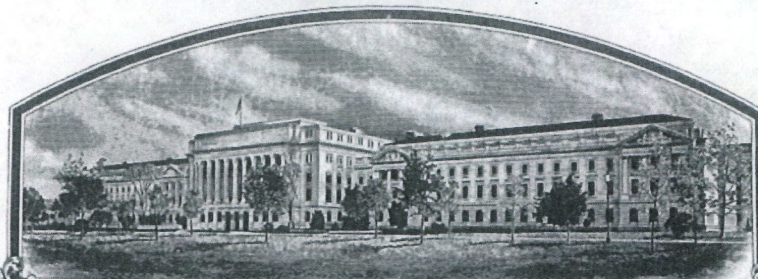


No.



201600025

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## University of Maine System Board of Trustees

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

'Caribou 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 sixth day of July, in the year two thousand and sixteen.*

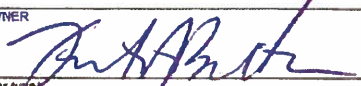
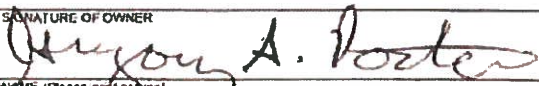
Attest:

Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. Include farm number and data on all reproductions

Form Approved - OMB No 0601-0055

<p><b>U.S. DEPARTMENT OF AGRICULTURE</b>  <b>AGRICULTURAL MARKETING SERVICE</b>          SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE</p> <p><b>APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE</b>  <i>(Instructions and information collection burden statement on reverse)</i></p>		<p><i>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.</i></p> <p><i>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)</i></p>	
<p>1. NAME OF OWNER</p> <p>University of Maine System Board of Trustees</p>		<p>2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME</p> <p>AF3362-1</p>	<p>3. VARIETY NAME</p> <p>Caribou Russet</p>
<p>4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)</p> <p>16 Central Street Bangor, ME 04101</p>		<p>5. TELEPHONE (include area code)</p> <p>207-581-2201</p>	<p>FOR OFFICIAL USE ONLY</p> <p>PVPO NUMBER</p> <p>201600025</p>
<p>7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.)</p> <p>Land Grant University, not for profit</p>		<p>8. IF INCORPORATED, GIVE STATE OF INCORPORATION</p> <p>Maine</p>	<p>9. DATE OF INCORPORATION</p> <p>1865</p>
<p>10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers)</p> <p>Michael T. Wiwchar &amp; Kristine H. Johnson Cochran Freund &amp; Young LLC 2026 Caribou Drive, Suite 201 Fort Collins, Colorado 80525</p>		<p>11. TELEPHONE (include area code)</p> <p>970-492-1100</p>	<p>FILING AND EXAMINATION FEES:</p> <p>\$ 4,382</p> <p>DATE 11/12/2015</p>
<p>13. E-MAIL</p> <p>mikew@patentlegal.com; kristineh@patentlegal.com; heatherg@patentlegal.com</p>		<p>12. FAX (include area code)</p> <p>970-492-1101</p>	<p>CERTIFICATION FEE:</p> <p>\$</p> <p>DATE</p>
<p>14. CROP KIND (Common Name)</p> <p>Potato</p>		<p>15. GENUS AND SPECIES NAME OF CROP</p> <p>Solanum tuberosum</p>	<p>16. FAMILY NAME (Botanical)</p> <p>Solanaceae</p>
<p>17. IS THE VARIETY A FIRST GENERATION HYBRID?</p> <p><input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>		<p>18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL)</p> <p><input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p> <p>IF YES, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.</p>	<p>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)</p> <p><input type="checkbox"/> YES (If "yes", answer items 21 and 22 below)</p> <p><input checked="" type="checkbox"/> NO (If "no", go to item 23)</p> <p><input type="checkbox"/> UNDECIDED</p>
<p>19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)</p> <p>a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety</p> <p>b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness</p> <p>c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety</p> <p>d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional)</p> <p>e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership</p> <p>f. <input checked="" type="checkbox"/> 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</p>		<p>21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED</p>	
<p>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?</p> <p><input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p> <p>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)</p>		<p>22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.</p> <p>___ FOUNDATION ___ REGISTERED ___ CERTIFIED</p> <p>(If additional explanation is necessary, please use the space indicated on the reverse.)</p>	
<p>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.</p> <p>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.</p>		<p>24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?</p> <p><input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p> <p>IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)</p>	
<p>SIGNATURE OF OWNER</p> 		<p>SIGNATURE OF OWNER</p> 	
<p>NAME (Please print or type)</p> <p>Kris A. Burton</p>		<p>NAME (Please print or type)</p> <p>Gregory A. Porter</p>	
<p>CAPACITY OR TITLE</p> <p>Director, Tech. Commercialization, Univ. Maine</p>		<p>DATE</p> <p>11/10/2015</p>	<p>CAPACITY OR TITLE</p> <p>Professor of Agronomy</p>
			<p>DATE</p> <p>11/10/2015</p>

**Continuation Page from ST – 470 (Application for Plant Variety Protection Certificate)**

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**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.)*

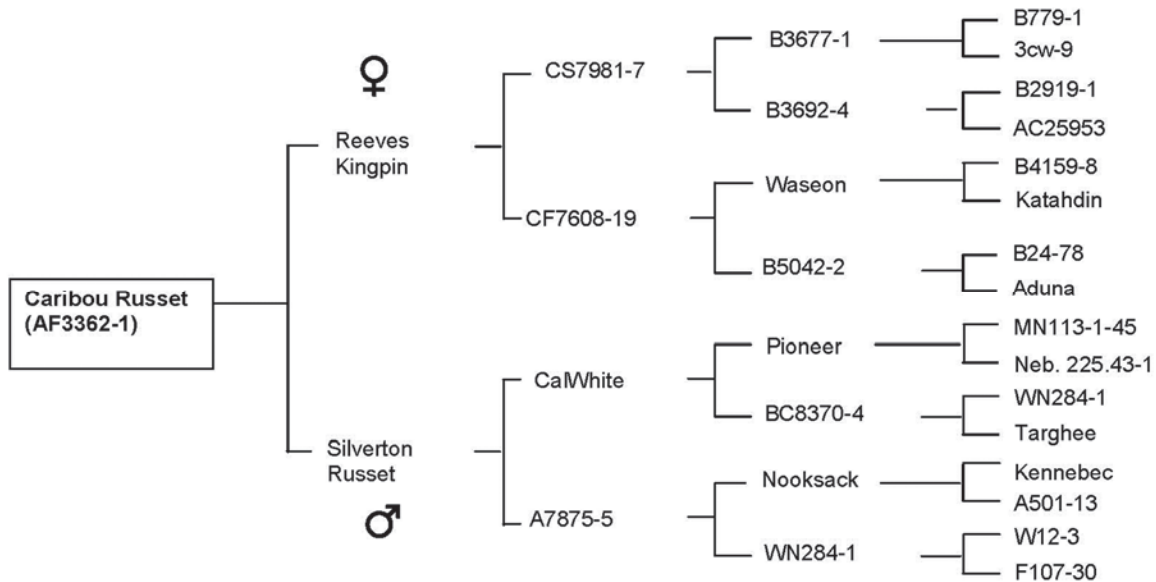
**24. CONTINUED FROM FRONT** *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE  <b>EXHIBIT A – ORIGIN AND BREEDING HISTORY</b> ** Use additional pages as needed.		FOR OFFICIAL USE ONLY PVPO NUMBER
1. Name of Owner  University of Maine System Board of Trustees	2. Temporary Designation or Experimental Name  AF3362-1	3. Variety Name  Caribou Russet
4. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s). ** The potato clone Caribou Russet, previously evaluated as AF3362-1, resulted from a cross made by the University of Maine Potato Breeding Program in 2001 between the fry processing, long-white variety Reeves Kingpin (female parent) and the dual-purpose, russeted variety Silverton Russet (pollen parent). The cross was conducted at the University of Maine's Aroostook Research Farm in Presque Isle, ME. Reeves Kinpin was developed by the University of Maine potato breeding program, while Silverton Russet is a product of the Colorado State University potato breeding program. Reeves Kingpin (CS7981-7 x CF7608-19) was chosen as a parent due to its tuber yields, high tuber dry matter content, favorable processing quality, long tubers, and Verticillium wilt resistance. Silverton Russet (CalWhite x A7875-5) was chosen as a parent due to its tuber yields, tuber appearance, russeted skin, and long tuber type.  Please see attached for a description of the full pedigree of Caribou Russet.		
5. Give the details of subsequent stages of selection and multiplication. **		
Year Please see attached.	Detail of Stage	Selection Criteria
6. Is the variety uniform? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  How did you test for uniformity? Caribou Russet has been observed in seed multiplication plots for 11 generations (since 2004) at Presque Isle, ME, as well as in replicated yield trials for nine years (since 2006) in Presque Isle, ME and other locations. It has been uniform and stable from generation to generation with no evidence of variants.		
7. Is the variety stable? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  How did you test for stability? Over how many generations? Caribou Russet has been observed in seed multiplication plots for 11 generations (since 2004) at Presque Isle, ME, as well as in replicated yield trials for nine years (since 2006) in Presque Isle, ME and other locations. It has been uniform and stable from generation to generation with no evidence of variants.		
8. Are genetic variants observed or expected during reproduction and multiplication? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  If yes, state how these variants may be identified, their type and frequency.		

**EXHIBIT A. ORIGIN AND BREEDING HISTORY OF THE VARIETY - CONTINUED**

The full pedigree of Caribou Russet is provided below.

**Pedigree of Caribou Russet (AF3362-1)**



Seeds from the Reeves Kingpin x Silverton Russet cross were planted in greenhouse flats at the University of Maine’s Aroostook Research Farm, Presque Isle, ME during spring 2002. Seedlings were transplanted to 3-inch pots and raised in the greenhouse at Aroostook Research Farm. Several seedling tubers were harvested from each greenhouse pot and the largest from each pot was saved to create a family of seedling tubers from the cross (family AF3362). This family of seedling tubers was planted in the field at Aroostook Research Farm during spring 2003. Field selections were made in the fall of 2003 based on visual characteristics such as tuber shape, appearance, size, and yield. Clones selected during the first round of selection in 2003 were planted and evaluated as 8-hill plots in 2004 (2<sup>nd</sup>-year of field selection) and 20-hill plots in 2005 (3<sup>rd</sup>-year of selection). From the fourth year of selection (2006) onward selection took place in replicated yield trials at Presque Isle and other locations as well as from seed increase plots at Presque Isle. The size of the seed plots increases as material advanced through the program (3<sup>rd</sup>-year material, 60 hills; 4<sup>th</sup>-year material, 100 hills; 5<sup>th</sup>-year material, 300 hills; 6<sup>th</sup> and older material, 800 to 1600 hills). In each successive year, evaluation becomes more intensive and the plots increased in size and/or the number of locations, so that progressively fewer and fewer clones were retained. Many traits were evaluated including yield, tuber size profile, specific gravity, ability to fry from the field and/or storage, freedom from internal and external physical defects, appearance, maturity, and yield.

