No. 201200159

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

The State of Idaho acting by and through the State Board of Higher Education on behalf of the University of Idaho is partner in the Northwest (Tri-State) Potato Variety Development Program and a signatory of the General Agreement on Policy and Procedure for Release of New Publicly Developed Plant Varieties in Idaho, Oregon, Washington, between Washington State University, Oregon State University, University of Idaho and (USDA-ARS) The United States of America, as represented by the Secretary of Agriculture. In accordance with provision 2.2 of this Agreement, University of Idaho is applying for the PVPC.

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

POTATO

'Teton Russet'

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 twenty-fifth day of June, in the year* ***two thousand and fourteen.***

Attest:

201200159

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)

RAD
10/02/2012

1. NAME OF OWNER
~~University of Idaho~~ The State of Idaho
(continued on Exhibit E, 11)

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
A0008-1TE

3. VARIETY NAME
Teton Russet

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

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

6. FAX *(include area code)*
208-885-6127

FOR OFFICIAL USE ONLY

PVPO NUMBER
201200159

FILING DATE
June 25, 2012

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Land Grant University
Not for Profit

8. IF INCORPORATED, GIVE STATE OF INCORPORATION
Idaho

9. DATE OF INCORPORATION
1947

10. NAME AND ADDRESSOF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Gaylene Anderson and Jeffrey C. Stark
University of Idaho Office of Technology Transfer
Morrill Hall 414 PO Box 443033
Moscow, ID 83844-3003

FEES RECEIVED
FILING AND EXAMINATION FEES: $ $4,382.00 DATE June 25, 2012
CERTIFICATION FEE: $ DATE

11. TELEPHONE (Include area code)
(208) 885-4550 or 529-8376

12. FAX (Include area code)
(208) 885-4551 or 522-2954

13. E-MAIL
gaylene@uidaho.edu , jstark@uidaho.edu

14. CROP KIND *(Common Name)*
Potato

16. FAMILY NAME *(Botanical)*
Solanaceae

15. GENUS AND SPECES NAME OF CROP
Solanum tuberosum

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

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? *(OPTIONAL)*
☐ YES ■ NO
IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION. _____

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. ■ Exhibit F. Declaration Regarding Deposit
g. ■ Voucher Sample *(3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
h. ■ Filing and Examination Fee ($4,382), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

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

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.)

RAD
8/20/2012

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 ASSGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been 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 OF OWNER
Gaylene Anderson	Jeffrey C. Stark
NAME *(Please print or type)*	NAME *(Please print or type)*
Gaylene Anderson	Jeffrey C. Stark
CAPACITY OR TITLE: Licensing Associate — DATE: 06/18/2012	CAPACITY OR TITLE: Research Professor — DATE: 06/18/2012

ST-470 (07-01-2009) designed by the Plant Variety Protection Office

received 6/20/2012

Exhibit A Form

1. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s).

Teton Russet was derived from a sexual hybridization made at the University of Idaho's Aberdeen Research and Extension Center in 2000. It resulted from a cross of Blazer Russet (female parent) and Classic Russet (male parent). It was first selected in the field in 2001 at the Tetonia Research and Extension Center.

A four generation pedigree is attached.

2. Give the details of subsequent stages of selection and multiplication.

Year	Detail of Stage	Selection Criteria
2001	Field selection in 2001.	Early yield and maturity, appearance, higher protein and vitamin C content, resistance to Fusarium dry rot, and french fry processing potential.
2006-2007	In 2006-2007 Teton Russet was evaluated in the Tri-State Potato Variety Trials.	
2008-2010	In 2008-2010 Teton Russet was entered and evaluated in the Western Regional Variety Trials. Teton Russet was selected for use in the early to medium season russet tablestock and french fry processing markets.	
2008-2011	Teton Russet in agronomic field trials	
2006-present	Seed source maintained at UI Tetonia R&E Center	

3a. Is the variety uniform? X Yes No

How did you test for uniformity?

Teton Russet has been clonally propagated since the first year of selection. The variety has remained uniform during all subsequent years of maintenance and propagation.

3b. Is the variety stable? X Yes No

How did you test for stability? Over how many generations?

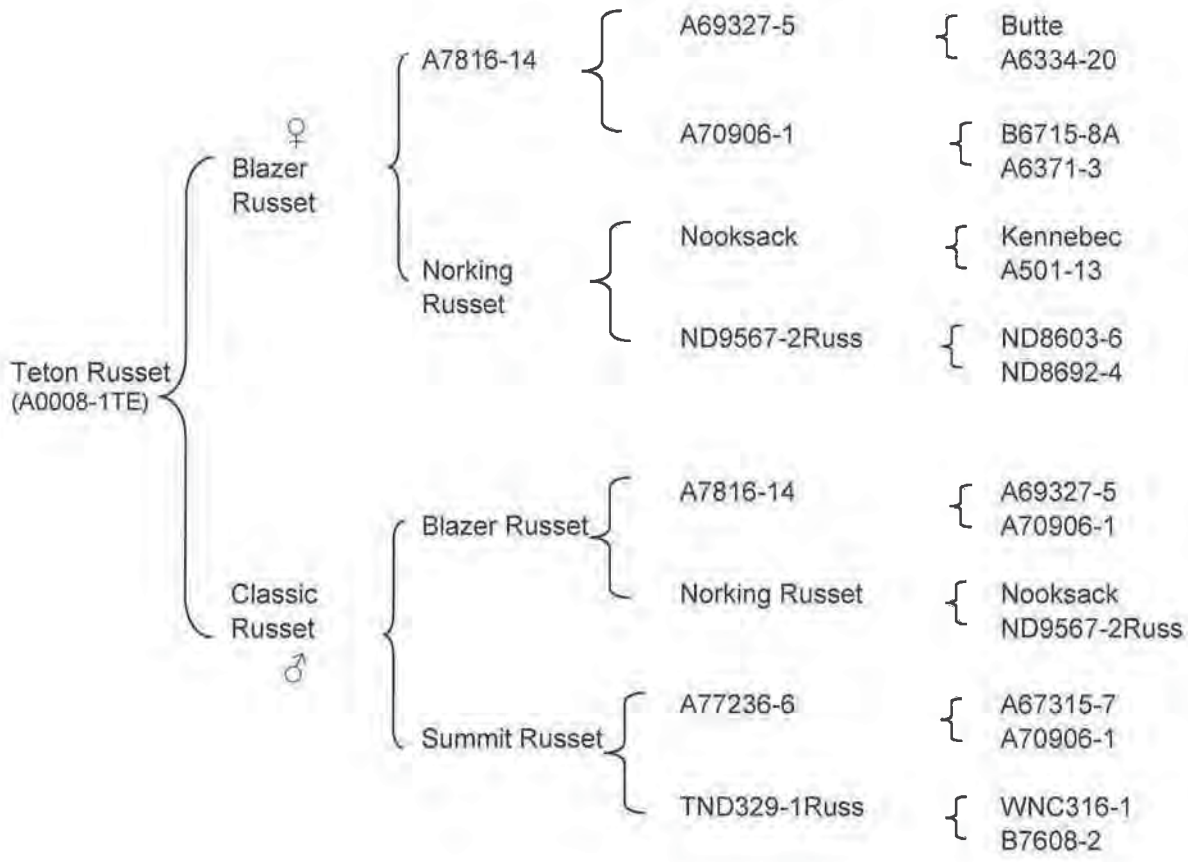
Teton Russet has been clonally propagated for ten years of evaluations. It has shown stability over ten generations and has not produced any recognizable variants.

4. Are genetic variants observed or expected during reproduction and multiplication? _____ Yes _X_ No

If yes, state how these variants may be identified, their type and frequency.

Continue on additional pages if necessary.

Pedigree of Teton Russet (A0008-1TE)



received 6/20/2012

Exhibit B Form

Based on overall morphology, 'Teton Russet' is most similar to 'Russet Burbank'
Applicant's new variety *Most similar comparison variety(ies)*

'Teton Russet' most clearly differs from ' Russet Burbank ' in the following traits:
Applicant's new variety *Most similar comparison variety(ies)*

Name the specific trait, and then list the value of that trait for each variety in the comparison. Attach appropriate supporting evidence (see the Guidelines for Presenting Evidence in Support of Variety Distinctness, available from the PVP Office or website).

1. Qualitative traits:	Applicant's New Variety 'Teton Russet'	1st Comparison Variety 'Russet Burbank'	Location of Evidence
Plant size Plant maturity	Short (1.33) Early (1.25)	Medium tall (2.58) Late (2.17)	Table 1 Exhibit C Exhibit D
2. Color traits: * measured using the Royal Horticultural Society Colour Chart (RHS)			
Leaf color* tuber skin color* Stem Anthocyanin	Dark green (RHS 137A) grayed-orange (RHS 165B) Strong (7)	Olive green (RHS 146 A) grayed-orange (RHS 164A) Weak (3)	Exhibit C and photographs
3. Quantitative traits:			
Protein Vitamin C content	High (6.4%) High (27.6 mg/100g FWB)	Low (4.8%) Low (20.8 mg/100g FWB)	Exhibit C Exhibit D
4. Other:			
Asparagine Dry Rot	Low (4.45 mg/g dry wt) Moderately Resistant (9.54 percent severity)	High (10.21 mg/g dry wt) Susceptible (25.75 percent severity)	Table 2 Table 3 Exhibit C Exhibit D

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

Table 5. Teton Russet and Russet Burbank Comparisons for Percent Protein using the GLM Procedure for Potatoes grown at Aberdeen, Idaho in 2008 and 2010.

