

2013 Research Progress Report
Potato Breeding and Selection

Submitted by

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San Luis Valley Research Center

to the

Colorado Potato Administrative Committee (Area II)
Research Committee

and the

Colorado Potato Administrative Committee (Area III)



Mission Statement

"The mission of the Colorado Potato Breeding and Selection Program is to develop cultivars that will help assure that the Colorado potato industry remains productive, competitive, and sustainable and that provide the consumer with improved nutrition and quality."

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Preface

We are pleased to provide this copy of the “**2013 Potato Breeding and Selection Research Progress Report.**” This report includes research funded by the Colorado potato industry (Area II and Area III), Colorado State University (Agricultural Experiment Station and the Department of Horticulture and Landscape Architecture), the National Institute of Food and Agriculture (NIFA), the US Potato Board and PVP royalties. These funds collectively continue to allow us to strengthen our overall collaborative research efforts with colleagues at CSU and with other universities and agencies. All of these efforts are aimed at developing improved potato cultivars for Colorado.

Ongoing support by the Colorado potato industry is key to maintaining funds received from NIFA and other potential sources. NIFA and PVP funding have allowed us to significantly expand our breeding efforts over the years to include resistance to the following: PVY, late blight (foliar and tuber), nematodes, pink rot, storage rots [dry rot (*Fusarium* and early blight) and bacterial soft rot], corky ringspot, powdery scab, and other special initiatives including graduate student support.

The Colorado Potato Breeding and Selection Program relies on the invaluable cooperation of several growers, shippers, and research personnel to assess the production, adaptability, marketability, and other characteristics of advanced selections.

Collaborators and areas of collaboration are:

- Robert D. Davidson (retired) and Andrew J. Houser - Disease Screening and Evaluation
- Samuel Y. C. Essah - Cultivar Specific Production Management
- Sastry S. Jayanty - Cultivar Specific Postharvest Management and Physiology
- Henry J. Thompson - Nutritional Characteristics and Health Attributes
- Jorge M. Vivanco and Dayakar Badri - Nematode and Pink Rot Resistance
- Kent P. Sather and Richard W. Haslar (retired) - Potato Certification Service
- Colorado Potato Growers
- Southwest Regional Potato Breeding and Cultivar Development Cooperators (Colorado, Texas, and California). The overall objective of this research group is to develop and evaluate improved potato cultivars to meet the production, marketing, and producer/consumer needs of the Southwest U.S.
- Other cooperating research/extension programs - several cooperators throughout the United States and Canada provide breeding material and opportunities to screen our germplasm under various growing conditions and disease pressures.

Best wishes for the 2014 production season!

Sincerely,

Dave Holm and Caroline Gray

Acknowledgments

We would like to express appreciation to the following individuals, groups, and organizations for their efforts on behalf of the Colorado Potato Breeding and Selection Program in 2013.

- ✓ Financial and In-kind Support from the following is gratefully acknowledged:
 - *Colorado Potato Industry* - Area II and III
 - *Colorado State University* - Colorado Agricultural Experiment Station & the Department of Horticulture and Landscape Architecture
 - *USDA - National Institute of Food and Agriculture* - Potato Research Award Number 2012-34141-20309
 - *United States Potato Board* - National Chip Processing Trial (NCPT) and National Fry Processing Trial (NFPT)
 - *Stone's Farm Supply* - in-kind support

- ✓ Colorado Potato Administration Committee, Area II - Research Committee (Members and At-large Members) and Area III

- ✓ Technical Support/Graduate Students*

Jill Francis	Mitzi Cisneros	Olivia Garcia	Helen Duran
Jeanette Gurule	Margaret Garcia	Merrie Jo Cisneros	Wendy Waldrop
Cody Johnson	Katie Larson*	Sara Kammlade*	Raven Bough*

Numerous other temporary support personnel assisted the project particularly during seed cutting, planting, and harvest.

- ✓ Research Collaborators - Colorado State University

Rob Davidson (retired)	Samuel Essah	Sastry Jayanty	Lavanya Reddivari
Henry Thompson	Jairam Vanamala	Jorge Vivanco	Dayakar Badri

- ✓ Staff - San Luis Valley Research Center

Michelle Leckler	Tim Poe	Ron Price	Stan Price
Sharon Yust			

- ✓ Potato Certification Service

Kent Sather	Rick Haslar (retired)	Andrew Houser	Carolyn Keller
Steve Keller	Rue Snell (retired)	Teresa Rivera	

- ✓ Southwest Regional Potato Breeding and Cultivar Development Cooperators (Colorado, Texas, and California).

- ✓ The Colorado Potato Breeding and Selection Program relies on the cooperation of several growers, shippers, processors, and research personnel to assess the production, adaptability, marketability, and other characteristics of advanced selections from our program. We sincerely appreciate their support and the valuable feedback they provide. We thank many cooperating breeding and selection programs throughout the United States and Canada who have provided breeding material and opportunities to screen our germplasm under various growing conditions and disease pressures not usually available in Colorado.

2013 Research Progress Report

Potato Breeding and Selection

Submitted by

David G. Holm and Caroline Gray

San Luis Valley Research Center

Introduction

The major objectives of the Colorado Potato Breeding and Selection Program are: (1) to develop new potato cultivars with increased yield, improved quality, improved nutritional and health characteristics, resistance to diseases and pests, and tolerance to environmental stresses; (2) to collaborate with growers, shippers, processors, and research/extension personnel to assess the production, adaptability, marketability, and other characteristics of advanced selections from the Colorado program; (3) to provide a basic seed source of selections to growers for seed increase and commercial testing; (4) to evaluate promising selections for possible export (interstate and international).

The primary emphasis is placed on the development of russet cultivars. The balance of the breeding effort is devoted to developing red, specialty, and chipping cultivars. This broad approach is important because it recognizes the diverse markets accessed by potato growers throughout Colorado.