AF3362-1, also named Caribou Russet, was one of the individuals selected during fall 2003 from family AF3362. It was retained during successive years of selection because it exceeded standard varieties in yield, tuber type, and several quality attributes (fry color, size profile, and freedom

from internal and external defects). It was evaluated in the eastern regional potato variety trials (formerly NE107, NE1084, NE1031 and now NE1231) from 2010 to 2014 where it has had high yields, good adaptation to northern trial sites, good baked quality, and good fry quality. Its yield, tuber size, and fry color typically exceeds the current high yielding, fry processing standard variety, 'Russet Burbank', as well as the current fresh market russet standard variety, Russet Norkotah. In addition, Caribou Russet typically provides better internal quality (less hollow heart, lower tuber glycoalkaloid levels) and fewer external defects (e.g. misshapes, growth cracks) than Russet Burbank. Caribou typically has similar tuber specific gravity to that of Russet Burbank (it has averaged 0.002 higher in Maine trials). While primarily expected to be used for fresh market due to its good external appearance, moderate specific gravity, good internal quality, favorable tuber size profile, and good baking quality sensory scores, it may also be useful for fry processing from the field and through mid-term storage. Short tuber dormancy limits its potential as a long-term storage, processing variety.

Caribou Russet is not expected to be useful in southern and mid-Atlantic growing areas where internal brown spot (a.k.a internal heat necrosis) is a predominant internal tuber defect.

Caribou Russet has been observed in seed multiplication plots for 11 generations (since 2004) at Presque Isle, ME, as well as in replicated yield trials for nine years (since 2006) in Presque Isle, ME and other locations. It has been uniform and stable from generation to generation with no evidence of variants.

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

<b>FOR OFFICIAL USE ONLY</b>
PVPO NUMBER

201600025

**EXHIBIT B – STATEMENT OF DISTINCTNESS**  
 \*\* Use additional tables to present clear differences for additional comparison varieties.  
 Use additional pages to present supporting evidence.

1. Name of Owner University of Maine System Board of Trustees	2. Temporary Designation or Experimental Name AF3362-1	3. Variety Name Caribou Russet
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Based on overall morphology, Caribou Russet is most similar to Russet Burbank & Russet Norkotah. Caribou Russet most clearly differs from Russet Burbank & Russet Norkotah in the following traits Name the specific trait. Then list the value of that trait for each variety in the comparison. Submit appropriate supporting evidence (see the [Guidelines for Presenting Evidence in Support of Variety Distinctness in the instructions](#)):

*Applicant's new variety*      *Most similar comparison variety(ies)*      *Applicant's new variety*

*Most similar comparison variety(ies)*

	<i>Eg. Leaf Pubescence</i> <i>Eg. Leaf Color</i> <i>Eg. Plant Height</i>	<i>heavy pubescence</i> <i>Dark Green (5GY 3/4)</i> <i>200 cm +/- 10 cm (N=25)</i>	<i>glabrous</i> <i>Light Green (2.5GY 8/10)</i> <i>250 cm +/- 15 cm (N=25)</i>	<i>photograph attached</i> <i>Munsell Color Chart</i> <i>statistics attached</i>
	1. Qualitative traits:	2. Color traits:	3. Quantitative traits:	4. Other traits:
Application Variety	Caribou Russet Please see attached.			
Comparison Variety 1				
Comparison Variety 2				
Comparison Variety 3				

Unofficial Copy

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

**EXHIBIT B. STATEMENT OF DISTINCTNESS - CONTINUED**

'Caribou Russet' (AF3362-1) is expected to be useful for both fresh market and French fry production. Caribou Russet is most similar to cultivars 'Russet Burbank' and 'Russet Norkotah' which are standard varieties used for French fry processing (Russet Burbank) and fresh market (Russet Burbank, Russet Norkotah). Russet Burbank is currently the predominant, standard French fry processing variety used in North America. Russet Norkotah is the standard, russet-skinned fresh market variety used in North America. Shepody is a regional standard that is used for fry processing early in the storage season; therefore, some Shepody information is provided in the text of Exhibit B and in the data tables of exhibit D for comparison purposes. Documentation comparing Caribou Russet to Russet Burbank, Russet Norkotah, and Shepody is provided in Exhibits C and D (objective descriptions, photos, data tables, and DNA fingerprinting).

Caribou Russet, Russet Burbank, and Russet Norkotah all have white flowers; however Caribou Russet is medium-late maturing, while Russet Burbank is late maturing and Russet Norkotah has medium-early maturity. Caribou Russet plants have a more upright growth habit than Russet Burbank and flower over a shorter time period. Russet Burbank plants are more indeterminate with a much greater vine length than Caribou Russet. Russet Norkotah produces smaller, more compact plants than either Russet Burbank or Caribou Russet. Russet Norkotah also matures 1-2 weeks earlier than Caribou Russet and 2-4 weeks earlier than Russet Burbank. Caribou Russet displays weak calyx anthocyanin pigmentation, while calyx anthocyanins are absent in the standard varieties. Caribou Russet is clearly distinguished from Shepody in that Caribou Russet has white flowers while Shepody has pale purple to pink flowers with white tips. Shepody is medium maturing, while Caribou Russet has medium-late maturity.

Caribou Russet tubers have much lower incidence of hollow heart tuber defects than the standard varieties and are more resistant to shatter and blackspot bruise. Caribou Russet tubers are very susceptible to internal brown spot (a.k.a internal heat necrosis) in growing areas where this defect is prevalent. Like Russet Burbank, Caribou Russet tubers are long and slightly flattened with a tan to light brown, lightly russeted skin; however, Caribou Russet tubers tend to be larger and size more quickly than those of Russet Burbank. Russet Burbank produces more tubers per plant than Caribou Russet. Caribou Russet is much less prone to tuber off-shapes and growth crack defects than Russet Burbank. Russet Norkotah tubers have brown, well-russeted skin and tended to be smaller, more uniformly shaped, and have more uniform russeting than Caribou Russet. Shepody tubers have a white to buff skin that is not russeted. Caribou Russet tubers have generally better appearance and uniformity than Russet Burbank or Shepody, while Russet Norkotah has better tuber appearance than Caribou Russet.

Tubers of Caribou Russet have lighter fried product color from short-term storage than does Russet Burbank. Tuber specific gravity is similar to that of Russet Burbank, but is much higher than that of Russet Norkotah. Caribou Russet has relatively short tuber dormancy and spouts up to 10 weeks earlier in storage than Russet Burbank and 4-6 weeks earlier than the other two standard varieties. Caribou Russet has moderate verticillium wilt resistance, while Russet Burbank is susceptible. Russet Norkotah and Shepody are very susceptible. Caribou Russet is moderately resistant to common scab, while Russet Burbank is resistant. Russet Norkotah is moderately resistant and Shepody is very susceptible. Caribou Russet, Russet Burbank, and Russet Norkotah are moderately resistant to powdery scab, while Shepody is



very susceptible. Caribou Russet has significantly lower tuber glycoalkaloid concentrations than Russet Burbank and baked flavor has been rated as better than Russet Burbank in sensory tests.

DNA fingerprinting of Caribou Russet shows a banding pattern which is distinct from Russet Burbank and Shepody (Exhibit D).

	<u>Caribou Russet</u>	<u>R. Burbank</u>	<u>R. Norkotah</u>	<u>Shepody</u>
<b><u>Qualitative Traits:</u></b>				
Terminal Leaflet	medium ovate	narrowly ovate	medium ovate	narrowly ovate
Plant size	large (7.0)	large (7.0)	medium (5.9)	med-large (6.4)
Maturity	med-late (6.0)	late (6.7)	med-early (4.3)	medium (5.1)
Skin texture	lt. russeted (3.6)	lt. russeted (3.6)	russeted (3.0)	mod. smooth (6.7)
Tuber shape	long (6.9)	long (7.0)	long-oblong (6.3)	long (7.0)
Tuber appearance	fair-good (5.6)	poor (3.9)	good (6.3)	poor (4.0)
<b><u>Color Traits:</u></b>				
Leaf color	Med. Green RHS 138A	Med. Green RHS 138A	Med. Green RHS 138A	Med. Green RHS 138A
Flower color	White RHS 155C	White RHS 155C	White RHS 155C	Lt. purple w/white tips RHS 76B:155C
Stem anthocyanin	weak	weak	absent	absent
Petiole anthocyanin	absent	absent	absent	absent
Calyx anthocyanin	weak	absent	absent	absent
Tuber Skin	brown RHS N199D	brown RHS N199D	brown RHS N199C	buff/white RHS 161A
<b><u>Quantitative Traits:</u></b>				
Tuber specific gravity	mod (1.083)	mod (1.081)	med-low (1.075)	mod (1.081)
Hollow Heart Incid.	Low (3.4%)	med-high (13.8%)	med-high (12.3%)	med-high (13.7%)
Fry 50F (Agtron)	G (50.8)	F (40.6)	F (40.4)	F (46.4)
Fry 45F (Agtron)	G (53.0)	F (45.1)	F (46.0)	FG (50.6)
Fry 38 or 42F (Agtron)	P (28.9)	P (26.4)	P (23.7)	P (26.0)
Tuber glycoalkaloids	med (12.72)	med-high (23.25)	n/a	n/a
Tuber asparagine	med-high (6.29)	med (5.10)	n/a	n/a
Days to sprouting @45F	115	194	157	140
% Wt. Loss at 50F	21.0	9.1	14.4	16.2
<b><u>Other Traits:</u></b>				
Shatter Bruise	resistant (0.76)	mod. res (1.02)	mod. res (0.90)	mod. res. (1.02)
Backspot Bruise	resistant (0.86)	susc. (1.56)	mod. susc. (1.12)	mod. res. (1.05)
Verticillium wilt	mod. resistant	susceptible	very susceptible	very susceptible
Common scab	mod. resistant	resistant	mod. resistant	very susceptible
Powdery scab	mod. resistant	mod. resistant	mod. resistant	very susceptible

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 8.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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).

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**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.

