No. 201100297

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

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

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of LAW in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and Whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the LAW.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable basic seed of the variety in a public repository as provided by LAW, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety therefrom, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

POTATO

'AmaRosa'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the* ***City of Washington, D.C.*** *this twenty-fifth day of June, in the year* ***two thousand and fourteen.***

Attest:

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

Form Approved - OMB No. 0581-0055

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

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

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

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

1. NAME OF OWNER

RAD 11/9/12

~~State of Oregon acting by and through the State Board of Higher Education on behalf of OREGON STATE UNIVERSITY representing the interests of Washington State University, the University of Idaho, and the United States of America, as represented by the Secretary of Agriculture~~
The State of Oregon, (continued on Exhibit E, 11)

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
POR01PG22-1

3. VARIETY NAME
AmaRosa

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
Office for Commercialization and Corporate Development
Oregon State University
312 Kerr Administration Building
Corvallis, OR 97331

5. TELEPHONE *(include area code)*
541-737-0674

6. FAX *(include area code)*
541-737-3093

FOR OFFICIAL USE ONLY

PVPO NUMBER
#201100297

FILING DATE
February 25, 2011

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Educational Institution

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

9. DATE OF INCORPORATION

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*

RAD 11/9/12

~~Denis Sather~~
~~Office for Commercialization and Corporate Development~~
~~Oregon State University~~
~~312 Kerr Administration Building~~
~~Corvallis, OR 97331~~

Mr. Berry J. Treat, Licensing Manager
Office for Commercialization & Corporate Development
Oregon State University
A322 Kerr Administration Building
Corvallis, Oregon 97331

FEES RECD
FILING AND EXAMINATION FEES: $ 2482.00
DATE February 25, 2011
CERTIFICATION FEE: $
DATE

RAD 11/9/12

11. TELEPHONE (Include area code)
541-737-8806

12. FAX (Include area code)
~~541-737-3093~~ (541) 737-8100

13. E-MAIL
~~denis.d.sather@oregonstate.edu~~ berry.treat@oregonstate.edu

14. CROP KIND *(Common Name)*
Potato

16. FAMILY NAME *(Botanical)*
Solanceae

15. GENUS AND SPECIES NAME OF CROP
Solanum tuberosum

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

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

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
(Follow instructions on reverse)

a. ☑ Exhibit A. Origin and Breeding History of the Variety
b. ☑ Exhibit B. Statement of Distinctness
c. ☑ Exhibit C. Objective Description of Variety
d. ☑ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☑ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☑ Exhibit F. Declaration Regarding Deposit
g. ☐ Voucher Sample *(3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
h. ☑ Filing and Examination Fee ($4,382), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

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

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

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

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
☐ YES ☑ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☐ YES ☑ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
B. Wall			
NAME *(Please print or type)*		NAME *(Please print or type)*	
BRIAN WALL			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
DIRECTOR	2/18/2011		

#201100297

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: PVPOmail@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).)*

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

Exhibit A: Origin and Breeding History of the Variety

AmaRosa was initially selected by Oregon State University Agriculture Experiment Station Scientists at Madras, Oregon in 2001 from a cross between PA97B23-2 and Red Bulk pollen made in 2000 by Dr. Charles Brown (USDA/ARS, Prosser, WA) (Figure 1).

It was tested as POR01PG22-1 (P= Prosser, WA cross; OR= Oregon selection; PG= pigmented) for 6 years in public and industry trials throughout the western U.S, including the Western Regional Specialty Trials (in CA, CO, ID, OR, TX and WA) in 2006 and 2007. The Oregon State University Potato Breeding & Variety Development Program, managed by Solomon Yilma, and Oregon State University sponsored POR01PG22-1 in all trials and supplied all seed. AmaRosa was released in 2010 by Oregon State University, in cooperation with the USDA/ARS and the universities of Idaho and Washington.

Uniformity & Stability: POR01PG22-1 was observed annually in Oregon Statewide Trials in four locations for six generations including two years in the Western Regional trials. POR01PG22-1 was determined to be genetically uniform and stable from generation to generation with no apparent evidence of variants. The stable and uniform characteristics of the subject variety, discussed elsewhere herein, were observed annually over the time interval from at least 2002 to 2007. Yield, quality and disease reactions were evaluated across locations in replicated trials to establish stability of the variety when compared with control varieties. These observations occurred in Oregon, Idaho, Washington and/or Western Regional Trials. Several distinct characteristics of AmaRosa were recorded including qualitative, quantitative and DNA fingerprinting to establish its uniqueness.

Breeding History:
AmaRosa was selected from a cross between PA97B23-2 (female red skin and pink flesh) and Red Bulk pollen (male); the attached pedigree chart (Figure 1) shows the parental lineage.

Variants:
At this point, no predictable variants have been specifically identified, though it is expected that variants will occur in the future. Most potato varieties eventually produce mutant plants known as “giant hills”, “bolters”, or “bull plants”. It is expected that these plants will be found in AmaRosa at a very low frequency.

Selection Criteria:
Selection in the first three years in the field was mainly visual characteristics such as tuber appearance, shape, size, tuber eyes, smooth skin, pigmented tuber skin and flesh (smooth red skin and red flesh) and small uniform tubers. Subsequent trials were replicated across locations.

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All yield and yield components, quality, disease reaction, & chemical characteristics were used as selection criteria.

Breeding Method:
A traditional breeding process was used. Female and male parents were crossed. Fruits (berries, 3-5) were produced. Each berry contained between 50-100 seeds (True Potato Seed or TPS). Seeds (150-500) were planted in the greenhouse to generate minitubers. Greenhouse-produced minitubers were planted in the field. AmaRosa was line selected from these plantings.

Exhibit A: Origin and Breeding History of the Variety (continued)

Difference from Original Material:
AmaRosa is different from its parents and siblings in tuber appearance (shallower eyes; fingerling vs. oblong and various shapes in parents and siblings, respectively), skin and flesh color.

Variety Name:
As a permanent potato variety name, AmaRosa is unique to this variety as shown in the Potato Association of America "North American Potato Variety Inventory" (http://www.umaine.edu/PAA/PVI.htm)

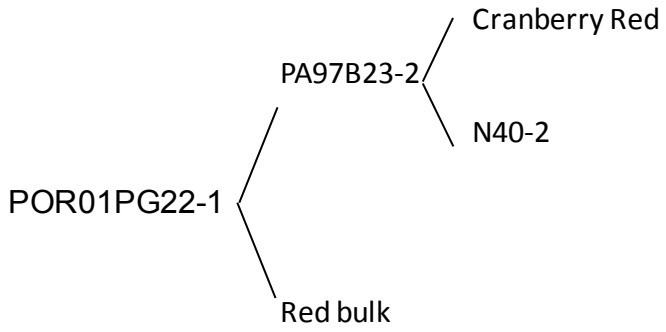

Figure 1. Pedigree of POR01PG22-1 resulted from the hybridization between PA97B23-2 (female) and a bulk of red pollen (male).

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Exhibit B Form

Based on overall morphology, AmaRosa is most similar to Red LaSoda_and Dark Red Norland
Applicant's new variety *Most similar comparison variety(ies)*

AmaRosa most clearly differs from Red LaSoda and Dark Red Norland in the following traits:
Applicant's new variety *Most similar comparison variety(ies)*

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

Eg. Leaf Pubescence	***heavy pubescence***	***glabrous***		***photograph attached***
Eg. Leaf Color	***Dark Green (5GY 3/4)***	***Light Green (2.5GY 8/10)***		***Munsell Color Chart***
Eg. Plant Height	***200 cm +/- 10 cm (N=25)***	***250 cm +/- 15 cm (N=25)***		***statistics attached***
1. Qualitative traits:	Applicant's New Variety	1st Comparison Variety	1st Comparison Variety	Location of Evidence
	AmaRosa	Red LaSoda	Dark Red Norland	
Tuber Shape	Fingerling	Oval	Oval	Exhibit B1 and Exhibit B3
Light sprout general shape	Ovoid	Ovoid	Broad Cyliderical	Exhibit B2
Light sprout tip	Light sprout has intermediate tip habit	Light sprout has closed tip habit	Light sprout has open tip habit	Exhibit B2
Tuber Eye Depth	Shallow eye	Deep eye	Intermediate eye depth	Exhibit B3
2. Color traits:				
Tuber Skin color	Purplish-red (59B, RHSCC)	Pink (58D, RHSCC)	Red (58B, RHSCC)	Exhibit B3
Tuber Flesh color	Purplish-red (60B, RHSCC)	White (155B, RHSCC)	White (155C, RHSCC)	Exhibit B3
Flower Color	Inner surface of the Corolla is purple (77B, RHSCC)	Inner surface of the Corolla is purple-violet (82D, RHSCC)	Inner surface of the Corolla is purple (76B, RHSCC)	Exhibit B4
3. Quantitative traits:				
Tuber grade and yield	AmaRosa produces lower yield of US#1 grade (49 CWT)	RedLaSoda Produces higher yield of US#1 grade (427 CWT/A)	RedLaSoda Produces higher yield of US#1 grade (380 CWT/A)	Exhibit B5
Tuber grade and yield	AmaRosa produces higher yield of size grade less than 4oz (215 CWT/A)	Red LaSoda produces higher yield of size grade less than 4oz (48 CWT/A)	Dark red Norland produces higher yield of size grade less than 4oz (58 CWT/A)	Exhibit B5
Late Blight Resistant	Amarosa is relatively resistant to late blight tuber damage	Red LaSoda is susceptible to late blight tuber damage	Red LaSoda is susceptible to late blight tuber damage	Exhibit B6
Potato Virus Y (PVY)	Moderately susceptible to PVY (63%)	Susceptible to PVY (90%)	Susceptible to PVY (90%)	Exhibit B7
Common Scab	Resistant to common scab (4.8)	Susceptible to common scab (4.1)	Susceptible to common scab (3.6)	Exhibit B7
DNA Finger Printing	AmaRosa has five unique alleles	Don't have the five unique alleles	Don't have the five unique alleles	Exhibit B10
4. Other:				
Culinary Quality	AmaRosa high sensory mark for chips when compared with Yukon Gold potato variety	Not applicable	Not applicable	Exhibit B 8
Tuber Biochemical Compostion	AmaRosa had significantely higher total anthocyanin than All Blue potato variety	Not applicable	Not applicable	Exhibit B 9
Tuber Biochemical Compostion	AmaRosa had significantely higher hydrophilic oxygen radical absorption capacity (H-ORAC) than All Blue potato variety	Not applicable	Not applicable	Exhibit B 9

Exhibit B 3: Tuber Characteristics

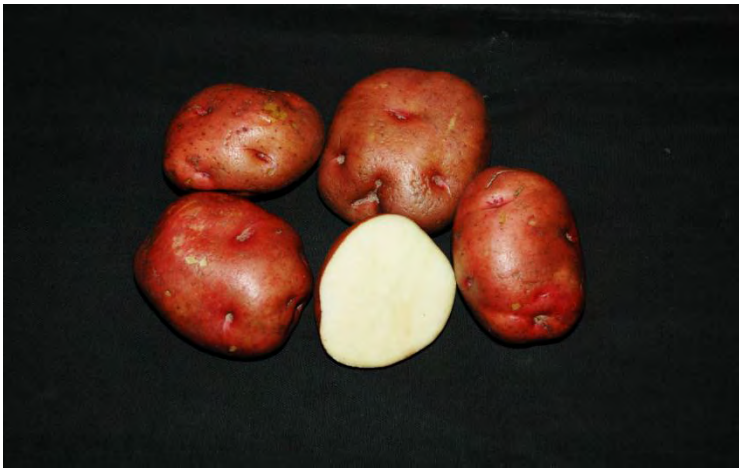
AmaRosa: Skin and Flesh Color , Shape

•General shape is fingerling

• Skin Color purplish-red (59B Royal Horticulture Society Color Chart) .

• Flesh Color purplish-red (60B Royal Horticulture Society Color Chart) .

• Shallow eye depth.



Red LaSoda: Skin and Flesh Color, Shape

• General shape is oval.

• Skin color pink (58D Royal Horticulture Society Color Chart) .

• Flesh Color white (155B Royal Horticulture Society Color Chart) .

• Deep eye depth.

Dark Red Norland: Skin and Flesh Color, Shape

• General shape is oval.

• Skin color red (58B Royal Horticulture Society Color Chart) .

• Flesh Color white (155C Royal Horticulture Society Color Chart) .

• Intermediate eye depth

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Exhibit B 4: Flower Color

AmaRosa Flowers

Inner surface of the Corolla is Purple (RHSCC77B)

Red LaSoda Flowers

Inner surface of the Corolla is Purple-violet (RHSCC82D)

Dark Red Norland Flowers

Inner surface of the Corolla is Purple (RHSCC76B)

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.