Besides the major objectives outlined previously, specific breeding emphasis is being placed on identifying germplasm and developing cultivars that have: (1) early vine maturity and early tuber bulking; (2) immunity to PVY; resistance to (3) late blight (foliar and tuber); (4) storage rots [dry rot (*Fusarium* and early blight) and bacterial soft rot]; (5) pink rot; (6) nematodes; (7) powdery scab; (8) corky ringspot, and (9) improved nutritional quality, health attributes, and other "consumer" characteristics such as improved red skin color retention and improved shelf life. Continued emphasis has been placed on breeding/selecting for "low input" cultivars, primarily for reduced nitrogen and fungicide input, for improved postharvest and processing qualities such as lengthened dormancy. Cultivars with these characteristics will help assure that the potato industry in Colorado will remain productive and in a competitive position.

Cultivar development is a five-step process, encompassing first, the generation of segregating populations followed by evaluation for visual agronomic traits. This involves identifying parents with desired characteristics for crossing to produce true (botanical) potato seed (TPS). TPS is planted to produce seedling tubers for field planting. Second, superior progeny are identified and these selections undergo additional evaluation for economically important characteristics. Third, a profile of cultivar specific management criteria - production and postharvest - are developed, which a grower, shipper, or

processor, and/or marketer may fine tune for his/her operation. Fourth, a basic seed source of selections is developed to facilitate further seed increase and commercial testing of advanced selections. Finally, market development takes place to determine consumer acceptance and recognition in the intended market. Each of these integrated steps is critical in the development and commercialization of new cultivars and provides the base for a successful cultivar release. Without all components, fruition is difficult to attain.

The process of cultivar development takes 14+ years. Year 1 and 2 are the potato breeding phase of the development process. As indicated earlier, parents are selected and crossed to produce true potato seed. Seedling tubers are then produced from the true seed in year 2. Subsequent years (3+) represent the selection phase of the development process. Each year represents another cycle of field selection. As each cycle is completed, fewer and fewer clones remain and the amount of seed per selection is increased. Clones remaining after eight cycles of field selection are released to growers for evaluations prior to official release as a named cultivar. Table 1 presents a detailed description of the steps involved in developing new potato cultivars.

The long-term process of cultivar development fosters collaborations among growers, shippers, processors, researchers, and extension personnel. The network must provide for a grower evaluation process to assist in the development of management guidelines, detect unforeseen problems, and determine the predictability of performance of each new cultivar.

Because the timeline for cultivar development is lengthy, improved methods to speed up the breeding and selection process are continually evaluated. Technologies such as marker assisted selection may provide opportunities, in concert with existing and new collaborators, to facilitate accelerated (focused) breeding for high priority characteristics.

A priority of the potato cultivar development process should always be to provide a good solid foundation for the development and commercialization of new potato cultivars prior to the "formal" naming and release process. As such, potato cultivar development is a long-term process and is difficult to shorten significantly.

Potato Breeding

Germplasm Accession and Introgression. Germplasm is continually being acquired from various sources with late blight resistance, virus resistance (PXY, PVY, and PLRV), nematode resistance, and other characteristics of importance. Primary sources are the USDA-ARS in Aberdeen, Idaho; Prosser, Washington; Madison, Wisconsin; and Oregon State University. Some material has also been acquired from Asia, Europe, and South America. All of these materials are being incorporated into our germplasm in the breeding program.

Our program recently acquired several seed families of a diploid hybrid population of *Solanum phureja* x *Solanum stenotomum* adapted to long-day growing conditions. This was accomplished by recurrent selection by Dr. Kathy Haynes, USDA-ARS, Beltsville, Maryland. This material was initially planted in 2009 and seedling tubers were planted in the field in 2010. Initial field selection occurred in the fall of 2010 for dark yellow flesh and materials were advanced to 12-hill plots in 2011. These selections were reevaluated in 2012 and 2013. This project dovetails with hybridization and selection efforts already underway for high carotenoid clones previously received from Dr. Chuck Brown, USDA-ARS, Prosser Washington, and will be part of an ongoing effort to enhance carotenoid levels in our breeding program.

We also acquired 4 diploid *Solanum phureja* cultivars from The James Hutton Institute (formerly the Scottish Crop Research Institute) via Mylnefield Research Services in 2012. The cultivars and release year are Mayan Gold (2001), Inca Dawn (2003), Mayan Queen (2008), and Mayan Twilight (2008). We have produced seedling tubers from Inca Dawn crosses and will be planting them in the field in 2014.

An M.S. graduate student, Katie Larson, just finished up her degree. She has been working with our yellow-fleshed material for the last 2-1/2 years. More detailed information about her project is included in the **Graduate Students** section on pages 5-6 of this report.

Crossing. The Colorado Potato Breeding and Selection Program intercrossed 98 parental clones in 2013 in two separate crossing blocks. The emphasis of the first crossing block was russet and yellow flesh cultivar development and PVY resistance. The second crossing block emphasized russet and specialty cultivar development and disease resistance, mostly PVY resistance. Seed from 431 combinations was obtained.

Approximately 33,903 first-size seedling tubers representing 154 families were produced from 2012 greenhouse crosses for initial field selection in 2014. An additional 52 families were just harvested for field planting in 2014. These seedlings represent crosses segregating primarily for russets, reds, specialty types, and resistance to late blight, PVY, corky ringspot, and nematodes. Second through fourth size seedling tubers will be distributed to Idaho (USDA-ARS), Maine, North Dakota, Oregon, Texas, Wisconsin, and Alberta, Canada (Agriculture and Agri-Food Canada).

Seedling Selection and Clonal Development

Colorado grew 88,037 first-year seedlings representing 362 families in 2013, with 536 selected for subsequent planting, evaluation, and increase in future years. A portion of these seedlings were obtained from the USDA-ARS (Aberdeen, Idaho), Agriculture Canada, Texas A&M University, and University of Maine. Another 973 clones were in 12-hill, preliminary, and intermediate stages of selection. At harvest, 196 were saved for further increase and evaluation. Eighty-seven advanced selections were saved and will be increased in 2014 pending further evaluation. Another 290 selections and cultivars were maintained for germplasm development, breeding, and other experimental purposes including seed increase/maintenance.

