
Dr. Jackie Rudd, Spring Wheat Breeder
South Dakota State University
Plant Science Department
NPB 244D Box 2140C
Brookings SD 57007-2141

FEES RECEIVED
FILING AND EXAMINATION FEES: $ 2450
DATE 2/26/99
CERTIFICATION FEE: $ 320.00
DATE 8/27/01

MAH 5/6/99

11. TELEPHONE (include area code): 605-688-4769

12. FAX (include area code): 605-688-4452

13. E_MAIL: ruddj@mg.sdstate.edu

14. CROP KIND (Common Name): Common Wheat

15. GENUS AND SPECIES NAME OF CROP: Triticum aestivum L.

16. FAMILY NAME (Botanical): Gramineae

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

18. 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 ($2,450), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)

19. 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 20 and 21 below) ☐ NO (If "no," go to item 22)

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☒ NO

21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. 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.)

23. 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.)

24. The owners declare that a viable sample of basic seed of the variety will be 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]

SIGNATURE OF OWNER:

NAME (Please print or type): Dr. Kevin Kephart

NAME (Please print or type):

CAPACITY OR TITLE: Director SDAES

DATE: 2-25-99

CAPACITY OR TITLE:

DATE:

INSTRUCTIONS

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 $2,450 ($300 filing fee and $2,150 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 500, 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 $300 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/pvp.htm

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ITEM

18a. 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

18b. 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

18c. 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.

18d 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.*

18e. 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.

19. 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).*

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

3. *See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.*

2. 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.)*

U.S.A., released to Registered seed growers, South Dakota Crop Improvement Association. March 1, 1998

3. 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. There is no charge for filing a change of address. The fee for filing a change of 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.)*

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center—East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes 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. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (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 the USDA Office of Communications at (202) 720-2791. To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD) USDA is an equal opportunity employer.

The revised Exhibit A for HRSW Ingot:

EXHIBIT A.
Ingot (SD3249)
Origin and Breeding History of the Variety

Ingot is an F_4 derived line from the cross 'SD3080/Dalen' made at Brookings, South Dakota in 1989. The pedigree of SD3080 is Butte 86/SD3004 and the pedigree of SD3004 is Butte*2/6549-8-101-16//SD8010. The pedigree beyond 6549-8-101-16 and SD 8010 is untraceable, however these two lines come from the South Dakota Hessian fly resistance breeding program. The F_1 plants were grown at Yuma, Arizona during the winter of 1990-1991. Individual F_2 plant selections were made at Brookings, South Dakota in 1991 and were grown at Yuma, Arizona the following winter (1991-92) as plant rows. The plant rows at Yuma were harvested as rows and used to plant $F_{2:4}$ yield trials and a space planted nursery at Brookings in 1992. Based on data collected from the yield trials, individual plants were selected within the selected populations. Populations were selected based on grain yield, grain volume weight, and bread-making characteristics and individual plants were visually selected for resistance to prevalent foliar pathogens (viz. leaf rust and stem rust). Plant rows were grown in Yuma during the winter (1992-93) and $F_{4:6}$ yield trials were conducted at Brookings in 1993. Based on the yield performance and the disease resistance, it was promoted to first year replicated yield trial in 1994 with an experimental designation of SD3249. Seed increase was conducted by the South Dakota Spring Wheat Breeding Program from 1994 through 1996. Breeders' seed was produced in 1996 and Foundation seed was produced in 1997.

Ingot was tested by the South Dakota Spring Wheat Breeding Program from 1994 through 1997 and in Crop Performance Trial (CPT) and the Uniform Regional Spring Wheat Nursery from 1996 through 1997. It was tested by the Wheat Quality Council (WQC) in 1997.

Ingot has been uniform and stable for all morphological characters during the past four generations of selfing and increase. A tall variant (12 cm taller) was identified in the breeders seed at a frequency of 0.005% in 1996 and 0.06% in 1997 foundation seed field. Up to 0.1% variant plants may be encountered in subsequent generations. The variants were similar to the general population with respect to head type and protein banding pattern.

EXHIBIT B.
Ingot (SD3249)
Statement of Distinctness

Ingot is most similar to the hard red spring wheat cultivars 'Forge' and 'Russ', but differs in the following characteristics:

Plant Height: On the average, Ingot is six centimeters taller than Forge and four centimeters taller than Russ (Table 1).

Test Weight: Ingot has 3 lb/bu higher test weight than Forge and Russ, when recorded directly from combine (Table 1).

Heading: Ingot is two days earlier than Russ, but is similar to Forge (Table 1).

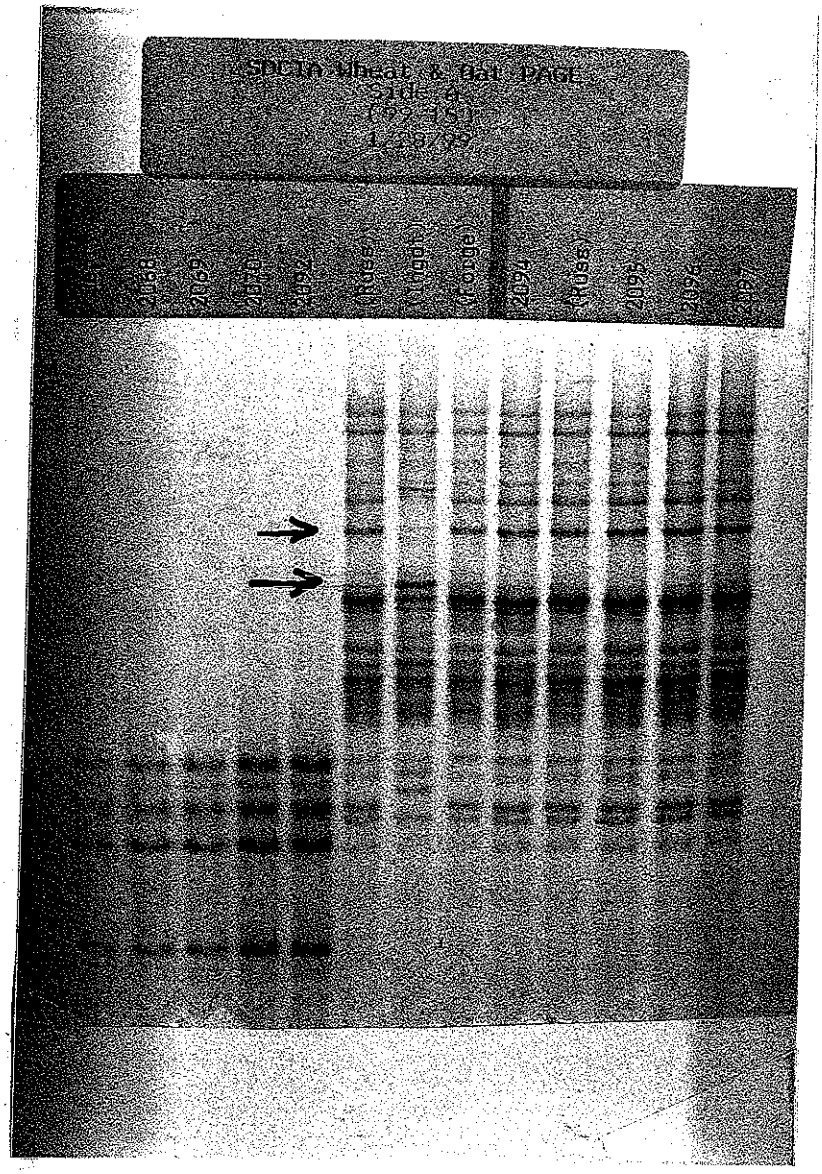
Polyacrylamide Gel Electrophoresis (PAGE): Polyacrylamide Gel Electrophoresis revealed that Ingot differs from Forge and Russ by at least two protein-bands (Photograph 1). The upper arrow on the photograph points to a band that is absent in Ingot but present in Forge and Russ, while the lower arrow points to a band that is present in Ingot but absent in Forge and Russ. PAGE was conducted by Dr. Brent Turnipseed, Seed Testing Lab, South Dakota State University.