RAD
11/9/2012

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
The State of Oregon, (continued on Exhibit E, 11)	POR01PG22-1	AmaRosa

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

Office for Commercialization and Corporate Development
Oregon State University
312 Kerr Administration Building
Corvallis, OR 97331

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PVPO NUMBER

#201100297

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)
AmaRosa	Red LaSoda	Dark Red Norland		

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 Red Skin Tablestock

V	R1	R2	R3	R4
6	6	6		

2. LIGHT SPROUT CHARACTERISTICS: (See Figure 1)

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

V	R1	R2	R3	R4
2	2	4		

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

V	R1	R2	R3	R4
3	3	3		

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

V	R1	R2	R3	R4
3	2	2		

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

V	R1	R2	R3	R4
5	4	3		

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

V	R1	R2	R3	R4
2	2	3		

2. LIGHT SPROUT CHARACTERISTICS: (continued)

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

V	R1	R2	R3	R4
3	2	5		

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

V	R1	R2	R3	R4
1	2	1		

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

V	R1	R2	R3	R4
2	4	1		

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

V	R1	R2	R3	R4
3	3	2		

3. PLANT CHARACTERISTICS:

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

V	R1	R2	R3	R4
5	3	5		

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

V	R1	R2	R3	R4
2	2	2		

MATURITY: Days after planting (DAP) at vine senescence

V	R1	R2	R3	R4
120	115	110		

PLANTING DATE:

V	R1	R2	R3	R4
5/22	5/22	5/22		

***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	R1	R2	R3	R4
1	11/14/1976	1		

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	R1	R2	R3	R4
3	3	2		

4. **STEM CHARACTERISTICS**: Measure at early first bloom

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

V	R1	R2	R3	R4
7	3	3		

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

V	R1	R2	R3	R4
5	3	3		

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	R1	R2	R3	R4
4	3	3		

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	R1	R2	R3	R4
138A	137B	139A		

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

V	R1	R2	R3	R4
2	3	2		

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

V	R1	R2	R3	R4
2	3	2		

(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	R1	R2	R3	R4
5	5	5		

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

V	R1	R2	R3	R4
7	3	3		

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

V	R1	R2	R3	R4
5	5	5		

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	R1	R2	R3	R4
1	3	2		

5. LEAF CHARACTERISTICS: (continued)

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

V	R1	R2	R3	R4
3	2	3		

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

V	R1	R2	R3	R4
2	4	4		

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

V	R1	R2	R3	R4
2	1	2		

NUMBER OF PRIMARY LEAFLET PAIRS: (See Figure 6)

AVERAGE:

V	R1	R2	R3	R4
3.7	5.8	6.0		

RANGE:

V	R1	R2	R3	R4
3 to 4	5 to 6	5 to 6	to	to

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

V	R1	R2	R3	R4
3	2	2		

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

V	R1	R2	R3	R4
3	4	4		

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	R1	R2	R3	R4
1	2	2		

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

V	R1	R2	R3	R4
4	4	4		

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

AVERAGE:

V	R1	R2	R3	R4
6.0	8.0	10.0		

RANGE:

V	R1	R2	R3	R4
(541) 737-	7 to 13	8 to 13	to	to

5. **LEAF CHARACTERISTICS**: (continued)

NUMBER OF INFLORESCENCE/PLANT:

AVERAGE:

V	R1	R2	R3	R4
9.1	3.3	3.6		

RANGE:

V	R1	R2	R3	R4
6 to 10	3 to 4	3 to 5	to	to

NUMBER OF FLORETS/INFLORESCENCE:

AVERAGE:

V	R1	R2	R3	R4
8.5	17.7	20.5		

RANGE:

V	R1	R2	R3	R4
7 to 11	11 to 27	14 to 29	to	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	R1	R2	R3	R4
77B	82D	76B		

* **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	R1	R2	R3	R4
77C	82D	76B		

* **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	R1	R2	R3	R4
9	11	9		

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

V	R1	R2	R3	R4
4	3	4		

6. **INFLORESCENCE CHARACTERISTICS**:

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

V	R1	R2	R3	R4
7	5	3		

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	R1	R2	R3	R4
15A	14A	17B		

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

V	R1	R2	R3	R4
3	3	1		

6. **INFLORESCENCE CHARACTERISTICS**: (continued)

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

V	R1	R2	R3	R4
5	3	5		

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

V	R1	R2	R3	R4
1	1	1		

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

V	R1	R2	R3	R4
138A	137C	138A		

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

V	R1	R2	R3	R4
5	3	3		

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	R1	R2	R3	R4
9	7	8		

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

V	R1	R2	R3	R4
59A	58D	58B		

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

V	R1	R2	R3	R4
1	1	1		

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	R1	R2	R3	R4
1	1	1		

7. TUBER CHARACTERISTICS: (continued)

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

V	6	R1	3	R2	3	R3		R4	

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

V	3	R1	3	R2	3	R3		R4	

TUBER LENGTH (mm):

AVERAGE:

V	162	R1	85	R2	84	R3		R4	

RANGE:

V	119 to 216	R1	57 to 108	R2	64 to 108	R3	to	R4	to

STANDARD DEVIATION:

V	27.8	R1	15.5	R2	12.4	R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	5000	R1	5000	R2	5000	R3		R4	

TUBER WIDTH (mm)

AVERAGE:

V	62	R1	72	R2	71	R3		R4	

RANGE:

V	38 to 76	R1	51 to 92	R2	54 to 89	R3	to	R4	to

STANDARD DEVIATION:

V	10.2	R1	10.8	R2	9.0	R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	5000	R1	5000	R2	5000	R3		R4	

7. TUBER CHARACTERISTICS: (continued)

TUBER THICKNESS (mm):

AVERAGE:

V	49	R1	58	R2	56	R3		R4	

RANGE:

V	to	R1	to	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	8.2	R1	7.6	R2	4.9	R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN (g):

V	5000	R1	5000	R2	5000	R3		R4	

TUBER EYE DEPTH:

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

V	3	R1	9	R2	7	R3		R4	

TUBER LATERAL EYES:

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

V	3	R1	7	R2	5	R3		R4	

NUMBER EYE/TUBER:

AVERAGE:

V	11	R1	13	R2	14	R3		R4	

RANGE:

V	5 to 19	R1	8 to 19	R2	10 to 18	R3	to	R4	to

DISTRIBUTION OF TUBER EYES:

1 = Predominantly apical 2 = Evenly distributed

V	2	R1	2	R2	2	R3		R4	

PROMINENCE OF TUBER EYEBROWS:

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

V	2	R1	3	R2	2	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	9	R1	1	R2	1	R3		R4	

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

V	60B	R1	155B	R2	155C	R3		R4	

SECONDARY TUBER FLESH COLOR:

1 = Absent 2 = Present, please describe: _____

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

8. DISEASES CHARACTERISTICS:

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

LATE BLIGHT: (Phytophthora)

V	R1	R2	R3	R4
7	7	7		

EARLY BLIGHT: (Alternaria)

V	R1	R2	R3	R4
7	7	7		

SOFT ROT (Erwinia)

V	R1	R2	R3	R4
7	7	7		

COMMON SCAB (Streptomyces)

V	R1	R2	R3	R4
2	7	7		

POWDERY SCAB (Spongospora)

V	R1	R2	R3	R4
7	7	7		

DRY ROT (Fusarium)

V	R1	R2	R3	R4
7	7	7		

POTATO LEAF ROLL VIRUS (PLRV)

V	R1	R2	R3	R4
7	7	7		

8. DISEASES CHARACTERISTICS: (continued)

POTATO VIRUS X (PVX)

V	R1	R2	R3	R4
7	7	7		

POTATO VIRUS Y (PVY)

V	R1	R2	R3	R4
4	7	7		

POTATO VIRUS M (PVM)

V	R1	R2	R3	R4
0	0	0		

POTATO VIRUS A (PVA)

V	R1	R2	R3	R4
0	0	0		

GOLDEN NEMATODE (Globodera)

V	R1	R2	R3	R4
0				

ROOT – KNOT NEMATODE (Meloidogyne)

V	R1	R2	R3	R4
0				

OTHER DISEASE _____

V	R1	R2	R3	R4
0				

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
0				

9. PESTS CHARACTERISTICS:

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

COLORADO POTATO BEETLE (CPB) (*Leptinotarsa*)

V	R1	R2	R3	R4
7	7	7		

GREEN PEACH APHID (*Myzus*)

V	R1	R2	R3	R4
7	7	7		

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	R1	3	R2	2	R3		R4	

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

V	4	R1	3	R2	2	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.

AmaRosa had high sensory mark for chips when compared with Red LaSoda and Dark red Norland (Exhibit B 8

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.

AmaRosa had significantly higher total antioxidant than All Blue potato variety (Exhibit 9)

13. FINGER PRINTING MARKERS:

ISOZYMES 1 = YES (2) = NO [■]

IF YES, attach information

14. DNA PROFILE: 1 = YES 2 = NO [1]

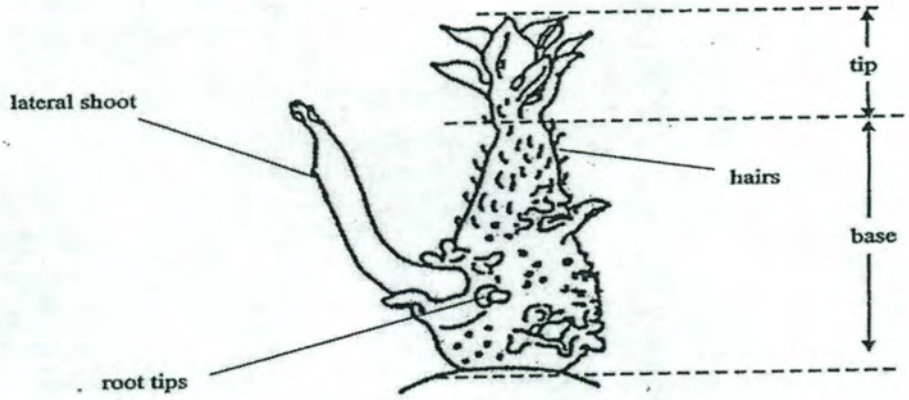
IF YES, attach information

15. ADDDITIONAL COMMENTS AND CHARACTERISTICS:

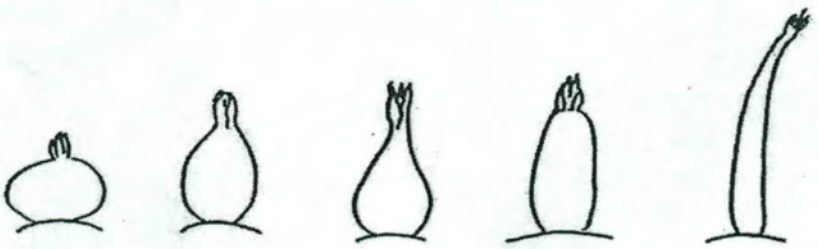
Include any additional descriptors that would be useful in distringuishing the candidate variety.

