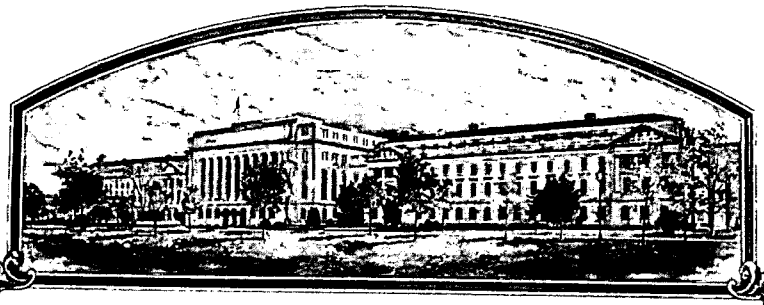

No. 201500295

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

University of Idaho and Washington State University

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 purposes, 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 THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'UI-WSU Huffman'

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 May, in the year* ***two thousand and sixteen.***

Attest:

Commissioner
Plant Variety Protection Office

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
University of Idaho and
Washington State University

MAH
8-11-2015

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME

3. VARIETY NAME
UI-WSU Huffman

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
University of Idaho
OTT, PO Box 443003
Morrill Hall 414
Moscow, Idaho, 83844-3003

5. TELEPHONE *(include area code)*
(208) 885 4550

6. FAX *(include area code)*
(208) 885 4551

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PVPO NUMBER
201500295

FILING DATE
[redacted] 3/17/2015

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
University of Idaho and Washington State University

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)*
Jack Brown
PSES, CALS
875 Perimeter Dr. MS 2339
University of Idaho
Moscow, ID 83844-2339

Include on all communications:
Karen Stevenson
OTT, 875 Perimeter Dr. MS 3003
Morrill Hall 414
Moscow, ID 83844-3003

11. TELEPHONE (Include area code)
(208) 885 7078 and (208) 885 4550

12. FAX (Include area code)
(208) 885 7760 and (208) 885 4551

FEES RECD

FILING AND EXAMINATION FEES:
$ 4,382
DATE [redacted] 3/17/15

CERTIFICATION FEE:
$
DATE

13. E-MAIL
jbrown@uidaho.edu, copy to karens@uidaho.edu

14. CROP KIND *(Common Name)*
Soft white winter wheat

15. GENUS AND SPECIES NAME OF CROP
Triticum aestivum

16. FAMILY NAME *(Botanical)*
Poaceae

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

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL)
☐ YES ☐ NO

IF YES, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*
■ YES *(If "yes", answer items 21 and 22 below)*
☐ NO *(If "no", go to item 23)*
☐ UNDECIDED

19. 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. ■ Filing and Examination Fee ($4,382), make checks payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)* other methods of payment explained in the instructions

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
☐ YES ☐ NO
IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
___ FOUNDATION ___ REGISTERED ___ CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

23. 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.)*

24. 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.)*

25. The owners declare that a viable sample of basic seed will be furnished directly to an acceptable depository in support of the variety within three months of filing. Seed will be replenished upon request in accordance with such regulations as may be applicable. For a tuber propagated variety or vegetative propagated parent of the variety, a tissue culture or vegetative sample will be deposited in a public repository within three months of the date of the certificate fee request letter. These will be maintained for the duration of the certificate."
The undersigned owner(s) is (are) the owner(s) 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 OF OWNER	
NAME *(Please print or type)*		NAME *(Please print or type)*	
Jack Brown		Karen A Stevenson	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Plant Breeder/Professor	12/12/2014	Licensing Associate	03/17/2015

22. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

23. 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.)*

Foundation seed of UI-WSU Huffman was sold/transferred in October 2014 and used to plant an increase of Registered Seed.

24. 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).)*

N/A

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

EXHIBIT A – ORIGIN AND BREEDING HISTORY
** Use additional pages as needed.

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PVPO NUMBER

1. Name of Owner	2. Temporary Designation or Experimental Name	3. Variety Name
University of Idaho and Washington State University		UI-WSU Huffman

4. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s). **
See Exhibit A attached

5. Give the details of subsequent stages of selection and multiplication. **

Year	Detail of Stage	Selection Criteria

6. Is the variety uniform? ✓ Yes _____ No

How did you test for uniformity?
The variety has been field tested over multiple years and sites and found to be uniform over environments and years.

