

No.

201900308

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

University of Idaho, Washington State University,
Oregon State University, and The United States
Government as represented by the Secretary of
Agriculture

Whereas, THERE HAS BEEN PRESENTED TO THE

Administrator of the Agricultural Marketing Service

An application requesting a certificate of protection for an alleged novel variety of sexually reproduced, asexually 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 germplasm material 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 there from, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)



POTATO

'La Belle 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 ninth day of November, in the year two thousand twenty one.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Administrator
Agricultural Marketing Service

201900308

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

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).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

<p>1. NAME OF OWNER The four partners of the Northwest Potato Variety Development Program: (i) The U. S. Government as represented by the Secretary of Agriculture; (ii) University of Idaho, (iii) Washington State University, and (iv) Oregon State University.</p>	<p>2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME A06021-1T</p>	<p>3. VARIETY NAME La Belle Russet</p>						
<p>4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) The U. S. Government as represented by the Secretary of Agriculture 1400 Independence Ave. SW Washington D.C. 20250</p>	<p>5. TELEPHONE (include area code) (301) 504-6905</p> <p>6. FAX (include area code) (301) 504-5060</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">FOR OFFICIAL USE ONLY</th> </tr> <tr> <td style="text-align: center;">PVPO NUMBER</td> <td style="text-align: center; font-size: 1.2em;">201900308</td> </tr> <tr> <td style="text-align: center;">FILING DATE</td> <td style="text-align: center; font-size: 1.2em;">8/28/2019</td> </tr> </table>	FOR OFFICIAL USE ONLY		PVPO NUMBER	201900308	FILING DATE	8/28/2019
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<p>7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) US Government Universities (Univ of Idaho, WSU, OSU)</p>	<p>8. IF INCORPORATED, GIVE STATE OF INCORPORATION</p>	<p>9. DATE OF INCORPORATION</p>						

<p>10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Brian Nakanishi, USDA, ARS, OTT 5601 Sunnyside Ave. Beltsville, MD 20705-5131</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">FILING AND EXAMINATION FEES:</td> <td style="text-align: center; font-size: 1.2em;">\$ 4382.00</td> </tr> <tr> <td style="text-align: center;">DATE</td> <td style="text-align: center; font-size: 1.2em;">8/28/2019</td> </tr> <tr> <td style="text-align: center;">CERTIFICATION FEE:</td> <td style="text-align: center;">\$</td> </tr> <tr> <td style="text-align: center;">DATE</td> <td style="text-align: center;">DATE</td> </tr> </table>	FILING AND EXAMINATION FEES:	\$ 4382.00	DATE	8/28/2019	CERTIFICATION FEE:	\$	DATE	DATE
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CERTIFICATION FEE:	\$								
DATE	DATE								

<p>11. TELEPHONE (Include area code) (301) 504-6905</p>	<p>12. FAX (include area code) (301) 504-5060</p>	<p>13. E-MAIL brian.nakanishi@usda.g</p>
<p>14. CROP KIND (Common Name) Potato</p>	<p>16. FAMILY NAME (Botanical) Solanaceae</p>	<p>15. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p> <p>IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.</p>
<p>15. GENUS AND SPECIES NAME OF CROP Solanum tuberosum</p>	<p>17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</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"/> Exhibit F. Declaration Regarding Deposit</p> <p>g. <input type="checkbox"/> 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)</p> <p>h. <input type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)</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>21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?</p> <p><input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p> <p>IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED</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 checked="" type="checkbox"/> NO</p> <p>IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.</p> <p><input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED</p> <p><i>(If additional explanation is necessary, please use the space indicated on the reverse.)</i></p>
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<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>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>
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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.

<p>SIGNATURE OF OWNER </p>	<p>SIGNATURE OF OWNER _____</p>
<p>NAME (Please print or type) Mojdeh Bahar</p>	<p>NAME (Please print or type) _____</p>
<p>CAPACITY OR TITLE Assistant Administrator</p>	<p>DATE 08/23/2019</p>

GENERAL INSTRUCTIONS: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). **NEW:** With the application for a seed reproduced variety or by direct deposit soon after filing, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

Plant Variety Protection Office
 Telephone: (301) 504-5518 FAX: (301) 504-5291
 General E-mail: PVP@mail@usda.gov
 Homepage: <http://www.ams.usda.gov/science/pvpo/PVPindex.htm>

SPECIFIC INSTRUCTIONS:

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, Seed Regulatory and Testing Branch, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 (2) the details of subsequent stages of selection and multiplication;
 (3) evidence of uniformity and stability; and
 (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

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).)

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 1.4 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). 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.

<p>U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE</p> <p>EXHIBIT A -- ORIGIN AND BREEDING HISTORY ** Use additional pages as needed.</p>		<p>FOR OFFICIAL USE ONLY</p> <p>PVPO NUMBER</p>														
<p>1. Name of Owner The four partners of the Northwest Potato Variety Development Program: (i) The U.S. Government as represented by the Secretary of Agriculture; (ii) University of Idaho, (iii) Washington State University; and (iv) Oregon State University.</p>	<p>2. Temporary Designation or Experimental Name A06021-1T</p>	<p>3. Variety Name La Belle Russet</p>														
<p>4. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s). **</p> <p>La Belle Russet was derived from a sexual hybridization made at the University of Idaho's Aberdeen Research and Extension Center in 2006. It resulted from a cross of A99031-1TE (female parent) and A96013-2 (male parent). It was first selected in the field in 2008 at the University of Idaho Tetonia Research and Extension Center Tetonia, Idaho.</p> <p>A four generation pedigree is attached (Figure 1).</p>																
<p>5. Give the details of subsequent stages of selection and multiplication. **</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Year</th> <th style="width: 40%;">Detail of Stage</th> <th style="width: 45%;">Selection Criteria</th> </tr> </thead> <tbody> <tr> <td>2008</td> <td>Field selection in 2008 at Tetonia, Idaho.</td> <td rowspan="5" style="vertical-align: top;">Yield, appearance, higher protein, resistance to tuber defects, fresh market and French fry processing potential.</td> </tr> <tr> <td>2008-2012</td> <td>Replicated yield trial evaluations and propagation.</td> </tr> <tr> <td>2013</td> <td>In 2013 La Belle Russet was evaluated in the Tri-State Potato Variety Trials.</td> </tr> <tr> <td>2014-2016</td> <td>In 2014-2016 La Belle Russet was entered and evaluated in the Western Regional Variety Trials. La Belle Russet was selected for use in the early and late season russet tablestock and early french fry processing markets.</td> </tr> <tr> <td>2015-2017</td> <td>La Belle Russet was evaluated in agronomic field trials.</td> </tr> </tbody> </table>			Year	Detail of Stage	Selection Criteria	2008	Field selection in 2008 at Tetonia, Idaho.	Yield, appearance, higher protein, resistance to tuber defects, fresh market and French fry processing potential.	2008-2012	Replicated yield trial evaluations and propagation.	2013	In 2013 La Belle Russet was evaluated in the Tri-State Potato Variety Trials.	2014-2016	In 2014-2016 La Belle Russet was entered and evaluated in the Western Regional Variety Trials. La Belle Russet was selected for use in the early and late season russet tablestock and early french fry processing markets.	2015-2017	La Belle Russet was evaluated in agronomic field trials.
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<p>6. Is the variety uniform? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>How did you test for uniformity?</p> <p>La Belle Russet has been clonally propagated since the first year of selection. The variety has remained uniform during all subsequent years of maintenance and propagation.</p>																
<p>7. Is the variety stable? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>How did you test for stability? Over how many generations?</p> <p>La Belle Russet has been clonally propagated for ten years of evaluation. It has shown stability over ten generations and has not produced any recognizable variants.</p>																
<p>8. Are genetic variants observed or expected during reproduction and multiplication? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If yes, state how these variants may be identified, their type and frequency.</p>																