Figure 1: Light sprout

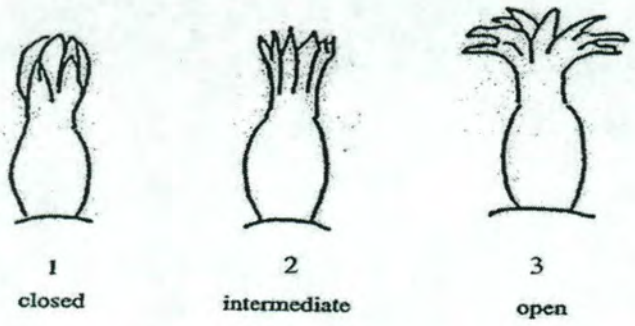
Light sprout dissection



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

Erect | Semi Erect | Spreading

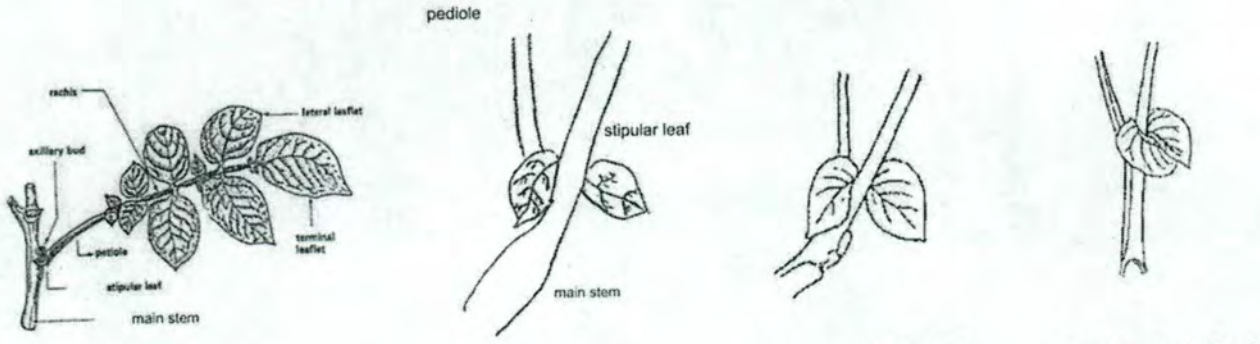
Figure 3: Stem Wings

Weak | Medium | Strong

Figure 4: Leaf Silhouette

Closed | Medium | Open

Figure 5: Leaf Stipules



General structures | Small stipular leaf | Medium stipular leaf | Large stipular leaf

Figure 6: Leaf Dissection

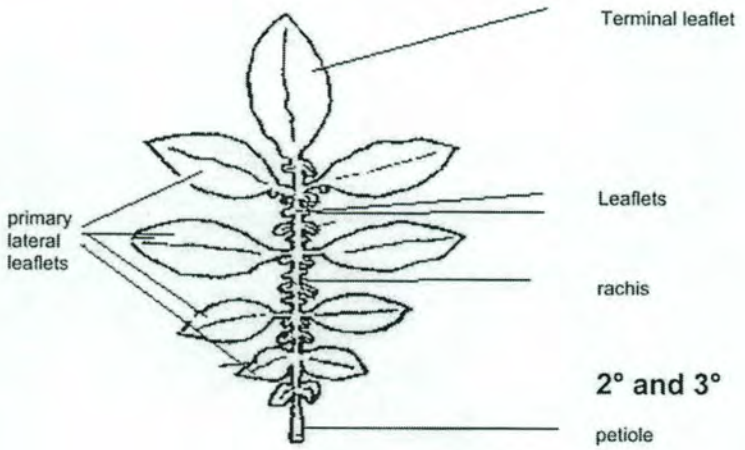


Figure 7: Terminal Leaflet Shape/Primary Leaflet Shape

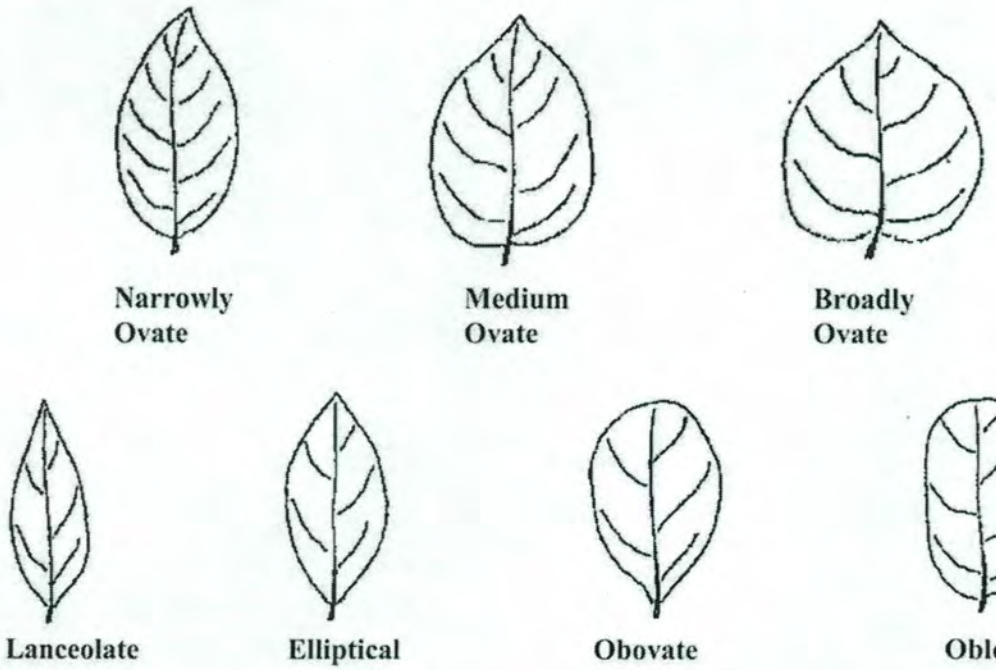


Figure 8: Terminal Leaflet Shape of Tip/Primary Leaflet Shape of Tip

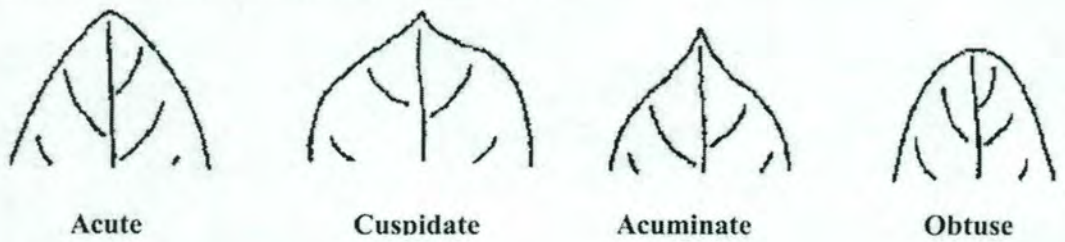


Figure 9: Terminal Leaflet Shape of Base/Primary Leafelet Shape of Base

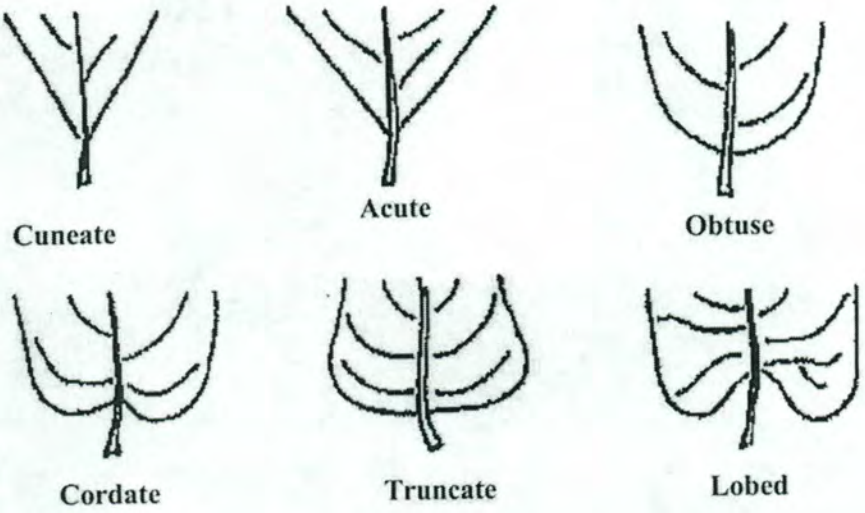


Figure 10: Corolla Shape

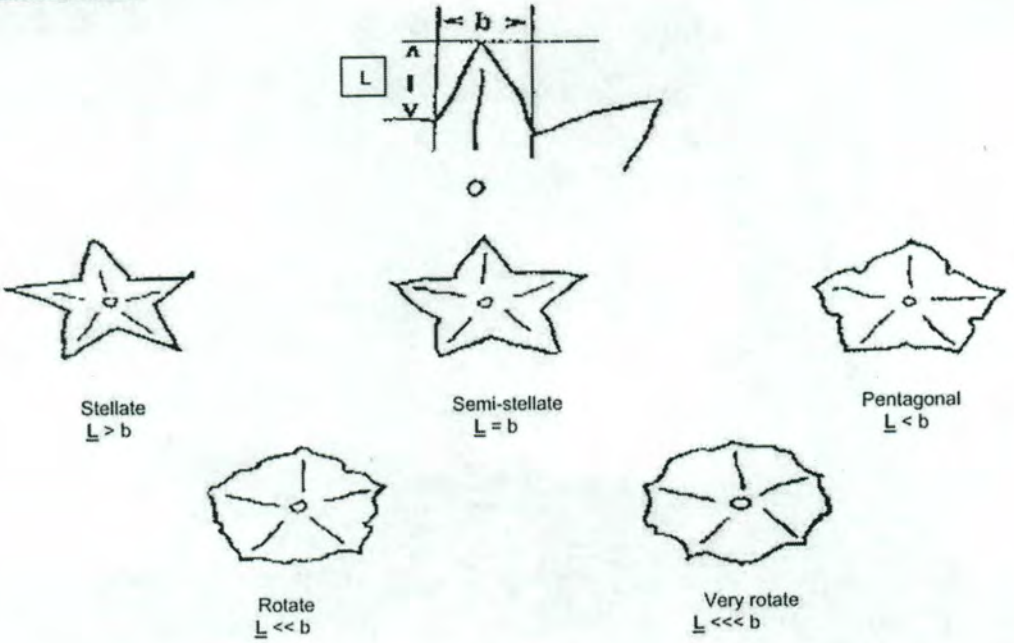


Figure 11: Anther Shape

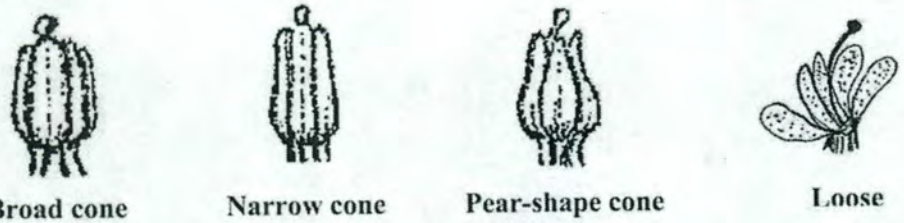
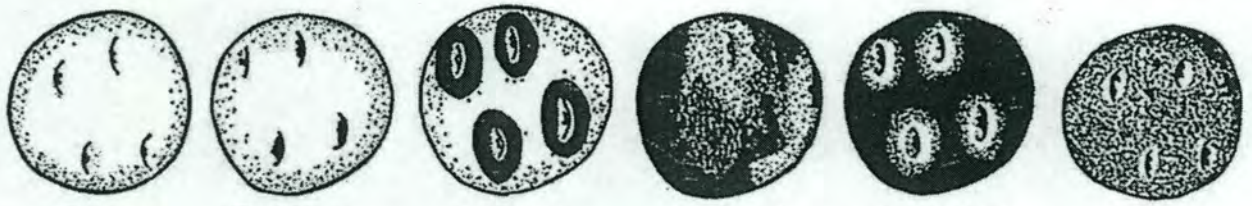


Figure 12: Stigma Shape

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 B 1 : Tuber Length and Width Ratio

AmaRosa (POR01PG22-1) tubers are longer than Red LaSoda and Dark red Norland tubers (Table 1). Twenty tubers were selected from each replication and the tuber length and width were measured to calculate the ratio. Field planting & harvesting procedures were followed as described in exhibit B 5.

Table 1: Tubers Length and Width Ratio for AmaRosa, Dark Red Norland and Red LaSoda (Corvallis, 2006 & 2007)

Year	Variety	Length: Width Ratio
2006	AmaRosa	2.49
2006	Dark red Norland	1.15
2006	Red LaSoda	1.07
	Mean	1.57
	LSD (0.05)	0.12
2007	AmaRosa	2.56
2007	Dark red Norland	1.16
2007	Red LaSoda	1.04
	Mean	1.58
	LSD (0.05)	0.32

#201100297

Exhibit B2: Tuber Sprouts

AmaRosa Light Sprouts

- Light sprout general shape is ovoid.
- Light sprout has weak pubescence of tip of the base.
- Light sprout base has strong intensity of coloration.
- Light sprout has intermediate tip habit.

Red LaSoda Light Sprouts

- Light sprout general shape is ovoid.
- Light sprout has strong pubescence of tip of the base.
- Light sprout base has medium intensity of coloration.
- Light sprout has closed tip habit.

Dark Red Norland Light Sprouts

- Light sprout general shape is broad cylindrical.
- Light sprout has medium pubescence of tip of the base.
- light sprout base has strong intensity of coloration.
- Light sprout has open tip habit.