Table 1. South Dakota State University, Spring Wheat Breeding Trials Combined over Locations and Years.

	Grain Yield (bu/a)				Test Weight (lb/bu)				Plant Height (cm)				Heading (days)			
	1996 (9)	1997 (7)	1998 (7)	96-98 (23)	1996 (8)	1997 (7)	1998 (6)	96-98 (21)	1996 (7)	1997 (4)	1998 (3)	96-98 (14)	1996 (7)	1997 (5)	1998 (6)	96-98 (18)
Ingot	54.3	40.8	41.7	46.4	63.7	60.4	58.9	61.2	91.8	85.4	88.0	89.2	178.7	178.4	171.7	176.3
Forge	55.3	42.0	43.3	47.6	62.1	56.3	54.2	57.9	85.0	77.1	87.0	83.2	178.5	177.8	170.7	175.7
Russ	56.6	44.1	42.9	48.6	61.3	57.8	54.8	58.3	88.2	80.4	84.6	85.2	180.8	180.3	173.9	178.4
CV%	6.7	6.7	7.8	7.2	1.4	2.4	3.7	2.8	3.7	2.3	3.0	3.3	0.5	0.4	0.5	0.5
LSD (5%)	3.4	2.9	3.5	1.9	0.8	1.5	2.3	1.0	3.5	2.6	4.3	2.1	0.9	1.0	1.0	0.6

N. B.: Figures in parentheses indicate the number of locations that data was collected.

Photograph 1. Acid Polyacrylamide Gel Electrophoresis (PAGE) of hard red spring wheat cultivars Ingot, Forge, and Russ.



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

EXHIBIT C
(*Wheat*)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S)

SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION

ADDRESS (*Street and No. or R.F.D. No., City, State, and Zip Code*)

South Dakota State University
Agricultural Hall, 129
Brookings SD 57007

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PVPO NUMBER 9900208

VARIETY NAME

Ingot

TEMPORARY OR EXPERIMENTAL DESIGNATION

SD 3249

PLEASE READ ALL INSTRUCTIONS CAREFULLY: 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. [ ][ ][ ] or [ ][ ]) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____.

Please answer all questions for your variety; lack of response may delay progress of your application.

1. **KIND:**

[1] 1=Common 2=Durum 3=Club 4=Other (SPECIFY) _____

2. **VERNALIZATION:**

[1] 1=Spring 2=Winter 3=Other (SPECIFY) _____

3. **COLEOPTILE ANTHOCYANIN:**

[1] 1=Absent 2=Present

4. **JUVENILE PLANT GROWTH:**

[2] 1=Prostrate 2=Semi-erect 3=Erect

5. **PLANT COLOR (boot stage):**

[2] 1 = Yellow-Green 2 = Green 3 = Blue-Green

6. **FLAG LEAF (boot stage):**

[2] 1 = Erect 2 = Recurved [2] 1 = Not Twisted 2 = Twisted

7. **EAR EMERGENCE:**

[0][2] Number of Days Earlier Than Russ *

[ ][ ] Number of Days Later Than _____ *

8. **ANTHER COLOR:**

[1] 1 = YELLOW 2 = PURPLE

9. **PLANT HEIGHT (from soil to top of head, excluding awns):**

[0][6] cm Taller Than Forage *

[0][6] cm Shorter Than Chris *

10. STEM:

A. ANTHOCYANIN

[1] 1= Absent 2=Present

B. WAXY BLOOM

[2] 1=Absent 2=Present

C. HAIRINESS (last internode of rachis)

[2] 1=Absent 2=Present

D. INTERNODE (SPECIFY NUMBER) 4 (including peduncle)

[1] 1=Hollow 2=Semi-solid 3=Solid

E. PEDUNCLE

[2] 1=Absent 2=Present

[40] cm Length

11. HEAD (at Maturity):

A. DENSITY

[2] 1=Lax 2=Middense 3= Dense

B. SHAPE

[1] 1 = Tapering 2= Strap 3 = Clavate 4 = Other (SPECIFY) _____

C. CURVATURE

[2] 1 = Erect 2 = Inclined 3 = Recurved

D. AWNEDNESS

[4] 1 = Awnless 2 = Apically Awnletted 3 = Awnletted 4 = Awned

12. GLUMES (at Maturity):

A. COLOR

[1] 1 = White 2 = Tan 3 = Other (SPECIFY) _____

B. SHOULDER

[2] 1 = Wanting 2 = Oblique 3 = Rounded 4 = Square 5 = Elevated 6 = Apiculate

C. BEAK

[3] 1 = Obtuse 2 = Acute 3 =Acuminate

D. LENGTH

[2] 1 = Short (ca. 7mm) 2 = Medium (ca. 8mm) 3 = Long (ca. 9mm)

E. WIDTH

[2] 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm) 3 = Wide (ca. 4mm)

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13. SEED:

A. SHAPE

[1] 1 = Ovate 2 = Oval 3 = Elliptical

B. CHEEK

[2] 1=Rounded 2=Angular

C. BRUSH

[2] 1=Short 2=Medium 3=Long

[1] 1 = Not Collared 2 = Collared

D. CREASE

[2] 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

[2] 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

13. SEED: (continued)

E. COLOR

[3] 1 = White 2 = Amber 3 = Red 4 = Other (SPECIFY) _____

F. TEXTURE

[1] 1=Hard 2=Soft

G. PHENOL REACTION *(see instructions)*:

[ ] 1 = Ivory 2 = Fawn 3 = Light Brown 4 = Dark Brown 5 = Black

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

Stem Rust *(Puccinia graminis* f. sp. *tritici)*
[2] field and seedling reaction

Stripe Rust *(Puccinia striiformis)*
[0]

Tan Spot *(Pyrenophora tritici-repentis)*
[0]

Halo Spot *(Selenophoma donacis)*
[0]

Septoria nodorum (Glume Blotch)
[0]

Septoria avenae (Speckled Leaf Disease)
[0]

Septoria tritici (Speckled Leaf Blotch)
[0]

Scab (*Fusarium* spp.)
[3]

"Black Point" (Kernel Smudge)
[0]

Barley Yellow Dwarf Virus (BYDV)
[0]

Soilborne Mosaic Virus (SBMV)
[0]

Wheat Yellow (Spindle Streak) Mosaic Virus
[0]

Wheat Streak Mosaic Virus (WSMV)
[0]

Other (SPECIFY) _____
[ ]

Other (SPECIFY) _____
[ ]

Other (SPECIFY) _____
[ ]

Leaf Rust *(Puccinia recondita* f. sp. *tritici)*
[3] field reaction

Loose Smut *(Ustilago tritici)*
[0]

Flag Smut *(Urocystis agropyri)*
[0]

Common Bunt *(Tilletia tritici* or *T. laevis)*
[0]

Dwarf Bunt *(Tilletia controversa)*
[0]

Karnal Bunt *(Tilletia indica)*
[0]

Powdery Mildew *(Erysiphe graminis* f. sp. *tritici)*
[0]

"Snow Molds"
[0]

Common Root Rot *(Fusarium, Cochliobolus* and *Bipolaris* spp.)
[0]

Rhizoctonia Root Rot *(Rhizoctonia solani)*
[0]

Black Chaff *(Xanthomonas campestris* pv. *translucens)*
[0]

Bacterial Leaf Blight *(Pseudomonas syringae* pv. *syringae)*
[0]

Other (SPECIFY) _____
[ ]

Other (SPECIFY) _____
[ ]

Other (SPECIFY) _____
[ ]

Other (SPECIFY) _____
[ ]

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

Hessian Fly *(Mayetiola destructor)*
[0] _____

Stem Sawfly *(Cephus* spp.)
[0] _____

Cereal Leaf Beetle *(Oulema melanopa)*
[0] _____

Russian Aphid *(Diuraphis noxia)*
[0] _____

Greenbug *(Schizaphis graminum)*
[0] _____

Aphids
[0] _____

Other (SPECIFY) _____
[ ] _____

Other (SPECIFY) _____
[ ] _____

Other (SPECIFY) _____
[ ] _____

Other (SPECIFY) _____
[ ] _____

Other (SPECIFY) _____
[ ] _____

Other (SPECIFY) _____
[ ] _____

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS:

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EXHIBIT D.
Ingot (SD3249)
Additional Description of the Variety

The following additional descriptive information is presented:

- Release notice of Ingot
- Table 2. South Dakota performance data.
- Table 3. Uniform Regional Spring Wheat performance data.
- Table 4. 1998 Wheat Quality Council data.

Release of 'Ingot' Hard Red Spring Wheat

Ingot was developed by the South Dakota Agricultural Experiment Station and tested under the experimental designation of SD3249. It is an early, standard height hard red spring wheat from the cross SD3080/Dalen. The pedigree of SD3080 is Butte 86/SD3004. It is anticipated that Ingot will be submitted for cultivar protection under the United States Plant Variety Protection Act with the certification option.

The most significant features of Ingot is very high test weight, good bread-making quality, and tolerance to scab. It has been in the South Dakota crop performance trials since 1995 and Uniform Regional Spring Wheat Nursery since 1996. It was tested by the Wheat Quality Council in 1997. In comparison to 'Butte 86', Ingot has a similar grain yield, is 1 day early heading, slightly taller, is 2 pounds per bushel higher in test weight, and is slightly higher in protein.

In South Dakota yield trials, Ingot has yielded similar to Butte 86, 'Sharp', and '2375' and has yielded 2 to 4 bushels per acre less than 'Russ' and 'Oxen'. The volume weight of Ingot is 2 pounds per bushel higher than Butte 86 and 1 pound higher than Sharp or 2375. Ingot is early in maturity - time from planting to heading in South Dakota is the same as 'Forge' and one day earlier than Butte 86. The plant height of Ingot averages one to two inches taller than Butte 86. The straw strength is similar to Butte 86 or Sharp. Although Ingot threshes easily, shattering has not been observed.

Ingot is resistant to the prevalent races of stem and leaf rust and is moderately susceptible to leaf spotting. Ingot is more tolerant to Fusarium head scab than Butte 86, Sharp, or 2375, but less than 'BacUp'.

The grain of Ingot has medium-high protein content with good milling and bread-making properties. In comparison to 'Grandin', Ingot is higher in volume weight, similar in protein content, similar in dough strength, and similar in baking properties.

Table 2. South Dakota performance data, 1998.