Field trials conducted in 2013 included: Preliminary Trial, Intermediate Yield Trial, Intermediate Specialty Yield Trial, Advanced Yield Trial, Southwest Regional Russet Trial, Southwest Regional Red Trial, Southwest Regional Chip Trial, Southwest Specialty Trial, Western Regional Russet/Processing Trial, Western Regional Red Trial, Western Regional Specialty Trial, San Luis Valley Chipping Trial, and Western Regional Chipping Trial. All trials are grown under "low input" conditions, primarily for reduced nitrogen and fungicide. Tables 2-14 present the data for the various trials. Appendix 1 summarizes the cultural information for the trials planted at the San Luis Valley Research Center in 2013.

A total of 159 samples were evaluated for two or more of the following postharvest characteristics: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, french fry color, french fry texture, and chip color. Appendix 2 lists the procedures used for the postharvest evaluations for the trials.

Eighty-seven advanced selections were saved and will be increased in 2014 pending results of ongoing evaluations. Advanced selections evaluated in the Southwest Regional Trials, Western Regional Trials, or by potato growers in 2013, included 13 russets (AC99375-1RU, AC00395-2RU, CO03276-5RU, CO05024-11RU, CO05040-1RU, CO05068-1RU, CO05110-6RU, CO05132-2RU, CO05149-3RU, CO05152-5RU, CO05175-1RU, CO05189-2RU, and CO05189-3RU), 3 reds (CO04159-1R, CO05211-4R, and CO05228-4R), 10 chippers (AC01151-5W, AC00206-2W, AC03433-1W, AC03452-2W, AC05153-1W, CO02024-9W, CO02033-1W, CO02321-4W, CO03243-3W, and CO05061-6W) and 13 specialties (AC99330-1P/Y, AC05175-3P/Y, ATTX01180-1R/Y, CO97222-1R/R, CO97226-2R/R, CO97232-2R/Y, CO97233-3R/Y, CO04067-8R/Y, CO04056-3P/PW, CO04063-4R/R, CO04099-3W/Y, CO05037-2R/Y, and CO05037-3W/Y).

Several selections are being considered for exclusive release. Included are russets - AC96052-1RU, CO97087-2RU, CO98067-7RU, CO99053-4RU, and CO03276-5RU; reds - CO98012-5R, CO99076-6R, CO99256-2R, CO00277-2R, and CO00291-5R; chippers - CO95051-7W, CO00188-4W, CO00197-3W, and CO00270-7W; and specialties (including yellows) - AC97521-1R/Y, ATC00293-1W/Y, CO97215-2P/P, CO97222-1R/R, CO97226-2R/R, CO97227-2P/PW, CO97232-1R/Y, CO97232-2R/Y, CO99045-1W/Y, CO00405-1R/F, CO00412-5W/Y, CO00415-1R/F, VC0967-2R/Y, VC1002-3W/Y, and VC1009-1W/Y. Any of these selections will be available for exclusive release through Colorado State University. Data summaries for all of these clones are available upon request. For further information contact David Holm.

In 2013, PVP applications were submitted for Masquerade (AC99329-7PW/Y), Crestone Russet (CO99053-3RU), and Mercury Russet (CO99100-1RU). Plant Variety Protection was granted for Mesa Russet. AC99330-1P/Y and CO97233-3R/Y will be named Midnight Moon and Red Luna.

Table 15 summarizes the performance of advanced selections that are available for growers to evaluate in 2014. Detailed data summaries for each of the advanced selections are presented in Tables 16A-AB. Figure 1 includes photographs of these selections. Data summaries for additional selections that are available for exclusive release are available upon request.

Collaborative Studies

The following collaborative studies were conducted in 2013

- Several advanced selections were evaluated for disease symptom expression screening trials in Colorado. These trials were conducted in cooperation with Rob Davidson, Andrew Houser, Kent Sather, and Rick Haslar. Diseases included were bacterial ring rot (35 selections), potato leafroll virus (16 selections), PVY (19 selections), and powdery scab (10 selections) in Colorado. Additionally we provided six selections to Sastry Jayanty for powdery scab evaluations.
- Several advanced selections were distributed to state/USDA-ARS collaborators in Idaho, Michigan, Oregon, Texas, Washington, and Wisconsin for additional disease evaluations. These selections were screened for one or more of the following diseases: late blight, early blight, scab (common and powdery), PVY, *Verticillium* wilt, and zebra chip. In addition, selections were provided to the National Trials for late blight and common scab screening trials.
- Twenty-one advanced selections were evaluated in cultural management trials in collaboration with Samuel Essah.

- Several selections were evaluated for various postharvest characteristics in collaboration with Sastry Jayanty.
- Tubers of selected clones/cultivars were provided to Jairam Vanamala and Lavanya Reddivari to support grant research projects conducted in the Departments of Horticulture and Landscape Architecture and Food Science and Human Nutrition.
- Ten selections were entered in the National Fry Processing Trials conducted in Washington, Idaho, North Dakota, Maine, Wisconsin, Michigan, and Minnesota (screening for common scab and PVY). A focus of these trials is to identify selections with low acrylamide potential that have suitable QSR attributes.
- Eight selections were entered in the National Chip Processing Trials. These trials were planted in up to 11 locations in northern and southern production areas of the US. Trials were conducted in California, Florida, North Carolina, Missouri, Oregon, Michigan, Maine, New York, Texas, North Dakota, and Wisconsin.
- Four selections were entered in the USPB/Snack Food Association Trials. These trials were planted in up to 11 locations in northern and southern production areas of the US. Trials were conducted in California, Florida, Idaho, Maine, Michigan, Missouri, North Carolina, Oregon, Pennsylvania, North Dakota, and Wisconsin.
- Efforts continue, to find outside funding to support nematode resistance studies with Jorge Vivanco and Dayakar Badri. Initial studies aimed at pink rot resistance were initiated in 2010 and continued through 2013.