<b>NAME OF APPLICANT (S)</b> University of Maine System Board of Trustees	<b>TEMPORARY OR EXPERIMENTAL DESIGNATION</b> AF3362-1	<b>VARIETY NAME</b> Caribou Russet
<b>ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country)</b> 16 Central Street Bangor, ME 04101		<b>FOR OFFICIAL USE ONLY</b>
		<b>PVPO NUMBER</b>

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**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)
Caribou Russet (AF3362-1)	Russet Burbank	Russet Norkotah	Shepody	

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**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	4-5	R1	4-5	R2	5	R3	4	R4	
---	-----	----	-----	----	---	----	---	----	--

**2. LIGHT SPROUT CHARACTERISTICS:** (See Figure 1)

**\*LIGHT SPROUT: GENERAL SHAPE**

1 = Spherical 2 = Ovoid 3 = Conica 4 = Broad cylindrical 5 = Narrow cylindrical 6 = Other \_\_\_\_\_

V	3	R1	2	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**\*LIGHT SPROUT BASE: PUBESCENCE OF BASE**

1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V	4	R1	3	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**\*LIGHT SPROUT BASE: ANTHOCYANIN COLORATION**

1 = Green 2 = Red-violet 3 = Blue-violet 4 = Other(describe) \_\_\_\_\_

V	2	R1	2	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**\*LIGHT SPROUT BASE: INTENSITY OF ANTHOCYANIN COLORATION (IF PRESENT)**

1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V	3	R1	3	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**\* LIGHT SPROUT TIP: HABIT**

1 = Closed 2 = Intermediate 3 = Open

V	2	R1	2	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

2. LIGHT SPROUT CHARACTERISTICS: (continued)

**LIGHT SPROUT TIP: PUBESCENCE**

1 = Absent    2 = Weak    3 = Medium    4 = Strong    5 = Very Strong

V	3	R1	3	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**LIGHT SPROUT TIP ANTHOCYANIN COLORATION**

1 = Green    2 = Red-violet    3 = Blue-violet    4 = Other(describe) \_\_\_\_\_

V	2	R1	2	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**LIGHT SPROUT TIP: INTENSITY OF ANTHOCYANIN COLORATION (IF PRESENT)**

1 = Absent    2 = Weak    3 = Medium    4 = Strong    5 = Very Strong

V	2	R1	2	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

**LIGHT SPROUT ROOT INITIALS: FREQUENCY**

1 = Absent    2 = Some    3 = Abundant

V	3	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	3	R1	5	R2	5	R3	5	R4	
---	---	----	---	----	---	----	---	----	--

**TYPE:**

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

V	2	R1	2	R2	2	R3	2	R4	
---	---	----	---	----	---	----	---	----	--

**MATURITY: Days after planting (DAP) at vine senescence**

V	~115	R1	>120	R2	~105	R3	~115	R4	
---	------	----	------	----	------	----	------	----	--

**PLANTING DATE:**

V	early/mid May	R1	early/mid May	R2	early/mid May	R3	early/mid May	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	3 (ME)	R1	3 (ME)	R2	3 (ME)	R3	3 (ME)	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	3	R1	4	R2	2	R3	3	R4	
---	---	----	---	----	---	----	---	----	--

**4. STEM CHARACTERISTICS:** Measure at early first bloom**\* STEM ANTHOCYANIN COLORATION:**

1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very Strong

V	3	R1	3	R2	1	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

**STEM WINGS:** (See Figure 3)

1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very Strong

V	7	R1	5	R2	3	R3	5	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	3	R1	3	R2	3	R3	3	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	138A	R1	138A	R2	138A	R3	138A	R4	
---	------	----	------	----	------	----	------	----	--

**LEAF PUBESCENCE DENSITY:**

1 = Absent 2 = Sparse 3 = Medium 4 = Thick 5 = Heavy

V	2	R1	2	R2	2	R3	2	R4	
---	---	----	---	----	---	----	---	----	--

**LEAF PUBESCENCE LENGTH:**

1 = None 2 = Short 3 = Medium 4 = Long 5 = Very Long

V	2	R1	2	R2	2	R3	2	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	3	R3	3	R4	
---	---	----	---	----	---	----	---	----	--

**PETIOLES ANTHOCYANIN COLORATION:**

1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very Strong

V	1	R1	1	R2	1	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

**LEAF STIPULES SIZE:** (See Figure 5)

1 = Absent 3 = Small 5 = Medium 7 = Large

V	3	R1	5	R2	5	R3	5	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	2	R1	1	R2	2	R3	1	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	3	R3	3	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	4	R2	4	R3	4	R4	
---	---	----	---	----	---	----	---	----	--

**TERMINAL LEAFLET MARGIN WAVINESS:**

1 = Absent 2 = Slight 3 = Weak 4 = Medium 5 = Strong

V	1	R1	2	R2	1	R3	2	R4	
---	---	----	---	----	---	----	---	----	--

**NUMBER OF PRIMARY LEAFLET PAIRS:** (See Figure 6)**AVERAGE:**

V	3.7	R1	3.9	R2	4.2	R3	3.0	R4	
---	-----	----	-----	----	-----	----	-----	----	--

**RANGE:**

V	3 to 4	R1	3 to 4	R2	4 to 5	R3	3 to 3	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	3	R3	3	R4	
---	---	----	---	----	---	----	---	----	--

**PRIMARY LEAFLET SIZE:**

1 = Very Small 2 = Small 3 = Medium 4 = Large 5 = Very Large

V	4	R1	3	R2	4	R3	4	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	2	R3	2	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	4	R3	4	R4	
---	---	----	---	----	---	----	---	----	--

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

V	4.3	R1	6.8	R2	7.9	R3	2.6	R4	
---	-----	----	-----	----	-----	----	-----	----	--

**RANGE:**

V	Please	R1	to	R2	to	R3	to	R4	to
---	--------	----	----	----	----	----	----	----	----

## 5. LEAF CHARACTERISTICS: (continued)

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## NUMBER OF INFLORESCENCE/PLANT:

## AVERAGE:

V	1.9	R1	2.6	R2	1.0	R3	5.4	R4	
---	-----	----	-----	----	-----	----	-----	----	--

## RANGE:

V	1 to 3	R1	2 to 4	R2	1 to 1	R3	2 to 11	R4	to
---	--------	----	--------	----	--------	----	---------	----	----

## NUMBER OF FLORETS/INFLORESCENCE:

## AVERAGE:

V	8.48	R1	11.08	R2	7.20	R3	10.89	R4	
---	------	----	-------	----	------	----	-------	----	--

## RANGE:

V	5.6 to 12.0	R1	8.0 to 14.0	R2	4.0 to 10.0	R3	8.7 to 12.1	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	155C	R1	155C	R2	155C	R3	76A:155C	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	155C	R1	155C	R2	155C	R3	76A:155C	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	1	R3	19	R4	
---	---	----	---	----	---	----	----	----	--

**COROLLA SHAPE:** (See Figure 10)

1 = Very rotate 2 = Rotate 3 = Pentagonal 4 = Semi-stellate 5 = Stellate

V	4	R1	3	R2	3	R3	3	R4	
---	---	----	---	----	---	----	---	----	--

## 6. INFLORESCENCE CHARACTERISTICS:

**CALYX ANTHOCYANIN COLORATION:**

1 = Absent 3 = Weak 5 = Medium 7 = Strong 9 = Very strong

V	3	R1	1	R2	1	R3	1	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	12A	R1	17A	R2	17A	R3	17A	R4	
---	-----	----	-----	----	-----	----	-----	----	--

**ANTHER SHAPE:** (See Figure 11)

1 = Broad cone 2 = Narrow cone 3 = Pear-shaped cone 4 = Loose 5 = Other

V	2	R1	3	R2	1	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

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6. INFLORESCENCE CHARACTERISTICS: (continued)

**POLLEN PRODUCTION:**

1 = None 3 = Some 5 = Abundant

V	5	R1	1	R2		R3	3	R4	
---	---	----	---	----	--	----	---	----	--

**STIGMA SHAPE:** (See Figure 12)

1 = Capitate 2 = Clavate 3 = Bi-lobed

V	1	R1	1	R2	1	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

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

V	146A	R1	146B	R2	146A	R3	146B	R4	
---	------	----	------	----	------	----	------	----	--

**BERRY PRODUCTION:** (Under field conditions)

1 = Absent 3 = Low 5 = Moderate 7 = Heavy 9 = Very Heavy

V	3	R1	1	R2	3	R3	3	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	6	R2	6	R3	4	R4	
---	---	----	---	----	---	----	---	----	--

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

V	N199D	R1	N199D	R2	N199C	R3	161A	R4	
---	-------	----	-------	----	-------	----	------	----	--

**SECONDARY SKIN COLOR:**

1 = Absent 2 = Present (please describe)

V	1	R1	1	R2	1	R3	1	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	4	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

## 7. TUBER CHARACTERISTICS: (continued)

\* TUBER SHAPE: (See Figure 14)

1 = Compressed    2 = Round    3 = Oval    4 = Oblong    5 = Long    6 = Other \_\_\_\_\_

V	5	R1	5	R2	5	R3	5	R4	
---	---	----	---	----	---	----	---	----	--

TUBER THICKNESS:

1 = Round    2 = Medium thick    3 = Slightly flattened    4 = Flattened    5 = Other \_\_\_\_\_

V	3	R1	3	R2	3	R3	4	R4	
---	---	----	---	----	---	----	---	----	--

TUBER LENGTH (mm):

AVERAGE:

V	122.6	R1	117.5	R2	113.3	R3	123.1	R4	
---	-------	----	-------	----	-------	----	-------	----	--

RANGE:

V	97 to 174	R1	90 to 150	R2	93 to 176	R3	95 to 157	R4	to
---	-----------	----	-----------	----	-----------	----	-----------	----	----

STANDARD DEVIATION:

V	18.2	R1	16.7	R2	20.4	R3	17.8	R4	
---	------	----	------	----	------	----	------	----	--

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	267.7	R1	193.2	R2	234.3	R3	246.7	R4	
---	-------	----	-------	----	-------	----	-------	----	--

TUBER WIDTH (mm)

AVERAGE:

V	67.2	R1	60.4	R2	6.38	R3	67.9	R4	
---	------	----	------	----	------	----	------	----	--

RANGE:

V	56 to 77	R1	48 to 98	R2	53 to 74	R3	60 to 82	R4	to
---	----------	----	----------	----	----------	----	----------	----	----

STANDARD DEVIATION:

V	5.8	R1	10.7	R2	6.4	R3	6.9	R4	
---	-----	----	------	----	-----	----	-----	----	--

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	268	R1	193	R2	247	R3	247	R4	
---	-----	----	-----	----	-----	----	-----	----	--