Entry	Name	Yield (bu/a) BRK	GRO	WAT	HIG	SEL	DAY	Average	TW lb/bu	Heading days	Ht cm	Scab %	97-98 Yield
12	SD3310	52.9*	45.6*	55.9*	42.2	56.9*	55.4*	51.5*	54.6	170	86	41.1	48.1
25	SD3411	53.2*	42.6*	56.2*	44.5*	49.1	48.3	49.0	54.3	171	84	55.9	
18	SD3355	46.8	45.3*	48.8	46.6*	54.6*	49.6	48.6	55.3	172	90	67.7	46.3
11	SD8119	53.3*	43.4*	51.5	44.5*	46.0	50.8	48.2	54.2	173	85	70.2	46.8
14	SD3348	51.8*	38.3	50.6	47.0*	50.0	51.6	48.2	56.7	172	84	61.9	46.4
19	SD3367	52.2*	39.5	53.4*	48.5*	48.2	46.5	48.1	55.0	171	84	47.9	45.0
16	SD3335	52.6*	43.4*	50.3	41.8	48.4	51.0	47.9	55.5	171	89	54.2	46.0
9	SD3219	46.5	38.6	50.8	45.2*	50.4	55.0*	47.7	51.7	173	84	53.9	44.8
34	SD3455	42.3	46.9*	48.2	43.7*	52.1	50.3	47.3	55.1	170	86	51.1	
13	SD3345	49.4	40.9	52.7	46.4*	42.7	50.9	47.1	58.0	171	89	65.1	45.3
20	SD3390	43.6	41.3	49.6	45.2*	48.7	49.8	46.4	53.9	170	84	57.9	44.1
7	FORGE	44.6	39.5	47.2	43.1	49.3	54.2*	46.3	54.2	169	87	60.9	44.2
6	OXEN	50.4*	36.5	45.1	41.5	52.9*	50.1	46.1	55.3	172	80	68.4	45.2
5	RUSS	52.9*	38.5	49.5	42.1	47.0	46.6	46.1	54.8	173	85	61.9	45.1
36	SD3458	47.3	42.9*	45.9	41.1	52.4	46.3	46.0	54.2	177	99	57.9	
23	SD3407	49.4	41.8	47.9	44.3*	45.9	45.1	45.7	54.6	171	86	43.2	
17	SD3337	48.4	39.1	53.7*	42.3	44.5	45.0	45.5	56.9	171	89	59.9	43.9
10	SD8108	46.4	46.3*	47.5	38.3	43.7	49.1	45.2	56.6	172	88	65.6	44.2
33	SD3437	50.4*	41.2	45.7	44.2*	44.9	42.6	44.8	56.0	173	89	65.6	
8	INGOT	45.7	40.4	47.2	41.6	42.6	51.4	44.8	58.9	170	88	54.2	42.8
27	SD3414	48.5	40.9	49.9	40.6	42.0	46.7	44.8	54.9	169	81	39.7	
2	BUTTE 86	48.2	35.1	49.7	45.9*	45.2	44.6	44.8	53.7	170	84	59.7	42.7
28	SD3417	49.0	37.7	46.5	40.0	46.7	45.2	44.2	47.1	175	87	61.7	
15	SD3356	46.4	39.5	40.1	40.4	48.7	48.6	44.0	56.1	172	77	67.1	43.5
29	SD3419	49.3	35.9	44.3	39.7	47.1	47.2	43.9	57.6	172	89	52.9	
21	SD3400	48.2	35.9	49.7	40.4	42.0	46.0	43.7	58.2	171	86	52.6	
22	SD3405	49.6	36.8	46.9	39.1	47.0	42.8	43.7	56.8	174	83	54.4	
3	SHARP	46.6	37.5	46.2	38.1	43.8	48.7	43.5	54.2	170	84	73.1	41.4
31	SD3429	49.1	36.8	41.8	40.7	47.1	44.4	43.3	53.8	172	87	61.6	
30	SD3423	47.9	37.6	47.9	41.3	43.3	40.8	43.1	56.7	169	83	42.4	
35	SD3457	47.5	36.1	45.7	44.1*	44.8	40.6	43.1	53.1	172	77	74.2	
32	SD3430	46.8	34.7	46.6	40.3	43.6	37.8	41.6	57.3	173	90	54.1	
24	SD3410	50.5*	30.4	43.7	43.3*	42.1	39.7	41.6	56.2	171	83	51.1	
4	2375	47.9	30.5	41.6	41.9	42.9	43.1	41.3	56.0	173	83	62.7	39.8
26	SD3412	44.6	34.6	35.4	29.0	44.3	41.5	38.2	55.0	173	93	47.9	
1	CHRIS	32.0	23.4	24.0	31.0	29.7	25.8	27.7	47.1	178	99	68.4	28.4
	Mean	48.1	38.8	47.2	41.9	46.4	46.5	44.8	55.0	172	86		
	LSD (.05)	2.9	4.9	3.0	5.0	4.0	3.9	1.5					
	C.V. (%)	3.7	6.2	3.9	7.4	5.2	5.1	5.2					

BRK=Brookings
DAY=Day County
GRO=Groton
HIG=Highmore
SEL=Selby
WAT=Watertown

Scab data is from 1998 inoculated nursery.

Table 3. Uniform Regional Spring Wheat performance data, 1996-97. 9900208

VARIETY OR STATE NO.	YIELD BU/AC	TWT LB/BU	HD DAYS	HT CM	LD	PROT
NO. LOCS:	31	30	29	31	10	6
MN93413	57.1	57.9	33	78	2.4	13.0
SBE0050	54.6	59.0	31	73	1.8	13.9
ND695	53.2	59.6	30	77	1.6	14.8
ND691	52.6	58.1	33	85	1.8	14.0
SBF0402	51.4	59.6	30	73	1.3	15.0
SD3219	51.4	60.5	28	77	2.2	13.9
ND694	51.2	60.7	30	85	1.5	14.9
SD8108	50.9	60.5	27	82	2.4	14.2
T801.93	49.9	58.5	31	73	1.5	13.8
SDM50005	48.4	58.7	32	78	1.3	14.2
SD3249	47.7	61.8	27	84	1.9	15.0
STOA	47.1	58.1	31	87	1.7	14.9
SHARPSHOOTER	47.1	61.0	29	82	2.3	14.2
BUTTE 86	46.2	59.4	28	81	1.6	14.6
ERA	45.5	57.6	34	73	1.7	13.7
MT9433	43.9	59.0	32	86	3.3	14.5
CHRIS	37.6	58.1	33	93	4.4	15.1
MARQUIS	32.7	57.4	34	96	4.0	13.7
MEANS:	48.3	59.2	31	81	2.1	14.3

TESTS	YIELD	TWT	HD	HT	LD	PROT
F-test:	30.3	30.5	99.9	81.9	6.8	4.4
LSD:	3.0	0.6	0.5	2.1	0.9	0.8
CV:	12.3	2.2	3.2	5.1	50.3	4.8

Table 4. Wheat Quality Council data, 1997.