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE		FOR OFFICIAL USE ONLY	
EXHIBIT B – STATEMENT OF DISTINCTNESS ** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.		PVPO NUMBER	
1. Name of Owner The four partners of the Northwest Potato Variety Development Program: (i) The U. S. Government as represented by the Secretary of Agriculture; (ii) University of Idaho, (iii) Washington State University, and (iv) Oregon State University.	2. Temporary Designation or Experimental Name <h2 style="text-align: center;">A06021-1T</h2>	3. Variety Name <h2 style="text-align: center;">La Belle Russet</h2>	
Based on overall morphology, <u>La Belle Russet</u> is most similar to <u>Russet Burbank</u> <i>Applicant's new variety</i> <i>Most similar comparison variety(ies)</i> <u>La Belle Russet</u> most clearly differs from <u>Russet Burbank</u> in the following traits: <i>Applicant's new variety</i> <i>Most similar comparison variety(ies)</i>			
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 below).			
Eg. Leaf Pubescence Eg. Leaf Color Eg. Plant Height	heavy pubescence Dark Green (5GY 3/4) 200 cm +/- 10 cm (N=25)	glabrous Light Green (2.5GY 8/10) 250 cm +/- 15 cm (N=25)	photograph attached Munsell Color Chart statistics attached
1. Qualitative traits:	Applicant's New Variety _____ La Belle Russet	1 st Comparison Variety Russet Burbank	Location of Evidence Within the Application
Sprout Tip	Closed (1)	Intermediately closed (2)	Exhibit C and Photographs
Pollen production	Male Fertile	Sterile	
2. Color traits:			
Leaf color*	Green (RHS 137 B)	Olive green (RHS 146 A)	Exhibit C and photographs
Stem Anthocyanin	Absent (1)	Weak (3)	
Petiole Anthocyanin	Absent (1)	Weak (3)	
Calyx Anthocyanin	Absent (1)	Weak (3)	
3. Quantitative traits:			
Plant Size	1.69 (Small)	2.53 (Medium)	Table 1 – Exhibit D Table 2 – Exhibit D
Protein Content	5.66 % (Moderate)	4.96 % (Low)	
Solids	21.71 %	20.04 %	Table 3 – Exhibit D
Specific Gravity	1.087	1.076	
Vitamin C Content 2013 2016	24.32 mg/100g FWB (Moderate) 22.20 mg/100g FWB (Moderate)	21.74 mg/100g FWB (Moderate) 17.03 mg/100g FWB (Low)	
4. Other:			
Fry color from 40°F**	Moderate (2.9)	Dark (3.9)	Table 4 – Exhibit D
Fry color from 45°F**	Low (0.7)	Low (1.0)	
Percent Sugar ends**	Low (12%)	High (42%)	

FWB= Fresh Weight Basis

**USDA color chart {00-4.0 (darkest)}. Samples stored at 40°F or 45°F for approximately 3 months.

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

Form Approved OMB NO 0581-0055

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The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

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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) The U. S. Government as represented by the Secretary of Agriculture	TEMPORARY OR EXPERIMENTAL DESIGNATION A06021-1T	VARIETY NAME La Belle Russet
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) 1400 Independence Ave. SW Washington D.C. 20250		FOR OFFICIAL USE ONLY PVPO NUMBER

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)
La Belle 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 4-5	R1 4-5	R2	R3	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 2	R1 2	R2	R3	R4
-----	------	----	----	----

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

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

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

*** LIGHT SPROUT TIP: HABIT**

1 = Closed 2 = Intermediate 3 = Open

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

LIGHT SPROUT TIP ANTHOCYANIN COLORATION

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

V	1	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	1	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	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	111	R1	111	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

PLANTING DATE:

V	5-May/2016, 5-May/2017	R1	5-May/2016, 5-May/2017	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	3	R1	3	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	1	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	3	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 B	R1	146 A	R2		R3		R4	
---	-------	----	-------	----	--	----	--	----	--

LEAF PUBESCENCE DENSITY:

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

V	2	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	5	R1	5	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

PETIOLES ANTHOCYANIN COLORATION:

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

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

LEAF STIPULES SIZE: (See Figure 5)

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

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

TERMINAL LEAFLET MARGIN WAVINESS:

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

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

NUMBER OF PRIMARY LEAFLET PAIRS: (See Figure 6)

AVERAGE:

V	4.2	R1	3.4	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

RANGE:

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

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

AVERAGE:

V	9.0	R1	6.1	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

RANGE:

V	7	to	12	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	7	R1	1	to	9	R2		to		R3		to		R4		to	
---	---	----	---	----	---	----	---	----	--	----	--	----	--	----	--	----	--	----	--

NUMBER OF FLORETS/INFLORESCENCE:

AVERAGE:

V	14.7	R1	12.0	R2		R3		R4	
---	------	----	------	----	--	----	--	----	--

RANGE:

V	8	to	19	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 B	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 B	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	3	R1	4	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

6. INFLORESCENCE CHARACTERISTICS:

CALYX ANTHOCYANIN COLORATION:

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

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

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

V	15 B	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	2	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 Munsell Color Chart (Circle the appropriate color chart)

V	144 A	R1	146 B	R2		R3		R4	
---	-------	----	-------	----	--	----	--	----	--

BERRY PRODUCTION: (Under field conditions)

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

V	5	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	4	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	164 C	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	5	R1	5	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

TUBER THICKNESS:

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

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

TUBER LENGTH (mm):

AVERAGE:

V	118	R1	135	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

RANGE:

V	85	to	156	R1	85	to	180	R2		to	R3		to	R4		to
---	----	----	-----	----	----	----	-----	----	--	----	----	--	----	----	--	----

STANDARD DEVIATION:

V	16.5	R1	18.6	R2		R3		R4	
---	------	----	------	----	--	----	--	----	--

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	245	R1	236	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

TUBER WIDTH (mm)

AVERAGE:

V	64	R1	61	R2		R3		R4	
---	----	----	----	----	--	----	--	----	--

RANGE:

V	49	to	78	R1	49	to	79	R2		to	R3		to	R4		to
---	----	----	----	----	----	----	----	----	--	----	----	--	----	----	--	----

STANDARD DEVIATION:

V	6.13	R1	5.82	R2		R3		R4	
---	------	----	------	----	--	----	--	----	--

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	245	R1	236	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

7. TUBER CHARACTERISTICS: (continued)

TUBER THICKNESS (mm):

AVERAGE:

V	54.7	R1	53	R2		R3		R4	
---	------	----	----	----	--	----	--	----	--

RANGE:

V	43	to	68	R1	43	to	72	R2		to		R3		to		R4		to	
---	----	----	----	----	----	----	----	----	--	----	--	----	--	----	--	----	--	----	--