## 7. TUBER CHARACTERISTICS: (continued)

## TUBER THICKNESS (mm):

## AVERAGE:

V	54.7	R1	50.5	R2	55.5	R3	53.4	R4	
---	------	----	------	----	------	----	------	----	--

## RANGE:

V	45 to 64	R1	34 to 64	R2	to	R3	to	R4	to
---	----------	----	----------	----	----	----	----	----	----

## STANDARD DEVIATION:

V	5.5	R1	6.6	R2	4.8	R3	4.7	R4	
---	-----	----	-----	----	-----	----	-----	----	--

## AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	268	R1	193	R2	234	R3	247	R4	
---	-----	----	-----	----	-----	----	-----	----	--

## TUBER EYE DEPTH:

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

V	5	R1	5	R2	5	R3	3	R4	
---	---	----	---	----	---	----	---	----	--

## TUBER LATERAL EYES:

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

V	5	R1	5-7	R2	5	R3	1	R4	
---	---	----	-----	----	---	----	---	----	--

## NUMBER EYE/TUBER:

## AVERAGE:

V	9.4	R1	19.6	R2	10.3	R3	10.2	R4	
---	-----	----	------	----	------	----	------	----	--

## RANGE:

V	9 to 21	R1	9 to 31	R2	8 to 17	R3	9 to 19	R4	to
---	---------	----	---------	----	---------	----	---------	----	----

## DISTRIBUTION OF TUBER EYES:

1 = Predominantly apical    2 = Evenly distributed

V	1	R1	1	R2	1	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

## PROMINENCE OF TUBER EYEBROWS:

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

V	3	R1	2	R2	3	R3	4	R4	
---	---	----	---	----	---	----	---	----	--

7. TUBER CHARACTERISTICS: (continued)

201600025

**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	1	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

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

V	155A	R1	158C	R2	155A	R3	155A	R4	
---	------	----	------	----	------	----	------	----	--

**SECONDARY TUBER FLESH COLOR:**

1 = Absent    2 = Present, please describe: \_\_\_\_\_

V	1	R1	1	R2	1	R3	1	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	2	R2	2	R3	1	R4	
---	---	----	---	----	---	----	---	----	--

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8. DISEASES CHARACTERISTICS:

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

LATE BLIGHT: (Phytophthora)

V	7	R1	6	R2	7	R3	7	R4	
---	---	----	---	----	---	----	---	----	--

EARLY BLIGHT: (Alternaria)

V	7	R1	4	R2	7	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

SOFT ROT (Erwinia)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

COMMON SCAB (Streptomyces)

V	4	R1	2	R2	4	R3	9	R4	
---	---	----	---	----	---	----	---	----	--

POWDERY SCAB (Spongospora)

V	4	R1	4	R2	4	R3	9	R4	
---	---	----	---	----	---	----	---	----	--

DRY ROT (Fusarium)

V	6	R1	7	R2	0	R3	5	R4	
---	---	----	---	----	---	----	---	----	--

POTATO LEAF ROLL VIRUS (PLRV)

V	7	R1	7	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

8. DISEASES CHARACTERISTICS: (continued)

POTATO VIRUS X (PVX)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

POTATO VIRUS Y (PVY)

V	7	R1	7	R2	7	R3	7	R4	
---	---	----	---	----	---	----	---	----	--

POTATO VIRUS M (PVM)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

POTATO VIRUS A (PVA)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

GOLDEN NEMATODE (Globodera)

V	3	R1	7	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

ROOT - KNOT NEMATODE (Meloïdogyne)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

OTHER DISEASE Verticillium wilt

V	4	R1	7	R2	9	R3	9	R4	
---	---	----	---	----	---	----	---	----	--

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 Lesions in Number and Size  
 4 = Moderately Resistance    5 = Intermedia Susceptible    6 = Moderate Susceptible  
 7 = Susceptible    9 = Highly Susceptible

COLORADO POTATO BEETLE (CPB) (*Leptinotarsa*)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

GREEN PEACH APHID (*Myzus*)

V	0	R1	0	R2	0	R3	0	R4	
---	---	----	---	----	---	----	---	----	--

OTHER:

V		R1		R2		R3		R4	
---	--	----	--	----	--	----	--	----	--

OTHER:

V		R1		R2		R3		R4	
---	--	----	--	----	--	----	--	----	--

**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	3	R3	3-4	R4	
---	-----	----	-----	----	---	----	-----	----	--

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

V	12.72	R1	23.25	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.

Caribou Russet has lighter fried product color than Russet Burbank or Russet Norkotah (see Exhibit D).

Boiled tubers of Caribou Russet have more sloughing than Russet Burbank (see Exhibit D)

**12. CHEMICAL IDENTIFICATION:**

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

Tuber TGA levels of Caribou Russet are lower than Russet Burbank and high references, such as Snowden and Lenape (see Exhibit D). Caribou Russet has similar to slightly higher tuber asparagine than Russet Burbank (see 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

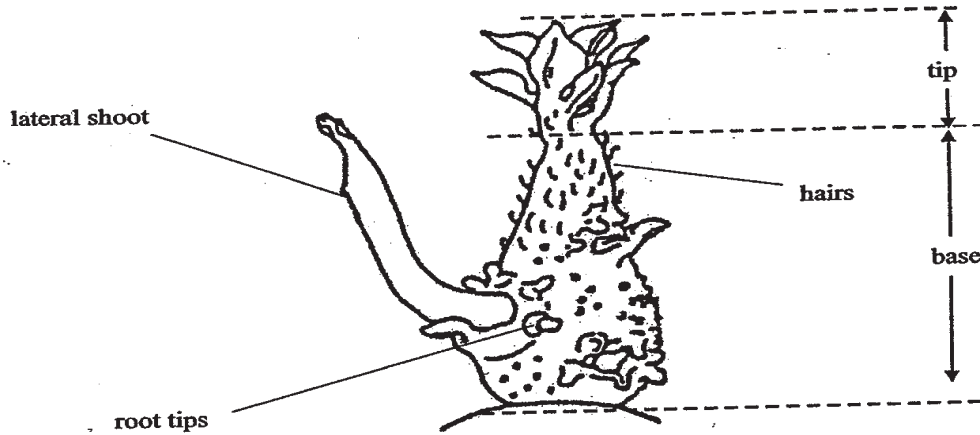
**15. ADDITIONAL COMMENTS AND CHARACTERISTICS:**

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

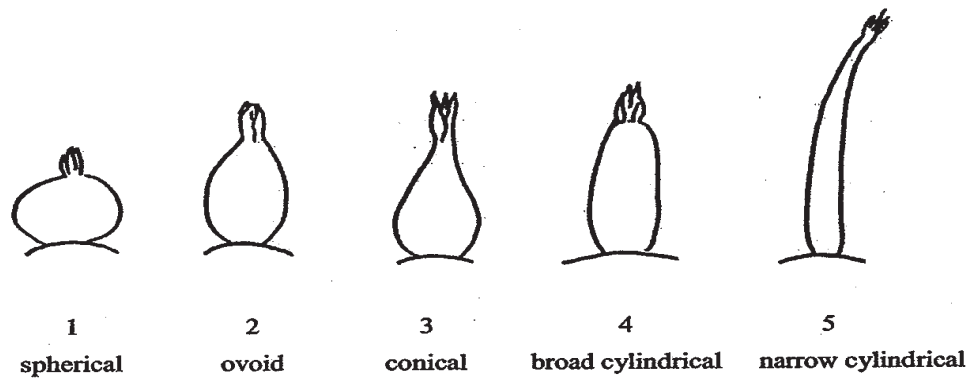
Caribou Russet has a more upright growth habit than Russet Burbank and has slightly darker foliage color and slightly earlier vine maturity. Flowers of both varieties are white; however, Caribou Russet flowers over a shorter flowering period and produces more fruits than Russet Burbank. Tubers of Caribou Russet and Russet Burbank are tan to light brown and russeted. Shepody has smooth, white to buff-skinned tubers. Caribou Russet has more uniform tuber shape than Russet Burbank or Shepody, but tubers are not as uniform in shape or russeting as Russet Norkotah. Caribou Russet has much shorter tuber dormancy than Russet Burbank and the other standards (see Exhibit D). Caribou Russet has lighter fry color, less hollow heart, and greater resistance to blackspot and shatter bruise than the standard varieties (see Exhibit D). It also has lower tuber concentrations of glycoalkaloids than Russet Burbank (see Exhibit D). It also has different DNA banding patterns than both Russet Burbank and Shepody (see Exhibit D).

Figure 1: Light sprout

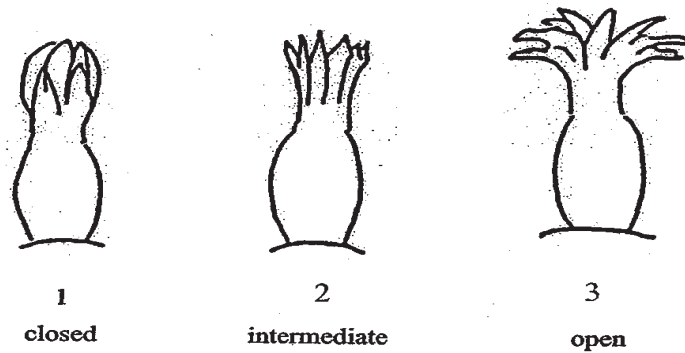
Light sprout dissection



Light sprout shape



Light sprout tip habit



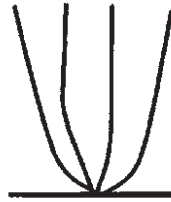
The characteristic should be observed after about 10 weeks to obtain a good differentiation in the collection.