Anova		2008 Percent Protein		2010 Percent Protein	
Source	DF	F Value	PR > F	F Value	PR > F
Variety	1	148.62	<0.0001	216.89	<0.0001
Replication	7	0.67	0.6919	2.80	0.0992

Variety		2008 Protein (%)	2010 Protein (%)
Teton Russet	Mean	6.69	6.20
	Minimum	6.10	5.87
	Maximum	7.04	6.82
	Stdev	0.31	0.30
Russet Burbank	Mean	4.96	4.72
	Minimum	4.55	4.32
	Maximum	5.16	5.19
	Stdev	0.20	0.25
Means		5.82	5.46
P>F		<0.0001	<0.0001
LSD =0.05		0.336	0.237

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PROTEIN
Standard Operating Procedure

Title: Determination of Protein Content of Freeze-dried Tuber Powder
Coomassie Blue Protein Assay.

Reagents:

1. Dye Reagent: Dissolve 100mg Coomassie Blue G-250 (Sigma) in 50ml of 95% Methanol; Add several hundred ml Ultra Purified Water (UPH_2O) , mix, slowly add 100ml of 85% Phosphoric Acid, bring to 1 liter final volume with UPH_2O. Protect from light. Discard after 2 weeks.
2. 0.5 N Sodium Hydroxide: Disolve 20g NaOH in about 500ml UPH_2O, cool, make up to 1 liter.
3. Protein standard (100ug/ml): Make up solution of Bovine Gamma Globulin (BGG) 5 mg/50ml 0.5N NaOH. BGG dissolves best in 1N NaOH, therefore, Dissolve 5mg BGG in 25 ml 1N NaOH then add 25ml UPH_2O. Should be made up fresh daily.

Procedure:

1. Weigh sample of about 15mg of freeze dried and ground tuber tissue into a test tube. Record exact weight. Duplicate each sample.
2. Add 5ml of 0.5N NaOH, gently mix (with vortex) with minimum foaming.
3. Let stand at room temperature for 2.5 hours.
4. Transfer a 0.2ml aliquote of the sample extract into a clean test tube and add 0.8ml of 0.5N NaOH.
5. Add 5ml dye reagent, mix well, read absorbance at 595nm after 5 minutes but within ½ hour of dye addition.
6. For standards add 0.1, 0.2, 0.3, 0.4 and 0.5ml to test tubes, bring to 1 ml volume with 0.5N NaOH, add 5ml of dye reagent, mix and read absorbance after 5 minutes but within ½ hr of dye addition.
7. Blank 1 ml 0.5N NaOH and 5ml dye reagent.

Calculations:

1. Determine average µg protein per OD unit from standards.
2. Unknown OD x µg protein/OD unit = µg protein in unknown per 0.2 aliquot.
3. µg protein per 0.2 ml aliquot x 5ml total extract volume – total µg
4. Total microgram protein υ mg tissue extracted =µg /mg (or mg/g)

-- or total microgram protein $\sum$ µg tissue extracted x 100 - % protein

--actual protein* = $\frac{\text{coomassie blue protein estimate using BGG (mg/G)} - 5.6}{0.86}$

*Actual protein determined from microkjeldahl anaysis of 80% ethanol extracted freeze dried powder compared with coomassie blue estimate using BGG standard (linear regression analysis 1989).

Reference: Bradford N.M. (1975) A rapid and sensitive method for the quantitation of microgram quantities of protein using the principle of protein dye binding. Anal. Biochem. 73:248-254

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

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Potato (*Solanum tuberosum* L.)

INSTRUCTIONS

The Objective Description Form:
The objective description form lists characteristics to be used as the basis for developing the description of potato varieties. It is designed to guide the applicant in describing a variety in detail so a meaningful comparison with other potato varieties can be accomplished. It is recommended that this form be completed in as much detail as possible to ensure an accurate description. Please fill in the requested data and place the appropriate number that describes the varietal characters typical of this potato variety and the reference varieties in the respective boxes.

Test Guidelines:
Any statistical and trial (field test) data that may be necessary to support the variety description should be attached to this form. Please include for trial data the plot size, number of replications, number of plants, plant spacing, trial locations and growing periods. Trials should normally be conducted at one place, in the region that the variety has been adapted for, with a minimum of one growing period in the United States. All comparative data should be determined from varieties entered in the same trials. The size of the plots should be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made at the end of the growing period. As a minimum, each test should include a total of 60 plants which should be divided between two or more replicates. Separate plots for observation and measuring can only be used if they have been subject to similar environmental conditions. To determine color for a plant or plant parts a recognized standard color chart must be used such as the Royal Horticultural Society (RHS) Color Chart or Munsell Color Chart (MCC).

Reference Varieties:
The application variety should be compared to at least one reference variety preferably a set of reference varieties. The reference varieties should be market class standard varieties currently grown in the United States and or the variety (ies) most similar. The following varieties are recommended as market class standards to be used as reference varieties:

Yellow-flesh table-stock	Yukon Gold
Round-white table-stock	Superior
Chip-processing	Atlantic, Snowden, Norchip
Frozen-processing	Russet Burbank
Russet table-stock	Russet Burbank, Russet Norkotah, Goldrush
Red table-stock	Red Pontiac, Red Norland, Red Lasoda

If the applicant does not use one of the recommended reference varieties by the PVP office, a complete description of the reference variety should be submitted by the applicant (Exhibit C).

Characteristics:
Light sprout characteristics are supplied in **Figure 1**. The plant type and growth habit characteristics are collected at early first bloom. **Figure 2** is supplied to help visualize the growth habit. For this descriptor, look at the stems rather than the stems and foliage. Plant maturity is measured at natural vine senescence.

Stem characteristics are also collected at early bloom. Stem anthocyanin coloration is divided into two descriptors: Location and intensity. **Figure 3** is supplied to give an example of stem wings.

Leaf characteristics are observed at early first bloom. Fully-developed leaves located on the middle third of the plant should be used. Leaf pubescence refers to general trichomes. **Figure 4** is supplied for examples of leaf silhouette. Leaf stipules are shown in **Figure 5** for visual definition. **Figure 6** is supplied to define leaf characteristics. **Figure 7** should be used to describe terminal and primary leaflet shape. **Figures 8 and 9** are used to describe the terminal and primary leaflet shape of tip and base, respectively. To measure the total number of primary leaflets pairs, collect 10 fully developed petioles (with leaves attached from each replication) and take the average number of secondary and tertiary leaflets. Glandular trichomes should be described in the Additional Comments and Characteristics (Descriptor 15).

Inflorescence characteristics should be measured at early first bloom. **Figures 10, 11 and 12** are supplied to describe anther and stigma shape, respectively. Corolla, calyx, anther, stigma, and pollen should be observed on newly opened flowers. Berry production should be based on field-grown plants rather than greenhouse plants.

Tuber characteristics should be observed following harvest**. Figures 13 and 14** are available to describe distribution of secondary color and tuber shape, respectively.

Disease and pest reactions should be based upon specific tests or statistical analysis rather than just field observations, rating 1 as Highly Resistance and 9 as Highly Susceptible, please follow the scale on each descriptor. Other diseases or pests reactions not requested can be described if it is felt that it would be helpful to determine novelty of the variety.

Quality characteristics should be described according to the market use.

If the plant is transgenic, this gene insertion(s) should be described.

Chemical identification and any other characteristics can be described if they are helpful in distinguishing the variety.

Legend:

V = Application Variety

R1-R4 = Reference Varieties

* = Both the reference variety (ies) and application variety must be described for characteristics designated with an asterisk.

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
University of Idaho	A0008-1TE	Teton Russet

ADDRESS *(Street and No. or RD No., City, State, Zip Code, and Country)*
Office of Technology Transfer
Morrill Hall 414
PO Box 443003
Moscow ID 83844-3003

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PVPO NUMBER

20120159

REFERENCE VARIETIES: Enter the reference variety name in the appropriate box.

Application Variety (V)	Reference Variety 1 (R1)	Reference Variety 2 (R2)	Reference Variety 3 (R3)	Reference Variety 4 (R4)
Teton Russet	Russet Burbank			

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

1. MARKET CHARACTERISTICS:

***MARKET CLASS**:
1 = Yellow-flesh Tablestock 2 = Round-white Tablestock 3 = Chip-processing 4 = Frozen-processing
5 = Russet Tablestock 6 = Other _____

V	R1	R2	R3	R4
4-5	4-5			

2. LIGHT SPROUT CHARACTERISTICS: (See Figure 1)

***LIGHT SPROUT: GENERAL SHAPE**
1 = Spherical 2 = Ovoid 3 = Conica 4 = Broad cylindrica 5 = Narrow cylindrical 6 = Other _____

V	R1	R2	R3	R4
1	2			

***LIGHT SPROUT BASE: PUBESCENCE OF BASE**
1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V	R1	R2	R3	R4
4	3			

***LIGHT SPROUT BASE: ANTHOCYANIN COLORATION**
1 = Green 2 = Red-violet 3 = Blue-violet 4 = Other(describe) _____

V	R1	R2	R3	R4
3	2			

***LIGHT SPROUT BASE: INTENSITY OF ANTHOCYANIN COLORATION (IF PRESENT)**
1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V	R1	R2	R3	R4
5	3			

* **LIGHT SPROUT TIP: HABIT**
1 = Closed 2 = Intermediate 3 = Open

V	R1	R2	R3	R4
2	2			

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2. LIGHT SPROUT CHARACTERISTICS: (continued)

LIGHT SPROUT TIP: PUBESCENCE
1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V	4	R1	3	R2		R3		R4	

LIGHT SPROUT TIP ANTHOCYANIN COLORATION
1 = Green 2 = Red-violet 3 = Blue-violet 4 = Other(describe) _____

V	3	R1	2	R2		R3		R4	

LIGHT SPROUT TIP: INTENSITY OF ANTHOCANIN COLORATION (IF PRESENT)
1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V	4	R1	2	R2		R3		R4	