Exhibit B 5: Tuber Grade and Yield

AmaRosa (POR01PG22-1) produces smaller tubers than Red LaSoda and Dark Red Norland (Table 1-3). Yield of US#1 is significantly lower than the control varieties. The yield of AmaRosa (POR01PG22-1) tubers under 4 oz is significantly higher than Red LaSoda and Dark Red Norland (Table 1- 3). Average tuber weights of POR01PG22-1 are significantly lower than the controls. In Corvallis, Oregon two years trials in 2006 & 2007 were conducted to compare AmaRosa with Dark red Norland and Red LaSoda. The trials were planted in May 22 & 23 in randomized complete block design with four replications. Plots were 25 feet long single rows. Seed pieces were spaced approximately 9 inches apart within rows. The space between rows was 34 inches. Plantings were amended with 500 lbs/acre of 15-15-15, N, P, K; respectively broadcasted and incorporated before planting followed by an additional 500 lbs banded at planting. Weeds were controlled with Matrix (Rimsulfuron, 0.016lb ai/A) and Prowl (Pendimethalin, 1 lb ai/A) post emergence. Insects were controlled satisfactorily with Platinum insecticide during planting, Provado 1.6F - 0.05 lb according to label directions. Disease control was achieved by using Bravo, Curzate, Dithane, Quadris as labeled. Irrigation water was applied, as needed using solid-set sprinklers. Vines were sprayed with Rely on September 10th and harvested on September 25th and 26th. Yield, grade, specific gravity, internal and external defects were evaluated after harvesting (Table 1 & 2). Similar trials were conducted in 18 Western Regional Specialty Trials conducted in California, Idaho, Oregon, Texas and Washington (2006 and 2007) (Table 3)

Table 1. Yield, Grade, Size Distribution, and Specific Gravities at Corvallis, 2006

Entry	Total CWT/A	U.S. No. 1 (Cwt/A)				Yield (Cwt/A)		U.S. #1 %	Tuber wt. Oz[1]/	Sp. Gravity[2]
		Total	4-6 oz	6-10 oz	>10 oz	<4 oz	2's + Culls			
Dk Red Norland	356	294	51	131	111	7	55	82	6.35	1.066
Red LaSoda	578	464	54	168	242	8	106	80	8.01	1.080
POR01PG22-1	346	12	2	10	0	201	132	4	2.70	1.077
Mean	426	257	36	103	118	72	98	55	5.68	1.075
CV (%)	17	25	50	27	38	11	30	10	11.62	0.465
LSD (0.05)	125	110	31	48	78	14	50	10	1.14	0.009

[1] Total weight per plot/total number of tubers per plot
[2] Air/water method

Table 2. Yield, Grade, Size Distribution, and Specific Gravities at Corvallis, 2007

Entry	Total Cwt/A	U.S. No. 1 (Cwt/A)				Yield (Cwt/A)		U.S. #1 %	Tuber wt. Oz[1]/	Sp. Gravity[2]
		Total	4-6 oz	6-10 oz	>10 oz	<4 oz	2's + Culls			
Dk Red Norland	666	486	127	142	217	59	121	73	7.55	1.075
Red LaSoda	564	349	19	164	167	46	169	62	8.62	1.116
POR01PG22-1	508	106	22	64	19	238	164	22	4.58	1.077
Mean	579	314	56	123	134	114	151	52	6.92	1.089
CV (%)	11	16	85	26	38	39	30	16	10.16	2.893
LSD (0.05)	113	84	82	55	89	77	NS	14	1.22	NS

[1] Total weight per plot/total number of tubers per plot
[2] Air/water method, NS= Not Significant

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Table 3. Yield and specific gravity of POR01PG22-1, Red LaSoda and Dark Red Norland summarized from 18 Western Regional Specialty Trials conducted in California, Idaho, Oregon, Texas and Washington (2006 and 2007).

Variety	Total yield	U.S. #1 yield[1]	U.S.#1	< 4 oz	Specific Gravity[2]
	cwt/A	cwt/A	%	cwt/A	g cm^{-3}
POR01PG22-1	239	49	18	215	1.072
Red Lasoda	523	427	82	48	1.073
Dark Red Norland	459	380	82	58	1.067
LSD (0.05)	68	65	11	65	NS

[1] Greater than 4 oz.
[2] Specific gravity was determined using the weight-in-air, weight-in-water method.

Exhibit B 6: Late Blight Reaction

AmaRosa is relatively resistant to late blight tuber damages when compared with Dark red Norland and Red LaSoda. AmaRosa is also moderately susceptible to foliage damage due to late blight infection as compared with Dark red Norland and Red LaSoda (Table 1). Summary of three years evaluations in Corvallis also confirmed that AmaRosa has tuber blight resistant when compared with the controls (Table 2).

Field Screening Procedures for Late Blight

The Willamette valley has favorable climate for late blight screening in both foliage & tubers. In Corvallis every year more than 300 potato cultivars are screened for late blight in collaboration with Tri-State Potato Breeding Programs and from other breeding programs in Colorado, Texas, Wisconsin, Michigan, California and Maryland in replicated and non-replicated trials. Similar procedures were used in 2006 & 2007.

- The clones were planted on June 15 in 2006 & 2007 at the Lewis Brown experiment station Corvallis, Oregon.
- A randomized complete block design in four replications was used. Twenty cut tubers were planted in standard spacing. Spacing between plots were 10 feet.
- Spreader rows of Russet Burbank were planted in alternate rows and were inoculated on with US-8 strain of late blight.
- Late Blight infection rate was recorded on a 9-point scale three times. The Area Under the Disease Progress Curve (AUDPC) was calculated using the midpoint rule method (Campbell and Madden, 1990) using the following formula:

$$\text{AUDPC} = \sum_{i=1}^{n-1}\left[(t_{i+1} - t_i)(y_i + y_{i+1})/2\right]$$

Where "t" is time in days of each reading, "y" is the percentage of affected foliage at each reading and "n" is the number of readings.

- Tubers were harvested on October 28 & 29. Ten tubers from each plot were stored under shade covered with tarps to promote blight progress. Tubers were cut & evaluated for infection on November 8-11.

All replicated trials were analyzed using the PROC GLM procedure and means were separated by Fisher's protected LSD test (SAS, 2002-2003).

Table 1: Results of Late Blight Foliage & Tuber Damage (2006 & 2007)

Year	Variety	Foliage Damage (1-9) scale[1]	AUDPC[3]	Tuber [2]Damage %
2006	AmaRosa	8.0	1121.7	5.0
2006	Dark red Norland	9.0	1279.1	25.0
2006	Red LaSoda	8.8	1240.6	32.5
	Mean	8.6	1213.8	20.8
	LSD (0.05)	0.5	NS	NS
2007	AmaRosa	9.0	1571.9	2.5
2007	Dark red Norland	9.0	1600.0	57.5
2007	Red LaSoda	9.0	1590.63	79.7
	Mean	9.0	1587.5	46.6
	LSD (0.05)	NS	24.2	15.3

[1]Ratings are averages for 4 reps: 1 = no foliar injury; 2 = 1-5% injury; 3 = 5-10% injury; 4 = 10-20%; 5 = 25-40%; 6 = 40-60%; 7 = 60-75%; 8 = 75-90%; 9 = 90- 100% injury.
[2] Percent of late blight infected tubers at harvest based on 10 randomly selected tubers per replication.
[3] AUDPC= Area Under the Disease Progress Curve
NS= Not Significant

Table 2. Summary of Late Blight Evaluation for POR01PG22-1, Red LaSoda and Dark Red Norland, Corvallis, OR, 2006-2008.

Entry	Foliage Infection[1] (1-9)	AUDPC[2]	Tuber Infection[3] %
POR01PG22-1	8.25	1210.78	2.50
Dark Red Norland	9.00	1403.75	27.50
Red LaSoda	8.75	1356.46	37.41
LSD (0.05)	0.26	136.98	11.22

[1] Scale used was 1-9, highest number being most severe.
[2] AUDPC= Area Under Disease Progress Curve.
[3] Percent of late blight infected tubers at harvest (40 randomly selected tubers, 10 per replication, 4 replications).

Exhibit B 7: Common Scab, Potato Virus Y (PVY) and Potato Leaf Roll Virus (PLRV)

POR01PG22-1 was resistant to common scab (Table 1). The common scab evaluations were made in highly infested soil in Tulelake, California. Tubers were scored from 1 to 5 where five is no scab. POR01PG22-1 showed moderate susceptibility to PVY and very high susceptibility to PLRV under field condition (Table 1). Virus evaluations were made at Hermiston, Oregon. Field planting & harvesting were similar as described in exhibit 5 but no insecticide was sprayed. The Hermiston area is known for high aphid populations to screen for viruses under natural conditions. Tubers were sampled & tested for PVY and PLRV by using standard ELISA methods.

Table 1. Disease ratings for POR01PG22-1, Red LaSoda and Dark Red Norland.

Disease Reaction	POR01PG22-1	Red LaSoda	Dark Red Norland
Common scab[1]	4.8	4.1	3.6
PVY[2] (%)	63	90	88
PLRV foliar infection[2] %)	48	50	55

[1] Evaluations made at California in 2007. Common scab rating 1-5 with 1 = high incidence of infection and 5 = none. LSD (0.05) = 0.3

[2] Evaluations made at Hermiston, Oregon. Virus readings are from evaluation of plants grown under high virus pressure, 2006 and 2007. LSD (0.05) for PVY = 9.8; NS for PLRV.

Exhibit B 8: Culinary Quality

A sensory evaluation test performed in 2006 (11 participants) gave high ratings to chips made from POR01PG22-1 indicating potential for the chipping snack sector (Appendix, Table X). Chips made from POR01PG22-1 tubers retain their red color (Figure 1). Steamed potatoes made from POR01PG22-1 were also good (Appendix, Table Y). A much larger consumer test (112 participants) performed at the Food Innovation Center, Portland, OR using boiled potatoes also ranked POR01PG22-1 high (Table 1).

Table 1. Potato sensory attributes evaluated on boiled potatoes by a panel of consumers (n = 112). Tests were performed at the Food Innovation Center, Portland, OR in January of 2010.

Clone	Overall Liking[1]	Appearance[1]	Flavor[1]	Texture[1]
Yukon Gold	6.63[b] (1.80)	6.84[ab] (1.41)	6.63[b] (1.80)	6.13[b] (2.03)
POR01PG22-1	7.28[a] (1.57)	6.75[ab] (2.37)	7.23[a] (1.67)	7.28[a] (1.53)

[1] Overall and attribute liking for appearance, flavor, and texture of boiled potatoes. The sensory test used a 9-point hedonic category scale with 1=dislike extremely, 2=dislike very much, 3=dislike moderately, 4=dislike slightly, 5=neither like nor dislike, 6= like slightly, 7=like moderately, 8=like very much, and 9=like extremely (n=112, $p<0.05$). Standard deviations are in parenthesis.

Table X. Potato sensory parameters evaluated in **chipped** potatoes during a potato tasting event celebrated in Philomath, OR, in 2006.

	Overall appearance*			Color liking*			Flavor liking*			Texture liking*			Overall liking*	
Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE
CO97232-1R/Y	7.8	0.4	CO97232-1R/Y	7.7	0.4	Yukon Gold	7.4	0.6	CO97232-1R/Y	7.5	0.5	**POR01PG22-1**	**7.3**	**0.5**
POR01PG22-1	**7.5**	**0.4**	**POR01PG22-1**	**7.7**	**0.5**	**POR01PG22-1**	**7.3**	**0.6**	**POR01PG22-1**	**7.4**	**0.5**	Yukon Gold	7.1	0.5
Yukon Gold	6.9	0.5	Yukon Gold	7.2	0.5	POR02PG26-6	6.8	0.6	Yukon Gold	7.2	0.5	CO97232-1R/Y	7.0	0.4
POR03PG80-2	6.9	0.3	POR03PG80-2	7.0	0.3	POR01PG45-5	6.6	0.4	POR02PG26-6	7.1	0.6	POR02PG26-6	7.0	0.5
POR02PG26-6	6.8	0.5	POR00PG4-1	6.8	0.3	OR00068-11	6.5	0.5	POR01PG45-5	6.7	0.4	POR01PG45-5	6.5	0.3
POR01PG16-1	6.7	0.5	POR01PG16-1	6.7	0.5	CO97226-2R/R	6.4	0.5	POR00PG4-1	6.6	0.4	POR03PG80-2	6.5	0.3
POR01PG45-5	6.6	0.3	POR02PG26-6	6.6	0.5	POR00PG4-1	6.3	0.4	POR03PG80-2	6.4	0.4	POR00PG4-1	6.4	0.3
POR00PG4-1	6.6	0.3	POR01PG45-5	6.3	0.3	CO97232-1R/Y	6.2	0.5	CO97233-3R/Y	6.4	0.5	CO97233-3R/Y	6.3	0.4
CO97233-3R/Y	6.6	0.4	POR03PG43-1	6.3	0.5	POR01PG16-1	6.1	0.6	CO97226-2R/R	6.3	0.5	POR01PG16-1	6.1	0.5
OR00068-11	6.2	0.4	CO97233-3R/Y	6.2	0.5	POR03PG80-2	5.8	0.4	AC97521-1R/Y	6.3	0.5	CO97226-2R/R	5.9	0.4
POR03PG43-1	6.2	0.5	CO97226-2R/R	6.0	0.4	CO97233-3R/Y	5.8	0.5	OR00068-11	6.2	0.5	OR00068-11	5.9	0.4
AC97521-1R/Y	6.0	0.4	OR00068-11	5.8	0.4	AC97521-1R/Y	5.8	0.6	Red Gold	6.0	0.5	AC97521-1R/Y	5.9	0.4
CO97226-2R/R	6.0	0.4	AC97521-1R/Y	5.4	0.5	POR03PG43-1	5.3	0.6	POR03PG43-1	5.9	0.6	POR03PG43-1	5.7	0.5
All Blue	5.4	0.4	All Blue	4.9	0.4	All Blue	5.2	0.5	OR00068-29	5.7	0.5	All Blue	5.3	0.4
OR00068-29	5.2	0.5	Red Gold	4.7	0.4	Red Gold	5.2	0.5	All Red	5.6	0.6	Red Gold	5.2	0.4
Red Thumb	5.1	0.5	OR00068-29	4.6	0.5	Klamath Pearl	4.7	0.7	All Blue	5.6	0.4	OR00068-29	4.6	0.5
Red Gold	4.9	0.4	Red Thumb	4.6	0.5	OR00068-29	4.4	0.6	POR01PG16-1	5.1	0.6	All Red	4.3	0.5
All Red	4.3	0.5	All Red	3.9	0.5	Jacqueline Lee	4.2	0.5	Jacqueline Lee	5.1	0.4	Red Thumb	4.2	0.5
Klamath Pearl	3.7	0.6	Klamath Pearl	3.9	0.6	All Red	3.6	0.6	Red Thumb	4.9	0.6	Klamath Pearl	4.2	0.6
Jacqueline Lee	3.4	0.4	Jacqueline Lee	3.1	0.4	Russian Banana	3.4	0.6	Klamath Pearl	4.4	0.6	Jacqueline Lee	4.0	0.4
Russian Banana	2.9	0.5	Russian Banana	3.1	0.5	Red Thumb	3.3	0.7	Russian Banana	3.9	0.5	Russian Banana	3.2	0.5

*Scale: 1 to 9 (1= dislike extremely, 5= neither like nor dislike, 9= like extremely)

Exhibit B8: Continue...