STANDARD DEVIATION:

V	5.47	R1	5.56	R2		R3		R4	
---	------	----	------	----	--	----	--	----	--

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	245	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	16.4	R1	26.6	R2		R3		R4	
---	------	----	------	----	--	----	--	----	--

RANGE:

V	11	to	24	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	1	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	2	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	5.5	R1	6.2	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

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	7	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

EARLY BLIGHT: (Alternaria)

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

SOFT ROT (Erwinia)

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

COMMON SCAB (Streptomyces)

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

POWDERY SCAB (Spongospora)

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

DRY ROT (Fusarium)

V	8	R1	7	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

POTATO LEAF ROLL VIRUS (PLRV)

V	8	R1	9	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

8. DISEASES CHARACTERISTICS: (continued)

POTATO VIRUS X (PVX)

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

POTATO VIRUS Y (PVY)

V	8	R1	7	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

POTATO VIRUS M (PVM)

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

POTATO VIRUS A (PVA)

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

GOLDEN NEMATODE (Globodera)

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

ROOT - KNOT NEMATODE (Meloidogyne)

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

OTHER DISEASE Corky Ringspot (Tobacco rattle Virus)

V	8	R1	9	R2		R3		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	4	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		R3		R4	
---	---	----	---	----	--	----	--	----	--

GREEN PEACH APHID (*Myzus*)

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

OTHER:

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

OTHER:

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

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

V	3.87	R1	3.18	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.

La Belle Russet has lighter fry color at 40F (3.24) than Russet Burbank 40F(3.61).

La Belle Russet produces la ower percentage of sugar ends (12%) compared to Russet Burbank (46%).

See attached Exhibit D for protocol.

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.

La Belle Russet has higher percent protein content (5.44%) than Russet Burbank (4.98%).

See protocol in attached Exhibit D

13. FINGER PRINTING MARKERS:

ISOZYMES 1 = YES 2 = NO

IF YES, attach information

14. DNA PROFILE: 1 = YES 2 = NO

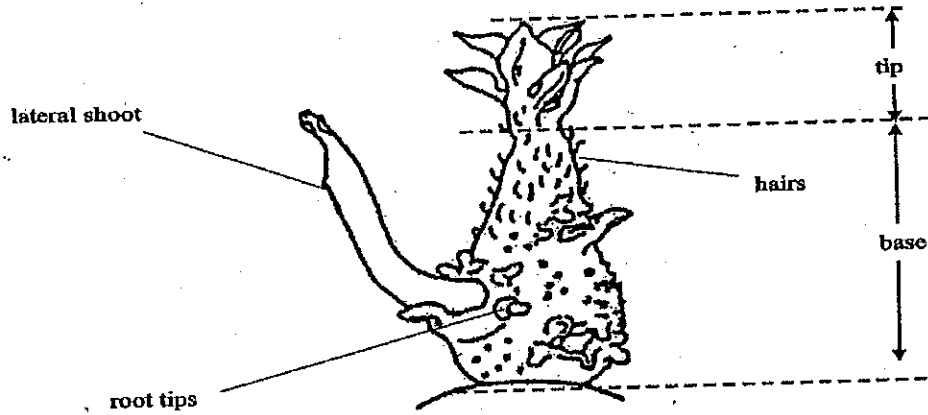
IF YES, attach information

15. ADDITIONAL COMMENTS AND CHARACTERISTICS:

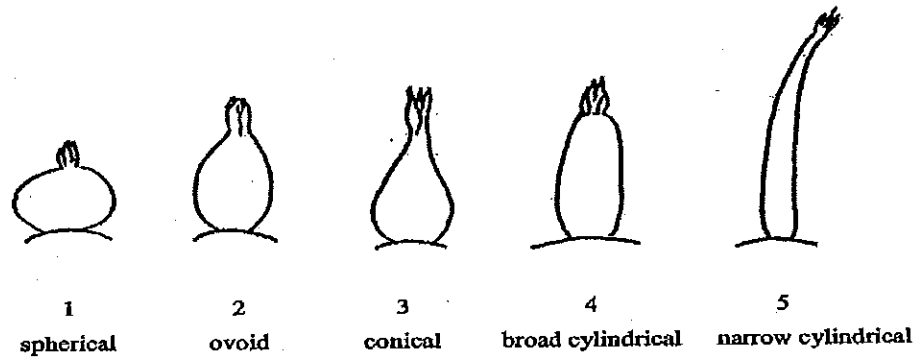
Include any additional descriptors that would be useful in distinguishing the candidate variety.