Graduate Students

Katie Larson, MS student. *Color, Carotenoid Content and Sensory Perceptions in Potato Germplasm from the Colorado Potato Breeding and Selection Program.* Co-advised by David Holm and Sastry Jayanty. More information from Ms. Larson's thesis can be provided upon request.

The major objectives of this research project were: (1) to evaluate and compare the tuber-flesh color of 138 genotypes in the Colorado Potato Breeding and Selection Program; (2) to measure select genotypes for total and individual carotenoid content; (3) to evaluate 12 select genotypes for volatile flavor compounds present using both steamed and microwaved cooking methods; and (4) to perform a sensory analysis for 5 select genotypes using both steamed and microwaved cooking methods.

Tuber flesh color was measured using a reflectance colorimeter to determine the chroma and hue of each genotype. Chroma indicates the intensity or saturation of a color and hue measures true color. A subset of 100 genotypes, 65 tetraploids and 35 diploids, were then analyzed for total carotenoid content. Carotenoids are phytonutrients produced in the tuber flesh of potatoes that contain various health benefits such as reduction of cardiovascular diseases, some cancers, and macular degeneration. Eight select genotypes were analyzed for carotenoid composition. The specific carotenoids detected were antheraxanthin, cryptoxanthin, lutein, neoxanthin, violaxanthin, and zeaxanthin. Volatile flavor compounds were analyzed in 12 select genotypes, including two diploid genotypes with high carotenoid levels, using both microwaved and steamed cooking methods. A sensory evaluation was done on a

subset of 5 genotypes that were analyzed for volatile compounds. The sensory evaluation used both microwaved and steamed cooking methods and included 98 untrained panelists. This research project provided insight into the tuber flesh color, carotenoid content, volatile profiles, and sensory assessment of various genotypes from the Colorado Potato Breeding and Selection Program.

Sara Kammlade, MS student. *The Influence of Agromanagement on Soil Health and Potato Mineral Nutrients.* Co-advised by David Holm and Samuel Essah.

Previous studies have observed differences in the mineral nutrient concentrations of food crops when grown in conventional versus organic systems. However, they have not accounted for inherent dissimilarities in the agroecosystems as a result of differing agromanagement, which may explain how and why such differences are observed. Agromanagement (rotation, fertilizer, pesticide inputs etc.) shapes soil health – the biological, chemical, and physical properties of soil. Soil organisms – bacteria, fungi, protozoa, and nematodes – are essential in regulating biogeochemical cycling and are therefore critical in crop mineral nutrient acquisition. By studying a spectrum of management practices from a conventional "feed the plant" paradigm to a biological "feed the soil" paradigm we can see how these management systems alter soil health and how, in turn, this influences potato mineral nutrients.

The objectives of this research are to:

1. Characterize how a spectrum of agromanagement practices, alter soil health;
2. Determine if and what certain soil health metrics correspond to higher potato mineral nutrients;
3. Determine the heritability of potato mineral nutrients to determine if high mineral nutrient concentration can be selectively bred for; and
4. Determine the stability of potato mineral nutrient uptake to identify clones that exhibit a stable response across many agroecosystems.

Raven Bough, MS student. *Screening Potato Germplasm for Flavor Utilizing HS-SPME/GC-MS and Sensory Panel Analyses.* Co-advised by David Holm and Sastry Jayanty.

The development of potato cultivars with improved flavor in the San Luis Valley has the potential to expand the region's fresh potato market by focusing on consumer appeal. Through analysis of existing cultivars, the objective of this project is to establish a flavor rating methodology for potato selections based on correlation of HS-SPME/GC-MS quantification of major flavor compounds and sensory panel tests. Flavor ratings will guide germplasm screening in the breeding process, which will enable the development of new cultivars with improved flavor.

Table 1. Generalized potato breeding and selection scheme used at the SLV Research Center.

Year	Comments
1	Select parents for crossing and true seed production in the greenhouse.
2	Produce seedling tubers from true seed in the greenhouse.
3	70,000-80,000 seedling tubers planted in the field as single hills. Several thousand tubers are obtained from other breeding programs. Initial selection of this material takes place at harvest. First cycle of field selection.
4	Twelve-hills of each single-hill selection are planted. Second cycle of field selection.
5	Preliminary Selections Tier 1 (PT1). Third cycle of field selection (48 plant tuber-unit seed increase). Initial evaluations for chipping qualities (chip color after various storage regimes and specific gravity) are conducted this year and subsequently.
6	Preliminary Selections Tier 2 (PT2). Fourth cycle of field selection (96 plant tuber-unit seed increase). Initial evaluations to characterize selections for blackspot bruise potential, storage weight loss, dormancy, and enzymatic browning. Initial evaluations for french fry potential (french fry color and specific gravity) are conducted this year and subsequently. Evaluations for chipping qualities are continued.
7	Intermediate Selections. Fifth cycle of field selection. Initial data collected on yield, grade, and growth characteristics. Plant a 144 plant tuber-unit seed increase and a 2 rep x 25 plants intermediate yield trial (IYT).
8-14+	<p>Advanced Selections: Includes selections that have advanced from the IYT. Additional selections are included that have graduated from the Southwest Regional and Western Regional Trials. The advanced yield trials for reds, specialty types, and chippers are planted with entries in the Western Regional Red, Specialty and Chip Trials. Selections are in the 6th-12th+ cycles of field selection. All advanced yield trials (AYT) have 4 reps x 25 plants. Sixth and seventh cycle field selections respectively have a 400/1,200 plant tuber-unit seed increase. All 8th year selections have up to a 1/3 acre tuber-unit seed increase planted. All 9th year and older selections generally have up to a ½ acre or more of seed increase depending on grower demand.</p> <p>Selections in the sixth cycle of selection are indexed for viruses and cleanup/micropropagation is initiated. Testing for ring rot and PLRV reaction is also initiated at this stage and continues as needed. Selections in the 7th cycle of field selection are entered into cultural management trials and postharvest disease reaction (dry rot and soft rot) evaluations.</p>
10	All 8 th year selections are entered in the Southwest Regional Trials (4 locations - CO, TX, two in CA). Cultural management trials and postharvest disease reaction evaluations continue as needed.
11-13	All 9 th -11 th year selections are entered in the Western Regional Trials (4 trials): main (russets and long whites), reds, specialties, and chippers. The Western Coordinating Committee (WERA027) directs these trials at 10+ locations in the Western United States each year. Cultural management trials and postharvest disease reaction evaluations continue as needed.
11+	Grower/industry evaluations. The Colorado Potato Breeding and Selection Project relies on the cooperation of several growers, shippers, and processors to evaluate advanced selections for adaptability and marketability.
14+	Release as a named cultivar.