Table Y. Potato sensory parameters evaluated in **steamed** potatoes during a potato tasting event celebrated in Philomath, OR, in 2006.

Overall appearance*			Color liking*			Flavor liking*			Texture liking*			Overall liking*		
Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE
POR02PG26-6	7.8	0.6	POR02PG26-6	7.6	0.6	Yukon Gold	6.8	0.6	Jacqueline Lee	7.0	0.5	Jacqueline Lee	6.7	0.6
POR00PG4-1	6.6	0.4	POR00PG4-1	6.6	0.4	Jacqueline Lee	6.7	0.6	Klamath Pearl	6.7	1.0	Yukon Gold	6.2	0.5
Jacqueline Lee	6.5	0.5	CO97232-1R/Y	6.5	0.5	Klamath Pearl	6.3	1.1	Yukon Gold	6.6	0.5	AC97521-1R/Y	6.0	0.5
CO97232-1R/Y	6.3	0.5	AC97521-1R/Y	6.4	0.5	Russian Banana	6.1	0.6	POR03PG43-1	6.6	0.6	Klamath Pearl	6.0	1.2
CO97233-3R/Y	6.3	0.5	Red Gold	6.2	0.5	**POR01PG22-1**	**6.0**	**0.6**	AC97521-1R/Y	6.5	0.5	Russian Banana	5.9	0.6
POR01PG22-1	**6.2**	**0.5**	Russian Banana	6.2	0.5	POR01PG16-1	5.6	0.5	Russian Banana	6.4	0.6	**POR01PG22-1**	**5.8**	**0.6**
Russian Banana	6.1	0.5	POR03PG43-1	6.1	0.6	CO97232-1R/Y	5.5	0.6	CO97226-2R/R	6.2	0.6	POR01PG16-1	5.7	0.5
AC97521-1R/Y	6.0	0.4	Jacqueline Lee	6.1	0.5	All Blue	5.5	0.5	CO97232-1R/Y	6.2	0.5	POR02PG26-6	5.7	0.7
Red Gold	6.0	0.4	**POR01PG22-1**	**6.1**	**0.5**	POR03PG43-1	5.4	0.6	**POR01PG22-1**	**6.1**	**0.6**	CO97232-1R/Y	5.5	0.5
POR03PG43-1	5.8	0.5	POR01PG16-1	6.1	0.5	AC97521-1R/Y	5.3	0.6	POR01PG16-1	6.0	0.5	POR00PG4-1	5.4	0.4
POR01PG16-1	5.8	0.4	CO97233-3R/Y	5.6	0.5	Red Gold	5.3	0.5	CO97233-3R/Y	5.5	0.6	Red Gold	5.3	0.5
Klamath Pearl	5.7	0.9	CO97226-2R/R	5.6	0.5	All Red	5.2	0.6	All Blue	5.4	0.5	CO97233-3R/Y	5.2	0.5
CO97226-2R/R	5.5	0.5	Yukon Gold	5.5	0.5	POR01PG45-5	5.2	0.4	Red Gold	5.3	0.5	POR03PG43-1	5.0	0.6
POR01PG45-5	5.4	0.4	Klamath Pearl	5.3	1.0	CO97233-3R/Y	5.2	0.6	Red Thumb	5.3	0.7	Red Thumb	5.0	0.7
Red Thumb	5.0	0.6	OR00068-29	5.2	0.5	POR00PG4-1	5.0	0.4	POR00PG4-1	5.2	0.4	All Red	4.9	0.6
All Red	4.9	0.5	POR01PG45-5	5.1	0.4	Red Thumb	5.0	0.7	POR01PG45-5	5.0	0.4	POR01PG45-5	4.9	0.4
Yukon Gold	4.8	0.5	Red Thumb	5.0	0.7	POR03PG80-2	4.9	0.4	OR00068-11	4.9	0.5	POR03PG80-2	4.8	0.4
POR03PG80-2	4.8	0.3	All Red	4.9	0.5	POR02PG26-6	4.9	0.7	POR03PG80-2	4.7	0.4	All Blue	4.6	0.5
OR00068-29	4.6	0.5	All Blue	4.6	0.5	OR00068-29	4.7	0.6	All Red	4.7	0.6	CO97226-2R/R	4.5	0.6
All Blue	4.2	0.4	POR03PG80-2	4.6	0.4	OR00068-11	4.6	0.6	POR02PG26-6	4.6	0.6	OR00068-29	4.2	0.6
OR00068-11	4.1	0.5	OR00068-11	3.8	0.5	CO97226-2R/R	4.2	0.6	OR00068-29	4.5	0.6	OR00068-11	4.0	0.5

*Scale: 1 to 9 (1= dislike extremely, 5= neither like nor dislike, 9= like extremely)

Fig:1 AmaRosa Chips

Exhibit B 9: Tuber Biochemical Compostion

AmaRosa (POR01PG22-1) had significantly higher total anthocyanins and hydrophilic oxygen radical absorption capacity (H-ORAC) than All Blue while total carotenoids and lipophylic oxygen radical absorption capacity (L-ORAC) were equivalent (Table 1). H-ORAC and L-ORAC are direct measurements of antioxidant capacity against hydrophilic and lipophilic chain-breaking hydroxyl radicals.

Years: 2007
Experimental design: Randomized Complete Block Design with 3 replications
Plot size: 7.5 ft
No. of plants per plot/row: 10
Spacing: 9 in. between hills and 34 in between rows
Planting dates: 4/10/2007
Harvest dates: 9/14/2007

Methods

Anthocyanin extraction followed the protocols outlined in Durst and Wrolstad (2001) as modified by Brown et al. (2003). Briefly, tubers were diced into 1 cm cubes with skin and frozen immediately in liquid N2. Anthocyanins were extracted from liquid N2-frozen tissue which was ground to a powder with liquid N2. The frozen powder was extracted by a 70% acetone:water (v/v) mixture, accompanied by hot water bath boiling to de-activate polyphenol oxidase. The acetone–water solution was partitioned with chloroform to remove lipophilic compounds and the acetone–water fraction was retained for anthocyanin analysis. Monomeric anthocyanin content was determined using the pH-differential method (Giusti and Wrolstad 2001). Pigment content was calculated as cyanidin-3-glucoside using an extinction coefficient of 26,900 L cm−1 mol−1 and molecular weight of 449.2 g mol−1 (Giusti and Wrolstad 2001).

Hydrophilic ORAC Measurements Oxygen Radical Absorbance Capacity (ORAC) is a measure of the capacity of an antioxidant to delay the oxidation of a target molecule. ORAC is the measure of the decay of fluorescence of a certain fluorogen in the presence of a radical generating compound and antioxidants. The assay is performed in a fluorometer that measures the decay over time at 2 min intervals. Antioxidant value is derived from an Area Under the Curve calibrated to a standard antioxidant. The technique used for anthocyanins was derived from Cao et al. (1993, 1995). Briefly, β-phycoerythrin (P-1286, Aldrich Co., St. Louis, MO, USA) was used as the fluorogen, 2,2'azobis(2-amidino-propane) dihydrochloride (AAPH, Wako Chemicals USA, Inc., Richmond, VA, USA) was used as the radical generator and Trolox ([±] 6-hydroxy-2,5,7,8 tetra-methylchromane-2-carboxylic acid; cat #36510, Fluka Chemie, Steinheim, Germany), a water soluble analog of α-tocopherol, was used as the standard. The test was performed on a CytoFluor 4000 fluorometer multi-well reader (PerSeptive Biosystems,

Exhibit B9: Continue...

Framingham, MA, USA) over 2 h with fluorescence measurements taken every 2 min. Area Under the Curve (AUC) was converted to "μmole Trolox equivalents per 100 g FW."

Statistical Analysis Analyses were conducted using Microsoft Excel (Microsoft, Redmond, WA).

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Exhibit B9: Continue...

Table 1.Total anthocyanins, carotenoides and tocopherols equivalents of POR01PG22-1 and All blue evaluated from six locations

	Total anthocyanins	se	H-ORAC	se	Total Carotenoids	se	L-ORAC	se
POR01PG 22-1 Aberdeen	16.8	1.8	5.5	0.7	90.5	22.2	38	0.5
POR01PG 22-1 Corvallis	17	0.9	13.1	3.1	93.6	6.7	43.4	12.4
POR01PG 22-1 Klamath Falls	16.5	0.6	10.6	1.3	122.3	25.8	65.4	2.3
POR01PG 22-1 Paterson	15.1	1.3	8.1	1.5	115.7	22.6	66	22.4
POR01PG 22-1 Powell Butte	23.8	1.5	11.5	1.4	226.5	46.6	30.7	9.4
POR01PG 22-1Toppenish	20.1	2.2	8	0.1	120.8	9.6	33.5	3.3
Mean over locations	18.2		9.5		128.2		46.1	
ALL BLUE Aberdeen	11.9	1	3.6	0.5	121.8	11.3	43.8	2.1
ALL BLUE Corvallis	14.5	0.6	5.6	1.7	112.1	48.2	51.6	2.4
ALL BLUE Klamath Falls	14.1	1.3	4.3	1.4	102.9	14.2	52.4	5.9
ALL BLUE Paterson	12.5	1.8	5.7	0.7	89.4	25.1	44.7	9
ALL BLUE Powell Butte	16.9	0.9	7.8	0.8	83.2	10.3	30.9	5.5
ALL BLUE Toppenish	12.7	1.1	5.2	0.7	89.2	10.1	49.2	7.2
Mean over locations	13.8		5.4		99.8		45.4	

Total Anthocyanins = mg per 100 g FW

H-ORAC = micromoles trolox equivalents per g FW

Total Carotenoids = micrograms per 100 g FW

L-ORAC =nanomoles tocopherol equivalents per 100 g FW

Table 6. Total anthocyanins, total carotenoides, H-ORAC and L-ORAC of POR01PG22-1 and All blue evaluated in 2007 at six locations[1]

Entry	Total Anthocyanins[2]	Total Carotenoids[3]	H-ORAC[4]	L-ORAC[5]
POR01PG 22-1	18.2	128.2	9.5	46.1
ALL BLUE	13.8	99.8	5.4	45.4
LSD (0.05)	1.7	NS	1.7	NS

[1] Aberdeen, ID; Corvallis, Klamath Falls, and Powell Butte, OR; Paterson and Toppenish, WA.

[2] Total Anthocyanins = mg per 100 g FW

[3] H-ORAC = micromoles of trolox equivalents per g FW

[5] Total Carotenoids = micrograms per 100 g FW

[4] L-ORAC =nanomoles of tocopherol equivalents per 100 g FW

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Exhibit B 10: DNA Fingerprinting

AmaRosa has a distinctive DNA SSR (simple sequence repeat) fingerprint, different from both Red LaSoda and Dark Red Norland. AmaRosa shares 7 alleles (out of the 21 obtained with the five SSR markers used) with Dark Red Norland and it shares 6 (out of 21) with Red LaSoda. AmaRosa has unique alleles in STI0001-189bp, STM0037-74, STG0016-128, STM0030-138, not present in the reference varieties Dark Red Norland and Red LaSoda.