Figure 1: Light sprout

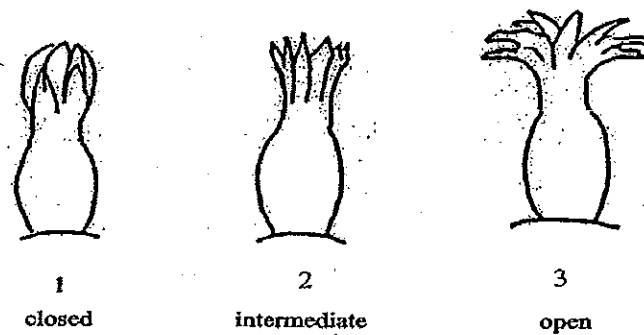
Light sprout dissection



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

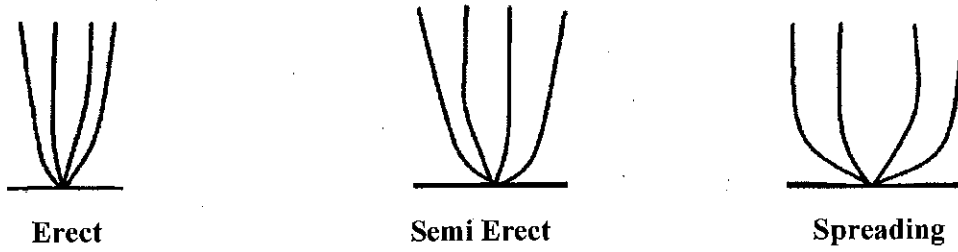


Figure 3: Stem Wings

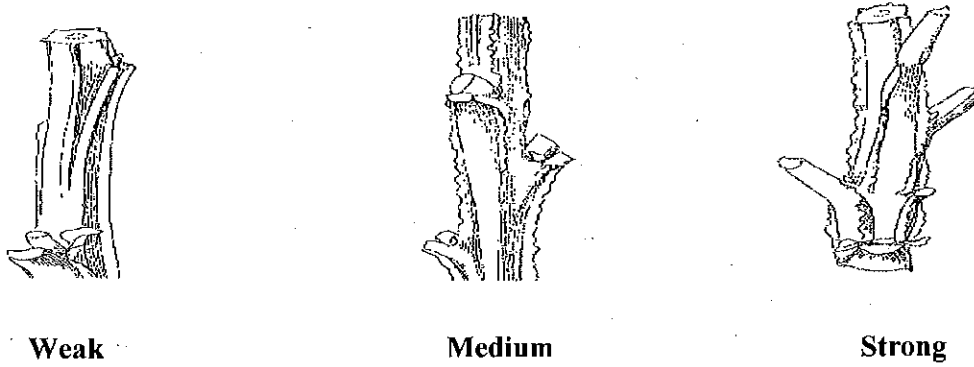


Figure 4: Leaf Silhouette

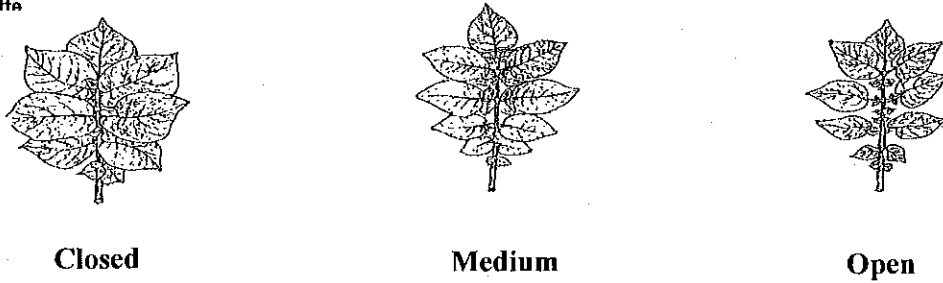


Figure 5: Leaf Stipules

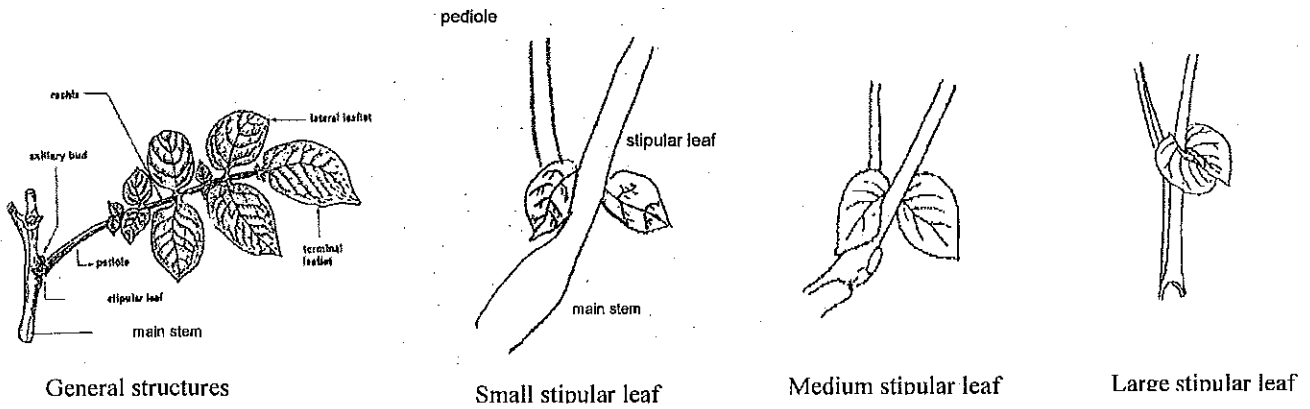


Figure 6: Leaf Dissection

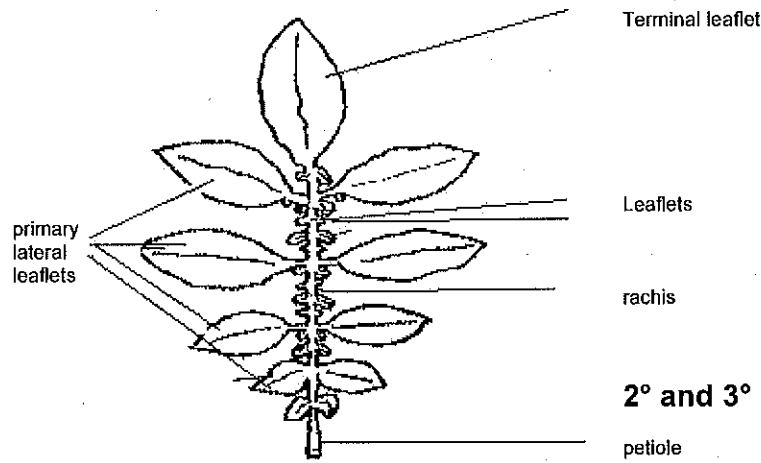


Figure 7: Terminal Leaflet Shape/Primary Leaflet Shape

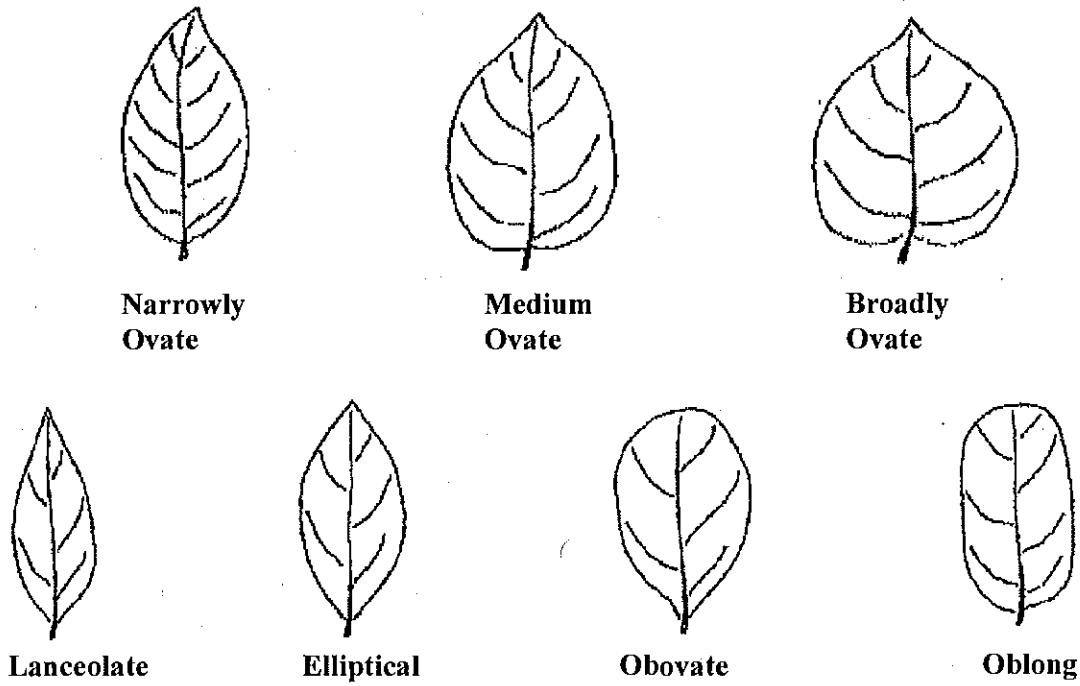


Figure 8: Terminal Leaflet Shape of Tip/Primary Leaflet Shape of Tip

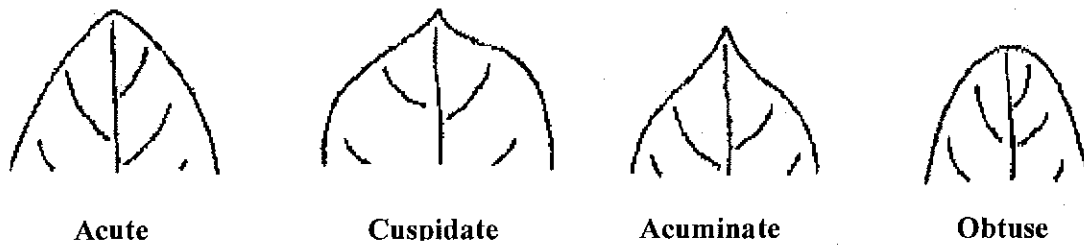


Figure 9: Terminal Leaflet Shape of Base/Primary Leaflet Shape of Base

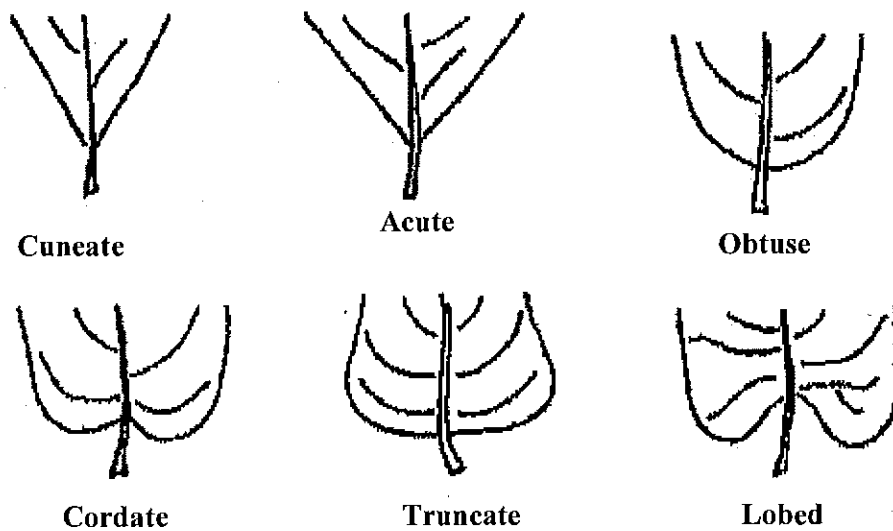


Figure 10: Corolla Shape

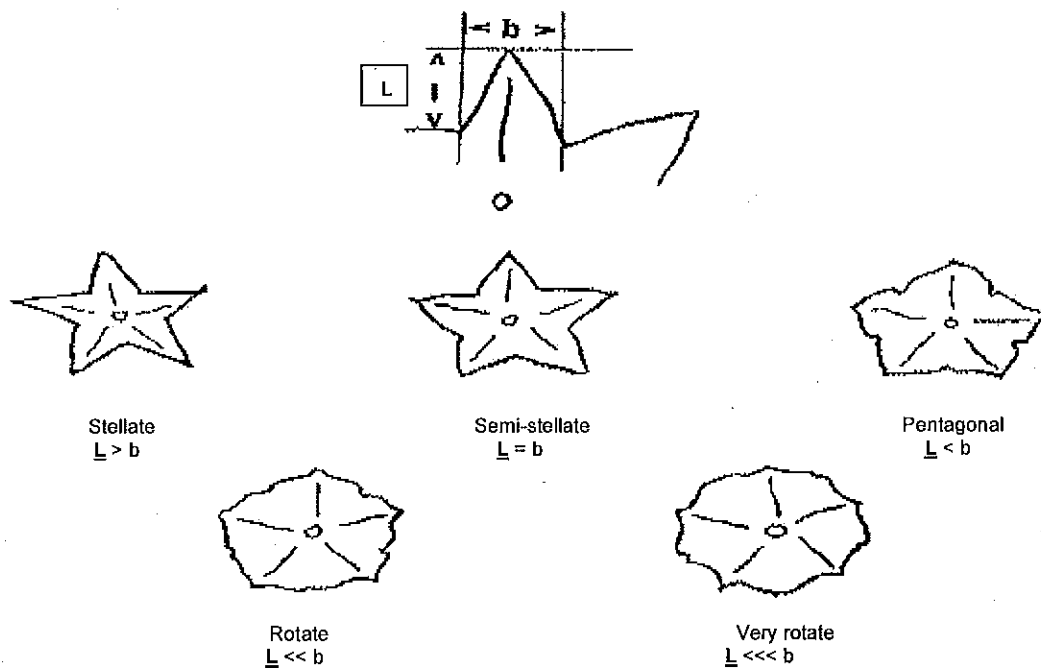


Figure 11: Anther Shape

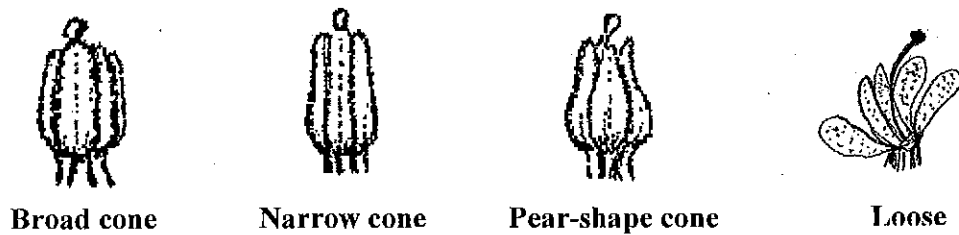


Figure 12: Stigma Shape



Capitate

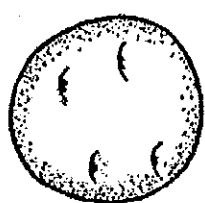


Clavate

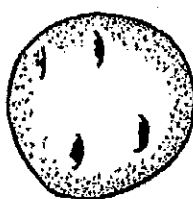


Bi-lobed

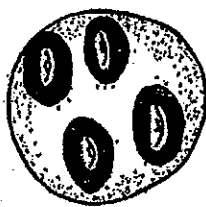
Figure 13: Distribution of Secondary Skin Tuber Color



Eyes



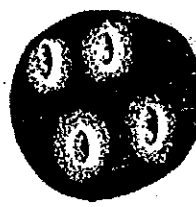
Eyebrows