Table 2A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Preliminary Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC06336-1R/Y	5.0	4.6	4.8	4.0	97	4.4
AC08064-1RU	5.0	5.0	5.0	2.5	97	4.4
CO08020-2RU	5.0	5.0	5.0	2.1	83	4.6
CO08029-1RF/R	---	---	---	2.0	118	---
CO08030-5R/R	---	---	---	2.4	76	---
CO08045-9RF/R	---	---	---	2.5	118	---
CO08061-1P/P	---	---	---	2.8	83	---
CO08065-2RU	5.0	4.8	4.9	4.6	104	4.2
CO08071-6RU	5.0	4.7	4.9	3.4	118	4.4
CO08155-2RU	5.0	4.9	5.0	2.8	89	4.8
CO08164-1RU	5.0	5.0	5.0	2.2	104	4.2
CO08178-12RU	5.0	4.9	5.0	2.4	83	4.2
CO08231-1RU	5.0	4.8	4.9	3.3	83	4.6
CO08352-2P/P	---	---	---	3.3	97	---
NDC081655-1R	4.8	5.0	4.9	3.4	104	4.2
Canela Russet	5.0	5.0	5.0	2.8	125	4.8
Centennial Russet	5.0	5.0	5.0	4.1	83	4.8
Purple Majesty	---	---	---	3.5	66	---
Rio Grande Russet	5.0	5.0	5.0	3.6	109	4.0
Russet Burbank	5.0	5.0	5.0	1.6	116	4.0
Russet Norkotah-S3	5.0	5.0	5.0	2.0	117	3.8
Russet Nugget	5.0	5.0	5.0	1.9	102	4.2
Sangre-S10	5.0	5.0	5.0	2.1	109	4.4
Yukon Gold	5.0	4.8	4.9	1.4	96	4.4

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 2B. Specific gravity, french fry color, and texture for Preliminary Trial clones - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
AC06336-1R/Y	1.082	1	1	3	3
AC08064-1RU	1.085	3	3	3	3
CO08020-2RU	1.082	3	3	3	2
CO08029-1RF/R	1.081	---	---	3	3
CO08030-5R/R	1.080	---	---	3	2
CO08045-9RF/R	1.057	---	---	1	2
CO08061-1P/P	1.078	---	---	3	3
CO08065-2RU	1.099	0	0	4	4
CO08071-6RU	1.094	0	1	3	4
CO08155-2RU	1.085	1	1	3	3
CO08164-1RU	1.085	3	3	3	2
CO08178-12RU	1.082	3	2	3	3
CO08231-1RU	1.081	2	2	2	3
CO08352-2P/P	1.092	---	---	3	2
NDC081655-1R	1.083	0	2	2	2
Canela Russet	1.079	2	3	4	3
Centennial Russet	1.068	3	4	2	2
Purple Majesty	1.081	---	---	2	1
Rio Grande Russet	1.074	2	3	3	3
Russet Burbank	1.080	1	2	3	3
Russet Norkotah-S3	1.070	4	4	3	3
Russet Nugget	1.098	0	1	4	4
Sangre-S10	1.075	3	4	2	3
Yukon Gold	1.092	1	3	3	3

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 3A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley Chipping study entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC00206-2W	4.9	4.3	4.6	3.6	79	5.0
AC01144-1W	4.9	4.8	4.9	2.0	104	4.2
AC01151-5W	5.0	5.0	5.0	2.7	94	2.2
AC03433-1W	4.6	4.6	4.6	3.2	87	4.6
AC03452-2W	5.0	5.0	5.0	2.4	59	4.8
AC05153-1W	4.8	3.9	4.4	5.1	81	3.2
AC08094-2W	5.0	4.7	4.9	3.1	146	4.4
CO95051-7W	5.0	2.7	3.9	4.2	84	2.6
CO02024-9W	5.0	4.7	4.9	3.0	104	4.2
CO02033-1W	4.6	4.7	4.7	4.4	104	4.5
CO02321-4W	5.0	4.5	4.8	4.2	87	4.2
CO03243-3W	5.0	4.5	4.8	3.1	79	3.2
CO05061-2P	4.9	3.5	4.2	3.4	61	3.0
CO05061-6W	4.5	3.7	4.1	2.7	81	4.0
CO07070-10W	4.3	3.6	4.0	2.6	103	4.6
CO07070-13W	4.8	4.0	4.4	3.8	82	4.6
Atlantic	4.0	3.3	3.7	2.8	87	5.0
Chipeta	4.8	4.3	4.6	2.5	105	4.6
Snowden	4.3	3.1	3.7	2.5	95	2.8