LIGHT SPROUT ROOT INITIALS: FREQUENCY
1 = Absent 2 = Some 3 = Abundant

V	2	R1	2	R2		R3		R4	

3. PLANT CHARACTERISTICS:

GROWTH HABIT: (See Figure 2)
3 = Erect (>45° with ground) 5 = Semi-erect (30-45° with ground) 7 = Spreading

V	5	R1	5	R2		R3		R4	

TYPE:
1 = Stem (foliage open, stems clearly visible) 2 = Intermediate 3 = Leaf (Foliage closed, stems hardly visible)

V	2	R1	2	R2		R3		R4	

MATURITY: Days after planting (DAP) at vine senescence

V	110	R1	125	R2		R3		R4	

PLANTING DATE:

V	05-03-2009,05-04-2010	R1	05-03-2009,05-04-2010	R2		R3		R4	

***REGIONAL AREA**:
1 = Pacific North West (WA, OR, ID, CO, CA) 2 = North Central (ND, WI, MI, MN, OH) 3 = North East (ME, NY, PA, NJ, MD, MA, RI,)
4 = Mid-Atlantic Erect (VI, NC, SC, South NJ, FL) 5 = South (LA, TX, AZ, NE) 6 = Canada
7 = Europe 8 = England 9 = Latin America 10 = Brazil 11 = Other _____

V	1 Aberdeen, ID	R1	1 Aberdeen, ID	R2		R3		R4	

MATURITY CLASS:
1 = Very Early (<100 DAP) 2 = Early (100-110 DAP) 3 = Mid-season (111-120 DAP) 4 = Late (121-130 DAP) 5 = Very Late (>130 DAP).

V	2,3	R1	4	R2		R3		R4	

4. STEM CHARACTERISTICS: Measure at early first bloom

*** STEM ANTHOCYANIN COLORATION**:
1 = Absent 3= Weak 5 = Medium 7 = Strong 9 = Very Strong

V	7	R1	3	R2		R3		R4	

STEM WINGS: (See Figure 3)
1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very Strong

V	3	R1	3	R2		R3		R4	

5. LEAF CHARACTERISTICS:

LEAF COLOR: (*Observe fully developed leaves located on middle 1/3 of plant)*
1 = Yellowing-green 2 = Olive-green 3 = Medium Green 4 = Dark Green 5 = Grey-green 6 = Other _____

V	4	R1	2	R2		R3		R4	

LEAF COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(*Observe fully developed leaves located on middle 1/3 of plant and circle the appropriate color chart)*

V	137 A	R1	146 A	R2		R3		R4	

LEAF PUBESCENCE DENSITY:
1 = Absent 2 = Sparse 3 = Medium 4 = Thick 5 = Heavy

V	3	R1	3	R2		R3		R4	

LEAF PUBESCENCE LENGTH:
1 = None 2 = Short 3 = Medium 4 = Long 5 = Very Long

V	2	R1	2	R2		R3		R4	

(*Note Descriptor #15 can be used to describe the type and length of the glandular trichomes observed.)*

*** LEAF SILHOUETTE**: (See Figure 4)
1 = Closed 3 = Medium 5 = Open

V	3	R1	5	R2		R3		R4	

PETIOLES ANTHOCYANIN COLORATION:
1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very Strong

V	3	R1	3	R2		R3		R4	

LEAF STIPULES SIZE: (Se Figure 5)
1 = Absent 3 = Small 5 = Medium 7 = Large

V	3	R1	5	R2		R3		R4	

TERMINAL LEAFLET SHAPE (See Figures 6 and 7)
1 = Narrowly ovate 2 = Medium Ovate 3 = Broadly Ovate 4 = Lanceolate 5 = Elliptical 6 = Obovate 7 = Oblong 8 = Other _____

V	3	R1	2	R2		R3		R4	

5. LEAF CHARACTERISTICS: (continued)

TERMINAL LEAFLET TIP SHAPE: (See Figures 6 and 8)
1 = Acute 2 = Cuspidate 3 = Acuminate 4 = Obtuse 5 = Other _____

V	3	R1	3	R2		R3		R4	

* **TERMINAL LEAFLET BASE SHAPE**: (See Figure 9)
1 = Cuneate 2 = Acute 3 = Obtuse 4 = Cordate 5 = Truncate 6 = Lobed 7 = Other _____

V	3	R1	3	R2		R3		R4	

TERMINAL LEAFLET MARGIN WAVINESS:
1 = Absent 2 = Slight 3 = Weak 4 = Medium 5 = Strong

V	3	R1	3	R2		R3		R4	

NUMBER OF PRIMARY LEAFLET PAIRS: (See Figure 6)

AVERAGE:

V	3.4	R1	3.4	R2		R3		R4	

RANGE:

V	2 to 5	R1	2 to 4	R2	to	R3	to	R4	to

PRIMARY LEAFLET TIP SHAPE: (See Figures 6 and 8)
1 = Acute 2 = Cuspidate 3 = Acuminate 4 = Obtuse 5 = Other _____

V	3	R1	3	R2		R3		R4	

PRIMARY LEAFLET SIZE:
1 = Very Small 2 = Small 3 = Medium 4 = Large 5 = Very Large

V	4	R1	3	R2		R3		R4	

PRIMARY LEAFLET SHAPE: (See Figures 6 and 7)
1 = Narrowly ovate 2 = Medium ovate 3 = Broadly ovate 4 = Lanceolate 5 = Elliptical 6 = Ovate 7 = Oblong 8 = Other _____

V	2	R1	2	R2		R3		R4	

PRIMARY LEAFLET BASE SHAPE: (See Figures 6 and 9)
1 = Cuneate 2 = Acute 3 = Obtuse 4 = Cordate 5 = Truncate 6 = Lobed 7 = Other _____

V	4	R1	3	R2		R3		R4	

NUMBER OF SECONDARY AND TERTIARY LEAFLET PAIRS: (See Figure 6)

AVERAGE:

V	6.7	R1	6.1	R2		R3		R4	

RANGE:

V	3 to 10	R1	2 to 11	R2	to	R3	to	R4	to

5. LEAF CHARACTERISTICS: (continued)

NUMBER OF INFLORESCENCE/PLANT:

AVERAGE:

V	3.3	R1	4.2	R2		R3		R4	

RANGE:

V	1 to 5	R1	1 to 9	R2	to	R3	to	R4	to

NUMBER OF FLORETS/INFLORESCENCE:

AVERAGE:

V	3.1	R1	12.0	R2		R3		R4	

RANGE:

V	1 to 6	R1	5 to 18	R2	to	R3	to	R4	to

*** COROLLA INNER SURFACE COLOR CHART VALUE**: Royal Horticulture Society Color Chart or Munsell Color Chart (Measure predominant color of newly open flower and circle the appropriate color chart)

V	155 A	R1	155 A	R2		R3		R4	

* **COROLLA OUTER SURFACE COLOR CHART VALUE**: Royal Horticulture Society Color Chart or Munsell Color Chart (Measure predominant color of newly open flower and circle the appropriate color chart)

V	155 A	R1	155 B	R2		R3		R4	

* **COROLLA INNER SURFACE COLOR**: (Measure predominant color of newly open flower, if flowers are bi-color please use the ratio codes)
1 = White 2 = Red-violet 3 = Blue-violet 4 = Cream 5 = Red-purple 6 = Blue 7 = Pink 8 = Pink-white 9 = Purple 10 = Violet 11 = Purple-violet 13 = Violet-White 1:1 14 = Violet-White 1:3 15 = Violet-White 3:1 16 = Violet-White Halo 17 = Pink-White 1:1 18 = Pink-White 1:3 19 = Pink-White 3:1 20 = Pink-White Halo 21 = RedViolet-White 1:1 22 = RedViolet-White 1:3 23 = RedViolet-White 3:1 24 = RedViolet-White Halo 25 = BlueViolet-White 1:1 26 = BlueViolet-White 1:3 27 = BlueViolet-White 3:1 28 = BlueViolet-White Halo 12 = Other _____

V	1	R1	1	R2		R3		R4	

COROLLA SHAPE: (See Figure 10)
1 = Very rotate 2 = Rotate 3 = Pentagonal 4 = Semi-stellate 5 = Stellate

V	4	R1	4	R2		R3		R4	

6. INFLORESCENCE CHARACTERISTICS:

CALYX ANTHOCYANIN COLORATION:
1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very strong

V	5	R1	3	R2		R3		R4	

ANTHER COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsel Color Chart (Measure when newly opened flower is fully expanded and circle the appropriate color chart)

V	15 A	R1	15 A	R2		R3		R4	

ANTHER SHAPE: (See Figure 11)
1 = Broad cone 2 = Narrow cone 3 = Pear-shaped cone 4 = Loose 5 = Other

V	4	R1	3	R2		R3		R4	

6. INFLORESCENCE CHARACTERISTICS: (continued)

POLLEN PRODUCTION:
1 = None 3 = Some 5 = Abundant

V	3	R1	1	R2		R3		R4	

STIGMA SHAPE: (See Figure 12)
1 = Capitate 2 = Clavate 3 Bi-lobed

V	1	R1	1	R2		R3		R4	

STIGMA COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsel Color Chart (Circle the appropriate color chart)

V	146 A	R1	146 B	R2		R3		R4	

BERRY PRODUCTION: (Under field conditions)
1 = Absent 3 = Low 5 = Moderate 7 = Heavy 9 = Very Heavy

V	1	R1	1	R2		R3		R4	

7. TUBER CHARACTERISTICS:

*** PREDOMINANT SKIN COLOR**:
1 = White 2 = Light Yellow 3 = Yellow 4 = Buff 5 = Tan 6 = Brown 7 = Pink 8 = Red 9 = Purplish-red
10 = Purple 11 = Dark purple-black 12 = Other _____