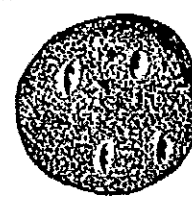
Splashed



Scattered



Spectacled



Stippled

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 D: Additional Description Information

Variety: La Belle Russet

Owner: Idaho Agricultural Experiment Station

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

La Belle Russet is shown to have significantly ($p=0.01$) higher protein content than Russet Burbank, 5.7% protein for La Belle Russet vs. 5.0% protein for Russet Burbank averaged over 4 years, (Table 2).

Four year average percent solids for La Belle Russet (21.71%) were significantly ($p=0.01$) higher than Russet Burbank (20.04%) as well as higher specific gravities (1.087 for La Belle Russet vs. 1.076 for Russet Burbank) as shown in Table 2.

La Belle Russet tubers have higher Vitamin C content than Russet Burbank; 23.26 mg/100g Fresh Weight Basis (FWB) for La Belle Russet vs. 19.37mg/100g FWB for Russet Burbank, averaged over 2 years, (Table 3). Mean total Vitamin contents for individual years were 24.32 mg/100g FWB for La Belle Russet and 21.74 mg/100g FWB for Russet Burbank in 2013, ($p=0.05$) and 22.20 mg/100g FWB for La Belle Russet and 17.03 mg/100g FWB for Russet Burbank in 2010 ($p=0.05$). Table 3.