9900208

SAMPLE	CULTIVAR	TW lb/bu	LG %	SM %	1000 KWT g	A B C D %	SKWCS HARD INDEX	SKWCS MOIST %	SKWCS WEIGHT mg	WHEAT MOIST %	KER VIT %	NIR HARD	FN sec	WHT PRO 14%mb %	WHT ASH 14%mb %	DON ppm
B-1	Grandin	60.7	84	1	35.8	000-003-016-081	70.3	11.1	33.6	10.1	38.5	76.4	402	15.02	1.569	0
B-13	Grandin	61.3	83	1	36.8	002-009-029-060	63.8	11.0	36.3	9.7	33.0	79.9	371	15.81	1.562	0
C-1	Grandin	60.9	74	1	30.8	000-001-009-090	75.5	11.4	28.7	10.1	75.8	84.4	352	15.50	1.818	3.6
C-13	Grandin	60.1	65	3	29.3	001-004-017-078	69.8	10.7	29.1	9.7	63.1	77.1	324	16.00	1.933	3.7
K-1	Grandin	59.5	76	2	31.3	000-005-014-081	69.7	11.9	30.5	10.4	54.7	80.4	266	15.74	1.824	10.4
K-13	Grandin	59.4	75	2	35.5	001-004-024-071	66.6	12.2	32.6	10.4	71.2	79.3	323	15.26	1.756	6.4
M-1	Grandin	59.5	79	1	33.7	000-003-016-081	70.5	12.5	32.4	10.5	54.1	83.6	334	15.85	1.461	0.8
M-13	Grandin	59.5	78	1	33.6	001-004-019-076	67.9	12.5	32.0	10.4	54.6	81.7	339	15.74	1.440	0.6
	AVERAGE	60.1	76.8	1.5	33.4		69.3	11.7	31.9	10.2	55.6	80.4	338.9	15.62	1.670	3.19
K-10	MN93413	59.9	57	3	31.3	002-005-020-073	66.1	12.0	29.6	10.1	56.3	74.2	301	14.54	1.751	5.5
M-10	MN93413	58.9	45	3	31.1	000-004-012-084	71.6	12.3	31.4	10.2	48.4	84.2	368	13.50	1.350	0
	AVERAGE	59.4	51.0	3.0	31.2		68.9	12.2	30.5	10.2	52.4	79.2	335	14.02	1.550	2.8
C-11	N92-0434	60.7	64	2	30.5	003-007-022-068	64.0	11.2	31.3	9.7	53.6	62.3	319	14.48	1.848	2.2
K-11	N92-0434	59.9	76	1	36.1	001-006-021-072	66.1	12.3	33.2	10.4	56.3	81.6	291	15.07	1.708	7.4
M-11	N92-0434	59.8	68	1	33.4	001-002-023-074	69.6	12.3	31.1	10.4	38.3	71.3	333	15.17	1.401	0
	AVERAGE	60.1	69.3	1.3	33.3		66.6	11.9	31.9	10.2	49.4	71.7	314.3	14.9	1.7	3.2
B-12	N93-0136	61.5	80	1	32.8	004-018-036-042	56.4	11.1	33.4	9.9	18.7	79.8	390	14.13	1.346	0
C-12	N93-0136	61.9	63	3	29.5	004-008-028-060	62.7	11.1	29.0	9.9	49.4	74.4	324	12.79	1.823	2.7
M-12	N93-0136	60.9	50	2	28.9	002-004-017-077	71.4	12.3	28.6	10.1	45.9	61.3	373	13.87	1.416	0
	AVERAGE	61.4	64.3	2.0	30.4		63.5	11.5	30.3	10.0	38.0	71.8	362.3	13.6	1.5	0.9
M-2	ND691	59.4	35	5	26.5	000-001-007-092	81.6	12.8	26.5	10.5	57.2	82.4	378	14.80	1.422	0.3
B-3	ND694	61.9	70	2	31	000-002-007-091	76.0	11.1	29.4	10.1	91.5	71.9	402	15.50	1.464	0
C-3	ND694	62.2	54	3	26.8	000-004-014-082	74.6	10.8	26.9	9.7	93.2	77.8	361	15.33	1.857	1.2
M-3	ND694	61.0	60	2	29.8	002-004-010-084	74.0	12.3	28.0	10.5	79.6	87.9	364	15.95	1.240	1.0
	AVERAGE	61.7	61.3	2.3	29.2		74.9	11.4	28.1	10.1	88.1	79.2	375.7	15.6	1.5	0.7
C-4	ND695	61.0	54	3	27.2	002-003-017-078	68.7	10.6	27.0	9.6	78.0	69.2	353	15.32	1.922	3.2
M-4	ND695	61.1	71	1	31.7	000-012-023-065	63.0	12.1	30.8	10.4	58.0	71.1	352	15.74	1.277	0.8
	AVERAGE	61.1	62.5	2.0	29.5		65.9	11.4	28.9	10.0	68.0	70.2	352.5	15.5	1.6	2.0
C-9	SBE0050	60.2	31	6	26.5	001-006-019-074	67.6	10.6	26.1	9.4	72.3	64.8	370	14.24	1.927	1.0
K-9	SBE0050	59.7	65	3	33.4	002-006-016-076	67.6	11.9	32.8	10.3	39.8	76.7	354	13.23	1.735	4.2
M-9	SBE0050	60.3	51	2	31.7	000-004-015-081	71.9	12.0	29.8	10.0	52.1	60.3	342	15.10	1.386	0
	AVERAGE	60.0	49.0	3.7	30.5		69.0	11.5	29.6	9.9	54.7	67.3	355.3	14.2	1.7	1.7
B-7	SD3219	62.5	72	2	33.4	001-002-012-085	72.6	11.3	32.4	9.8	28.2	78.4	379	14.02	1.402	0
B-5	SD3249	63.4	80	1	33.8	001-005-028-066	64.5	10.9	32.9	9.9	68.1	85.3	387	16.51	1.575	0
C-5	SD3249	62.7	52	3	28.6	001-007-021-071	65.8	10.5	28.3	9.6	87.9	74	371	15.51	1.922	1.9
K-5	SD3249	59.9	56	4	29.6	002-007-027-064	63.7	11.9	28.9	10.4	50.5	61.5	322	15.17	1.872	7.6
M-5	SD3249	61.9	72	1	31.3	002-018-036-044	57.6	12.2	30.4	10.4	62.3	77.7	324	16.41	1.363	0
	AVERAGE	62.0	65.0	2.3	30.8		62.9	11.4	30.1	10.1	67.2	74.6	351.0	15.9	1.7	2.4
B-6	SD8108	62.4	78	1	34.5	003-012-038-047	58.5	11.2	33.4	9.9	39.9	55.9	393	14.79	1.470	0
B-8	Sharpshooter	62.1	78	1	34.8	002-013-035-050	59.3	11.2	32.9	9.7	15.6	72.8	400	14.76	1.590	0
C-8	Sharpshooter	61.9	49	5	28.5	004-011-029-056	60.9	10.8	26.7	9.7	72.2	69.7	364	14.76	1.771	2.6
K-8	Sharpshooter	60.8	69	3	31.1	001-011-035-053	61.4	12.0	29.0	10.1	38.4	75.9	356	14.54	1.827	4.2
M-8	Sharpshooter	62.6	79	1	34.6	003-009-026-062	63.1	12.1	30.8	10.2	65.1	69.4	339	15.13	1.350	0.6
	AVERAGE	61.9	68.8	2.5	32.3		61.2	11.5	29.9	9.9	47.8	72.0	365	14.80	1.635	1.9