7. Is the variety stable? ✓ Yes _____ No

How did you test for stability? Over how many generations?
The variety has been field tested over multiple years and sites and found to have stable performance.

8. Are genetic variants observed or expected during reproduction and multiplication? ✓ Yes _____ No

If yes, state how these variants may be identified, their type and frequency.
During certification of Breeders and Foundation seed, less than 30 red seed variants kg-1 of seed were observed. Allowable variants of up to 54 red seed kg-1 of UI-WSU Huffman are allowed. In addition, slight variation in head shapes (see Figure B1, above, for examples) are allowed.

'UI-WSU Huffman'
Soft White Winter Wheat
Triticum aestivum

Exhibit A: Origin and Breeding History

'UI-WSU Huffman' is a soft white winter wheat (*Triticum aestivum*) cultivar developed by the Idaho Agricultural Experiment Station and released in October 2014. This cultivar is protected by U.S. Plant Variety Protection (PVP pending).

UI-WSU Huffman was selected for high adaptation to the intermediate to high rainfall dry-land environments of the Pacific Northwest (Idaho, Oregon and Washington). The cultivar was developed from a single plant selection in summer of 2007 from a segregating F_3 population derived from the cross J99C0009//'Bruneau'/J99C0009' made in 2003. J99C0009 was a winter soft white winter wheat breeding line developed at Washington State University with high resistance to *Cephalosporium* strip (*Ceophalsporium gramineum*). Bruneau is a soft white winter wheat cultivar developed at the University of Idaho from the cross 'Dusty'/WA7433//Lewjain. After making the initial cross the F_1 generation was grown over winter and spring in a glasshouse. The F_2 and F_3 generations were grown and evaluated as progeny bulks derived from the glasshouse F_1's. Selected heads were taken from the F_3 population at maturity and planted in the fall of 2004 in F_4 head-rows. These head-row plots were evaluated for heading date, maturity, head type and disease resistance the head-row designated as 03-29902A was bulk harvested and used as a seed source for F_5 and future yield trials.

UI-WSU Huffman was evaluated in replicated yield trials at a single location in 2003-2004 and thereafter tested at two locations at F_6 and multiple locations throughout Idaho and Washington in years 2010-2011, 2011-2012, 2012-2013, and 2013-2014.

In fall of 2011, 360 single head selections were taken from the 03-29902A F_7 population (i.e. $F_{4.7}$) and planted at head-row plots in the field in fall of 2011. Head-row plots were evaluated for morphological uniformity and at harvest in fall 2013, 40 head-row plots were individually harvested and see from each plot used to plant a 7 row x 12 feet plot in fall of 2012. Plots were visually observed throughout the growing season and at harvest the yield from all plots was combined as UI-WSU Huffman Breeder's Seed.

During certification of Breeders and Foundation seed, less than 30 red seed variants kg^{-1} of seed were observed. Allowable variants of up to 54 red seed kg-1 of UI-WSU Huffman are allowed. In addition, light variation in head shapes (see Figure B1, above, for examples) are allowed.

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

EXHIBIT B – STATEMENT OF DISTINCTNESS

**** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.***

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PVPO NUMBER

1. Name of Owner	2. Temporary Designation or Experimental Name	3. Variety Name
University of Idaho and Washington State University		UI-WSU Huffman

Based on overall morphology, _____ is most similar to _____. _____ most clearly
Applicant's new variety *Most similar comparison variety(ies)* *Applicant's new variety*

differs from _____ in the following traits Name the specific trait. Then list the value of that trait for each variety in the comparison. Submit
Most similar comparison variety(ies)

appropriate supporting evidence (see the Guidelines for Presenting Evidence in Support of Variety Distinctness in the instructions):