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth: Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 3B. Chip color¹ after various storage regimes and specific gravity of San Luis Valley Chipping study entries - 2013.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
AC00206-2W	1.084	3.0	3.0	1.0	2.5
AC01144-1W	1.080	3.0	3.5	1.0	3.0
AC01151-5W	1.078	5.0	4.0	1.0	2.0
AC03433-1W	1.078	3.0	3.0	1.0	2.0
AC03452-2W	1.073	3.0	3.5	1.0	2.5
AC05153-1W	1.087	4.5	4.0	2.5	2.5
AC08094-2W	1.081	5.0	4.5	2.5	2.0
AC09033-3W	1.087	5.0	4.5	1.5	3.0
CO95051-7W	1.107	3.5	1.5	1.0	1.5
CO02024-9W	1.080	4.0	3.0	1.0	1.0
CO02033-1W	1.091	3.0	3.0	2.0	1.0
CO02321-4W	1.092	3.5	2.5	2.0	2.0
CO03243-3W	1.084	3.5	3.0	1.0	2.0
CO05061-2P	1.091	2.5	1.5	1.5	2.0
CO05061-6W	1.091	3.5	3.5	2.0	2.5
CO07070-10W	1.103	4.0	3.5	2.0	3.0
CO07070-13W	1.090	3.0	3.0	1.5	2.0
TC09403-4W	1.076	4.0	4.0	2.0	2.0
Atlantic	1.103	5.0	4.0	2.0	2.0
Chipeta	1.087	5.0	4.5	2.0	3.5
Snowden	1.108	4.5	1.5	1.5	2.0

¹ Chip color was rated using the Snack Food Association 1-5 scale. Ratings of ≤ 2.0 are acceptable.

Table 4A. Yield, grade and tuber shape for Intermediate Main Yield Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape L:W/W:T
	Total	US #1			<4 oz		
		Total	%	4-10 oz			
CO07014-1RU	311	213	67	173	40	97	1.66/1.15
CO07015-4RU	308	246	78	211	35	58	1.75/1.20
CO07030-1RU/Y	304	214	69	192	23	90	1.77/1.22
CO07049-1RU	341	251	73	241	9	90	1.69/1.31
CO07105-4RU/Y	390	267	69	267	0	122	1.29/1.29
CO07205-4RU	269	192	71	188	5	74	1.91/1.22
CO07222-1RU	312	232	73	224	9	79	1.63/1.26
CO07357-4RU	235	164	69	157	8	68	1.72/1.22
Canela Russet	306	292	96	191	101	14	1.89/1.21
Russet Norkotah	211	182	86	135	46	25	1.87/1.21
Mean	299	225	75	198	28	72	1.72/1.23
LSD ² (0.05)	63	76	15	55	44	38	0.08/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 4B. Grade defects for Intermediate Main Yield Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO07014-1RU	0.2	MS*	0.0
CO07015-4RU	0.0		0.0
CO07030-1RU/Y	0.0		0.0
CO07049-1RU	0.0		0.0
CO07105-4RU/Y	0.0		0.0
CO07205-4RU	0.9	MS*	0.0
CO07222-1RU	0.3	GR*	0.0
CO07357-4RU	1.0	MS*	0.0
Canela Russet	0.0		0.0
Russet Norkotah	2.1	GR*	0.0

¹ Percent external defects based on the proportion of the total sample weight with significant defects.

² MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³ Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 4C. Growth characteristics of Intermediate Main Yield Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO07014-1RU	100	3.0	3.5	3.2	2.5	3.0	3.0
CO07015-4RU	96	3.0	3.5	4.3	2.5	3.0	2.5
CO07030-1RU/Y	94	3.0	3.0	4.5	2.5	2.5	1.5
CO07049-1RU	98	3.0	3.5	3.7	3.5	3.0	3.0
CO07105-4RU/Y	100	3.0	3.5	4.1	3.5	3.0	3.0
CO07205-4RU	100	3.5	2.5	4.5	2.5	3.0	1.5
CO07222-1RU	100	4.0	3.0	2.8	3.5	3.0	2.5
CO07357-4RU	100	3.0	2.5	4.4	2.0	2.0	1.5
Canela Russet	98	3.0	1.5	1.7	3.5	4.0	3.5
Russet Norkotah	94	3.5	2.5	4.0	2.0	2.5	1.0
Mean	98	3.2	2.9	3.7	2.8	2.9	2.3
LSD ⁶ (0.05)	6	0.8	0.7	1.3	0.7	0.7	0.8

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference.

Table 4D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Main Yield Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO07014-1RU	4.6	4.2	4.4	3.6	104	3.6
CO07015-4RU	4.7	4.3	4.5	3.2	90	3.4
CO07030-1RU/Y	5.0	4.2	4.6	5.8	41	3.0
CO07049-1RU	5.0	4.9	5.0	5.2	90	4.0
CO07105-4RU/Y	3.0	2.5	2.8	2.8	104	2.4
CO07205-4RU	5.0	4.7	4.9	2.7	90	4.0
CO07222-1RU	5.0	5.0	5.0	4.2	83	4.4
CO07357-4RU	5.0	4.9	5.0	2.7	104	4.8
Canela Russet	5.0	5.0	5.0	2.7	83	5.0
Russet Norkotah	5.0	5.0	5.0	2.7	90	2.4

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 4E. Specific gravity, french fry color, and texture for Intermediate Main Yield Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
CO07014-1RU	1.101	0	1	4	4
CO07015-4RU	1.085	1	2	4	4
CO07030-1RU/Y	1.092	1	2	2	4
CO07049-1RU	1.082	1	2	3	3
CO07105-4RU/Y	1.088	3	3	2	3
CO07205-4RU	1.081	1	1	2	3
CO07222-1RU	1.093	2	3	3	4
CO07357-4RU	1.084	1	2	3	4
Canela Russet	1.092	1	2	3	4
Russet Norkotah	1.079	2	2	3	4