Using data collected from two trials grown at Aberdeen, Idaho in 2013-2016, La Belle Russet produced significantly ($p=0.01$) lighter French fry color, based on USDA color chart, from tubers stored for approximately 3 months at 40°F (2.9 for La Belle Russet vs. 3.9 for Russet Burbank (Table 4). La Belle Russet also had a lower ($p=0.01$) percentage of sugar ends (12%) than Russet Burbank (42%) as shown in Table 4.

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

Table 1. La Belle Russet and Russet Burbank Comparisons for plant maturity and size using the GLM Procedure for Potatoes grown at Aberdeen, Idaho in 2013-2016.

Anova		Maturity		Size	
Source	DF	F Value	PR > F	F Value	PR > F
Variety	1	12.08	0.0017	17.91	0.0002
Replication	3	0.30	0.8263	0.61	0.6117

Variety		Maturity (1-5^a)	Size (1-5^b)
La Belle Russet	Mean	1.28	1.69
	Minimum	1.0	1.0
	Maximum	2.0	2.5
	Stdev	0.31	0.51
Russet Burbank	Mean	1.84	2.53
	Minimum	1.0	1.5
	Maximum	3.0	3.5
	Stdev	0.54	0.59
Means		1.56	2.11
P>F		0.0017	0.0002
LSD = 0.05		0.332	0.409

^a Plant size rating (1-5) with 1=short and 5=very tall.

^b Plant maturity rating (1-5) with 1=very senesced and dying and 5= very lush and growing.

Table 2. La Belle Russet and Russet Burbank Comparisons for percent protein, solids content and specific gravity using the GLM Procedure for Potatoes grown at Aberdeen, Idaho in 2013-2016.

Anova		Protein		Solids		Gravity	
Source	DF	F Value	PR > F	F Value	PR > F	F Value	PR > F
Variety	1	8.90	0.0060	15.02	0.0006	64.37	<.0001
Replication	3	0.43	0.7304	1.17	0.3410	0.86	0.4759

Variety		Protein	Solids	Gravity
La Belle Russet	Mean	5.66	21.71	1.087
	Minimum	4.79	20.04	1.083
	Maximum	7.00	23.42	1.091
	Stdev	0.68	0.92	0.003
Russet Burbank	Mean	4.96	20.04	1.076
	Minimum	4.18	17.10	1.069
	Maximum	6.20	22.61	1.083
	Stdev	0.60	1.47	0.004

Means	5.31	20.87	1.081
P>F	0.0060	0.0006	<.0001
LSD = 0.05	0.48	0.88	0.003

Table 3. La Belle Russet and Russet Burbank Comparisons for vitamin C content using the GLM Procedure for Potatoes grown at Aberdeen, Idaho in 2013 and 2016.

Anova		2013 Vitamin C (mg/g FWB)		2016 Vitamin C (mg/g FWB)	
Source	DF	F Value	PR > F	F Value	PR > F
Variety	1	87.04	0.0026	13.99	0.0333
Replication	3	2.84	0.2071	1.91	0.3049

Variety		2013 Vitamin C (mg/g FWB)	2016 Vitamin C (mg/g FWB)
La Belle Russet	Mean	24.32	22.20
	Minimum	23.22	20.05
	Maximum	24.76	25.03
	Stdev	0.74	2.54
Russet Burbank	Mean	21.74	17.03
	Minimum	21.46	14.35
	Maximum	21.95	19.33
	Stdev	0.21	2.15
Means		23.03	19.61
P>F		0.0026	0.0333
LSD =0.05		0.87	4.40

Table 4. La Belle Russet and Russet Burbank Comparisons for French fry color stored at 40°F and percent sugar end using the GLM Procedure for Potatoes grown at Aberdeen and Kimberly, Idaho in 2013-2016.

Anova		Fry Color 40°F		Sugar Ends	
Source	DF	F Value	PR > F	F Value	PR > F
Variety	1	16.16	0.0002	0.93	0.0006
Replication	3	0.57	0.6414	14.20	0.4371

Variety		Fry Color 40°F (USDA 00-4.0)	Sugar Ends (%)
La Belle Russet	Mean	2.89	11.68
	Minimum	0.8	0.0
	Maximum	4.0	33.3
	Std. Dev.	0.94	14.99
Russet Burbank	Mean	3.9	41.66
	Minimum	2.7	0.0
	Maximum	4.0	100.0
	Std. Dev.	0.34	34.44
LSD =0.05		0.51	16.15

USDA color chart {00-4.0 (darkest)}. Samples stored at 40° F for approximately 3 months.

Sugar ends were determined when end of fry is >1.0 darker than remaining fry.

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 (UPH₂O) , mix, slowly add 100ml of 85% Phosphoric Acid, bring to 1 liter final volume with UPH₂O. Protect from light. Discard after 2 weeks.
2. 0.5 N Sodium Hydroxide: Dissolve 20g NaOH in about 500ml UPH₂O, 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 UPH₂O. 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 \div mg tissue extracted = $\mu\text{g}/\text{mg}$ (or mg/g)
 -- or total microgram protein \sum μg tissue extracted x 100 = % protein
 --actual protein* = coomassie blue protein estimate using BGG (mg/G) - 5.6

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

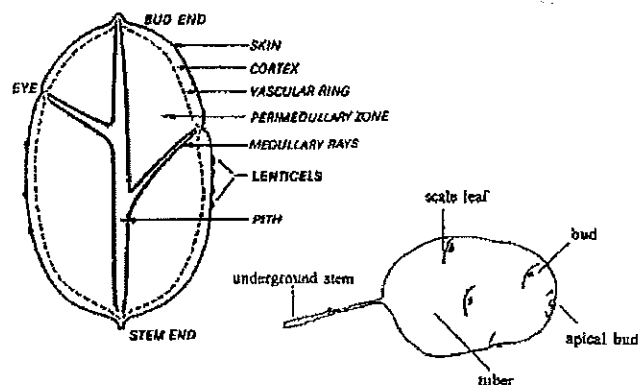
Reference: Bradford N.M. (1975) A rapid and sensitive method for the quantitation of microgram quantities of protein using the principle of protein dye binding. Anal. Biochem. 73:248-254

Solids Standard Operating Procedure

Title: Determination of Solid Content of Freeze-dried Tuber Powder.

Tuber Prep Procedure:

1. Wash Tubers
2. Quarter potatoes length-wise (stem to bud end) reserving one quarter for sample. (Toss remaining $\frac{3}{4}$ unless, of course, the sample is too small. Then use $\frac{1}{2}$ or all.) This method of cutting is to ensure a random sampling of all parts of each potato skin to pith, stem to bud all areas inclusive.
3. Cube potatoes into approximately 1/2" cubes.
 - a. AVOID: All green and rotten areas, bruise, Rizok and scab if possible and any dirt missed in washing.
4. Mix sample well.
5. *Weigh up sample (Fresh Weight) in corresponding numbered Ziploc freezer bag & record exact fresh weight on solids sheet.
 - a. *TARE (zero) scale with bag and large weigh plate
6. For 150 grams and up add 2 scoops of liquid nitrogen. For 100 grams and under add 1 scoop of liquid nitrogen.
 - a. 1 Scoop = approx. 8 oz.