	Eg. Leaf Pubescence ***Eg. Leaf Color*** ***Eg. Plant Height***	***heavy pubescence*** ***Dark Green (5GY 3/4)*** ***200 cm +/- 10 cm (N=25)***	***glabrous*** ***Light Green (2.5GY 8/10)*** ***250 cm +/- 15 cm (N=25)***	***photograph attached*** ***Munsell Color Chart*** ***statistics attached***
	1. Qualitative traits:	**2. Color traits:**	**3. Quantitative traits:**	**4. Other traits:**
Application Variety			UI-WSU Huffman is most similar in plant appearance to the soft white winter wheat cultivar Bruneau. However, UI-WSU Huffman heads emerge significantly later (163 days on average) compared to Bruneau (161 days on average) seeTable B1.	
Comparison Variety 1				
Comparison Variety 2				
Comparison Variety 3				

***** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.***

'UI-WSU Huffman'
Soft White Winter Wheat
Triticum aestivum

Exhibit B: Statement of Distinctness

UI-WSU Huffman is most similar in plant appearance to the soft white winter wheat cultivar Bruneau. However, UI-WSU Huffman heads emerge significantly later (~~164~~ 163 days on average) compared to Bruneau (161 days on average) Table B1. In addition UI-WSU Huffman has a more blocky/oblong head shape (Figure B1) compared to Bruneau, and has a lighter head color.

fixed typographical error MAH 8-11-2015

Table B1. Days from January 1st to 50% heading of UI-WSU Huffman compared to Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (28 sites)	Rank	2010-2011 (8 sites)	2011-2012 (11 sites)	2012-2013 (7 sites)	2013-2014 (2 sites)
	---------- Days after January 1st ----------					
Bruneau	161	2	173	160	157	136
03-29902A	163	1	175	162	159	140
Mean	162	-	174	161	158	138
LSD 5%	1.2	-	1.0	1.1	0.5	1.8

Figure B1. Head color at 100% heading and head shape of UI-WSU Huffman soft white winter wheat al heading and full maturity.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

Exhibit C

University of Idaho and
Washington State University

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

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
Idaho Agricultural Experiment Station	03-29902A	UI-WSU Huffman

ADDRESS *(Street and No. or RD No., City, State, Zip Code and Country)*

University of Idaho

Moscow, Idaho, 83844-2339

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PVPO NUMBER

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., 0 9 9 or 0 9) 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 is the Royal Horticultural Scociety. 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**: 2

1 = Spring
2 = Winter
3 = Other (Specify) _____

1a. COMMON WHEAT MARKET CLASSES:

____ HRW (Hard Red Winter)
____ HRS (Hard Red Spring)
____ HW (Hard White)
____ SRW (Soft Red Winter)
XX SW (Soft White)

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)

1 1 = Erect 2 = Recurved

1 1 = Not Twisted 2 = Twisted

1 1 = Wax Absent 2 = Wax Present

7. EAR EMERGENCE:

164 Number of Days (Average)

4 Number of Days Earlier Than * Madsen

Same As *

3 Number of Days Later Than * Bruneau or Brundage-96

**Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial*

8. ANTHER COLOR: 1 1 = Yellow 2 = Purple

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

88.9 cm (Average)

2.8 cm Taller Than Brundage-96 *

Same As Bruneau *

2.2 cm Shorter Than Madsen *

10. STEM:

A. ANTHOCYANIN 1 1 = Absent 2 = Present

B. WAXY BLOOM 1 1 = Absent 2 = Present

C. HAIRINESS (last internode of rachis) 1 1 = Absent 2 = Present

D. INTERNODE 2 1 = Hollow 2 = Semi-Solid 3 = Solid

005 Number of Nodes

E. PEDUNCLE 1 1 = Erect 2 = Recurved 3 = Semi-Erect

013 cm Length

F. AURICLE

1 Anthocyanin: 1 = Absent 2 = Present

1 Hair: 1 = Absent 2 = Present

11. HEAD: (At Maturity)

A. DENSITY 3

1 = Lax
2 = Middense (Laxidense)
3 = Dense

B. SHAPE 2

1 = Tapering
2 = Strap
3 = Clavate
4 = Other (Specify) _____

C. CURVATURE 1

1 = Erect
2 = Inclined
3 = Recurved

D. AWNEDNESS 4

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

12. GLUMES: (At Maturity)

A. COLOR 2

1 = White
2 = Tan
3 = Other (Specify) _____

B. SHOULDER 2

1 = Wanting 2 = Oblique
3 = Rounded 4 = Square
5 = Elevated 6 = Apiculate
7 = Other (Specify) _____