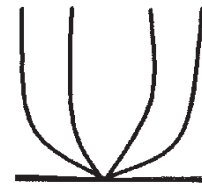
**Figure 2: Growth Habit**



**Erect**



**Semi Erect**



**Spreading**

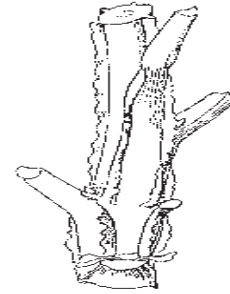
**Figure 3: Stem Wings**



**Weak**



**Medium**

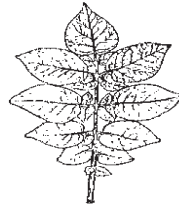


**Strong**

**Figure 4: Leaf Sillhouette**



**Closed**

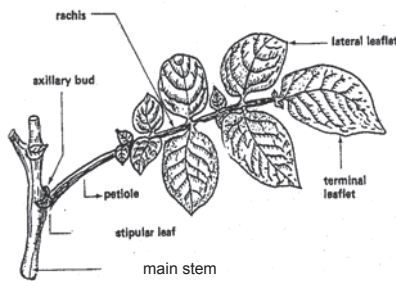


**Medium**

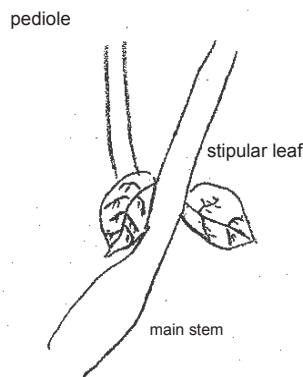


**Open**

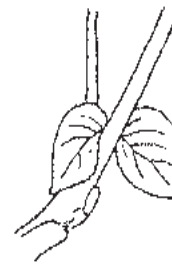
**Figure 5: Leaf Stipules**



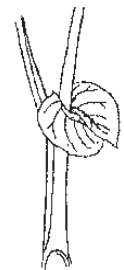
**General structures**



**Small stipular leaf**

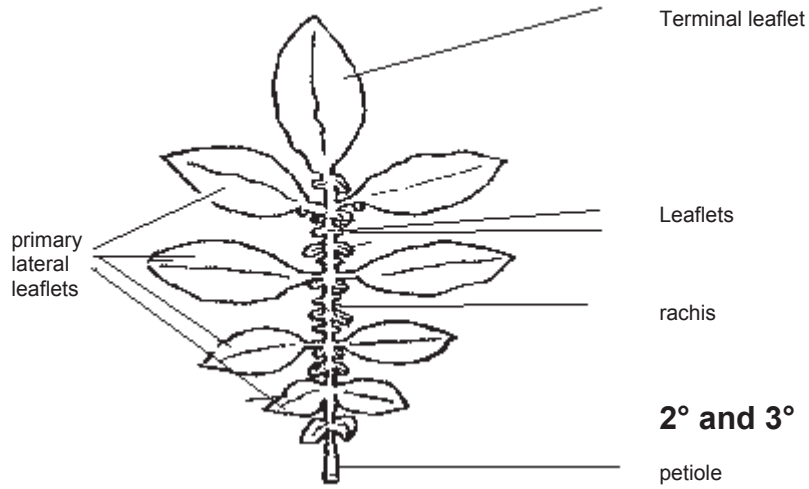


**Medium stipular leaf**

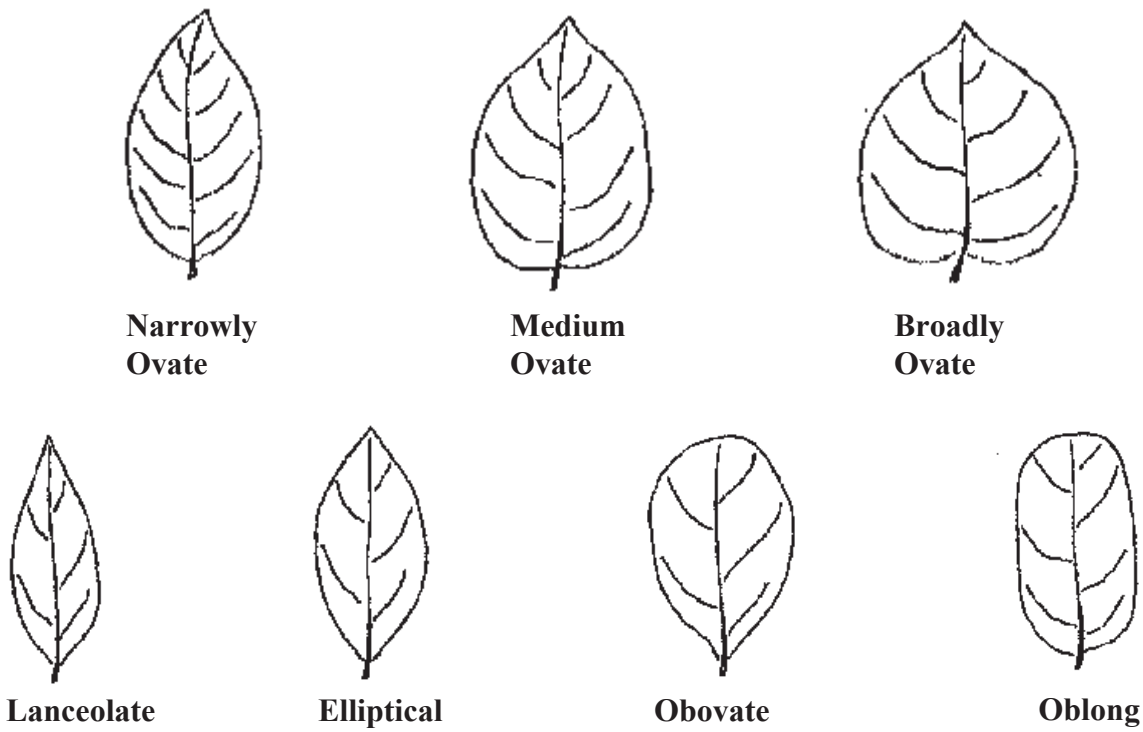


**Large stipular leaf**

**Figure 6: Leaf Dissection**



**Figure 7: Terminal Leaflet Shape/Primary Leaflet Shape**



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

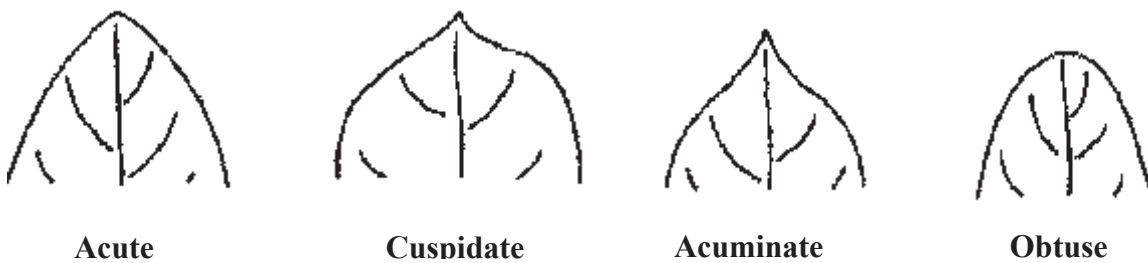


Figure 9: Terminal Leaflet Shape of Base/Primary Leaflet Shape of Base

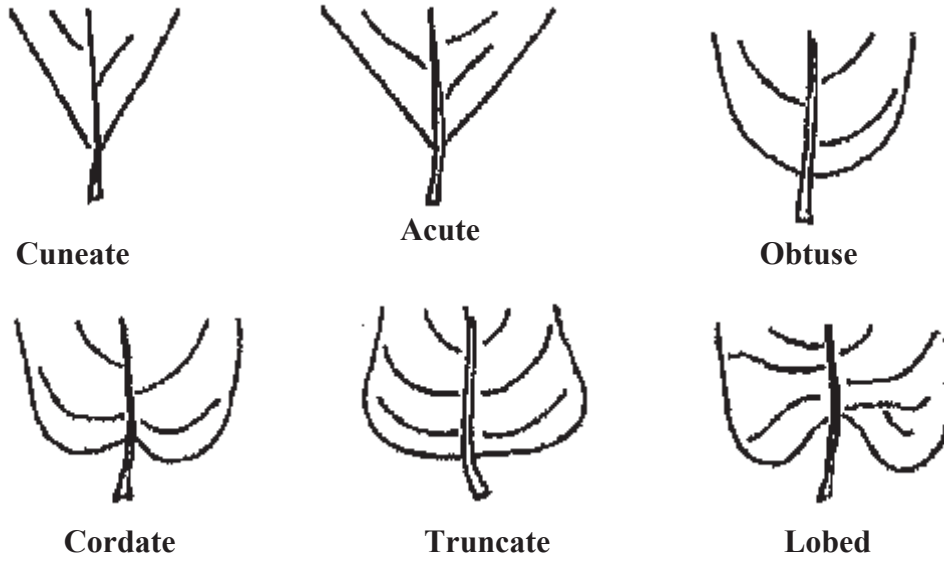


Figure 10: Corolla Shape

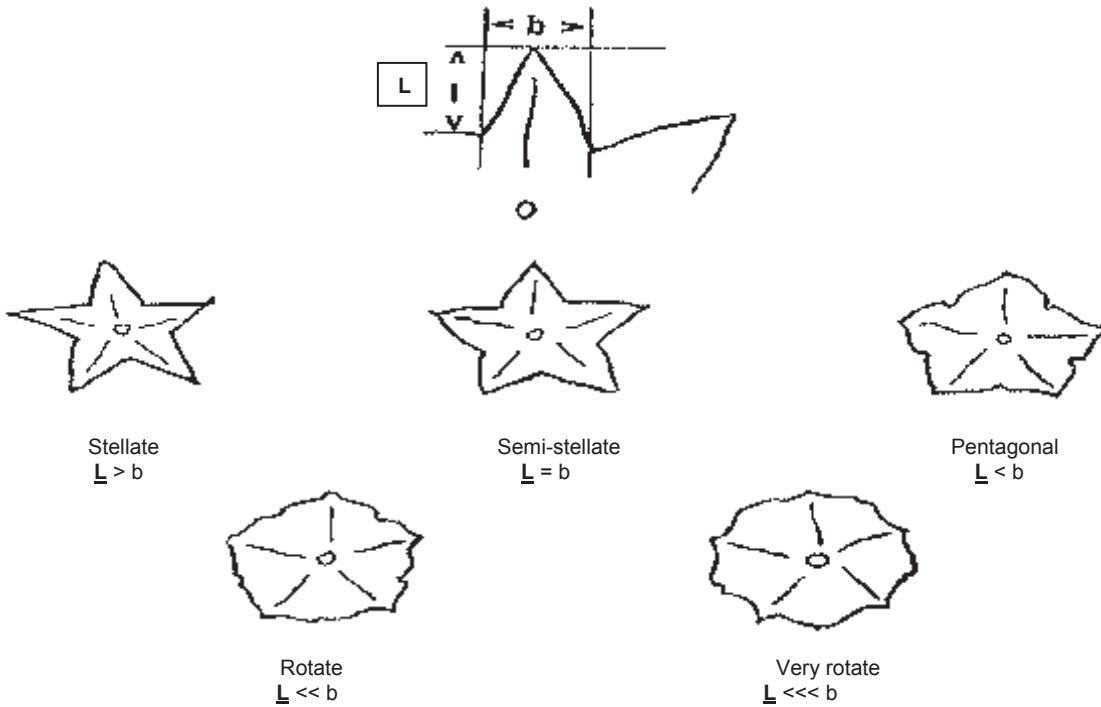


Figure 11: Anther Shape

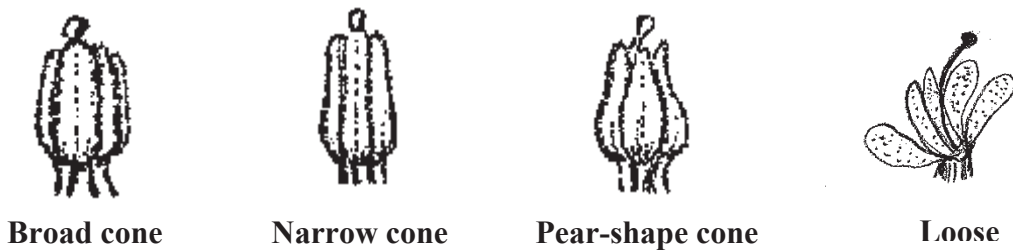


Figure 12: Stigma Shape



Capitate



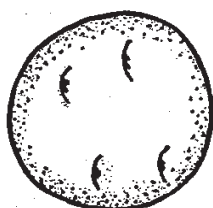
Clavate



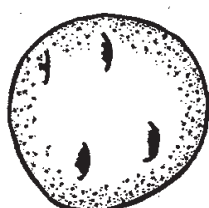
Bi-lobed

201600025

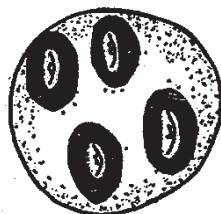
Figure 13: Distribution of Secondary Skin Tuber Color