Table 4 contd…

SAMPLE	CULTIVAR/ EXPERIMENTAL	PERCENT FLOUR EXTRACTION Short Patent	1st Clear	Total	2nd Clear	Feed	MILLING VALUE Patent ($10/cwt)	Clear ($8/cwt)	Feed ($5/cwt)	Gross MV
B-ck	Grandin	68.6	2.6	71.2	4.0	24.9	$ 6.86	$ 0.52	$ 1.24	$ 8.63
C-ck	Grandin	68.7	3.2	71.9	3.3	24.8	$ 6.87	$ 0.52	$ 1.24	$ 8.63
K-ck	Grandin	66.6	5.0	71.6	3.5	25.0	$ 6.66	$ 0.68	$ 1.25	$ 8.58
M-ck	Grandin	72.0	0.9	72.9	3.3	23.8	$ 7.20	$ 0.34	$ 1.19	$ 8.73
	AVERAGE	69.0	2.9	71.9	3.5	24.6	$ 6.90	$ 0.51	$ 1.23	$ 8.64
K-10	MN93413	62.0	9.5	71.4	4.0	24.6	$ 6.20	$ 1.08	$ 1.23	$ 8.50
M-10	MN93413	53.0	19.0	72.0	3.8	24.2	$ 5.30	$ 1.83	$ 1.21	$ 8.34
	AVERAGE	57.5	14.2	71.7	3.9	24.4	$ 5.75	$ 1.45	$ 1.22	$ 8.42
C-11	N92-0434	61.5	8.0	69.5	4.3	26.2	$ 6.15	$ 0.99	$ 1.31	$ 8.45
K-11	N92-0434	69.2	2.3	71.5	4.4	24.1	$ 6.92	$ 0.54	$ 1.21	$ 8.66
M-11	N92-0434	70.0	0.0	70.0	4.1	25.9	$ 7.00	$ 0.33	$ 1.29	$ 8.62
	AVERAGE	66.9	3.5	70.4	4.3	25.4	$ 6.69	$ 0.62	$ 1.27	$ 8.58
B-12	N93-0136	72.6	0.0	72.6	3.0	24.4	$ 7.26	$ 0.24	$ 1.22	$ 8.72
C-12	N93-0136	66.3	6.7	73.0	3.0	24.0	$ 6.63	$ 0.78	$ 1.20	$ 8.60
M-12	N93-0136	70.8	0.9	71.7	3.3	25.1	$ 7.08	$ 0.33	$ 1.25	$ 8.66
	AVERAGE	69.9	2.5	72.4	3.1	24.5	$ 6.99	$ 0.45	$ 1.22	$ 8.66
M-2	ND691	59.1	9.3	68.4	5.1	26.5	$ 5.91	$ 1.15	$ 1.32	$ 8.39
B-3	ND694	69.7	0.0	69.7	5.1	25.2	$ 6.97	$ 0.41	$ 1.26	$ 8.64
C-3	ND694	67.8	0.0	67.8	5.5	26.7	$ 6.78	$ 0.44	$ 1.34	$ 8.55
M-3	ND694	71.6	0.0	71.6	2.9	25.5	$ 7.16	$ 0.23	$ 1.28	$ 8.67
	AVERAGE	69.7	0.0	69.7	4.5	25.8	$ 6.97	$ 0.36	$ 1.29	$ 8.62
C-4	ND695	67.7	1.1	68.8	4.4	26.9	$ 6.77	$ 0.44	$ 1.34	$ 8.55
M-4	ND695	69.1	0.0	69.1	5.2	25.7	$ 6.91	$ 0.41	$ 1.29	$ 8.61
	AVERAGE	68.4	0.6	68.9	4.8	26.3	$ 6.84	$ 0.43	$ 1.31	$ 8.58
C-9	SBE0050	56.7	14.0	70.8	3.2	26.0	$ 5.67	$ 1.38	$ 1.30	$ 8.35
K-9	SBE0050	65.7	7.5	73.1	3.9	23.0	$ 6.57	$ 0.91	$ 1.15	$ 8.62
M-9	SBE0050	70.6	0.0	70.6	4.0	25.4	$ 7.06	$ 0.32	$ 1.27	$ 8.65
	AVERAGE	64.3	7.2	71.5	3.7	24.8	$ 6.43	$ 0.87	$ 1.24	$ 8.54
B-7	SD3219	71.3	0.0	71.3	4.5	24.2	$ 7.13	$ 0.36	$ 1.21	$ 8.70
B-5	SD3249	71.8	0.0	71.8	4.6	23.7	$ 7.18	$ 0.36	$ 1.18	$ 8.72
C-5	SD3249	70.0	0.0	70.0	3.6	26.4	$ 7.00	$ 0.29	$ 1.32	$ 8.61
K-5	SD3249	67.6	1.2	68.8	3.6	27.5	$ 6.76	$ 0.39	$ 1.38	$ 8.53
M-5	SD3249	71.3	0.0	71.3	4.6	24.2	$ 7.13	$ 0.36	$ 1.21	$ 8.70
	AVERAGE	70.2	0.3	70.5	4.1	25.4	$ 7.02	$ 0.35	$ 1.27	$ 8.64
B-6	SD8108	71.7	0.0	71.7	3.5	24.9	$ 7.17	$ 0.28	$ 1.24	$ 8.69
B-8	Sharpshooter	71.9	0.0	71.9	3.4	24.7	$ 7.19	$ 0.27	$ 1.23	$ 8.70
C-8	Sharpshooter	70.9	0.0	70.9	3.4	25.7	$ 7.09	$ 0.27	$ 1.28	$ 8.65
K-8	Sharpshooter	70.9	1.0	71.9	3.4	24.8	$ 7.09	$ 0.35	$ 1.24	$ 8.68
M-8	Sharpshooter	72.6	0.0	72.6	3.6	23.7	$ 7.26	$ 0.29	$ 1.19	$ 8.74
	AVERAGE	71.6	0.2	71.8	3.5	24.7	$ 7.16	$ 0.30	$ 1.24	$ 8.69

Table 4 contd...