Materials and Methods

Genomic DNA of AmaRosa, Dark Red Norland, and Red LaSoda was obtained from young potato leaves using the DNeasy 96 Plant Kit (Qiagen Inc, Valencia, CA). Five single locus simple sequence repeat (SSR) markers (Table 1) were used to illustrate distinctiveness of AmaRosa at the molecular level. Forward primers were modified with a 5' M13 extension (Steffens et al., 1993). In addition, a M13 forward primer was labelled with the fluorescent infrared dye IRD700 or 800 (LI-COR Biosciences, Lincoln, NE). Each polymerase chain reaction (PCR) was performed in a volume of 20 µL containing 15 ng of template DNA, 1X PCR Buffer (Fermentas, Glen Burnie, MD), 200 µM dNTPs, 30 pM of 700 or 800 IRDye-labeled M13 forward primer (LI-COR Inc, Lincoln, NE) and 30 pM reverse primer, 20 pM forward SSR primer and 0.05 U/µL Taq DNA polymerase (Fermentas, Glen Burnie, MD). PCR amplifications were carried out on Techne (TC-412) and MWG Biotech (Primus 96 plus) thermocyclers using the following conditions: 4 min at 94 °C; 31 cycles of 50 sec at 94 °C, 1 min. at annealing temperature (specific for each SSR marker) and 50 sec. at 72 °C; with a final extension step of 4 min. at 72 °C. Manually prepared blue stop solution was added to each reaction in a ratio of 1:3 to the PCR reaction before denaturing for 3 min. at 93 °C. The PCR products were separated by electrophoresis on 6.5 % denaturing polyacrilamide gels on a 4300 LI-COR DNA Analyzer system (LI-COR Biosciences, Lincoln, NE). LI-COR IRDye 50-350 bp size standard (LI-COR Biosciences, Lincoln, NE) was used as internal molecular size ladder. SSR alleles were detected and scored using SAGA Generation 2 software (LI-COR Biosciences, Lincoln, NE).

Exhibit B10: Continue...

Table 1. Simple sequence repeat (SSR) markers used for the declaration of distinctiveness of AmaRosa, source (reference), chromosome location and annealing temperature.

Locus_Name	Source	Chromosome Location	Annealing Temperature (^{0}C)
STG0016	Ghislain et al. 2009	I	55
STI0001	Feingold et al. 2005	IV	59
STI0012	Feingold et al. 2005	IV	55
STM0037	Milbourne et al. 1998	XI	54
STM0030	Milbourne et al. 1998	XII	58

Table 2. DNA fingerprints of AmaRosa, Red LaSoda and Dark Red Norland using five SSR markers.

		Potato Clones		
Locus Name	Allele Size (bp)	AmaRosa	Dark Red Norland	Red LaSoda
STG0016	122		x	
	128	x		
	131	x		x
	134	x	x	x
	152			x
STI0001	177		x	x
	180		x	x
	189	x		
	192	x	x	x
STI0012	165			x
	168	x	x	x
	171	x	x	
	183		x	x
	189	x	x	
STM0037	72	x		x
	74	x		
	80	x	x	x
	88	x	x	
STM0030	138	x		
	142			x
	164		x	

[a]'x' indicates presence of the corresponding allele. The allele size does not include the M13 tail.

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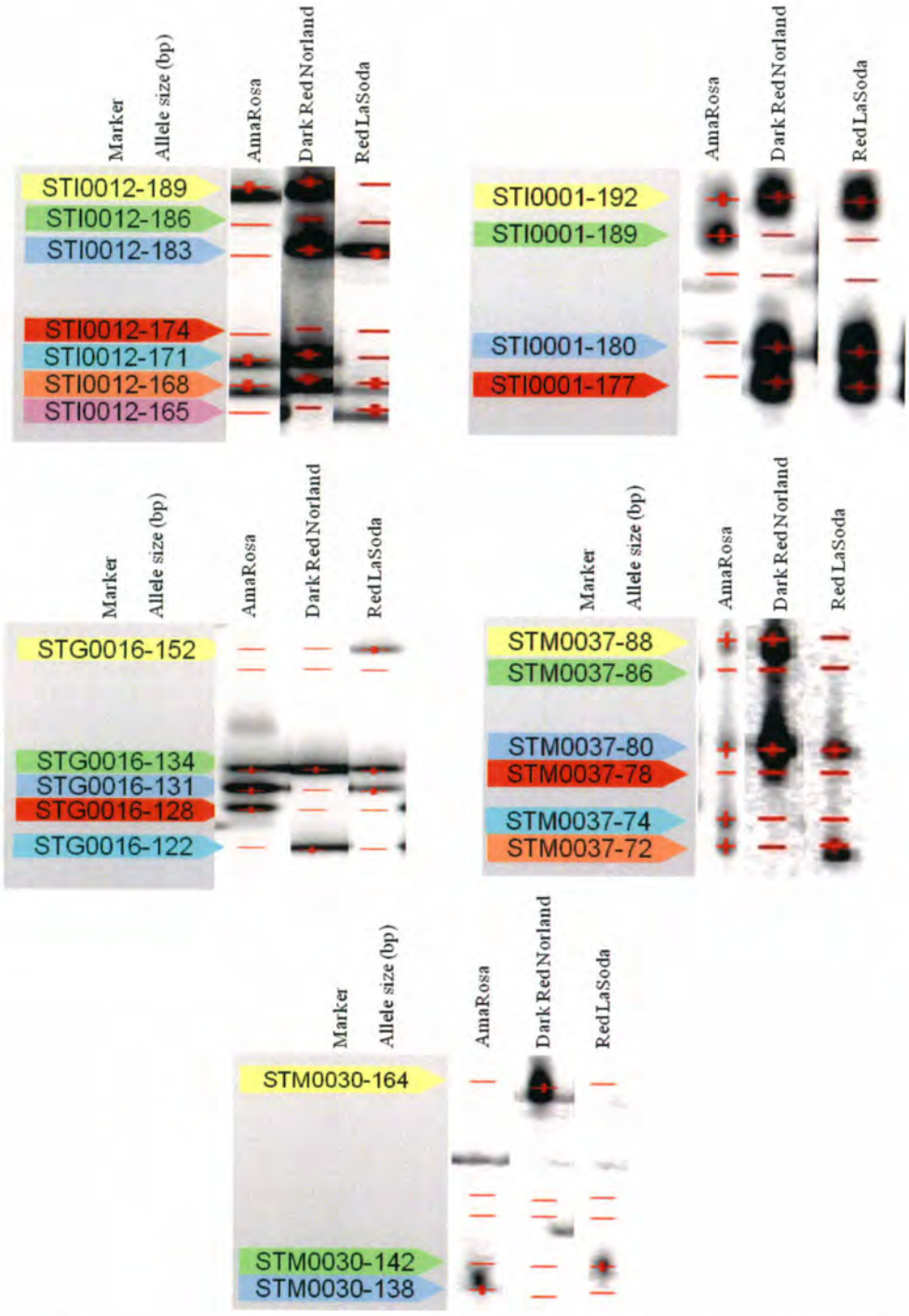

Figure 1. SSR profile of AmaRosa, Dark Red Norland and Red LaSoda for STI0012, STI001, STG0016, STM0037 and STM0030.

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Proposed Potato Variety Release

Proposed name: AmaRosa
Experimental designation: POR01PG22-1
Botanical name: *Solanum tuberosum* L.
Intended Market: Specialty

General Description:

POR01PG22-1 resulted from a cross made in 2000 by Dr. Charles Brown (USDA/ARS, Prosser, WA) between PA97B23-2 and Red bulk pollen (Figure 1). POR01PG22-1 was selected from seedlings tubers planted at Madras, Oregon in 2001. It has been evaluated for six years (2002-2007) in public trials throughout the western U.S, including the Western Regional Specialty Trials in OR, ID, WA, CA and TX in 2006 and 2007. Oregon State University will take the lead on the release of this variety. The release will be made jointly by the experiment stations of Oregon, Idaho, and Washington, and USDA/ARS.

POR01PG22-1 is a mid season specialty potato with red skin and red flesh. This selection is unique among commercially available potato varieties in that plants set a large number of smooth, small, fingerling-shaped tubers with red skin and red flesh. POR01PG22-1 tubers have higher total anthocyanin and hydrophilic oxygen radical absorption capacity (H-ORAC) than the variety All Blue. Tubers are ideal for boiling, baking, and microwaving, and chips made from POR01PG22-1 tubers retain their red color and have very good taste. POR01PG22-1 could be a good candidate for the organic sector due to its resistance to common scab and to tuber late blight.

Plant Characteristics:

Plants of POR01PG22-1 have mid-season maturity and semi-erect growth habit (Table 1, Figure 2A). The terminal leaflet is narrowly ovate with slight waviness (Table 1, Figure 2B). Flowers are purple and produce abundant pollen under normal field conditions (Table 1, Figure 2C). POR01PG22-1 is both male and female fertile under greenhouse conditions. Berry production under field conditions is moderate.

Table 1. Plant characteristics of POR01PG22-1 compared with those of Red LaSoda and Dark Red Norland.[1]

Characteristic	POR01PG22-1	Red LaSoda	Dark Red Norland
Vine maturity	Mid-season	Early	Early
Growth habit	Semi-erect	Erect	Semi-erect
Leaf type (silhouette)	Open	Open	Open
Leaflet shape (terminal)	Narrowly ovate	Broadly ovate	Medium ovate
Terminal Leaflet waviness	Slight	Absent	Slight
Flower color	Purple	Purple- Violet	Purple
Pollen production	Abundant	Some	Abundant
Berry production	Moderate	Low	Low

[1]Foliage characteristics were observed at Corvallis, OR.

Tuber Characteristics:

POR01PG22-1 produces a large set of small fingerling (long) tubers with bright red skin and red flesh (Table 2, Figure 2D,) which are desired characteristics for the potato specialty market. The tubers have shallow eyes that are evenly distributed. Eyebrows appear absent in POR01PG22-1. Light sprouts of POR01PG22-1 have very strong blue-violet anthocyanin pigmentation on the base and mainly green tips (Table 3, Figure 2D), they are ovoid in shape and have medium pubescence on the tip of the base.

Table 2. Physical tuber characteristics of POR01PG22-1 as compared with those of Red LaSoda and Dark Red Norland.

Characteristic	POR01PG22-1	Red LaSoda	Dark Red Norland
Skin color[1]	Bright red (4.4)	Red (2.8)	Red (3.0)
Flesh color[1]	Red (3.5)	White (1.1)	White (1.1)
Skin texture	Smooth	Smooth	Smooth
Size[2]	Small (2.5 oz.)	Large (8.0 oz)	Large (6.7 oz)
Shape[3]	Long (4.8)	Oval (2.2)	Oval (2.4)
Thickness	Round	Flattened	Flattened
Eye depth	Shallow (3.9)	Very deep (1.8)	Deep (3.1)
Eye number[4]	11	10	11
Eye distribution	Evenly distributed	Evenly distributed	Evenly distributed
Eyebrow prominence	Absent	Medium	Slight
Tuber set	Large (7.7)	Low (5.4)	Low (5.2)
Dormancy	Medium	Early	Early

[1] Rating 1-5 with 1 = light and 5= dark from 14 (skin color) and 10 (flesh color) Western Regional Specialty Trials.
Skin color LSD (0.05) = 0.4, flesh color LSD (0.05) = 0.3.
[2] Average tuber weights from 12 Western Regional Specialty Trials. LSD (0.05) = 1.0.
[3] Shape rating 1-5 with 1= round and 5= long from 6 Western Regional Specialty Trials. LSD (0.05) = 0.4.
[4] Average number of eyes based on 60 medium sized tubers.

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Table 3. Light Sprout (LS) characteristics of POR01PG22-1 as compared with those of Red LaSoda and Dark Red Norland[1].

Characteristic	POR01PG22-1	Red LaSoda	Dark Red Norland
LS shape	Ovoid	Ovoid	Cylindrical
LS base - pubescence of tip	Medium	Strong	Medium
LS base - anthocyanin coloration	Blue-violet	Red-violet	Red-violet
LS Base - Intensity of coloration	Very Strong	Medium	Strong
LS tip habit	Intermediate	Closed	Open

[1] Data collected in Corvallis, OR in 2007.