V	6	R1	5	R2		R3		R4	

PREDOMINANT SKIN COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart (Circle the appropriate color chart)

V	165 B	R1	164 B	R2		R3		R4	

SECONDARY SKIN COLOR:
1 = Absent 2 = Present (please describe)

V	1	R1	1	R2		R3		R4	

SECONDARY SKIN COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart (Circle the appropriate color)

V		R1		R2		R3		R4	

SECONDARY SKIN COLOR DISTRIBUTION: (See Figure 13)
1 = Eyes 2 = Eyebrows 3 = Splashed 4 = Scattered 5 = Spectacled 6 = Stippled 7 = Other _____

V		R1		R2		R3		R4	

SKIN TEXTURE:
1 = Smooth 2 = Rough (flaky) 3 = Netled 4 = Russetted 5 = Heavily russetted 6 = Other _____

V	4	R1	4	R2		R3		R4	

7. TUBER CHARACTERISTICS: (continued)

*** TUBER SHAPE**: (See Figure 14)
1 = Compressed 2 = Round 3 = Oval 4 = Oblong 5 = Long 6 = Other _____

V	4	R1	5	R2		R3		R4	

TUBER THICKNESS:
1 = Round 2 = Medium thick 3 = Slightly flattened 4 = Flattened 5 = Other _____

V	2	R1	3	R2		R3		R4	

TUBER LENGTH (mm):

AVERAGE:

V	106	R1	135	R2		R3		R4	

RANGE:

V	80 to 137	R1	85 to 180	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	11.41	R1	18.6	R2		R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	213	R1	236	R2		R3		R4	

TUBER WIDTH (mm)

AVERAGE:

V	61.0	R1	61	R2		R3		R4	

RANGE:

V	50 to 75	R1	49 to 79	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	4.64	R1	5.82	R2		R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	213	R1	236	R2		R3		R4	

7. TUBER CHARACTERISTICS: (continued)

TUBER THICKNESS (mm):

AVERAGE:

V	56	R1	53	R2		R3		R4	

RANGE:

V	45 to 69	R1	43 to 72	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	4.1	R1	5.56	R2		R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	213	R1	236	R2		R3		R4	

TUBER EYE DEPTH:

1 = Protruding 3 = Shallow 5 = Intermediate 7 = Deep 9 = Very deep

V	3	R1	5	R2		R3		R4	

TUBER LATERAL EYES:

1 = Protruding 3 = Shallow 5 = Intermediate 7 = Deep 9 = Very deep

V	3	R1	5	R2		R3		R4	

NUMBER EYE/TUBER:

AVERAGE:

V	13.9	R1	26.6	R2		R3		R4	

RANGE:

V	10 to 19	R1	19 to 42	R2	to	R3	to	R4	to

DISTRIBUTION OF TUBER EYES:

1 = Predominantly apical 2 = Evenly distributed

V	2	R1	2	R2		R3		R4	

PROMINENCE OF TUBER EYEBROWS:

1= Absent 2 = Slight prominence 3 = Medium prominence 4 = Very prominent 5 = Other _____

V	3	R1	2	R2		R3		R4	

7. TUBER CHARACTERISTICS: (continued)

PREDOMINANT TUBER FLESH COLOR
1 = White 2 = Light Yellow 3 = Yellow 4 = Buff 5 = Tan 6 = Brown 7 = Pink 8 = Red 9 = Purplish-red
10 = Purple 11 = Dark purple-black 12 = Other _____

V	1	R1	1	R2		R3		R4	

PRIMARY TUBER FLESH COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart (Circle the appropriate color chart)

V	158 B	R1	158 C	R2		R3		R4	

SECONDARY TUBER FLESH COLOR:

1 = Absent 2 = Present, please describe: _____

V	1	R1	1	R2		R3		R4	

SECONDARY TUBER FLESH COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart (Circle the appropriate color chart)

V		R1		R2		R3		R4	

NUMBER OF TUBERS/PLANT:
1 = Low (<8) 2 = Medium (8-15) 3 = High (>15)

V	1	R1	1	R2		R3		R4	

8. DISEASES CHARACTERISTICS:

DISEASES REACTION: 0 = Not Tested 1 = Highly Resistant 2 = Resistant Few Symptoms 3 = Resistance Few Lessions in Number and Size 4 = Moderately Resistance 5 = Intermedia Susceptible 6 = Moderate Susceptible 7 = Susceptible 9 = Highly Susceptible

LATE BLIGHT: (Phytophthora)

V	7	R1	7	R2		R3		R4	

EARLY BLIGHT: (Alternaria)

V	6	R1	6	R2		R3		R4	

SOFT ROT (Erwinia)

V	7	R1	7	R2		R3		R4	

COMMON SCAB (Streptomyces)

V	2	R1	4	R2		R3		R4	

POWDERY SCAB (Spongospora)

V	0	R1	0	R2		R3		R4	

DRY ROT (Fusarium)

V	4	R1	7	R2		R3		R4	

POTATO LEAF ROLL VIRUS (PLRV)

V	6	R1	9	R2		R3		R4	

8. DISEASES CHARACTERISTICS: (continued)

POTATO VIRUS X (PVX)

V	R1	R2	R3	R4
4	9			

POTATO VIRUS Y (PVY)

V	R1	R2	R3	R4
7	7			

POTATO VIRUS M (PVM)

V	R1	R2	R3	R4
0	0			

POTATO VIRUS A (PVA)

V	R1	R2	R3	R4
0	0			

GOLDEN NEMATODE (Globodera)

V	R1	R2	R3	R4
0	0			

ROOT – KNOT NEMATODE (Meloidogyne)

V	R1	R2	R3	R4
7	7			

OTHER DISEASE Corly Ringspot

V	R1	R2	R3	R4
4	9			

PHYSIOLOGICAL DISORDER

1 = Malformed shape 2 = Tuber cracking 3 = Feathering 4 = Hollow heart 5 = Internal necrosis
6 = Blackheart 7 = Internal sprouting 8 = Other _____

V	R1	R2	R3	R4

9. PESTS CHARACTERISTICS:

PEST REACTION: 0 = Not Tested 1 = Highly Resistant 2 = Resistant Few Symptoms 3 = Resistance Few Lessions in Number and Size
4 = Moderately Resistance 5 = Intermedia Susceptible 6 = Moderate Susceptible
7 = Susceptible 9 = Highly Susceptible

COLORADO POTATO BEETLE (CPB) (*Leptinotarsa*)

V	R1	R2	R3	R4
0	0			

GREEN PEACH APHID *(Myzus)*

V	R1	R2	R3	R4
0	0			

OTHER:

V	R1	R2	R3	R4
0	0			

OTHER:

V	R1	R2	R3	R4
0	0			

10. GENE TRAITS:

INSERTION OF GENES: 1 = YES 2 = NO ☑

IF YES, describe the gene(s) introduced or attach information:

11. QUALITY CHARACTERISTICS:

CHIEF MARKET:

SPECIFIC GRAVITY (wt. air/wt. air – wt. water)
1 = <1.060 2 = 1.060-1.069 3 = 1.070-1.079 4 = 1.080-1.089 5 = >1.090

V	3-4	R1	3-4	R2		R3		R4	

TOTAL GLYCOALKALOID CONTENT (mg./100 g. fresh tuber)

V	1.50	R1	3.49	R2		R3		R4	

OTHER QUALITY CHARACTERISTICS: Describe any other quality characteristics that may aid in identification, (e.g., chip-processing, french fry processing, baking, boiling, after-cooking darkening). Please attach data and corresponding protocol.

Teton Russet has lower Asparagine level (4.44) than Russet Burbank (10.21). See attached Exhibit D.

12. CHEMICAL IDENTIFICATION:

Describe chemical traits of the candidate variety that aid in its identification (e.g., protien or DSN electrophoresis). Please attach data and the corresponding protocol.

Teton Russet has higher percent protein content (6.5%) than Russet Burbank (4.8%).

Teton Russet has higher Vitamin C content (27.6 mg/100g Fresh weight basis FWB) than Russet Burbank (20.8 mg/100 g FWB).

See protocol and attached Exhibit D

13. FINGER PRINTING MARKERS:

ISOZYMES 1 = YES 2 = NO ☑

IF YES, attach information

14. DNA PROFILE: 1 = YES 2 = NO ☑

IF YES, attach information

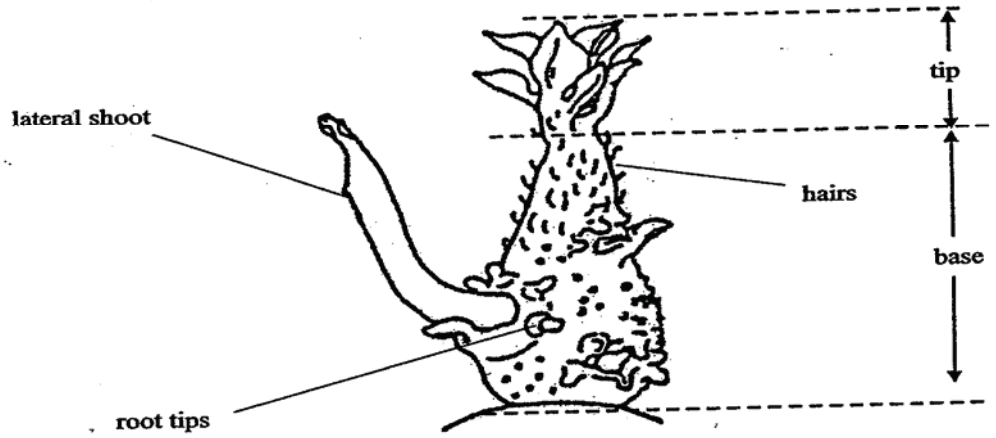
15. ADDDITIONAL COMMENTS AND CHARACTERISTICS:

Include any additional descriptors that would be useful in distringuishing the candidate variety.