9900208

SAMPLE	CULTIVAR/ EXPERIMENTAL	FLOUR MOISTURE %	FLOUR PROTEIN 14%mb	FLOUR ASH 14%mb	FARINOGRAPH DATA WA 14%mb	PT min	Stab min	MTI BU	TTB min
B-ck	Grandin	14.1	14.52	0.401	62.7	8.7	25.0	9.0	27.5
C-ck	Grandin	13.7	14.24	0.457	61.6	6.0	8.9	33.0	10.3
K-ck	Grandin	14.2	14.14	0.411	61.7	5.2	8.6	29.0	10.6
M-ck	Grandin	13.6	14.72	0.408	61.6	9.8	32.6	12.0	36.0
	AVERAGE	13.9	14.41	0.419	61.9	7.4	18.8	20.8	21.1
K-10	MN93413	13.4	13.11	0.437	58.6	7.1	10.7	32.0	11.6
M-10	MN93413	14.0	12.59	0.430	60.1	6.5	12.4	25.0	12.1
	AVERAGE	13.7	12.85	0.433	59.4	6.8	11.6	28.5	11.9
C-11	N92-0434	13.6	12.84	0.438	59.8	5.7	9.8	23.0	11.6
K-11	N92-0434	13.2	13.57	0.436	60.8	7.1	9.2	39.0	10.8
M-11	N92-0434	14.0	14.20	0.400	62.7	13.3	21.2	11.0	26.0
	AVERAGE	13.6	13.54	0.425	61.1	8.7	13.4	24.3	16.1
B-12	N93-0136	14.1	13.31	0.380	60.0	7.9	17.8	4.0	23.5
C-12	N93-0136	13.8	11.67	0.439	57.8	4.5	7.0	38.0	8.4
M-12	N93-0136	13.5	12.92	0.407	59.3	13.0	16.8	6.0	20.0
	AVERAGE	13.8	12.63	0.409	59.0	8.5	13.9	16.0	17.3
M-2	ND691	13.8	13.87	0.449	61.3	11.8	26.0	13.0	30.5
B-3	ND694	13.7	14.94	0.388	62.8	8.9	23.6	10.0	26.0
C-3	ND694	14.1	13.81	0.420	61.6	6.2	9.9	31.0	10.6
M-3	ND694	12.7	15.18	0.404	62.4	9.9	16.1	20.0	18.2
	AVERAGE	13.5	14.64	0.404	62.3	8.3	16.5	20.3	18.3
C-4	ND695	14.9	13.75	0.404	62.0	6.7	8.0	43.0	10.1
M-4	ND695	13.1	14.65	0.346	61.4	10.9	15.6	13.0	20.0
	AVERAGE	14.0	14.20	0.375	61.7	8.8	11.8	28.0	15.1
C-9	SBE0050	14.2	12.92	0.483	58.3	7.4	11.8	32.0	12.1
K-9	SBE0050	13.8	12.06	0.439	59.2	5.5	7.7	48.0	8.9
M-9	SBE0050	14.2	13.93	0.391	60.7	15.4	24.3	9.0	29.0
	AVERAGE	14.0	12.97	0.437	59.4	9.4	14.6	29.7	16.7
B-7	SD3219	12.8	13.12	0.414	58.4	3.3	18.2	9.0	20.0
B-5	SD3249	13.2	15.65	0.386	63.7	10.6	16.6	15.0	19.4
C-5	SD3249	14.0	14.00	0.380	61.3	6.4	10.1	23.0	12.5
K-5	SD3249	14.2	13.74	0.401	60.2	6.5	10.1	37.0	10.8
M-5	SD3249	13.2	15.25	0.357	61.1	9.8	13.2	30.0	14.7
	AVERAGE	13.6	14.66	0.381	61.6	8.3	12.5	26.3	14.4
B-6	SD8108	13.0	13.75	0.356	59.5	5.9	28.6	16.0	30.5
B-8	Sharpshooter	14.0	13.81	0.340	61.1	9.4	12.8	27.0	14.8
C-8	Sharpshooter	14.2	13.43	0.391	60.6	4.2	4.9	46.0	7.2
K-8	Sharpshooter	14.1	13.21	0.410	59.7	5.9	7.4	37.0	9.8
M-8	Sharpshooter	13.8	14.27	0.359	61.1	6.7	8.5	29.0	12.0
	AVERAGE	14.0	13.68	0.375	60.6	6.6	8.4	34.8	11.0