Eyes



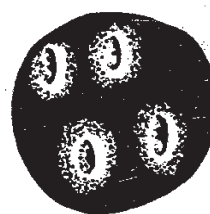
Eyebrows



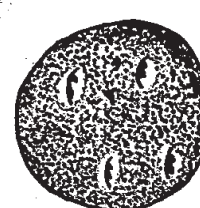
Splashed



Scattered



Spectacled



Stippled

Unofficial Copy

Figure 14: Tuber Shape



Compressed



Round



Oval



Oblong



Long

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.

**EXHIBIT C. Continued - CARIBOU RUSSET (AF3362-1) PHOTOGRAPHS & FINGERPRINTING**



**Photo 1. Caribou Russet (AF3362-1) Flowers**



**Photo 2. Caribou Russet (AF3362-1) Leaves**



**Photo 3. Caribou Russet (AF3362-1) Foliage**



Photo 4. Caribou Russet (AF3362-1), center two rows



Photo 5. Caribou Russet (AF3362-1) Light Sprouts

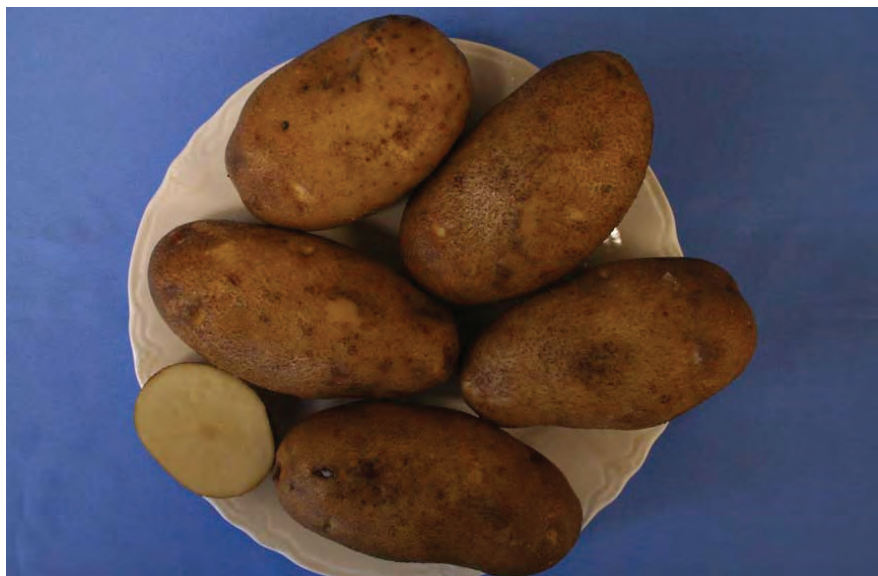


Photo 6. Caribou Russet (AF3362-1) Tubers

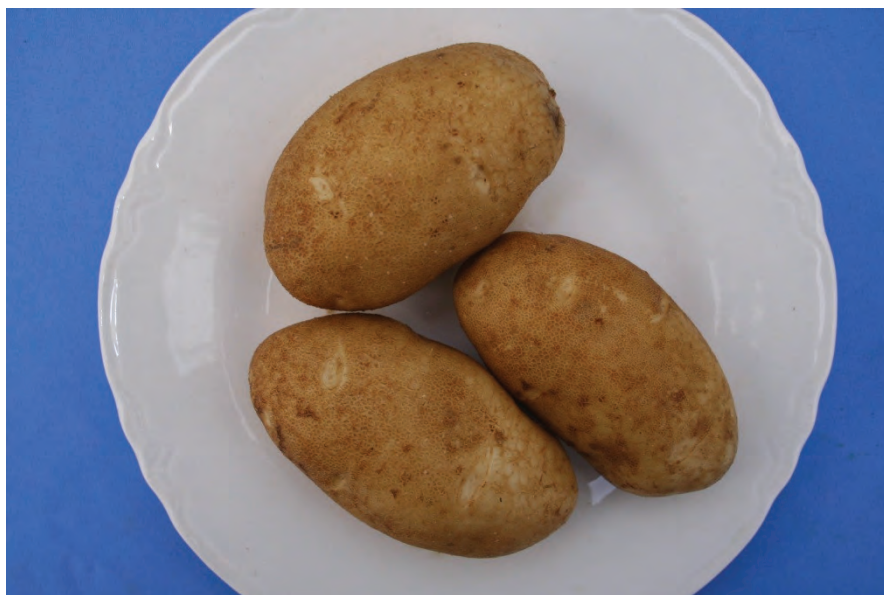
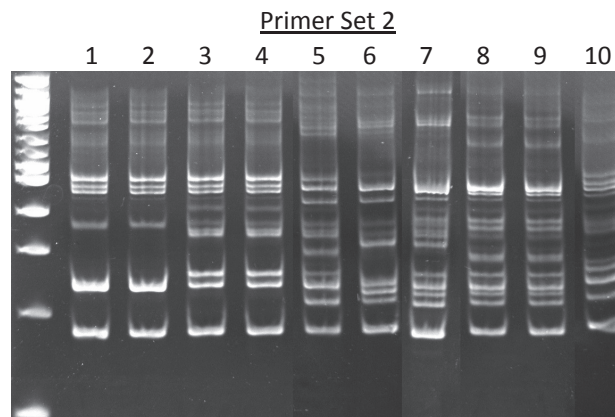
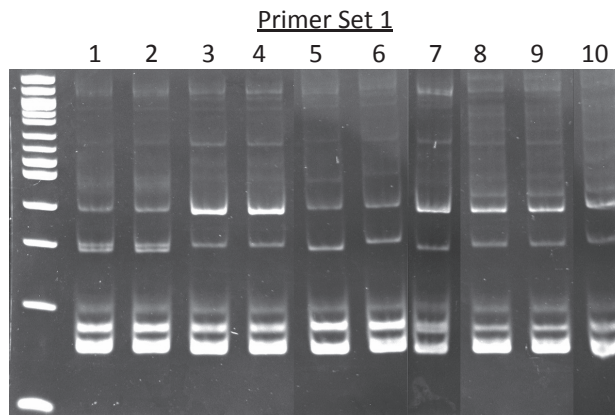


Photo 7. Caribou Russet (AF3362-1) Tubers



Maine Fingerprint Data November 05, 2012

Sample #	Name
1	AF3362-1 Sample 1
2	AF3362-1 Sample 2
3	AF3001-6 Sample 1
4	AF3001-6 Sample 2
5	Russet Burbank
6	Norkotah
7	Shepody
8	AF0338-17 Sample 1
9	AF0338-17 Sample 2
10	Atlantic



Conclusion:

Samples were prepared from 2 independent tubers for each sample type and each pair appears to be identical and unique when compared to other samples and 4 controls. Pictures are a composite image, relative distance of migration for all bands has been preserved.

PCR Setup  
Per 20ul reaction  
6ul primer set 1\* (top gel) or 2^ (bottom gel)  
4ul water  
10ul Promega Go Green MM  
1ul DNA sample

\*Primer Set 1 = add 1ul each of STM1024F and R, STM2022F and R, STM2028F and R.  
^Primer Set 2 = add 1ul each of STM3012F and R, STM5136F and R, STM5148F and R.

Amplify using program SSR50:  
94' 3min 1 cycle; 94' 30sec; 50' 30sec; 72' 45sec; cycle 30x; then 72' 5min; Hold at 4'C.