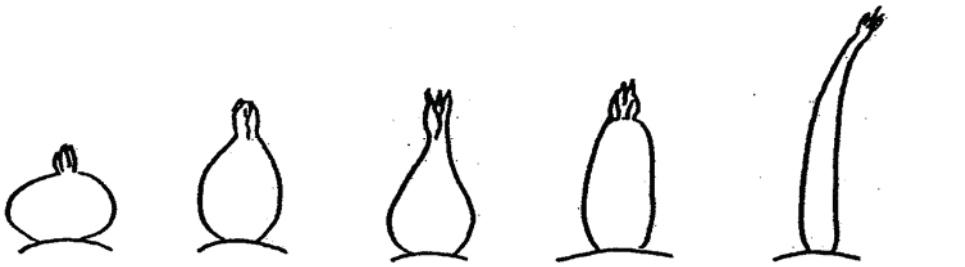
Phenotypically the terminal and primary leaves may be fused or "connate" as seen in attached photographs.

Figure 1: Light sprout

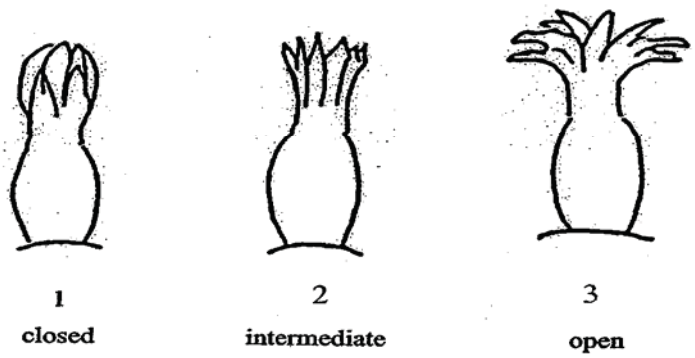
Light sprout dissection



Light sprout shape



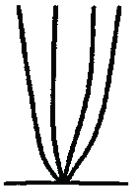
Light sprout tip habit



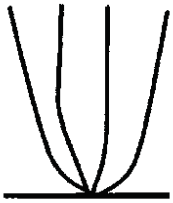
The characteristic should be observed after about 10 weeks to obtain a good differentiation in the collection.