Tuber Yield:

POR01PG22-1 produces smaller tubers than Red LaSoda and Dark Red Norland (Table 2, Table 4). Total yield and yield of US#1 is significantly lower than the control varieties. POR01PG22-1 total yield was underestimated in all locations where harvest was automatic; many tubers fell through the chains due to its small fingerling shape. Growers interested in small fingerling tubers are now purchasing special harvesters that can handle this type of tubers; the alternative is to harvest the tubers manually. The yield of tubers under 4 oz is significantly higher than Red LaSoda and Dark Red Norland (Table 4). POR01PG22-1 has tuber size distribution favored by most packing facilities dedicated to the small fingerlings specialty/gourmet markets. No differences were observed for specific gravity.

Table 4. Yield and specific gravity of POR01PG22-1, Red LaSoda and Dark Red Norland summarized from 18 Western Regional Specialty Trials conducted in California, Idaho, Oregon, Texas and Washington (2006 and 2007).

Variety	Total yield	U.S. #1 yield[1]	U.S.#1	< 4 oz	Specific Gravity[2]
	cwt/A	cwt/A	%	cwt/A	g cm^{-3}
POR01PG22-1	239	49	18	215	1.072
Red Lasoda	523	427	82	48	1.073
Dark Red Norland	459	380	82	58	1.067
LSD (0.05)	68	65	11	65	NS

[1] Greater than 4 oz.
[2] Specific gravity was determined using the weight-in-air, weight-in-water method.

Tuber External and Internal Characteristics:

POR01PG22-1 is rarely misshapen due to growth cracks or knobs (Table 5). Percent hollow heart is very low, which may be correlated to its smaller average tuber size. Shatter bruise, which is minimal, does not differ from Red LaSoda and Dark Red Norland.

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Table 5. Internal and external defects of POR01PG22-1, Red LaSoda and Dark Red Norland summarized from Western Regional Trials from 2006 and 2007.

Defect	POR01PG22-1	Red LaSoda	Dark Red Norland
Skinning[1,2]	3.3	3.3	4.0
Growth cracks[1,2]	5.0	4.4	4.3
Knobs[1,2]	4.5	4.7	4.5
Shatter bruise[1,2]	4.6	4.7	4.6
Blackspot bruise[1,2]	3.5	4.0	4.5
Hollow heart (%)[2]	0.5	12.8	4.2

[1] Skinning, growth cracks, knobs, shatter bruise, and blackspot bruise rating 1-5 where 1 = severe occurrence and 5= no occurrence of the defect.
[2] LSD (0.05) = NS for all the defects evaluated.

Tuber Biochemical Composition:

POR01PG22-1 had significantly higher total anthocyanins and hydrophilic oxygen radical absorption capacity (H-ORAC) than All Blue while total carotenoids and lipophylic oxygen radical absorption capacity (L-ORAC) were equivalent (Table 6). H-ORAC and L-ORAC are direct measurements of antioxidant capacity against hydrophilic and lipophilic chain-breaking hydroxyl radicals. POR01PG22-1 did not differ from Red LaSoda or Dark Red Norland for other biochemical compounds tested (Table 7).

Table 6. Total anthocyanins, total carotenoides, H-ORAC and L-ORAC of POR01PG22-1 and All blue evaluated in 2007 at six locations[1]

Entry	Total Anthocyanins[2]	Total Carotenoids[3]	H-ORAC[4]	L-ORAC[5]
POR01PG 22-1	18.2	128.2	9.5	46.1
ALL BLUE	13.8	99.8	5.4	45.4
LSD (0.05)	1.7	NS	1.7	NS

[1] Aberdeen, ID; Corvallis, Klamath Falls, and Powell Butte, OR; Paterson and Toppenish, WA.
[2] Total Anthocyanins = mg per 100 g FW
[3] H-ORAC = micromoles of trolox equivalents per g FW
[5] Total Carotenoids = micrograms per 100 g FW
[4] L-ORAC =nanomoles of tocopherol equivalents per 100 g FW

Table 7. Biochemical composition of POR01PG22-1 tubers compared with those of Red LaSoda and Dark Red Norland based on 2 trials grown in Aberdeen, Idaho in 2006 and 2007.

Component	POR01PG22-1	Red LaSoda	Dark Red Norlland
Glycoalkaloids (mg/100g)[1]	4.0	2.9	2.4
Reducing sugars (% FWB)[1]	0.09	0.11	0.04
Sucrose (% FWB)[1]	0.34	0.17	0.17
Protein (% DWB)[1]	5.2	5.9	5.4
Vitamin C (mg/100g)[1]	19.6	31.6	28.2

[1] LSD (0.05) = NS for the chemical compounds tested.

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Culinary Quality:

POR01PG22-1 boiled, baked, and microwaved potato quality was equivalent to Red LaSoda and Dark Red Norland (Table 7). Tubers are ideal for boiling, baking, and microwaving whole. A sensory evaluation test performed in 2006 (11 participants) gave high ratings to chips made from POR01PG22-1 indicating potential for the chipping snack sector (Appendix, Table X). Chips made from POR01PG22-1 tubers retain their red color (Figure 2F). Steamed potatoes made from POR01PG22-1 were also good (Appendix, Table Y). A much larger consumer test (112 participants) performed at the Food Innovation Center, Portland, OR using boiled potatoes also ranked POR01PG22-1 high (Table 8).

Table 7. Culinary quality of POR01PG22-1 compared with Red LaSoda and Dark Red Norland. All culinary qualities tested at Washington State University, Pullman, WA in 2006 and 2007[1].

Entry	Boiled (0-25)[1]	Baked (0-25)[1]	Microwaved (0-25)[1]	Total (0-75)[1]
POR01PG22-1	17.7	17.9	18.5	54.1
Red LaSoda	18.6	20.3	17.7	56.6
Dark Red Norland	19.1	20.2	18.5	57.8
LSD (0.05)	NS	NS	NS	NS

[1]Higher score = better quality. Maximum points: 25 per preparation method; 75 in total.

Table 8. Potato sensory attributes evaluated on boiled potatoes by a panel of consumers (n = 112). Tests were performed at the Food Innovation Center, Portland, OR in January of 2010.

Clone	Overall Liking[1]	Appearance[1]	Flavor[1]	Texture[1]
Yukon Gold	6.63^{b} (1.80)	6.84^{ab} (1.41)	6.63^{b} (1.80)	6.13^{b} (2.03)
POR01PG22-1	7.28^{a} (1.57)	6.75^{ab} (2.37)	7.23^{a} (1.67)	7.28^{a} (1.53)

[1] Overall and attribute liking for appearance, flavor, and texture of boiled potatoes. The sensory test used a 9-point hedonic category scale with 1=dislike extremely, 2=dislike very much, 3=dislike moderately, 4=dislike slightly, 5=neither like nor dislike, 6= like slightly, 7=like moderately, 8=like very much, and 9=like extremely (n=112, $p<0.05$). Standard deviations are in parenthesis.

Disease and Herbicide Reactions:

POR01PG22-1 was resistant to common scab (Table 9). This selection has lower incidence of tuber late blight and moderate resistant to foliage infection when compared to Red LaSoda and Dark Red Norland (Table 10) when grown under high late blight disease pressure. POR01PG22-1 showed moderate susceptibility to PVY and PLRV under field condition. POR01PG22-1 is very susceptible to Metribuzin, a herbicide commonly used on potato, thus herbicides other than metribuzin should be considered for weed control in POR01PG22-1 fields.

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Table 9. Disease ratings for POR01PG22-1, Red LaSoda and Dark Red Norland.

Disease Reaction	POR01PG22-1	Red LaSoda	Dark Red Norland
Common scab[1]	4.8	4.1	3.6
PVY[2] (%)	63	90	88
PLRV [2] (%)	48	50	55

[1] Evaluations made at California in 2007. Common scab rating 1-5 with 1 = high incidence of infection and 5 = none. LSD (0.05) = 0.3

[2] Evaluations made at Hermiston, Oregon. Virus readings are from evaluation of tubers from plants grown under high virus pressure, 2006 and 2007. LSD (0.05) for PVY = 9.8; NS for PLRV.

Table 10. Summary of Late Blight Evaluation for POR01PG22-1, Red LaSoda and Dark Red Norland, Corvallis, OR, 2006-2008.

Entry	Foliage Infection[1] (1-9)	AUDPC[2]	Tuber Infection[3] %
POR01PG22-1	8.25	1210.78	2.50
Dark Red Norland	9.00	1403.75	27.50
Red LaSoda	8.75	1356.46	37.41
LSD (0.05)	0.26	136.98	11.22

[1] Scale used was 1-9, highest number being most severe.

[2] AUDPC= Area Under Disease Progress Curve.

[3] Percent of late blight infected tubers at harvest (40 randomly selected tubers, 10 per replication, 4 replications).

Protection, seed availability and licensing:

Plant Variety Protection (PVP) will be requested for 'AmaRosa'. Disease-free pre-nuclear plantlets and minitubers are available from the Foundation Potato Seed Program at Oregon State University and from the University of Idaho Tissue Culture Laboratory. 'AmaRosa' will be licensed to the Potato Variety Management Institute (PVMI, a non-profit organization working on behalf of the Tri-State Potato Breeding Program) based on a prior agreement between OSU, the Oregon Potato Commission, and PVMI. PVMI will offer this variety to interested parties without restrictions.

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Appendix.

Table X. Potato sensory parameters evaluated in **chipped** potatoes during a potato tasting event celebrated in Philomath, OR, in 2006.

	Overall appearance*			Color liking*			Flavor liking*			Texture liking*			Overall liking*	
Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE
CO97232-1R/Y	7.8	0.4	CO97232-1R/Y	7.7	0.4	Yukon Gold	7.4	0.6	CO97232-1R/Y	7.5	0.5	**POR01PG22-1**	**7.3**	**0.5**
POR01PG22-1	**7.5**	**0.4**	**POR01PG22-1**	**7.7**	**0.5**	**POR01PG22-1**	**7.3**	**0.6**	**POR01PG22-1**	**7.4**	**0.5**	Yukon Gold	7.1	0.5
Yukon Gold	6.9	0.5	Yukon Gold	7.2	0.5	POR02PG26-6	6.8	0.6	Yukon Gold	7.2	0.5	CO97232-1R/Y	7.0	0.4
POR03PG80-2	6.9	0.3	POR03PG80-2	7.0	0.3	POR01PG45-5	6.6	0.4	POR02PG26-6	7.1	0.6	POR02PG26-6	7.0	0.5
POR02PG26-6	6.8	0.5	POR00PG4-1	6.8	0.3	OR00068-11	6.5	0.5	POR01PG45-5	6.7	0.4	POR01PG45-5	6.5	0.3
POR01PG16-1	6.7	0.5	POR01PG16-1	6.7	0.5	CO97226-2R/R	6.4	0.5	POR00PG4-1	6.6	0.4	POR03PG80-2	6.5	0.3
POR01PG45-5	6.6	0.3	POR02PG26-6	6.6	0.5	POR00PG4-1	6.3	0.4	POR03PG80-2	6.4	0.4	POR00PG4-1	6.4	0.3
POR00PG4-1	6.6	0.3	POR01PG45-5	6.3	0.3	CO97232-1R/Y	6.2	0.5	CO97233-3R/Y	6.4	0.5	CO97233-3R/Y	6.3	0.4
CO97233-3R/Y	6.6	0.4	POR03PG43-1	6.3	0.5	POR01PG16-1	6.1	0.6	CO97226-2R/R	6.3	0.5	POR01PG16-1	6.1	0.5
OR00068-11	6.2	0.4	CO97233-3R/Y	6.2	0.5	POR03PG80-2	5.8	0.4	AC97521-1R/Y	6.3	0.5	CO97226-2R/R	5.9	0.4
POR03PG43-1	6.2	0.5	CO97226-2R/R	6.0	0.4	CO97233-3R/Y	5.8	0.5	OR00068-11	6.2	0.5	OR00068-11	5.9	0.4
AC97521-1R/Y	6.0	0.4	OR00068-11	5.8	0.4	AC97521-1R/Y	5.8	0.6	Red Gold	6.0	0.5	AC97521-1R/Y	5.9	0.4
CO97226-2R/R	6.0	0.4	AC97521-1R/Y	5.4	0.5	POR03PG43-1	5.3	0.6	POR03PG43-1	5.9	0.6	POR03PG43-1	5.7	0.5
All Blue	5.4	0.4	All Blue	4.9	0.4	All Blue	5.2	0.5	OR00068-29	5.7	0.5	All Blue	5.3	0.4
OR00068-29	5.2	0.5	Red Gold	4.7	0.4	Red Gold	5.2	0.5	All Red	5.6	0.6	Red Gold	5.2	0.4
Red Thumb	5.1	0.5	OR00068-29	4.6	0.5	Klamath Pearl	4.7	0.7	All Blue	5.6	0.4	OR00068-29	4.6	0.5
Red Gold	4.9	0.4	Red Thumb	4.6	0.5	OR00068-29	4.4	0.6	POR01PG16-1	5.1	0.6	All Red	4.3	0.5
All Red	4.3	0.5	All Red	3.9	0.5	Jacqueline Lee	4.2	0.5	Jacqueline Lee	5.1	0.4	Red Thumb	4.2	0.5
Klamath Pearl	3.7	0.6	Klamath Pearl	3.9	0.6	All Red	3.6	0.6	Red Thumb	4.9	0.6	Klamath Pearl	4.2	0.6
Jacqueline Lee	3.4	0.4	Jacqueline Lee	3.1	0.4	Russian Banana	3.4	0.6	Klamath Pearl	4.4	0.6	Jacqueline Lee	4.0	0.4
Russian Banana	2.9	0.5	Russian Banana	3.1	0.5	Red Thumb	3.3	0.7	Russian Banana	3.9	0.5	Russian Banana	3.2	0.5

*Scale: 1 to 9 (1= dislike extremely, 5= neither like nor dislike, 9= like extremely)

Table Y. Potato sensory parameters evaluated in **steamed** potatoes during a potato tasting event celebrated in Philomath, OR, in 2006.