C. SHOULDER WIDTH 3

1 = Narrow
2 = Medium
3 = Wide

D. BEAK 3

1 = Obtuse
2 = Acute
3 = Acuminate

E. BEAK WIDTH 1

1 = Narrow
2 = Medium
3 = Wide

F. GLUME LENGTH 3

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

G. WIDTH 3

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

H. PUBESCENCE 1

1 = Not Present
2 = Present

13. SEED:

A. SHAPE 1 1 = Ovate 2 = Oval 3 = Elliptical

B. CHEEK 1 1 = Rounded 2 = Angular

C. BRUSH

3 1 = Short
2 = Medium
3 = Long

2 1 = Not Collared
2 = Collared

D. CREASE

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

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

E. COLOR 1 1 = White 2 = Amber 3 = Red
4 = Other (Specify) _____

F. TEXTURE 2 1 = Hard 2 = Soft 3 = Other (Specify) _____

G. PHENOL REACTION (See Instructions) _____

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

H. SEED WEIGHT

25 g/1000 Seed (whole number only)

I. GERM SIZE 2

1 = Small
2 = Midsize
3 = Large

14. DISEASE: PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

0	Stem Rust (*Puccinia graminis* f. sp. *tritici*)	Race:
0	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Race:
2	Stripe Rust (*Puccinia striiformis*)	Race:
0	Loose Smut (*Ustilago tritici*)	Race:
0	Powdery Mildew (*Erysiphe graminis* f. sp. *tritici*)	Race:
0	Common Bunt (*Tilletia tritici* or T. *laevis*)	Race:
0	Dwarf Bunt (*Tilletia controversa*)	Race:
0	Karnal Bunt (*Tilletia indica*)	Race:
0	Flag Smut (*Urocystis agropyri*)	Race:
0	Tan Spot (*Pyrenophora tritici-repentis*)	Race:
0	Halo Spot (*Selenophoma donacis*)	Race:
0	Septoria spp.	Race:
0	*Septoria nodorum* (Glume Blotch)	Race:
0	*Septoria avenae* (Speckled Leaf Disease)	Race:
0	*Septoria tritici* (Speckled Leaf Blotch)	Race:
0	Scab (*Fusarium* spp.)	Race:
0	"Snow Molds"	Race:
0	Kernel Smudge ("Black Point")	Race:
0	Common Root Rot (*Fusarium*, *Cochliobolus* and *Bipolaris* spp.)	Race:
0	Barley Yellow Dwarf Virus (BYDV)	Race:
0	Rhizoctonia Root Rot (*Rhizoctonia solani*)	Race:
0	Soilborne Mosaic Virus (SBMV)	Race:
0	Black Chaff (*Xanthomonas campestris* pv. *translucens*).	Race:

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

0 Wheat Yellow (Spindle Streak) Mosaic Virus Race: _____

0 Bacterial Leaf Blight (*Pseudomonas syringae* pv. *syringae*) Race: _____

0 Wheat Streak Mosaic Virus (WSMV) Race: _____

2 Other (Specify) *Cephalosporium gramineum* Race: _____

_____ Other (Specify) _____ Race: _____

_____ Other (Specify) _____ Race: _____

_____ Other (Specify) _____ Race: _____

15. HOMOZYGOUS FOR SPECIFIC DISEASE RESISTANCE GENE

_____ Stem rust _____

_____ Leaf rust _____

_____ Other _____

16. INSECT: PLEASE SPECIFY BIOTYPE (Where Needed) (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

0 Stem Sawfly (*Cephus* spp.) (Specify) _____

0 Cereal Leaf Beetle (*Oulema melanopa*) (Specify) _____

0 Russian Aphid 1 (*Diuraphis noxia*) _____

0 Russian Aphid 2 (*Diuraphis noxia*) _____

0 Greenbug (*Schizaphis graminum*) (General) _____

0 Greenbug (*Schizaphis graminum*) Biotype A _____

0 Greenbug (*Schizaphis graminum*) Biotype B _____

0 Greenbug (*Schizaphis graminum*) Biotype C _____

0 Greenbug (*Schizaphis graminum*) Biotype E _____

0 Greenbug (*Schizaphis graminum*) Other (Specify) _____

0 Aphids (Specify) _____

0 Other (Specify) _____

0 Hessian Fly (*Mayetiola destructor*) Biotype A _____

0 Hessian Fly (*Mayetiola destructor*) Biotype B _____

0 Hessian Fly (*Mayetiola destructor*) Biotype C _____

0 Hessian Fly (*Mayetiola destructor*) Biotype D _____

0 Hessian Fly (*Mayetiola destructor*) Biotype E _____

0 Hessian Fly (*Mayetiola destructor*) Biotype F _____

0 Hessian Fly (*Mayetiola destructor*) Biotype G _____

0 Hessian Fly (*Mayetiola destructor*) Biotype GP _____

0 Hessian Fly (*Mayetiola destructor*) Biotype H _____

16. **INSECT**: (continued) (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

0 Hessian Fly (*Mayetiola destructor*) Biotype I

0 Hessian Fly (*Mayetiola destructor*) Biotype J

0 Hessian Fly (*Mayetiola destructor*) Biotype L

0 Hessian Fly (*Mayetiola destructor*) Biotype M

0 Hessian Fly (*Mayetiola destructor*) Biotype N

0 Hessian Fly (*Mayetiola destructor)* Biotype O

0 Hessian Fly (*Mayetiola destructor*) (Specify)

17. HIGH MOLECULAR WEIGHT GLUTENIN SUBUNIT PROFILE (Check those that apply):

Glu-A1
- ☐ 1
- ☐ 2*
- ☐ null
- ☐ 1*

Glu-B1
- ☐ 6+8
- ☐ 7+8
- ☐ 7+9
- ☐ 13+16
- ☐ 13+19
- ☐ 17+18

Glu-D1
- ☐ 2+11
- ☐ 2+12
- ☐ 3+12
- ☐ 5+10
- ☐ null

18. **TRANSLOCATIONS** (1=Present 2=Absent 3=Heterogeneous 4= Not Tested):

4 1BL/1RS 4 1A/1R 4 2NS/2AS 4 4DL/4AgS

19. **IMIDAZOLINONE HERBICIDE TOLERANCE** (1=Present 2=Absent 3=Not Tested):

2 Als-1 2 Als-2 2 Als-3

20. END USE QUALITY:

Grain Protein 11.4

cw Bruneau = 12.1

Flour Protein 9.0 cw Bruneau 9.0 %

SDS N/A

Farniograph N/A

Other Cookie Diam. 8.8 cm cw Bruneau = 8.9 cm

21. ADDITIONAL INFORMATION ON ANY ITEM ABOVE OR GENERAL COMMENTS:

WHEAT DESCRIPTOR ILLUSTRATIONS

Section Numbers Correspond to the Numbers of the Sections on the Form

4. EARLY PLANT GROWTH HABIT:

1 Prostrate | 2 Intermediate | 3 Erect

10. (D.) STEM INTERNODE X-SECTION:

1 Hollow | 2 Semi-solid | 3 Solid

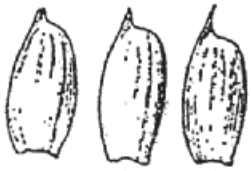
11. (B.) SPIKE SHAPE:

1 Tapering | 2 Oblong | 3 Clavate | 4 Elliptical

11. (D.) AWNEDNESS:

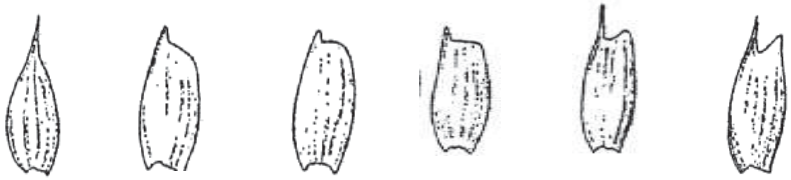
1 Awnless | 2 Apically Awnleted | 3 Awnleted | 4 Awned

12. (D.) BEAK SHAPE:



1 Obtuse | 2 Acute | 3 Acuminate

12. (C.) SHOULDER SHAPE:



1 Wanting | 2 Oblique | 3 Rounded | 4 Square | 5 Elevated | 6 Apiculate

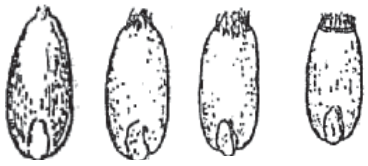
13. (A.) SEED SHAPE:

1 Ovate | 2 Oval | 3 Elliptical

13. (B.) CHEEK SHAPE:

1 Rounded | 2 Angular

13. (C.) BRUSH SIZE



1 Small | 2 Midsized | 3 Large | 4 Collared

13. (C.) BRUSH HAIR LENGTH:

1 Short | 2 Medium | 3 Long

13. (I.) GERM (EMBRYO) SIZE:

1 Small | 2 Midsized | 3 Large

13. (D.) SEED CREASE WIDTH:

1 Narrow | 2 Mid-wide | 3 Wide

13. (D.)SEED CREASE DEPTH:

1 Shallow | 2 Mid-Deep | 3 Deep

References:

(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.

'UI-WSU Huffman'
Soft White Winter Wheat
Triticum aestivum

Exhibit D: Additional Description of Variety

UI-WSU Huffman is a winter soft white winter wheat which requires vernilization to induce flowering. Juvenile plants are semi-erect in stature and coleoptile anthocyanin is absent. Plants are light-green to green and the flag leaf at the boot stage is erect, not twisted and has no leaf waxes.

UI-WSU Huffman ear emergence is on average 164 days after January 1st, which is 4 d. earlier than 'Madsen' and 2 d. later than Bruneau (Table D1). At full heading, UI-WSU Huffman plants are 35 inches tall, similar to Bruneau, but significantly taller than 'Brundage-96' (Table D2). UI-WSU Huffman stems are free from anthocyanin, waxy bloom and hairs. Internodes are semi-solid, with an average of 5 nodes on the main stem. Heads are dense, awned and with strap shape. At maturity plants have stiff straw and are resistant to lodging (Table D3)

UI-WSU Huffman is highly resistant to *Cephalosporium* strip (*Ceophalsporium gramineum*) (Table D4). In field trials where *Cephalosporium* strip inoculum was relatively high, there were no disease symptoms noted on UI-WSU Huffman, while all other control cultivars showed varying degrees of susceptibility. UI-WSU Huffman also have shown good resistance to strip rust (Table D5) rated as 1.2 on a 1-9 scale, with 9 being highly susceptible. Strip rust resistance of UI-WSU Huffman was always significantly higher than Brundage-96, and consistently better than Bruneau.

Yield performance (dryland and irrigated combined) of UI-WSU Huffman was compared to 'Stephens', Brundage, 'Bobtail' (2013-2014 only), Brundage-96, Madsen and Bruneau in field trials from 2009-2010 through 2013-2014 (Table D6). Averaged over 42 year-sites of field performance, UI-WSU Huffman averages 104.2 bu $acre^{-1}$,higher but not significantly different from Bruneau, and significantly higher yielding compared to all the other control cultivars in the trials. Under dryland conditions, UI-WSU Huffman was significantly higher yielding than all control cultivars (Table D7). UI-WSU Huffman had average test weight of 58.3 lb. bu^{-1}, which was not significantly different from the other control cultivars (Table D8).

Seed protein content of UI-WSU Huffman was consistently lower in each years tested, but was not significantly different from the other soft while winter wheat control cultivars in the field trials (Table D9). Overall end use quality of UI-WSU Huffman is excellent, with low flour protein, flour and break flour yield and good cookie diameter (Table D10).

Table D1. Days from January 1st to 50% heading of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Bobtail, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (30 sites)	Rank	2009-2010 (2 sites)	2010-2011 (8 sites)	2011-2012 (11 sites)	2012-2013 (7 sites)	2013-2014 (2 sites)
	---------- Days after January 1st ----------						
Stephens	162	3	-	172	159	156	-
Madsen	175	1	-	175	174	-	-
Brundage	157	6	-	169	148	-	-
Bobtail	-	-	-	-	-	-	137
Brundage-96	161	5	172	172	159	156	133
Bruneau	161	4	-	173	160	157	136
UI-WSU Huffman	164	2	177	175	162	159	140
Mean	164	-	175	173	160	157	136
LSD 5%	3.2	-	1.0	2.7	4.5	2.4	2.2