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 5A. Yield, grade and tuber shape for Intermediate Specialty Yield Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1			<4 oz		
		Total	%	4-10 oz			
AC06358-1W/Y	567	400	71	327	73	160	1.23/1.27
AC06358-2W/Y	351	139	40	137	2	212	1.20/1.33
AC06725-1W/Y	407	217	53	211	7	184	1.13/1.18
ATC06258-1R/Y	280	29	10	29	0	251	1.13/1.19
CO07044-2W/Y	288	30	11	30	0	259	1.16/1.24
CO07099-2R	382	229	60	220	9	146	1.23/1.10
CO07102-1R	400	256	64	247	9	137	1.17/1.23
CO07114-2RW/Y	483	288	59	260	28	195	1.11/1.25
CO07131-1RW/Y	110	0	0	0	0	110	1.09/1.06
CO07150-1W/Y	305	49	16	49	0	256	1.24/1.14
CO07153-3RW/Y	453	255	56	245	10	196	1.25/1.23
CO07322-3R	271	155	55	135	20	113	1.26/1.12
CO07329-1P/Y	498	395	79	304	91	97	1.13/1.33
CO07370-1W/Y	423	284	67	264	20	135	1.08/1.19
Sangre-S10	552	466	85	280	186	53	1.22/1.22
Yukon Gold	330	259	78	165	94	53	1.23/1.23
Mean	381	216	50	181	34	160	1.18/1.21
LSD ² (0.05)	88	90	13	77	33	38	0.06/0.05

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 5B. Grade defects for Intermediate Specialty Yield Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC06358-1W/Y	1.2	MS, GC, GR*	0.0
AC06358-2W/Y	0.0		0.0
AC06725-1W/Y	1.3	MS*	0.0
ATC06258-1R/Y	0.0		0.0
CO07044-2W/Y	0.0		0.0
CO07099-2R	1.6	GC*	0.0
CO07102-1R	2.0	MS, GR*	0.0
CO07114-2RW/Y	0.0		0.0
CO07131-1RW/Y	0.0		0.0
CO07150-1W/Y	0.0		0.0
CO07153-3RW/Y	0.6	GC*, GR*	0.0
CO07322-3R	1.1	GR*	0.0
CO07329-1P/Y	1.0	MS*, GC	0.0
CO07370-1W/Y	1.1	GR*	0.0
Sangre-S10	6.0	MS, GC*, GR	0.0
Yukon Gold	5.6	MS, GC, GR*	1.1

¹ Percent external defects based on the proportion of the total sample weight with significant defects.

² MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³ Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 5C. Growth characteristics of Intermediate Specialty Yield Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC06358-1W/Y	98	3.0	3.5	2.4	4.0	3.0	3.5
AC06358-2W/Y	86	3.0	3.5	2.8	4.5	3.0	4.0
AC06725-1W/Y	98	4.0	3.5	4.4	3.0	2.5	3.0
ATC06258-1R/Y	100	3.0	3.5	5.3	2.5	3.0	2.0
CO07044-2W/Y	100	3.0	3.0	5.4	3.0	3.0	2.5
CO07099-2R	100	3.5	2.0	4.0	4.0	3.0	3.0
CO07102-1R	94	3.5	3.0	3.9	3.0	3.0	2.0
CO07114-2RW/Y	96	3.0	3.5	6.1	4.0	3.0	3.0
CO07131-1RW/Y	100	3.0	1.0	7.3	2.0	3.0	2.5
CO07150-1W/Y	100	4.0	3.5	5.3	3.0	3.0	3.0
CO07153-3RW/Y	98	3.5	3.5	4.8	3.0	3.0	3.0
CO07322-3R	98	3.5	2.5	3.0	2.5	2.5	3.5
CO07329-1P/Y	98	3.5	3.0	2.7	5.0	3.0	4.0
CO07370-1W/Y	100	3.5	3.0	4.7	5.0	3.5	5.0
Sangre-S10	100	3.5	2.5	3.0	4.5	3.0	4.0
Yukon Gold	96	3.5	3.0	2.3	3.0	3.0	3.0
Mean	98	3.4	3.0	4.2	3.5	3.0	3.2
LSD ⁶ (0.05)	6	NS	1.2	1.3	0.8	0.7	0.9

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference; NS=not significant.

Table 5D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Specialty Yield Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC06358-1W/Y	5.0	4.8	4.9	4.0	104	4.0
AC06358-2W/Y	5.0	4.5	4.8	5.3	62	5.0
AC06725-1W/Y	5.0	5.0	5.0	5.6	75	4.8
ATC06258-1R/Y	5.0	4.3	4.7	5.9	41	3.0
CO07044-2W/Y	4.9	4.8	4.9	5.8	55	4.2
CO07099-2R	5.0	5.0	5.0	5.8	75	3.8
CO07102-1R	5.0	4.5	4.8	9.5	55	1.6
CO07114-2RW/Y	5.0	4.9	5.0	4.4	69	3.2
CO07131-1RW/Y	4.1	3.7	3.9	11.4	20	1.6
CO07150-1W/Y	5.0	5.0	5.0	9.3	20	3.4
CO07153-3RW/Y	5.0	5.0	5.0	6.8	48	2.0
CO07322-3R	4.4	4.3	4.4	3.6	90	2.2
CO07329-1P/Y	5.0	5.0	5.0	3.3	118	2.2
CO07370-1W/Y	4.6	4.3	4.5	6.3	75	3.0
Sangre-S10	5.0	5.0	5.0	2.8	97	3.4
Yukon Gold	5.0	5.0	5.0	1.9	90	4.6

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 5E. Specific gravity, french fry color, and texture for Intermediate Specialty Yield Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
AC06358-1W/Y	1.073	4	3	2	1
AC06358-2W/Y	1.084	4	3	1	2
AC06725-1W/Y	1.087	0	2	3	3
ATC06258-1R/Y	1.070	3	4	1	1
CO07044-2W/Y	1.098	0	1	4	4
CO07099-2R	1.081	2	4	3	2
CO07102-1R	1.084	1	1	3	3
CO07114-2RW/Y	1.083	2	3	3	2
CO07131-1RW/Y	1.072	1	3	2	2
CO07150-1W/Y	1.082	0	1	2	2
CO07153-3RW/Y	1.095	3	2	3	3
CO07322-3R	1.082	2	3	4	3
CO07329-1P/Y	1.076	2	3	3	3
CO07370-1W/Y	1.072	2	3	3	2
Sangre-S10	1.074	3	4	2	3
Yukon Gold	1.083	2	3	3	2