Overall appearance*			Color liking*			Flavor liking*			Texture liking*			Overall liking*		
Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE	Clone Name	Mean	SE
POR02PG26-6	7.8	0.6	POR02PG26-6	7.6	0.6	Yukon Gold	6.8	0.6	Jacqueline Lee	7.0	0.5	Jacqueline Lee	6.7	0.6
POR00PG4-1	6.6	0.4	POR00PG4-1	6.6	0.4	Jacqueline Lee	6.7	0.6	Klamath Pearl	6.7	1.0	Yukon Gold	6.2	0.5
Jacqueline Lee	6.5	0.5	CO97232-1R/Y	6.5	0.5	Klamath Pearl	6.3	1.1	Yukon Gold	6.6	0.5	AC97521-1R/Y	6.0	0.5
CO97232-1R/Y	6.3	0.5	AC97521-1R/Y	6.4	0.5	Russian Banana	6.1	0.6	POR03PG43-1	6.6	0.6	Klamath Pearl	6.0	1.2
CO97233-3R/Y	6.3	0.5	Red Gold	6.2	0.5	**POR01PG22-1**	**6.0**	**0.6**	AC97521-1R/Y	6.5	0.5	Russian Banana	5.9	0.6
POR01PG22-1	**6.2**	**0.5**	Russian Banana	6.2	0.5	POR01PG16-1	5.6	0.5	Russian Banana	6.4	0.6	**POR01PG22-1**	**5.8**	**0.6**
Russian Banana	6.1	0.5	POR03PG43-1	6.1	0.6	CO97232-1R/Y	5.5	0.6	CO97226-2R/R	6.2	0.6	POR01PG16-1	5.7	0.5
AC97521-1R/Y	6.0	0.4	Jacqueline Lee	6.1	0.5	All Blue	5.5	0.5	CO97232-1R/Y	6.2	0.5	POR02PG26-6	5.7	0.7
Red Gold	6.0	0.4	**POR01PG22-1**	**6.1**	**0.5**	POR03PG43-1	5.4	0.6	**POR01PG22-1**	**6.1**	**0.6**	CO97232-1R/Y	5.5	0.5
POR03PG43-1	5.8	0.5	POR01PG16-1	6.1	0.5	AC97521-1R/Y	5.3	0.6	POR01PG16-1	6.0	0.5	POR00PG4-1	5.4	0.4
POR01PG16-1	5.8	0.4	CO97233-3R/Y	5.6	0.5	Red Gold	5.3	0.5	CO97233-3R/Y	5.5	0.6	Red Gold	5.3	0.5
Klamath Pearl	5.7	0.9	CO97226-2R/R	5.6	0.5	All Red	5.2	0.6	All Blue	5.4	0.5	CO97233-3R/Y	5.2	0.5
CO97226-2R/R	5.5	0.5	Yukon Gold	5.5	0.5	POR01PG45-5	5.2	0.4	Red Gold	5.3	0.5	POR03PG43-1	5.0	0.6
POR01PG45-5	5.4	0.4	Klamath Pearl	5.3	1.0	CO97233-3R/Y	5.2	0.6	Red Thumb	5.3	0.7	Red Thumb	5.0	0.7
Red Thumb	5.0	0.6	OR00068-29	5.2	0.5	POR00PG4-1	5.0	0.4	POR00PG4-1	5.2	0.4	All Red	4.9	0.6
All Red	4.9	0.5	POR01PG45-5	5.1	0.4	Red Thumb	5.0	0.7	POR01PG45-5	5.0	0.4	POR01PG45-5	4.9	0.4
Yukon Gold	4.8	0.5	Red Thumb	5.0	0.7	POR03PG80-2	4.9	0.4	OR00068-11	4.9	0.5	POR03PG80-2	4.8	0.4
POR03PG80-2	4.8	0.3	All Red	4.9	0.5	POR02PG26-6	4.9	0.7	POR03PG80-2	4.7	0.4	All Blue	4.6	0.5
OR00068-29	4.6	0.5	All Blue	4.6	0.5	OR00068-29	4.7	0.6	All Red	4.7	0.6	CO97226-2R/R	4.5	0.6
All Blue	4.2	0.4	POR03PG80-2	4.6	0.4	OR00068-11	4.6	0.6	POR02PG26-6	4.6	0.6	OR00068-29	4.2	0.6
OR00068-11	4.1	0.5	OR00068-11	3.8	0.5	CO97226-2R/R	4.2	0.6	OR00068-29	4.5	0.6	OR00068-11	4.0	0.5

*Scale: 1 to 9 (1= dislike extremely, 5= neither like nor dislike, 9= like extremely)

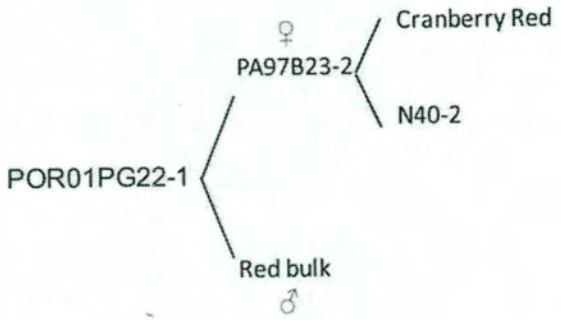

Figure 1. Pedigree of POR01PG22-1 resulted from the hybridization between PA97B23 (female) and bulk of red bulk pollen (male).

Received February 25, 2011

#201100297

NOTICE OF NAMING AND RELEASE OF
AmaRosa

A SPECIALTY FINGERLING POTATO WITH RED SKIN AND RED FLESH AND TUBER LATE BLIGHT RESISTANCE

for Jan Aumsing
Director, Oregon Agricultural Experiment Station — 5-20-10 Date

Director, Washington Agricultural Experiment Station — Date

Director, Idaho Agricultural Experiment Station — Date

Administrator, USDA-Agricultural Research Service — Date

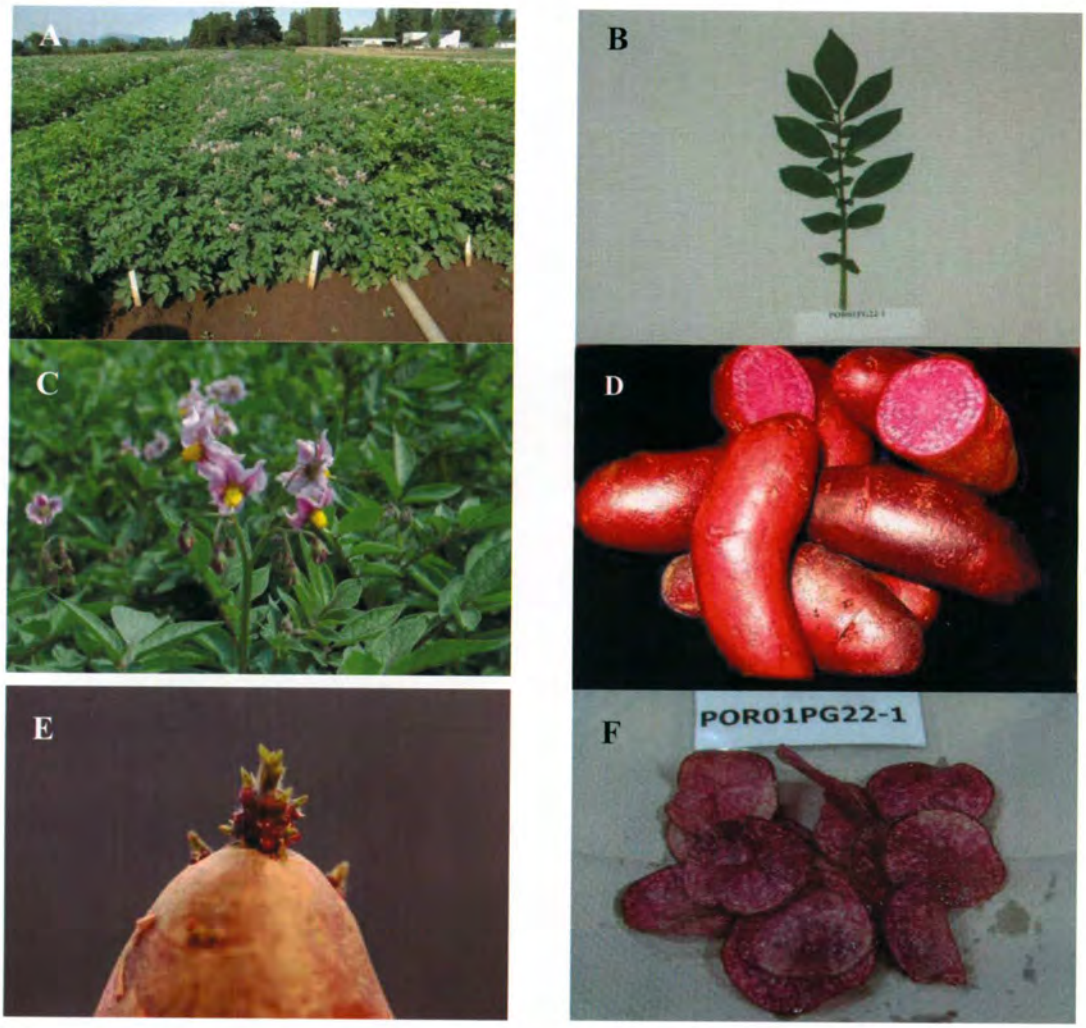

Figure 2. POR01PG22-1 canopy (A), compound leaf (B), inflorescence (C), tubers (D), light sprout (E), and potato chips (F).

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RAD 11/06/2012

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

The State of Oregon, (continued on Exhibit E, 11)

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

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

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
~~State of Oregon acting by and through the State Board of Higher Education on behalf of OREGON STATE UNIVERSITY~~ representing the interests of Washington State University, the University of Idaho, and the United States of America, as represented by the Secretary of Agriculture	POR01PG22-1	AmaRosa
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)* Office for Commercialization and Corporate Development Oregon State University 312 Kerr Administration Building Corvallis, OR 97331	**5. TELEPHONE** *(Include area code)* 541-737-0674	**6. FAX** *(Include area code)* 541-737-3093
	7. PVPO NUMBER #201100297	

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

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

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

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

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

RAD 11/06/2012

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:
~~The STATE OF OREGON,~~ acting by and through the State Board of Higher Education on behalf of OREGON STATE UNIVERSITY is a partner in the Northwest (Tri-State) Potato Variety Development Program and a signatory of the General Agreement on Policy and Procedure for Release of New Publicly Developed Plant Varieties in Idaho, Oregon, and Washington, between Washington State University, Oregon State University, University of Idaho, and the United States of America, as represented by the Secretary of Agriculture. In accordance with provision 2.2 of this Agreement, Oregon State University is applying for this PVPC.

PLEASE NOTE:

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

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

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

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

RAD 11/06/2012

The State of Oregon, (continued on Exhibit E, 11)

EXHIBIT F
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	TEMPORARY OR EXPERIMENTAL DESIGNATION
~~State of Oregon acting by and through the State Board of Higher Education on behalf of OREGON STATE UNIVERSITY, representing the interests of Washington State University, the University of Idaho, and the United States of America, as represented by the Secretary of Agriculture~~	Office for Commercialization and Corporate Development Oregon State University 312 Kerr Administration Building Corvallis, OR 97331	POR01PG22-1 **VARIETY NAME** AmaRosa
NAME OF OWNER REPRESENTATIVE (S)	**ADDRESS** *(Street and No. or RD No., City, State, and Zip Code and Country)*	**FOR OFFICIAL USE ONLY**
Denis Sather	Office for Commercialization and Corporate Development Oregon State University 312 Kerr Administration Building Corvallis, OR 97331	**PVPO NUMBER** #201100297

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.

B Silman
Signature

2/18/2011
Date