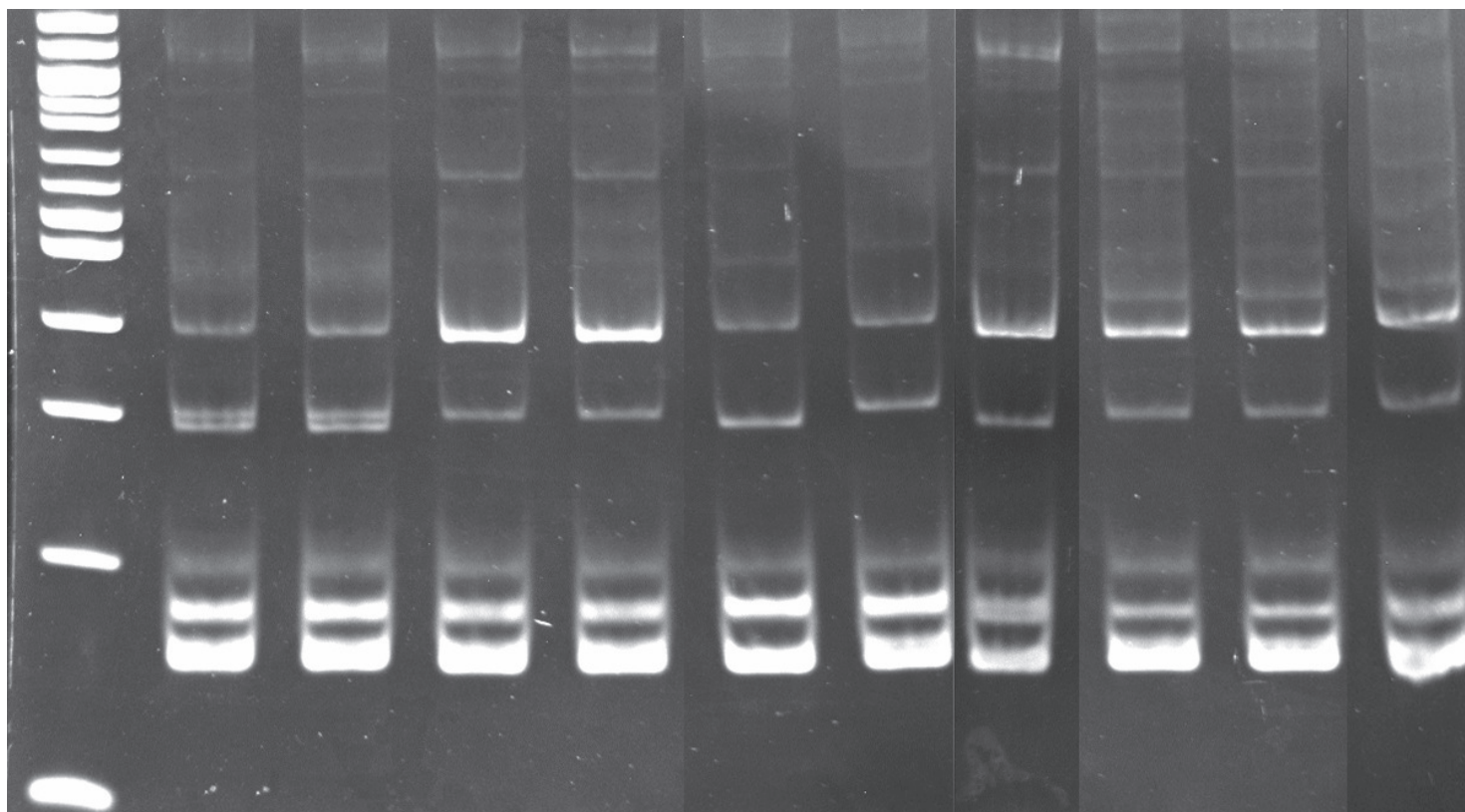
Each lane represents DNA from a single tuber or plant leaves extracted with a Qiagen DNA extraction kit.

Ref. Reid, A., and E. M. Kerr. 2007. A rapid simple sequence repeat (SSR)-based identification method for potato cultivars. Plant Genetic resources: Characterization and Utilization. 5(1): 7-13.

Gels prepared using Sigma (A-6050) Acrylamide/bis-Acrylamide 40% stock). To make 2x 1.5mm minigels (Biorad Mini-Protean II) add 2ml Acrylamide, 1ml 10x TBE, 16ml water, 20mg APS, swirl then add 15ul TEMED. Cast gels using a syringe and let sit 30min. Load entire sample and run gel in 0.5x TBE at 84v for exactly 65min (blue runs off of bottom). Stain gel 20 min in 100ml water with 5ul EtBr. The size ladder used is the New England Biolabs 100bp DNA ladder (N3231) .

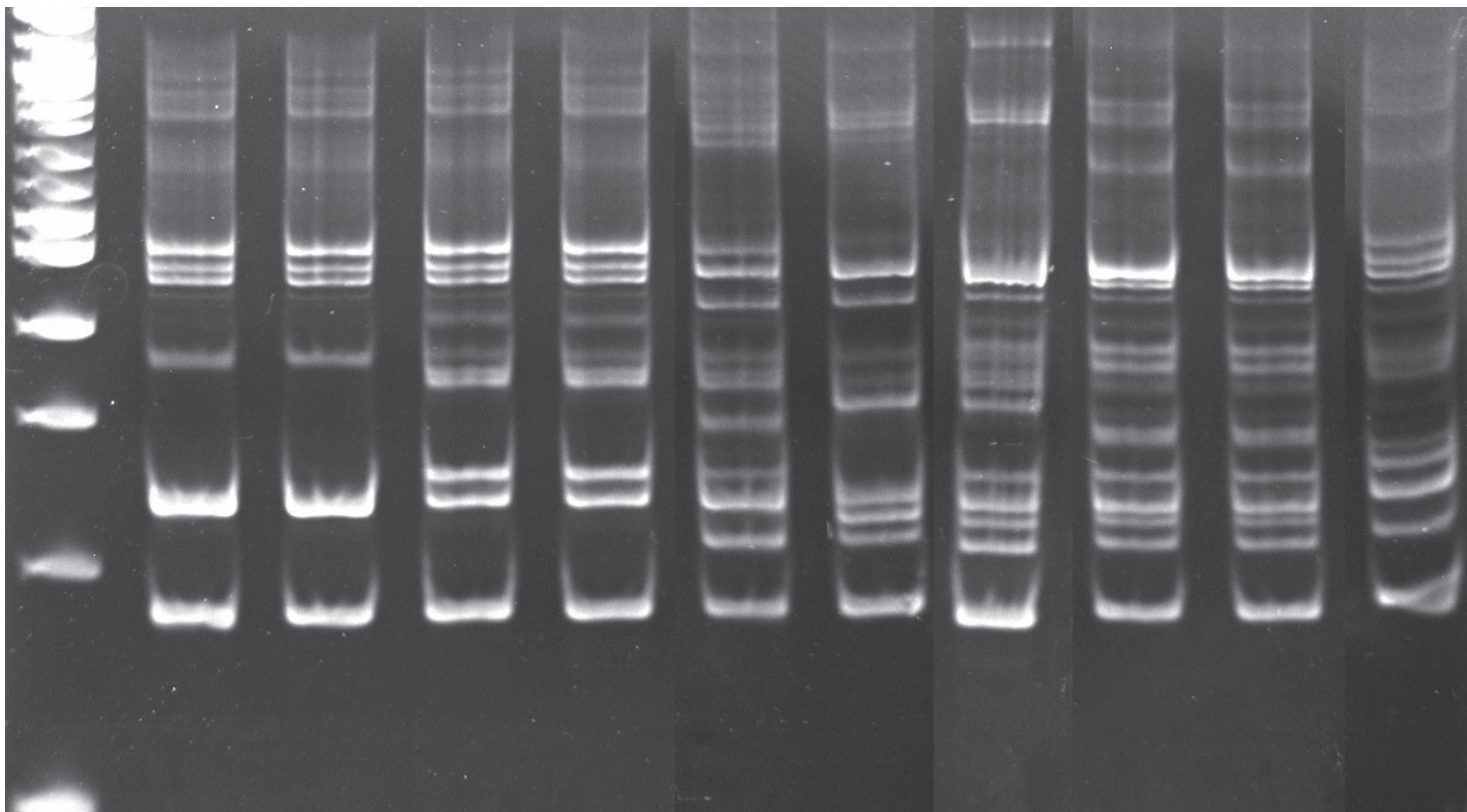
# Primer Set 1

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# Primer Set 2

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**EXHIBIT D. ADDITIONAL DESCRIPTION OF THE VARIETY**

Below are several tables that further characterize Caribou Russet (AF3362-1) and compare the variety to reference varieties.

**Table 1. Plant and Tuber Characteristics, Maine (20 experiments 2007-2014)**

<b>Potato Variety</b>	<b>Plant Size</b>	<b>Plant Maturity</b>	<b>Tuber Skin Texture</b>	<b>Tuber Shape</b>	<b>Tuber Appearance</b>
Caribou Rus. (AF3362-1)	7.0	6.0	3.6	6.9	5.6
Russet Burbank	7.0	6.7	3.6	7.0	3.9
Russet Norkotah	5.9	4.3	3.0	6.3	6.3
Shepody	6.4	5.1	6.7	7.0	4.0
Mean	6.6	5.8	4.3	6.8	5.0
Std dev	0.728	0.544	0.446	0.296	0.667
Pr > F	0.0005	<.0001	<.0001	<.0001	<.0001
W-D LSD <sub>0.05</sub>	0.4	0.3	0.3	0.2	0.4
Caribou Russet					
Low	5.0	4.3	3.0	6.0	5.0
High	9.0	7.0	4.0	7.0	6.0
Russet Burbank					
Low	6.0	5.3	3.0	7.0	3.0
High	8.0	8.0	4.0	7.0	5.0

**Table 2. Tuber Yield and Quality Characteristics (numbers in parentheses indicate yield relative to the Russet Burbank standard or specific gravity differential relative to Russet Burbank), Maine (20 experiments 2007-2014)**

Potato Variety	Total Yield cwt/A	US#1 Yield cwt/A	Tuber Size		Specific Gravity	Ext. Defs. %	Hollow Heart %
			<4oz %	>8oz %			
Caribou Rus. (AF3362-1)	346(106)	320(130)	15.1	39.8	1.083(+0.002)	6.5	3.4
Russet Burbank	326(100)	256(100)	20.0	37.6	1.081( 0.000)	18.2	13.8
Russet Norkotah	290( 89)	263(107)	31.1	22.4	1.075(-0.006)	7.2	12.3
Shepody	302( 93)	203( 86)	16.3	40.5	1.081(-0.000)	28.9	13.7
Mean	326	273	19.3	36.1	1.080	14.8	9.0
Std dev	34.53	52.33	7.11	9.81	0.0042	11.96	10.75
Pr > F	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0007
W-D LSD <sub>0.05</sub>	20	30	4.1	5.9	0.002	7.0	6.8
Caribou Russet							
Low	171	164	3.0	7.0	1.071	2.8	0.0
High	475	444	40.0	82.0	1.093	12.4	32.5
Russet Burbank							
Low	208	92	6.0	9.0	1.071	2.3	0.0
High	433	396	48.0	59.0	1.095	37.3	57.5

**Table 3. Agtron Fry Color Scores, Maine (December data from 18 experiments 2008-2014)**

Potato Variety	December 50F	Jan/Feb 50F	February 45F	Jan/Feb 38 or 42F	Jan/Feb Recondition
Caribou Rus. (AF3362-1)	50.8	48.6	53.0	28.9	36.8
Russet Burbank	40.6	45.1	45.2	26.4	37.2
Russet Norkotah	40.4	43.8	46.0	23.7	35.7
Shepody	46.4	48.0	50.6	26.0	40.0
Mean	47.1	48.2	51.2	28.9	39.9
Std dev	5.16	5.61	8.34	4.22	7.49
Pr > F	<0.0001	<0.0001	0.0451	<0.0001	0.0002
W-D LSD <sub>0.05</sub>	3.1	4.6	12.4	3.2	6.1
Caribou Russet					
Low	30.0	30.0	41.0	18.0	27.0
High	66.0	65.0	58.0	42.0	51.0
Russet Burbank					
Low	26.0	26.0	31.0	19.0	24.0
High	59.0	61.0	57.0	34.0	54.0