Freeze Dryer Start Up Procedure:

1. Close both the condenser and the product chamber doors.
2. Press "CONDENSER" to begin cooling the condenser. Wait until the condenser reaches -50oC before proceeding.

3. Fill trays with frozen samples, making sure bags are all open, and air can move freely past opening.
4. Insert temperature probes into samples near the middle of each tray and slide trays into position in product chamber.
5. Close product chamber door.
6. Press "VACUUM" to start the vacuum pump.
7. Check both doors to make sure they are sealed and pulling a vacuum.
8. Set Shelf Control on Manual and set Shelf Set Point on 30.
 - a. Red light on M.

During Run:

1. Check temperature of samples daily.
2. Samples are done when probe temperatures are 28-30°C.
 - a. Depending on sample size and fullness of tray
 - b. This will take 2 to 5 days for large tuber samples.
3. Remove from freeze-dryer and weigh for Dry Weight.
 - a. *TARE (zero) scale with bag and large weigh plate.

Standard Operating Procedure

Title: Determination of Specific Gravity

1. A random 8-10 lb sample of dry, 6-12 oz U.S. No. 1 tubers is first weighed in air.
2. After submerging the same tuber sample in water, the tubers are weighed again.
3. From these two measurements, specific gravity is calculated by the following formula:

$$\text{Specific gravity} = \frac{\text{Weight in air}}{\text{Weight in air} - \text{Weight in Water}}$$

For example,

$$\frac{10.0 \text{ lb}}{10.0 \text{ lb} - 0.81 \text{ lb}}$$

$$= 1.081$$

VITAMIN C Standard Operating Procedure

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

Reagents:

4. Extracting solution: Dissolve with shaking 15g. Meta-phosphoric Acid in 200ml Ultra Purified H₂O (UPH₂O) 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.
5. O-Phenylenediamine Solution: For each 100ml solution, weigh 20 mg O-Phenylenediamine-2HCL; Dilute to volume with UPH₂O immediately before use.
6. Sodium Acetate Solution: Dissolve 500g Sodium Acetate Tri-hydrate in UPH₂O and dilute to 1 liter.
7. Boric Acid – Sodium Acetate Solution: Dissolve 3g boric acid in 100ml. Sodium Acetate Solution; Prepare fresh for each assay.
8. Activated Charcoal

Procedure:

8. 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.
9. 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.
10. 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.
11. 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 UPH₂O.
12. 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 UPH₂O, dilute to volume with UPH₂O.

13. 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).
14. 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.

VITAMIN C MSDS

LABORATORY PROTECTIVE EQUIPMENT: NITRILE GLOVES, GOGGLES, LAB COAT

Meta-Phosphoric Acid

HAZARDS IDENTIFICATION

OSHA Hazards: Corrosive

HMIS Classification: Health Hazard: 3 Flammability: 0 Physical hazards: 0

NFPA Rating: Health Hazard: 3 Fire: 0 Reactivity Hazard: 0

Potential Health Effects

INHALATION: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

DERMAL May be harmful if absorbed through skin. Causes skin burns.

EYES: Causes eye burns.

INGESTION: May be harmful if swallowed. Causes burns.

FIRST AID MEASURES

GENERAL ADVICE: Consult a physician. Show this safety data sheet to the doctor in attendance.

Move out of dangerous area.

IF INHALED: If breathed in, move person into fresh air. If not breathing give artificial respiration Consult a physician.

IN CASE OF SKIN CONTACT : Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

IN CASE OF EYE CONTACT: Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

IF SWALLOWED: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Acetic Acid Glacial

HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards: Combustible Liquid, Target Organ Effect, Harmful by skin absorption., Corrosive

Target Organs: Teeth., Kidney

HMIS Classification: Health Hazard: 3 Chronic Health Hazard: * Flammability: 2

Physical hazards: 0

NFPA Rating: Health Hazard: 3 Fire: 2 Reactivity Hazard: 0

Potential Health Effects

INHALATION: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

SKIN: Harmful if absorbed through skin. Causes skin burns.

EYES: Causes eye burns.

INGESTION: May be harmful if swallowed. Causes burns.

FIRST AID MEASURES

GENERAL ADVICE: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

IF INHALED: If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

IN CASE OF SKIN CONTACT: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

IN CASE OF EYE CONTACT: Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

IF SWALLOWED: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

O-Phenylenediamine dihydrochloride

Hazards Identification: Toxic. Dangerous for the environment. Harmful by inhalation and in contact with skin. Toxic if swallowed. Irritating to eyes. Limited evidence of a carcinogenic effect. May cause sensitization by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of irreversible effects.

Possible Carcinogen US). (Target organ(s): Bladder. Liver.

HMIS RATING: HEALTH: 3* FLAMMABILITY: 0 REACTIVITY: 1

NFPA RATING: HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 1

*additional chronic hazards present. For additional information on toxicity, please refer to Section 11.

FIRST AID MEASURES

ORAL EXPOSURE: If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE: If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE: In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE: In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Boric Acid

HAZARDS IDENTIFICATION

OSHA Hazards: Delayed target organ effects Reproductive hazard

Target Organs Testes.

HMIS Classification: Health Hazard: 1 Chronic Health Hazard: * Flammability: 0 Physical hazards: 0
 NFPA Rating: Health Hazard: 0 Fire : 0 Reactivity Hazard: 0

Potential Health Effects

INHALATION: May be harmful if inhaled. May cause respiratory tract irritation.

SKIN: May be harmful if absorbed through skin. May cause skin irritation.

EYES: May cause eye irritation.

INGESTION: May be harmful if swallowed.

FIRST AID MEASURES

General advice: Move out of dangerous area.

IF INHALED: If breathed in, move person into fresh air. If not breathing give artificial respiration

IN CASE OF SKIN CONTACT: Wash off with soap and plenty of water.

IN CASE OF EYE CONTACT: Flush eyes with water as a precaution.

IF SWALLOWED: Never give anything by mouth to an unconscious person. Rinse mouth with water

Sodium Acetate Trihydrate

HAZARDS IDENTIFICATION

OSHA Hazards: No OSHA Hazards

HMIS Classification: Health Hazard: 0 Flammability: 0 Physical hazards: 0

NFPA Rating: Health Hazard: 0 Fire : 0 Reactivity Hazard: 0

Potential Health Effects

INHALATION: May be harmful if inhaled. May cause respiratory tract irritation.

SKIN: May be harmful if absorbed through skin. May cause skin irritation.

EYES: May cause eye irritation.

INGESTION: May be harmful if swallowed.

FIRST AID MEASURES

IF INHALED: If breathed in, move person into fresh air. If not breathing give artificial respiration

IN CASE OF SKIN CONTACT: Wash off with soap and plenty of water.

IN CASE OF EYE CONTACT: Flush eyes with water as a precaution.

IF SWALLOWED: Never give anything by mouth to an unconscious person. Rinse mouth with water.

Protocol for frying russet variety potatoes at the University of Idaho

After harvest, potatoes are graded sized and weighed. A three-tuber sample is used for two temperature regimes. Tubers are gradually cooled to approximately 45-50° F during a 4-6 week period. The samples are then moved to 40° or 45° storage unit, where they remained for 6 weeks.