20120159

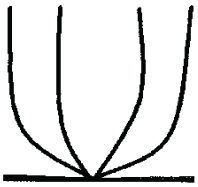
Figure 2: Growth Habit



Erect



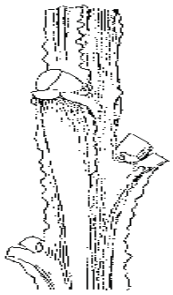
Semi Erect



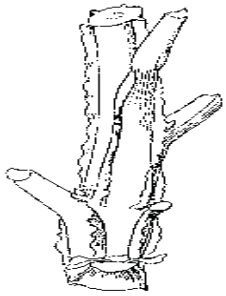
Spreading

Figure 3: Stem Wings

Weak



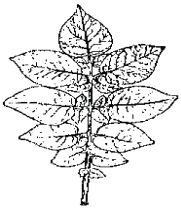
Medium



Strong

Figure 4: Leaf Sillhouette

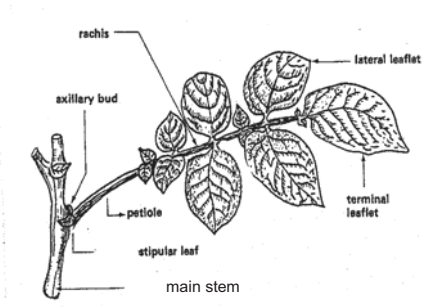
Closed



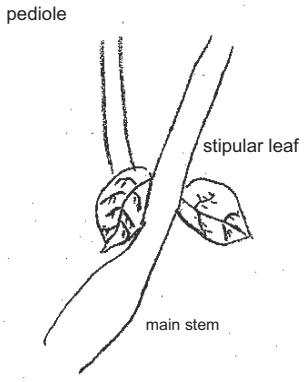
Medium

Open

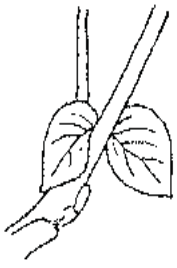
Figure 5: Leaf Stipules



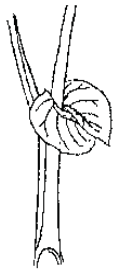
General structures



Small stipular leaf



Medium stipular leaf



Large stipular leaf

received 6/20/2012

Figure 6: Leaf Dissection

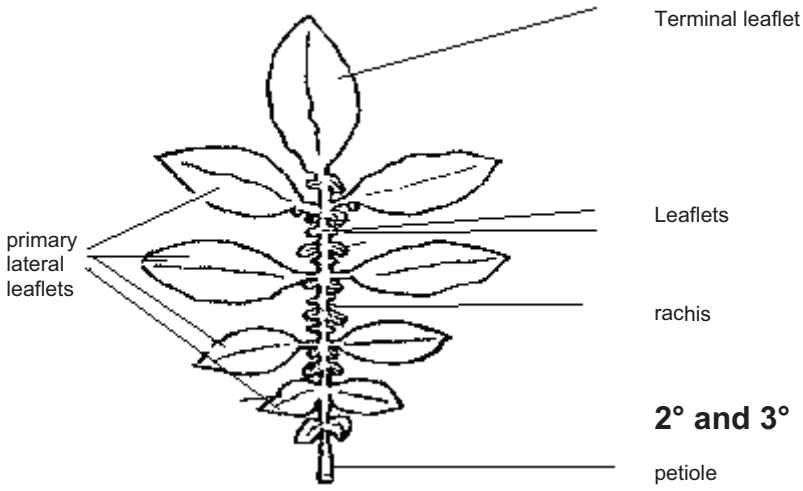


Figure 7: Terminal Leaflet Shape/Primary Leaflet Shape

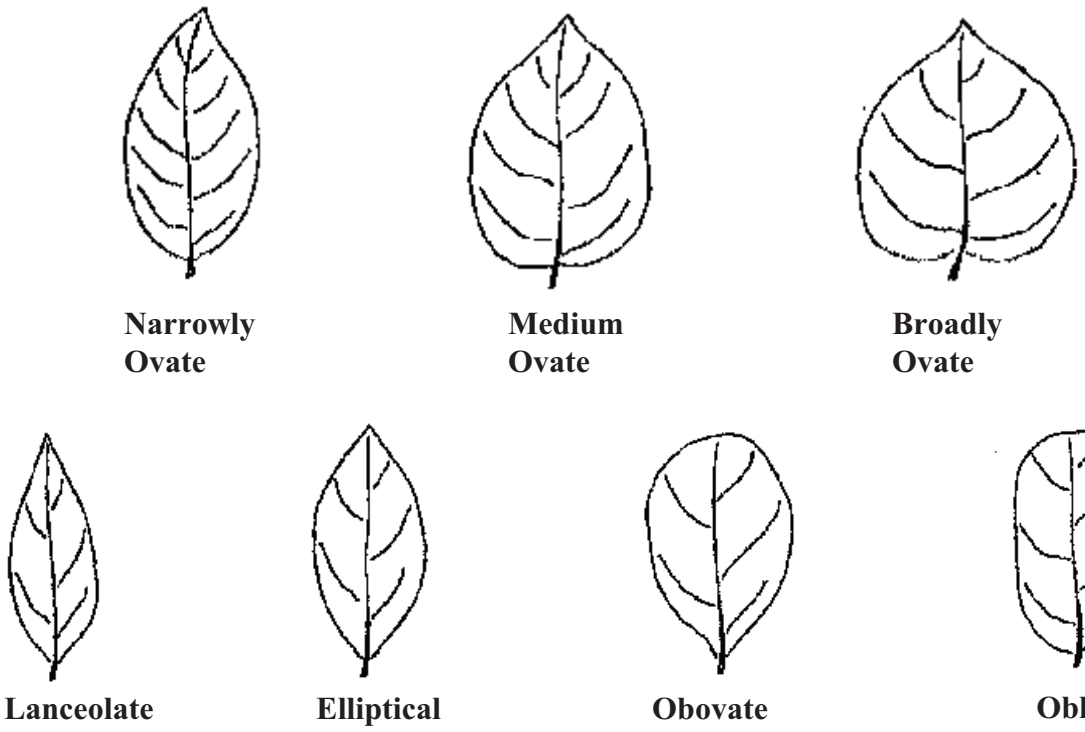


Figure 8: Terminal Leaflet Shape of Tip/Primary Leaflet Shape of Tip

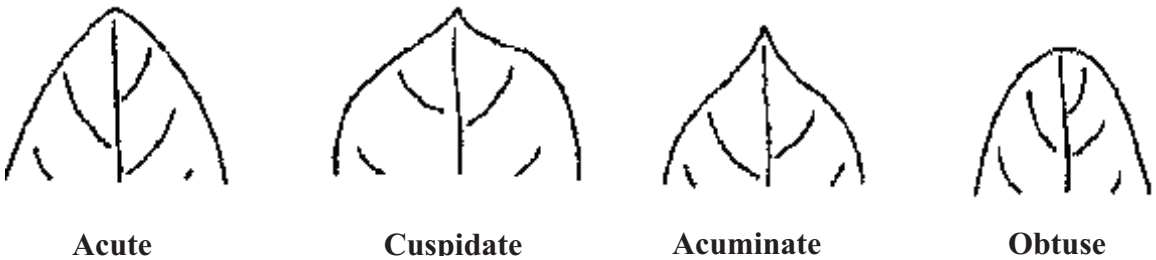


Figure 9: Terminal Leaflet Shape of Base/Primary Leafelet Shape of Base

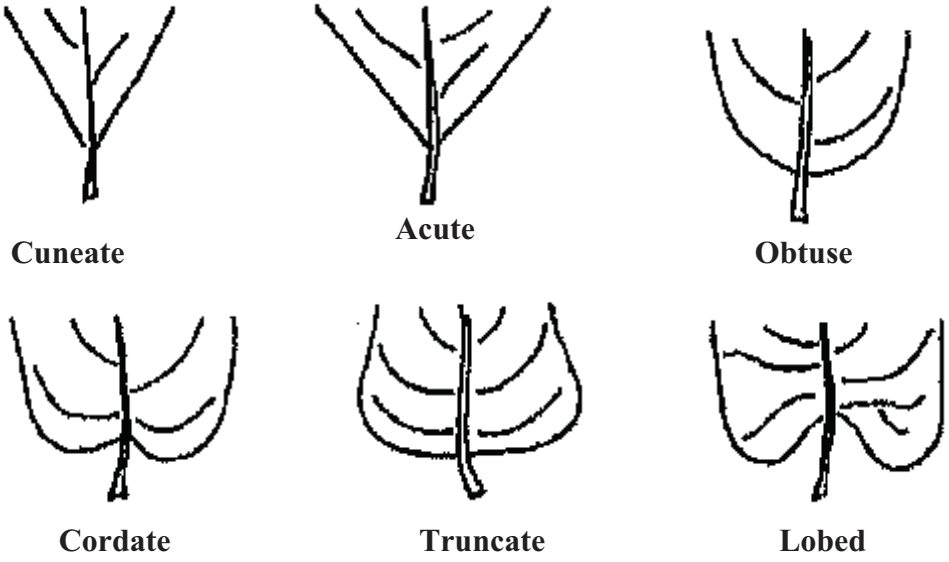


Figure 10: Corolla Shape

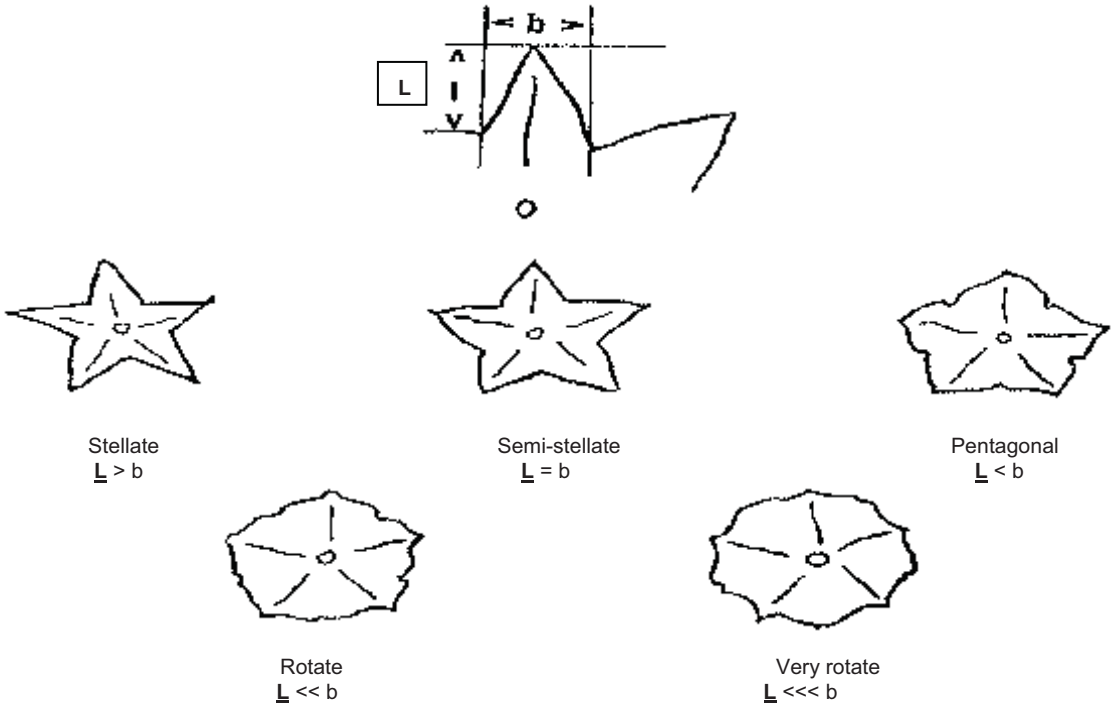


Figure 11: Anther Shape

Figure 12: Stigma Shape

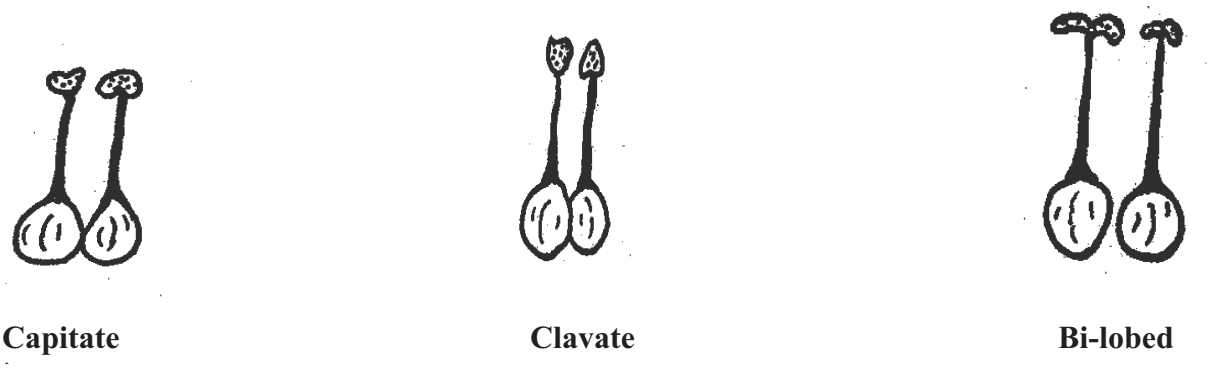


Figure 13: Distribution of Secondary Skin Tuber Color

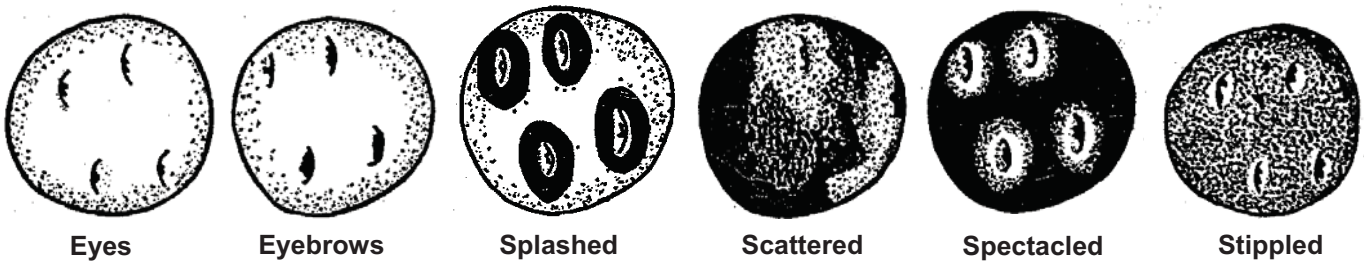


Figure 14: Tuber Shape

References:
Huaman, Z. 1986. Systematic botany and morphology of the potato. Technical information Bulletin 6. International Potato Center, Lima, Peru.

Huaman, Z., Williams, J.T., Salhuana, W. and Vincent, L. Descriptors for the cultivated potato and the maintenance and distribution of germplasm collections. 1977. International Board for Plant Genetic Resources. Rome, Italy.

Potato (*Solanum tuberosum* L.) Guidelines for the conduct of tests for distinctness, uniformity and stability. International union for the protection of new varieties of plants (UPOV). 2004-03-31.

Teton Russet (A0008-1TE)