Table D2. Plant height before harvest of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Bobtail, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (16 sites)	Rank	2009-2010 (2 sites)	2010-2011 (4 sites)	2011-2012 (5 sites)	2012-2013 (4 sites)	2013-2014 (1 sites)
	---------- inches ----------						
Stephens	35.8	2	-	36.6	35.3	35.6	-
Madsen	35.9	1	-	36.9	35.1	-	-
Brundage	33.1	6	-	33.3	33.0	-	-
Bobtail	28.0	-	-	-	-	-	28.0
Brundage-96	33.9	5	33.0	35.0	34.2	33.2	29.5
Bruneau	34.4	4	-	35.2	34.9	33.2	30.5
UI-WSU Huffman	35.0	3	33.0	36.4	34.3	36.0	28.5
Mean	34.7		33.0	35.6	34.5	34.5	29.1
LSD 5%	2.03		1.00	2.32	1.94	2.13	-

Table D3. Plant lodging resistance before harvest of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (3 sites)	Rank	2010-2011 (1 site)	2011-2012 (2 sites)
		---------- 1 to 5† ----------		
Stephens	3.0	1	4.0	2.6
Brundage	1.6	4	2.0	1.3
Brundage-96	2.0	3	2.0	2.0
Bruneau	2.2	2	3.0	1.8
UI-WSU Huffman	1.4	5	1.0	1.6
Mean	2.0	.	2.4	1.8
LSD 5%	0.9	.	1.05	0.78

† 1 = no lodging observed; 5 = severe lodging.

Table D4. *Cephalosporium* strip resistance evaluations of UI-WSU Huffman compared to Stephens, Madsen, Brundage-96 and Bruneau control cultivars.

Entry	Disease rating	Infection rate
	- 1 to 9†-	--- % ---
Stephens	8.0	6.0
Madsen	2.0	2.0
Brundage-96	5.0	2.0
Bruneau	2.0	1.0
UI-WSU Huffman	0.0	0.0
Average	3.4	2.2
LSD 5%	3.13	2.28

† 0 = no disease symptoms observed; 9 = severe disease.

Table D5. Strip rust resistance ratings of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (7 sites)	Rank	2009-2010 (2 sites)	2011-2012 (3 sites)	2012-2013 (2 sites)
	---------- 0 to 9† scale ----------				
Stephens	5.4	2	-	4.8	6.3
Madsen	2.3	4	-	2.3	-
Brundage	7.7	1	-	7.7	-
Brundage-96	3.7	3	4.3	3.1	4.0
Bruneau	2.2	5	-	2.5	1.7
UI-WSU Huffman	1.2	6	1.0	1.3	1.3
Mean	3.3	-	2.7	3.6	3.3
LSD 5%	1.3	-	1.0	1.2	1.8

† 0 = no disease symptoms observed; 9 = severe disease.

Table D6. Seed yield, averaged over all dryland and irrigated sites from of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Bobtail, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (42 sites)	Rank	2009-2010 (2 sites)	2010-2011 (8 sites)	2011-2012 (13 sites)	2012-2013 (10 sites)	2013-2014 (9 sites)
	---------- bu acre^{-1} ----------						
Stephens	96.9	5	-	100.4	95.5	95.8	-
Madsen	102.0	3	-	111.0	96.5	-	-
Brundage	83.0	7	-	76.4	87.1	-	-
Bobtail	86.8	6	-	-	-	-	86.8
Brundage-96	98.0	4	65.0	109.9	102.4	103.8	82.1
Bruneau	102.0	2	-	112.7	105.2	106.6	83.0
UI-WSU Huffman	104.2	1	73.6	119.5	106.2	113.3	84.3
Mean	100.9		69.3	114.0	104.6	107.9	83.1
LSD 5%	5.1		1.54	4.41	7.30	3.50	6.00

Table D7. Seed yield, averaged over only dryland sites from of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Bobtail, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (23 sites)	Rank	2009-2010 2 sites	2010-2011 5 sites	2011-2012 6 sites	2012-2013 5 sites	2013-2014 5 sites
	---------- bu acre^{-1} ----------						
Stephens	87.6	4	-	89.2	80.2	94.8	-
Madsen	89.4	2	-	104.0	77.3	-	-
Brundage	72.9	6	-	72.9	-	-	-
Bobtail	61.6	7	-	-	-	-	61.6
Brundage-96	85.9	5	65.0	110.2	82.0	96.1	64.2
Bruneau	88.7	3	-	112.9	83.5	98.4	61.2
UI-WSU Huffman	91.4	1	73.6	119.1	83.4	108.1	63.7
Mean	85.0		69.3	81.3	81.3	99.4	62.9
LSD 5%	3.00		1.54	3.92	3.45	2.14	6.00

Table D8. Seed test weight averaged over all sites from of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Bobtail, Brundage-96, and Bruneau from replicated field trials. The number of sites used in the year averages is shown in parenthesis.