Tubers are cut stem to bud end using a Shaver Specialty Co Cutter (20608 Earl Street Torrance, CA 90503. Phone (310) 370-6941). Four 3/8" fry strips are cut from the center of each of three tubers. Oil temperature is 375° F and fry time is 3.5 minutes. A creamy liquid frying shortening made from soybean oil is used in frying. (Purchased from the local grocery/bakery). Frying is done in a Hobart commercial fryer.

The presence or absence of sugar end was recorded for each strip. A strip was considered to have a sugar end if a predominant color of number 3 or darker, when compared with

the USDA Color Chart for French Fried Potatoes, was seen on any 2 sides extending $\frac{1}{2}$ inch or more from the end of the fried strip.

Color is rated visually using the USDA fry color chart with a scale of 000-4. A scale modification is made to .01, .03, .05, 1, 2, 3, 4 for calculating averages.

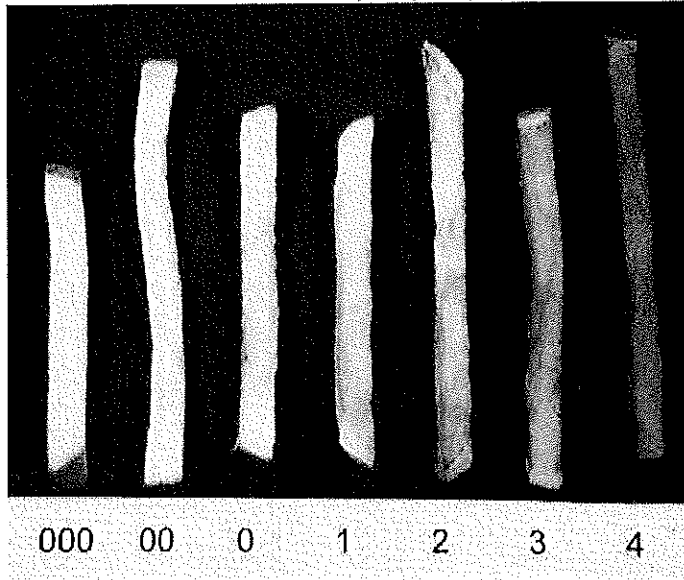
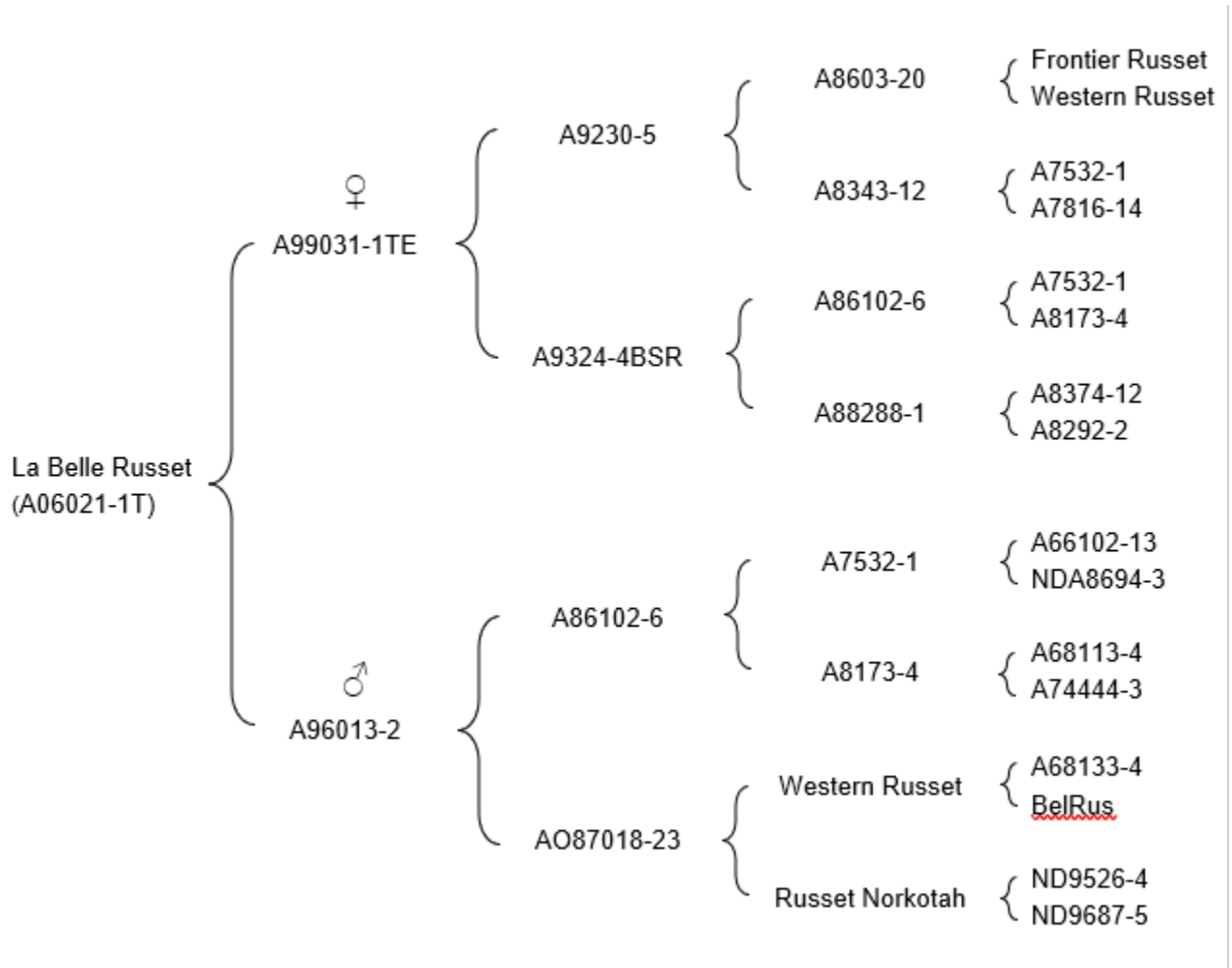


Figure 1. Pedigree for 'La Belle Russet'



U.S. DEPARTMENT OF AGRICULTURE
 AGRICULTURAL MARKETING SERVICE

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).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) The U. S. Government as represented by the Secretary of Agriculture	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER A06021-1T	3. VARIETY NAME La Belle Russet
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) 1400 Independence Ave. SW Washington D.C. 20250	5. TELEPHONE (Include area code) (301) 504-6905	6. FAX (Include area code) (301) 504-5060
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. 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

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

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

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

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 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

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.

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Form Approved OMB NO 0581-0055

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 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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

**EXHIBIT F
DECLARATION REGARDING DEPOSIT**

NAME OF OWNER (S) The four partners of the Northwest Potato Variety Development Program: (i) The U. S. Government as represented by the Secretary of Agriculture; (ii) University of Idaho, (iii) Washington State University, and (iv) Oregon State University.	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) The U. S. Government as represented by the Secretary of Agriculture 1400 Independence Ave. SW Washington D.C. 20250	TEMPORARY OR EXPERIMENTAL DESIGNATION A06021-1T
		VARIETY NAME La Belle Russet
NAME OF OWNER REPRESENTATIVE (S) Mojdeh Bahar	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) Mojdeh Bahar, USDA, ARS, OTT 5601 Sunnyside Ave. Beltsville, MD 20705-5131	FOR OFFICIAL USE ONLY
		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.

Signature

Date