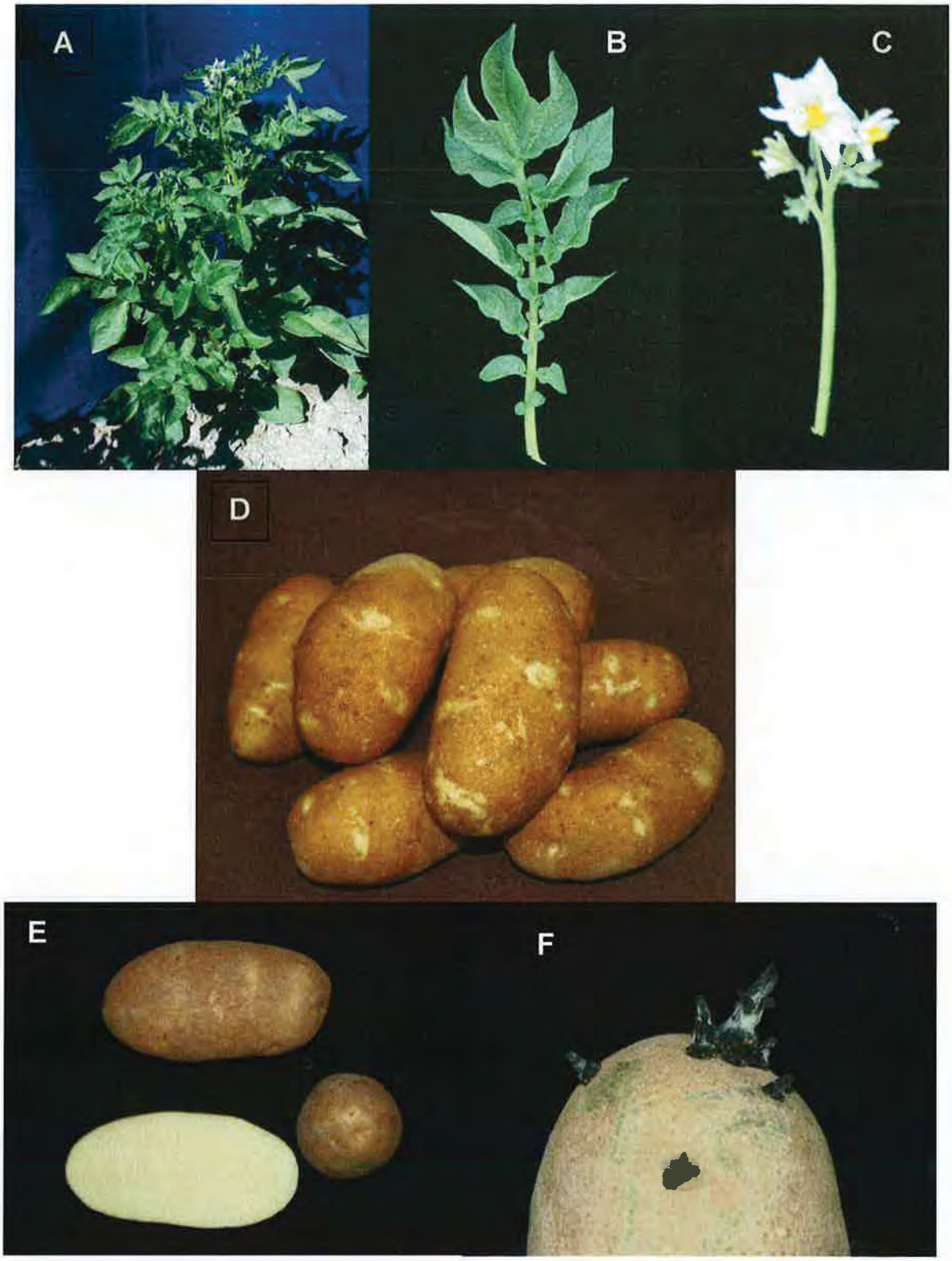


Figure 2. Photographs A0008-1TE showing a) plant, b) leaf, c) flower, d) field tubers, e) external tuber appearance and tuber flesh color, and f) light sprout.

Teton Russet (A0008-1TE)

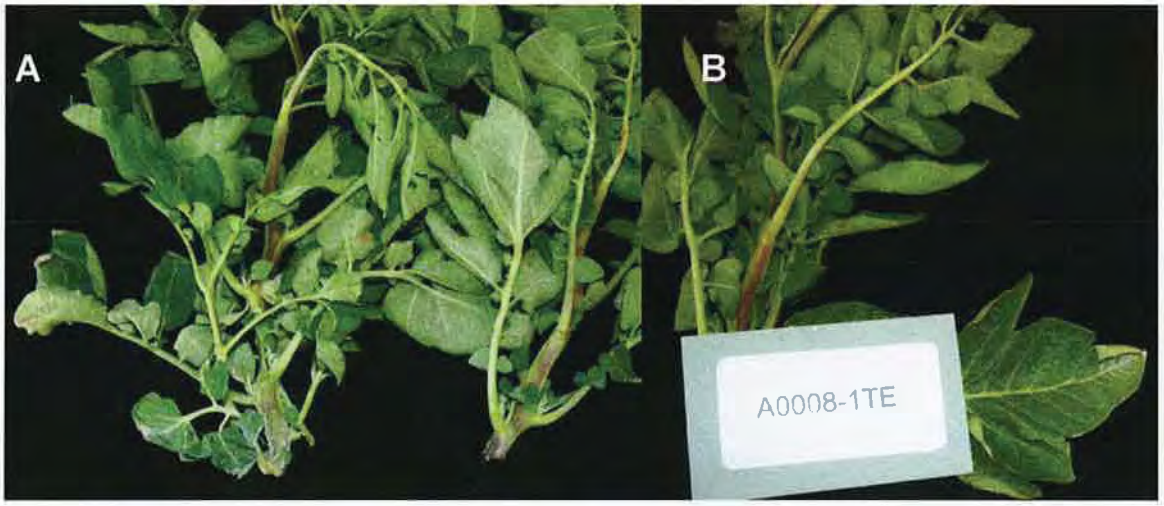


Figure 3. Photographs Teton Russet showing a) the plant stems Anthocyanin b) leaf, with connate primary and secondary leaves.

Application for Plant Variety Protection Certificate

Exhibit D: Additional Description Information
Variety: Teton Russet
Owner: Idaho Agricultural Experiment Station

Teton Russet is an earlier maturing variety than Russet Burbank (Table 1) with a shorter plant height (p=0.01).

Teton Russet is shown to have relatively lower asparagine concentrations (4.45 mg/g dry weight) p=0.05 compared to Russet Burbank with (10.21 mg/g dry weight) as shown in Table 2. Lower asparagine indicates a reduced acrylamide forming potential. Table 3 shows asparagine concentrations are lower for Teton Russet (11.16 mg/g dry weight) p=0.01 than Russet Burbank (14.60 mg/g dry weight) following storage at 48, 44, and 40°F for 60 days.

Teton Russet is moderately resistant to Fusarium dry rot caused by F. sambucinum (Table 4). Severity of the dry rot for Teton Russet were (9.5 %) compared to Russet Burbank at (25.7 %) p=0.05.

In direct comparison with Russet Burbank, Teton Russet tubers have higher protein content (6.4% protein for Teton Russet vs. 4.8% protein for Russet Burbank averaged over 2 years) Table 5. Mean protein content for individual years were 6.69% for Teton Russet and 4.95% for Russet Burbank in 2008 (p=0.01) and 6.20% for Teton Russet and 4.72% for Russet Burbank in 2010 (p=0.01).

Teton Russet tubers have higher Vitamin C content (27.6mg/100g Fresh Weight Basis (FWB) vs. 20.8mg/100g FWB averaged over 2 years) Table 6. Mean total Vitamin contents for individual years were 26.94 mg/100g FWB for Teton Russet and 21.79 mg/100g FWB for Russet Burbank in 2008, (p=0.01) and 28.23 mg/100g FWB for Teton Russet and 19.93 mg/100g FWB for Russet Burbank in 2010 (p=0.01).

Protocols are attached. Statistical analysis was performed using the GLM procedure from SAS.

Table 1. Teton Russet and Russet Burbank Comparisons for Plant Size and Maturity using the GLM Procedure for Potatoes grown at Aberdeen, Idaho in 2008-2009.

Anova		Plant Size		Plant Maturity	
Source	DF	F Value	PR > F	F Value	PR > F
Variety	1	18.06	0.0014	13.53	0.0036
Replication	11	1.72	0.1914	1.12	0.4254

Variety		Plant Size	Plant Maturity
Teton Russet	Mean	1.33	1.25
	Minimum	1	1
	Maximum	2	2
	Stdev	0.492	0.399
Russet Burbank	Mean	2.58	2.17
	Minimum	1	1
	Maximum	4	3
	Stdev	0.900	0.615
Means		1.708	1.958
P>F		0.0014	0.0036
LSD =0.05		0.3997	0.6328

Plant size determined using a scale of 1-5 with 1=short and 5=very tall.
Plant maturity determined using a scale of 1-5 with 1=very senesced and dying and 5= very lush and growing.

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Table 2. Teton Russet and Russet Burbank Comparisons for Asparagine using the GLM Procedure for Potatoes grown at Aberdeen, Idaho and Othello, Washington in 2011.

Anova		Asparagine (mg/g dry weight)	
Source	DF	F Value	PR > F
Variety	1	16.66	0.0266
Replication	3	3.09	0.1894

Variety		Asparagine (mg/g dry weight)
Teton Russet	Mean	4.45
	Minimum	3.43
	Maximum	5.56
	Stdev	1.089
Russet Burbank	Mean	10.21
	Minimum	6.73
	Maximum	13.66
	Stdev	3.890
Means		7.33
P>F		0.0266
LSD =0.05		4.49

Eighty-one varieties were entered in to the National Fry and Processing Trial. The entries were grown in several locations, only the Aberdeen, Idaho and Othello Washington data for Teton Russet and Russet Burbank is presented here. Samples were sent to University of Wisconsin for evaluation. Trial means for ID and WA entries is 8.36 mg/g dry wt asparagine with a range of 2.32-19.57 and standard deviation of 3.48. Idaho trial was planted May 4, and harvested September 21, 2011 and Washington trial was planted April 27 and harvested September 14, 2011.

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Table 3. Teton Russet and Russet Burbank Comparisons for Asparagine at three storage temperatures using the GLM Procedure for Potatoes grown at Othello, Washington in 2010.

Anova		Asparagine (mg/g dry weight)	
Source	DF	F Value	PR > F
Temperature	2	3.85	0.1170
Variety	1	42.15	0.0029
Temp*Variety	2	0.09	0.9132
Replication	2	1.79	0.2791
Temp*Rep	4	1.11	0.4605
Variety* Rep	2	2.21	0.2260

Variety		Asparagine (mg/g dry weight)
Teton Russet	Mean	11.16
	Minimum	9.58
	Maximum	12.55
	Stdev	1.041
Russet Burbank	Mean	14.60
	Minimum	11.57
	Maximum	17.59
	Stdev	1.663
Means		12.88
P>F		0.0029
LSD =0.05		1.473

Samples stored at 48, 44, and 40°F for 60 days.