Entry	Average (29 sites)	Rank	2009-2010 (2 sites)	2010-2011 (8 sites)	2011-2012 (8 sites)	2012-2013 (4 sites)	2013-2014 (7 sites)
	---------- lb bu^{-1} ----------						
Stephens	57.6	4	-	57.7	56.6	59.3	-
Madsen	58.6	1	-	58.8	58.5	-	-
Brundage	57.1	6	-	55.7	58.6	-	-
Bobtail	54.3	7	-	-	-	-	54.3
Brundage-96	57.5	5	59.4	57.3	57.9	58.5	56.2
Bruneau	58.5	2	-	59.5	58.9	59.2	56.6
UI-WSU Huffman	58.3	3	59.6	58.9	58.5	59.0	56.6
Mean	58.4		59.5	58.0	58.2	59.0	55.9
LSD 5%	1.97		1.04	1.87	1.93	2.71	1.14

Table D9. Seed protein content of UI-WSU Huffman compared to Stephens, Madsen, Brundage, Brundage-96, and Bruneau from replicated field trials in 2011-2012 and 2012-2013. Seed protein content was determined using near infrared reflection (NIR). The number of sites used in the year averages is shown in parenthesis.

Entry	Average (7 sites)	Rank	2011-2012 3 sites	2012-2013 2 sites	2013-2014 2 sites
			%		
Stephens	11.6	2	11.5	11.8	-
Brundage	12.3	1	12.3	-	-
Brundage-96	11.3	4	11.3	11.8	10.7
Bruneau	11.6	3	12.3	11.7	10.3
UI-WSU Huffman	11.2	5	11.4	11.5	10.7
Mean	11.7	.	11.7	11.7	10.6
LSD 5%	1.5	.	1.7	1.3	-

Table D10. Flour protein, seed hardness (determined by near infrared reflection), break flour yield, flour yield, flour ash and cookie diameter of UI-WSU Huffman averaged over field trials from 2010-2011, 2011-2012, and 2012-2013, compared to Stephens, Madsen, Brundage, Brundage-96, and Bruneau from replicated field trials.

Entry	Flour Protein	NIR Hardness	Break Flour Yield	Flour Yield	Flour Ash	Cookie Diam.
	-- % --	-0 to 100-	-- % --	-- % --	-- % --	-- cm --
Stephens	9.3	20.0	42.8	61.2	0.4	8.7
Madsen	8.3	20.6	36.9	63.3	0.4	8.6
Brundage	8.6	17.3	47.3	60.4	0.4	8.9
Brundage_96	9.3	16.1	46.8	60.7	0.4	9.1
Bruneau	9.0	19.9	44.8	62.3	0.4	8.9
UI-WSU Huffman	9.0	22.6	45.7	63.4	0.4	8.8
Mean	8.9	19.4	44.0	61.9	0.4	8.8
LSD 5%	1.00	-	4.47	0.36	0.03	0.18

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

EXHIBIT E - STATEMENT OF THE BASIS OF OWNERSHIP

FOR OFFICIAL USE ONLY
PVPO NUMBER

1. Name of Owner	2. Temporary Designation or Experimental Name	3. Variety Name
University of Idaho and Washington State University		UI-WSU Huffman

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

5. Is the applicant a U.S. national or a U.S. based entity? **If no, give name of country.** ☑ **YES** ☐ **NO**

6. Is the applicant the original owner? ☑ **YES** ☐ **NO** **If no, please answer <u>one</u> of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
☑ **YES** ☐ **NO** **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
☑ **YES** ☐ **NO** **If no, give name of country**

7. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:

PLEASE NOTE:

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

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