**Table 4. Total Tuber Glycoalkaloids, Maine (7 experiments, 2007-2012, 2014)**

Potato Variety	Total Tuber Glycoalkaloids (mg/100 g fw)
Caribou Russet (AF3362-1)	12.72
Atlantic	12.08
Lenape	40.80
Russet Burbank	23.25
Snowden	25.07
Superior	10.27
Mean	21.21
Std dev	6.28
Pr > F	<0.0001
W-D LSD <sub>0.05</sub>	6.48
Caribou Russet	
Low	6.78
High	20.21
Russet Burbank	
Low	12.81
High	43.49

**Table 5. Baked and Boiled Quality Characteristics, Maine (5 experiments, 2008-2012)**

Potato Variety	<u>Baked Quality:</u>				<u>Boiled Quality:</u>	
	Color	Flavor	Texture	Overall	Sloughing	Graying
Caribou Rus. (AF3362-1)	6.49	6.42	6.21	6.21	9.38	4.37
R. Burbank	6.25	5.94	6.20	5.97	5.69	3.78
Mean	6.398	6.206	6.234	6.134	7.614	3.974
Std dev	0.219	0.274	0.246	0.230	3.601	1.486
Pr > F	0.162	0.043	0.944	0.175	0.149	0.5515
Caribou Russet						
Low	6.40	6.30	6.10	6.10	3.80	2.80
High	6.70	6.80	6.50	6.60	13.70	5.60
Russet Burbank						
Low	5.96	5.57	5.84	5.55	2.90	1.80
High	6.70	6.50	6.50	6.30	9.40	6.53



**Table 6. Tuber Asparagine, Maine (10 experiments, ME, WI, ND, ID, WA, 2011-2013)**

<b>Potato Variety</b>	<b>Tuber Asparagine (mg/g dw)</b>
Caribou Russet (AF3362-1)	6.29
Russet Burbank	5.10
Mean	5.69
Std dev	1.96
Pr > F	0.2074
Caribou Russet	
Low	3.17
High	15.58
Russet Burbank	
Low	3.10
High	13.58

**Table 7. Sprouting and Weight Loss, Maine (5 experiments 2010-2014)**

Potato Variety	<u>Days to Indicated Sprout Length</u>		<u>Storage Weight Loss (%)</u>	
	1/8"	1/2"	38F	50F
Caribou Russet (AF3362-1)	115	151	5.5	21.0
Russet Burbank	194	218	4.4	9.1
Russet Norkotah	157	185	4.2	14.4
Shepody	140	171	4.5	16.2
Mean	154	184	4.93	14.68
Std dev	13.45	12.04	1.150	5.034
Pr > F	<0.0001	<0.0001	0.0854	0.0216
W-D LSD <sub>0.05</sub>	16.5	14.8	1.78	7.22
Caribou Russet				
Low	99	131	3.3	7.5
High	131	171	8.8	31.0
Russet Burbank				
Low	180	201	2.4	5.4
High	207	242	6.2	15.5

**Table 8. Tuber Skinning, Shatter Bruise, and Blackspot Bruise Susceptibility Scores, Maine (2007-2014)**

Potato Variety	Tuber Skinning Eval.		Shatter Bruise Index	Blackspot Bruise Index
	Index	%Thumbnail Cracks		
Caribou Russet (AF3362-1)	1.91	13.3	0.76	0.86
Russet Burbank	2.65	30.5	1.02	1.56
Russet Norkotah	1.33	9.6	0.90	1.12
Shepody	1.90	13.7	1.02	1.05
Mean	2.37	18.0	1.04	1.20
Std dev	0.991	17.24	0.316	0.411
Pr > F	<0.0001	0.0303	<0.0001	0.0006
W-D LSD <sub>0.05</sub>	0.72	15.87	0.247	0.330
Caribou Russet				
Low	0.58	0.0	0.00	0.10
High	3.94	62.0	2.02	1.71
Russet Burbank				
Low	1.70	0.0	0.00	0.10
High	4.40	70.0	2.48	3.28

### **Methods (Tables 1 and 2).**

Data are means generated from 20 replicated yield trials conducted in Maine from 2007 to 2014. The trial locations were in Presque Isle and St. Agatha, ME. Each experiment was a randomized complete block design with four replications per treatment. Regional trial experiments and potato breeding program experiments were included.

Plant size, plant maturity, tuber skin texture, tuber shape, and tuber appearance are qualitative ratings using the Eastern regional variety evaluation project rating system:

**Plant size:** 1=very small; 3=small; 5=medium; 7=large; 9=very large

**Plant maturity:** 1=very early; 3=early; 4=medium-early; 5=medium; 6=medium-late; 7=late; 9=very late

**Tuber skin texture:** 1=partial russetting; 2=heavy russet; 3=moderate russetting; 4=light russet; 5=netted; 6=slightly netted; 7=moderately smooth; 8=smooth; 9=very smooth.

**Tuber shape:** 1=round; 2=mostly round; 3=round to oblong; 4=mostly oblong; 5=oblong;

**6=oblong to long;** 7=mostly long; 8=long; 9=extremely long.

**Tuber appearance:** 1=very poor; 3=poor; 5=fair; 7=good; 9=excellent.

Total yield: plots were harvested and all tubers collected here weighed to generate total yield data.

US#1 yield: total yield minus tubers <1-7/8" diameter, >4" diameter, and external defects (sunburn, off shapes, growth cracks, scab, and rot).

Tuber size: the harvested tubers were graded using a spool-type sizer. Percentage of yield <1-7/8" and >2-1/2" are reported.

Specific gravity is a measure related to tuber dry matter and starch content. Our specific gravity is calculated using the weight-in-air/weight-in-water method.

External defect is the percentage of yield with external defects (sunburn, off shapes, growth cracks, scab, and rot).

Hollow heart incidence is measured by cutting on 10 tubers per plot (40 tubers per experiment for each variety).

### **Methods (Table 3).**

December 50F storage data are means generated from 18 replicated yield trials conducted in Maine from 2008 to 2014. The trial locations were in Presque Isle and St. Agatha, ME. Each experiment was a randomized complete block design with four replications per treatment. Regional trial experiments and potato breeding program experiments were included. January/February 50F, 38F/42F, and reconditioned data are from twelve replicated regional project trials (February) and breeding program trials (January) conducted from 2007 to 2014. Cool temperature storage for the regional trials was 38F while for the breeding program was 42F. Reconditioning was for 2 weeks at room temperature (~65F) regional project and for two weeks at 55F for the breeding program. February 45F data are from five replicated regional project trials conducted from 2010 to 2014.

Higher Agron scores indicate lighter fry color. Scores are chip color scores using crushed chips measured three times per sample. Chips were fried at 350F for 3 minutes per sample. Scores are from an Agron M35 calibrated with the black "0 disk" set equal to 0 and the white "90 disk" set at 90.

**Methods (Table 4).**

Total tuber glycoalkaloids were measured on tubers from seven experiments conducted from 2007-2014. For each variety in each experiment, a 15-tuber sample was homogenized and analyzed using standard HPLC methods. Solanine and chaconine were used as standards to calculate total tuber glycoalkaloids.

**Methods (Table 5).**

Sensory quality evaluations are summarized for five experiments conducted from 2008 to 2012. Test lines were compared to appropriate industry standards using sensory panels at the University of Maine food science sensory quality facility. Only lines with acceptable total glycoalkaloid (TGA) content (<20 mg per 100g) were evaluated (Asano et al., 1996; Baker et al., 1991; Friedman and McDonald, 1997). A nine-point hedonic scale (Peryam and Pilgrim, 1957) was used for each of the baked attributes (e.g. cooked color, texture, flavor, and overall acceptability). Fifty panelists were utilized in each experiment. High scores indicate better quality. After cooking darkening and sloughing of boiled selections were evaluated subjectively using sensory panels and a 1 to 16 hedonic scale where lower numbers indicate better quality. Typically 10-20 panelists were used in each experiment.

**Methods (Table 6).**

Tuber asparagine was measured on tubers from ten experiments conducted from 2011-2013. The tubers were grown in National Fry Processing Trial experiments conducted in ME, WI, ND, ID, and WA. Freeze-dried tuber tissue was extracted in 70% ethanol. Diluted extracts were derivatized and analyzed for amino acids using the EZ:fast Amino Acid Analysis kit for GC-FID (Phenomenex, Torrance, CA).

**Methods (Table 7).**

Tuber sprouting and weight loss characteristics are from three NE1031 regional trial experiments conducted from 2010-2012. Days to indicated sprout length was determined on 1-tuber samples stored at 45°F, 85% R.H. Sprout length was determined on a weekly basis. Days from vinekill to indicated sprout length are reported. During each year, percentage sprout and weight loss was determined on duplicate samples following storage from October until early April at indicated temperature and 85% R.H. Total weight loss from moisture loss, respiration, and sprouting is reported.

**Methods (Table 8).**

Tuber sprouting and weight loss characteristics are from five NE1031 regional trial experiments conducted from 2010-2014. Skinning severity and thumbnail bruise incidence were measured using a tumbling bruise barrel procedure (usually within one day of harvest. Approximately 10 lbs of tubers that exceeded 1 7/8" diameter were tumbled in a drum with three stones for 1 minute at 15 rpm. Tubers were then rated for combined skinning and shatter bruise. Data presented represent indices where: 1=all tubers have 0% of surface affected and 9=all tubers have 100% of surface affected. Percentage of tubers with thumbnail cracks is reported.

Shatter and blackspot tests were conducted using the weight-drop method (12" for shatter and 6" for blackspot). The index presented indicates the combined incidence and severity of bruising/discoloration where: 0=no tubers show no bruising/discoloration and 4=all tubers have severe bruising/discoloration. Evaluations were conducted on stored tubers. Blackspot tubers were allowed to develop color for 48 hours before rating bruise incidence and severity.

**Statistical Analysis:**

Statistical analysis was conducted with the SAS PROC GLM procedure using experiment as the blocking variable. Mean separation was conducted with the Waller-Duncan LSD test (k=100, approximates alpha=0.05).

**EXHIBIT E - STATEMENT OF THE BASIS OF OWNERSHIP**

1. Name of Owner University of Maine System Board of Trustees	2. Temporary Designation or Experimental Name AF3362-1	3. Variety Name Caribou Russet
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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 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**

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

'Caribou Russet' was developed at the University of Maine. The breeder(s) is obligated to assign by virtue of employment by the Applicant. The ownership rights are the property of the University of Main System Board of Trustees, a U.S. based organization.

**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.

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