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Table 4. Teton Russet and Russet Burbank Comparisons for Dry Rot Resistance using the GLM Procedure for Potatoes grown at Kimberly, Idaho in 2009-2011.

Anova		Dry Rot % Severity		Percent Dry Rot of tubers with any infection		Percent Dry Rot of tubers with ≥ 5% infection	
Source	DF	F Value	PR > F	F Value	PR > F	F Value	PR > F
Variety	1	30.55	0.0006	0.62	0.4522	6.36	0.0357
Replication	8	1.68	0.2396	0.83	0.6028	0.98	0.5106

Variety		Dry Rot % Severity	Percent Dry Rot of tubers with any infection	Percent Dry Rot of tubers with ≥ 5% infection
Teton Russet	Mean	9.54	64.81	35.93
	Minimum	1.80	20.00	3.33
	Maximum	16.17	96.67	60.00
	Stdev	5.87	22.74	23.56
Russet Burbank	Mean	25.75	72.22	57.78
	Minimum	14.50	43.33	40.00
	Maximum	40.57	83.33	73.33
	Stdev	8.325	14.337	10.672
Means		17.648	68.518	46.851
P>F		0.0006	0.4522	0.0357
LSD =0.05		6.764	NS	19.975

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Table 6. Teton Russet and Russet Burbank Comparisons for Vitamin C content using the GLM Procedure for Potatoes grown at Aberdeen, Idaho in 2008 and 2010.

Anova		2008 Vitamin C (mg/g FWB)		2010 Vitamin C (mg/g FWB)	
Source	DF	F Value	PR > F	F Value	PR > F
Variety	1	33.17	0.0007	33.73	0.0007
Replication	3	1.51	0.2998	0.61	0.7354

Variety		2008 Vitamin C (mg/g FWB)	2010 Vitamin C (mg/g FWB)
Teton Russet	Mean	26.94	21.80
	Minimum	23.35	20.21
	Maximum	30.70	24.11
	Stdev	2.59	1.15
Russet Burbank	Mean	28.23	19.93
	Minimum	23.44	16.75
	Maximum	33.02	23.93
	Stdev	2.87	2.21
Means		24.37	24.08
P>F		0.0007	0.0007
LSD =0.05		2.112	3.379

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Protocol used to determine plant size and maturity

Plants were grown at Aberdeen, Idaho in variety yield trials. Planting was on May 3, 2008 and May 4, 2009. Plants were rated at approximately 105-110 days after planting. Plant size determined using a scale of 1-5 with 1=short and 5=very tall. Plant maturity determined using a scale of 1-5 with 1=very senesced and dying and 5= very lush and growing.

Protocol used to determine asparagine analysis

Eighty-one varieties were entered in to the National Fry and Processing Trial. The entries were grown in several locations, only the Aberdeen, Idaho and Othello Washington data for Teton Russet and Russet Burbank is presented here. Samples were sent to University of Wisconsin for evaluation. Trial means for ID and WA entries is 8.36 mg/g dry wt asparagine with a range of 2.32-19.57 and standard deviation of 3.48. Idaho trial was planted May 4, and harvested September 21, 2011 and Washington trial was planted April 27 and harvested September 14, 2011.

WA Regional Trial 2010

Twelve tubers of each clone were sampled following 60 days storage at each of three temperatures: 4.4, 6.7, and 8.9°C. These were grouped into four replicates of three tubers. A longitudinal 1 cm x 3 cmslab was removed from the center of each tube and a 0.5-cm slice was removed from one of the long edges of each slab. The four slices forming each replicate were coarsely chopped and frozen in liquid N_2. After freeze-drying, 200 mg tissue were extracted in 4 ml 70 % ethanol then diluted with 6 ml H2O. Extracts were stored at – 18 °C until analysis. A 75-µl aliquot of this extract was derivatized and analyzed using the EZ:faast Amino Acid Analysis kit for GC-FID (Phenomenex , Torrance, CA, USA). Calibration curves for asparagine were derived from authentic standards of 5, 10, 50, 100 and 150 nmoles 100 μL^{-1}.

Protocol used to determine Fusarium dry rot

Fusarium dry rot tests were initiated within one week after harvest in 2009, 2010 and 2011. Three replications of 25 pounds each were bruised by dropping samples 4.7 ft through a vertical chamber comprised of a series of baffles made from potato harvester chain. Tubers were inoculated by spraying each side with a 0.8 ml of $1x10^5$conidia /ml solution *Fusariumsambucinum*. Inoculated samples were cured at 55°F and then ramped to 45°F at 0.5°F/ day. Tubers were sliced longitudinally into quarters and evaluated for percent incidence and severity of dry rot infection after 4 months in storage.Analysis of variance (ANOVA) was performed on percent incidence and severity and means separated by LSD at α=0.05.

VITAMIN C
Standard Operating Procedure

Title: Determination of Vitamin C Content of Freeze-dried Tuber Powder
Total Ascorbic Acid Microfluorometric Method.

Reagents:

1. Extracting solution: Dissolve with shaking 15g. Meta-phosphoric Acid in 200ml Ultra Purified H_2O (UPH_2O) and 40ml. Glacial Acetic Acid; dilute to 500ml and filter rapidly through fluted paper into glass bottle with stopper; store in refrigerator – good for 1 week.
2. O-Phenylenediamine Solution: For each 100ml solution, weigh 20 mg O-Phenylenedine-2HCL; Dilute to volume with UPH_2O immediately before use.
3. Sodium Acetate Solution: Dissolve 500g Sodium Acetate Tri-hydrate in UPH_2O and dilute to 1 liter.
4. Boric Acid – Sodium Acetate Solution: Dissolve 3g boric acid in 100ml. Sodium Acetate Solution; Prepare fresh for each assay.
5. Activated Charcoal

Procedure:

1. Preparation of Standard Curve: Dissolve 10mg L-Ascorbic Acid in 100ml extraction solution; dilute 10ml, 20ml, and 30ml aliquots to 100ml with extracting solution. Proceed with these standard solutions in the ascorbic acid determination. Final concentrations of standard solutions are 10µg /ml, 20µg /ml and 30µg /ml.
2. Sample Preparation: Use 1.5 grams freeze dried material per 50ml extracting solution (25g fresh tuber tissue per 150ml) Place in 125 ml flask; allow to sit at least 5 minutes; filter through a Whatman #4 filter paper folded and placed in a funnel. Proceed with ascorbic acid determination.
3. Weigh 50 grams Acid-washed Norit (Charcoal) into 50ml flasks. Pour 25ml extract into Norit, shake vigorously and pour through clean Whatman #4 filter paper, discarding first few ml.
4. Transfer 5ml of this filtrate to a 100ml volumetric flask containing 5ml boric acid-sodium acetate solution. Let stand 15 minutes swirling occasionally. This is the blank determination since the H3BO3-dehydroascorbate complex will not produce a fluorophor with phenylenediamine. After 15 minutes dilute to volume with UPH_2O.
5. During the 15 minute period during which the blank is sitting, transfer a second 5ml of filtrate to a 100ml volumetric containing 5ml sodium acetate solution and 75ml of UPH_2O, dilute to volume with UPH_2O.
6. Transfer 2ml of each solution to a test tube. Add 5ml O-Phenylenediamine solution to each tube; mix well; let stand 35 minutes at room temp protected from the light (i.e. in closed cabinet).
7. Measure fluorescence of each tub at 1X setting in a Turner fluorometer primary filter 7-60 secondary filter 2A. Net fluorescence in the difference between the borate treated and non-treated extract. Unknown samples are determined by comparison with known reading as defined by the standard curve.

Reference: AOAC Handbook 12th Edition 43.0563.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
The State of Idaho (continued question 11) ~~The UNIVERSITY OF IDAHO, representing the interests of the entities listed under Exhibit E, Item 11~~	A0008-1TE	Teton Russet

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	5. TELEPHONE *(Include area code)*	6. FAX *(Include area code)*
Office of Technology Transfer Morrill Hall 414 PO Box 443003 Moscow ID 83844-3003	(208) 885-4550	(208) 885-4551
	7. PVPO NUMBER	

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

9. Is the applicant a U.S. national or a U.S. based entity? **If no, give name of country.** [X] **YES** ☐ **NO**

10. Is the applicant the original owner? ■ **YES** ☐ **NO** **If no, please answer one 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**

RAD
10/02/2012

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

~~The STATE OF IDAHO~~, acting by and through the State Board of Higher Education on behalf of the UNIVERSITY OF IDAHO is a partner in the Northwest (Tri-State) Potato Variety Development Program and a signatory of the General Agreement on Policy and Procedure for Release of New Publicly Developed Plant Varieties in Idaho, Oregon and Washington, between Washington State University, Oregon State University, University of Idaho and the United States of America, as represented by the Secretary of Agriculture. In accordance with provision 2.2 of this Agreement, the University of Idaho is applying for this PVPC.

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.

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
BELTSVILLE, MD 20705

RAD
10/02/2012

EXHIBIT F
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	TEMPORARY OR EXPERIMENTAL DESIGNATION
~~University of Idaho~~ The State of Idaho (continued on Exhibit E, 11)	Morrill Hall 414 PO Box 443003 Moscow, ID 83844-3003	A0008-1TE **VARIETY NAME** Teton Russet
NAME OF OWNER REPRESENTATIVE (S)	**ADDRESS** *(Street and No. or RD No., City, State, and Zip Code and Country)*	**FOR OFFICIAL USE ONLY**
Gaylene Anderson Jeffrey C. Stark	Morrill Hall 414 PO Box 443003 Moscow, ID 83844-3003	**PVPO NUMBER**

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Jeffrey C. Stark — Signature

5 April 2012 — Date