9900208

Table 4 contd…

Cultivar	Sample	Bake Absorption		Mix Time		Mix Tolerance		Dough Out Mixer		Dough at Makeup		Loaf Volume		Crumb Color		Crumb Grain		Crumb Texture		Overall Bake Score	
Grandin	**Bck**	**4.3**	1.2	**4.9**	1.2	**5.2**	1.1	**3.6**	1.7	**3.3**	1.8	**4.8**	0.9	**5.0**	1.0	**3.9**	1.5	**4.4**	0.9	**4.8**	0.7
ND694	B3	4.4	1.2	4.9	1.3	5.1	0.8	3.7	1.8	2.9	1.8	4.6	1.2	4.7	0.9	3.3	1.0	4.2	1.1	4.3	0.7
SD3249	B5	4.7	1.1	4.8	1.3	4.8	1.1	3.7	1.9	2.8	1.6	4.9	1.1	4.8	1.0	3.6	1.2	4.2	1.1	4.4	0.6
SD8108	B6	3.4	1.6	5.2	1.3	4.8	1.5	3.0	1.7	2.3	1.2	3.4	1.7	4.6	1.1	3.7	1.0	3.9	1.0	3.4	1.1
SD3219	B7	2.5	1.3	5.0	1.2	4.3	1.5	3.0	1.7	2.8	1.5	3.2	1.5	4.3	1.2	4.2	1.1	3.9	0.8	3.2	1.2
Sharpshooter	B8	3.2	1.1	4.5	1.4	4.6	1.3	3.6	1.8	3.4	1.5	4.0	1.1	5.0	1.0	4.3	1.2	4.2	1.0	4.0	1.1
N93-0136	B12	2.8	1.2	4.5	1.4	4.9	1.1	3.7	1.9	3.3	1.7	4.1	0.9	4.9	1.0	4.3	1.2	4.4	0.9	4.1	1.4
Grandin	**Cck**	**3.6**	1.2	**4.1**	1.3	**4.1**	1.2	**4.2**	1.8	**4.3**	1.6	**4.8**	0.9	**4.4**	1.1	**4.2**	1.4	**4.1**	1.1	**4.4**	0.4
ND694	C3	3.6	0.9	3.6	1.5	3.8	1.3	4.1	1.4	4.2	1.5	4.3	1.3	4.3	1.3	3.5	1.2	4.1	1.2	4.1	0.5
ND695	C4	3.4	0.8	2.6	1.5	3.4	1.3	3.6	1.4	3.8	1.4	3.5	1.1	3.5	1.4	2.9	0.9	3.4	1.2	3.3	0.7
SD3249	C5	3.6	1.1	3.6	1.8	3.5	1.5	3.7	1.5	3.5	1.4	4.4	1.8	4.5	1.0	4.3	0.9	4.1	1.3	4.0	0.8
Sharpshooter	C8	2.8	1.1	1.9	1.0	2.3	1.3	3.7	1.4	3.5	1.5	3.9	1.5	4.3	1.3	3.6	1.1	3.7	1.3	3.4	0.8
SBE0050	C9	2.6	1.1	4.0	1.8	3.7	1.3	3.7	1.6	3.8	1.6	4.2	1.4	4.6	1.0	4.2	1.1	4.1	0.8	3.8	0.9
N92-0434	C11	2.9	1.0	3.5	1.8	3.6	1.6	4.1	1.7	3.8	1.5	4.7	1.1	4.5	0.7	3.9	1.0	4.0	1.1	4.0	0.7
N93-0136	C12	2.0	1.0	2.7	1.2	2.6	0.7	4.0	1.5	3.7	1.3	3.4	1.3	4.3	1.0	4.1	1.0	3.7	0.9	3.1	0.9
Grandin	**Kck**	**3.2**	1.4	**3.1**	1.6	**3.6**	1.7	**3.7**	1.5	**3.6**	1.4	**4.1**	1.4	**3.8**	1.0	**3.0**	1.0	**3.4**	1.4	**3.8**	0.8
SD3249	K5	2.8	1.0	3.1	1.3	3.2	1.0	3.7	1.6	3.6	1.4	3.8	1.7	3.4	1.3	2.8	1.0	3.4	1.3	3.3	0.7
Sharpshooter	K8	2.5	1.4	2.7	1.7	3.0	1.7	3.1	1.5	3.2	1.6	3.3	1.5	3.8	1.2	3.0	1.3	3.4	1.3	3.1	0.7
SBE0050	K9	2.4	1.1	2.6	1.4	2.7	1.1	4.2	1.5	4.0	1.5	3.5	1.3	3.8	1.3	3.4	1.3	3.5	1.3	3.2	0.9
MN93413	K10	2.5	1.1	3.4	1.4	3.8	1.3	4.0	1.3	4.3	1.1	3.9	1.4	4.2	1.3	3.6	1.5	3.8	1.3	3.6	1.0
N92-0434	K11	3.3	1.2	3.1	1.3	3.9	1.5	4.1	1.4	4.2	1.2	3.9	1.7	3.4	1.3	3.0	1.1	3.5	1.5	3.5	0.7
Grandin	**Mck**	**4.0**	1.2	**4.7**	1.6	**4.9**	1.4	**3.6**	1.9	**3.4**	2.0	**4.8**	1.6	**4.7**	0.9	**3.6**	1.1	**4.0**	1.3	**4.6**	0.6
ND691	M2	3.6	1.2	4.9	1.4	5.0	1.1	3.5	1.9	2.9	1.6	3.5	1.4	3.8	0.9	3.3	1.0	3.8	1.2	3.9	0.5
ND694	M3	4.0	1.2	4.4	1.5	4.4	1.2	3.5	1.7	3.6	1.7	4.4	1.7	4.5	0.7	3.0	0.8	3.5	1.4	4.1	0.8
ND695	M4	3.4	1.1	3.6	1.7	4.1	1.3	3.8	1.4	3.8	1.7	4.3	1.6	4.2	0.9	2.6	0.7	3.6	1.7	3.7	0.6
SD3249	M5	3.4	1.0	4.5	1.4	4.5	1.1	4.0	1.8	3.5	1.6	4.7	1.5	4.9	1.1	4.3	1.5	4.4	1.4	4.4	0.9
Sharpshooter	M8	3.4	1.0	3.1	1.0	3.1	1.3	3.8	1.4	4.0	1.2	3.5	1.7	4.3	1.1	3.0	0.7	3.7	1.3	3.4	0.7
SBE0050	M9	3.4	1.0	4.6	1.6	5.1	0.9	3.7	1.7	3.6	1.5	4.1	1.5	4.8	1.0	3.9	1.4	4.2	1.3	4.3	0.6
MN93413	M10	3.3	1.0	3.9	1.6	3.8	1.2	3.8	1.3	3.4	1.3	3.0	1.3	4.5	1.0	4.1	1.2	4.2	1.3	3.8	0.6
N92-0434	M11	4.2	1.0	4.9	1.5	5.1	0.9	3.7	1.8	3.5	1.7	4.2	1.5	4.6	0.8	3.5	1.1	3.9	1.4	4.1	0.4
N93-0136	M12	2.8	1.3	4.2	1.6	4.9	0.9	4.0	1.7	4.1	1.2	4.0	1.4	4.6	0.7	3.5	1.2	4.0	1.5	3.8	0.7

Means (+/- standard deviation) of bread baking scores submitted by bake cooperators (11 cooperators)

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

FORM APPROVED - OMB NO. 0581-0055 EXPIRES: 12-31

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

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

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

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

1. NAME OF APPLICANT(S)

SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

SD 3249

3. VARIETY NAME

Ingot

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*

South Dakota State University
Ag Hall 129
Brookings, SD 57007

5. TELEPHONE *(include area code)*

(605) 688-4149

6. FAX *(include area code)*

(605) 688-6065

7. PVPO NUMBER

9900208

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

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

10. Is the applicant the original breeder? If no, please answer the following: [X] YES [ ] NO

a. If original rights to variety were owned by individual(s):
Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____

b. If original rights to variety were owned by a company: [ ] YES [ ] NO
Is the original breeder(s) U.S. based company? If no, give name of country _____

11. Additional explantion on ownership *(If needed, use reverse for extra space):*

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of 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 breeder, both the original breeder and the applicant must meet one of the above criteria.

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

Public reporting burden for this collection of information is estimated to average 10 minutes 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. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter.

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STD-470-E (03-96)