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 6A. Yield, grade and tuber shape for Advanced Yield Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
AC05039-2RU	284	253	89	190	62	27	1.79/1.14
CO06024-7RU	416	353	85	309	45	60	1.76/1.18
CO06032-1RU	406	305	75	283	22	97	1.61/1.24
CO06057-3RU	371	250	67	245	5	116	1.87/1.16
CO06062-3RU	254	135	53	131	5	114	1.83/1.23
Canela Russet	257	237	92	179	58	19	1.88/1.24
Russet Norkotah	169	111	65	101	10	54	1.87/1.23
Mean	308	235	75	205	29	70	1.80/1.20
LSD ² (0.05)	48	45	6	39	17	19	0.08/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 6B. Grade defects for Advanced Yield Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC05039-2RU	1.6	MS*, GC, GR	0.6
CO06024-7RU	0.5	GR*	0.0
CO06032-1RU	1.3	MS*, GR	0.0
CO06057-3RU	1.2	GC*, GR	0.0
CO06062-3RU	1.7	MS, GC*	0.0
Canela Russet	0.7	GR*	0.0
Russet Norkotah	2.1	MS*	0.0

¹Percent external defects based on the proportion of the total sample weight with significant defects.

²MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 6C. Growth characteristics of Advanced Yield Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC05039-2RU	100	3.3	3.0	3.0	2.3	2.3	1.8
CO06024-7RU	99	2.8	2.8	2.9	4.0	3.0	3.5
CO06032-1RU	98	3.3	3.5	4.1	4.0	3.0	3.0
CO06057-3RU	100	3.3	3.5	5.8	3.3	3.0	3.0
CO06062-3RU	98	3.0	3.3	7.0	2.0	2.5	1.3
Canela Russet	96	3.0	1.8	1.6	3.3	4.0	3.5
Russet Norkotah	96	3.3	2.3	3.6	1.8	2.3	1.0
Mean	98	3.1	2.9	4.0	2.9	2.9	2.4
LSD ⁶ (0.05)	4	NS	0.6	1.0	0.6	0.5	0.5

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference; NS=not significant.

Table 6D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced Yield Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC05039-2RU	5.0	4.7	4.9	3.0	83	4.2
CO06024-7RU	5.0	5.0	5.0	6.9	90	3.4
CO06032-1RU	5.0	5.0	5.0	4.0	62	4.4
CO06057-3RU	5.0	4.5	4.8	7.6	55	3.6
CO06062-3RU	5.0	5.0	5.0	6.6	55	3.8
Canela Russet	5.0	5.0	5.0	4.8	140	5.0
Russet Norkotah	5.0	4.7	4.9	3.2	90	3.2

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 6E. Specific gravity, french fry color, and texture for Advanced Yield Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
AC05039-2RU	1.088	1	2	4	4
CO06024-7RU	1.088	2	4	3	4
CO06032-1RU	1.089	1	2	3	3
CO06057-3RU	1.097	0	0	4	4
CO06062-3RU	1.087	0	0	3	3
Canela Russet	1.092	3	3	3	3
Russet Norkotah	1.079	2	3	3	3

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 7A . Yield, grade and tuber shape for Southwest Regional Russet Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1			<4 oz		
		Total	%	4-10 oz			
CO05024-11RU	375	301	80	275	26	69	1.72/1.21
CO05040-1RU	361	254	70	232	22	100	1.69/1.20
CO05068-1RU	420	371	88	254	117	31	1.79/1.24
CO05110-6RU	299	255	85	215	40	42	1.82/1.23
CO05149-3RU	283	213	75	176	38	67	2.11/1.19
CO05152-5RU	401	334	83	297	37	63	1.75/1.15
CO05175-1RU	410	378	92	206	172	25	2.13/1.21
CO05189-2RU	323	225	69	212	14	97	1.85/1.27
CO05189-3RU	315	292	92	131	161	18	1.65/1.23
CO05132-2RU	265	209	79	179	30	40	1.78/1.16
Canela Russet	214	190	88	161	28	23	1.87/1.22
Russet Norkotah	159	101	59	79	22	55	1.97/1.17
Mean	319	260	80	201	59	53	1.84/1.20
LSD ² (0.05)	50	54	9	42	33	19	0.11/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 7B. Grade defects for Southwest Regional Russet Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO05024-11RU	1.1	GC, GR*	0.0
CO05040-1RU	2.2	GC*, GR	0.0
CO05068-1RU	4.2	MS, GR*	0.3
CO05110-6RU	0.7	MS*, GC, GR	0.0
CO05149-3RU	1.2	GC*, GR*	0.8
CO05152-5RU	1.0	MS*, GR*	0.0
CO05175-1RU	1.7	MS*, GR*	0.8
CO05189-2RU	0.0		0.0
CO05189-3RU	1.4	MS*, GR*	0.3
CO05132-2RU	6.1	MS, GC*, GR	0.0
Canela Russet	0.6	MS*	0.0
Russet Norkotah	1.9	MS*, GR	0.9

¹Percent external defects based on the proportion of the total sample weight with significant defects.

²MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 7C. Growth characteristics of Southwest Regional Russet Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO05024-11RU	99	3.8	3.5	3.9	3.8	3.0	3.0
CO05040-1RU	96	3.3	3.5	3.2	4.0	3.0	3.0
CO05068-1RU	98	3.5	3.0	2.7	4.5	3.0	4.0
CO05110-6RU	100	3.8	2.3	2.5	2.5	2.8	2.3
CO05149-3RU	98	3.0	3.5	3.7	2.8	2.0	2.0
CO05152-5RU	99	3.5	3.8	2.9	3.0	2.5	2.5
CO05175-1RU	92	3.0	3.3	3.4	4.0	2.8	3.3
CO05189-2RU	96	2.8	2.0	3.6	2.3	2.8	2.3
CO05189-3RU	99	3.5	2.8	2.0	2.8	3.0	2.8
CO05132-2RU	96	3.5	3.0	3.2	3.0	2.5	2.8
Canela Russet	88	3.5	1.0	1.2	3.3	4.3	3.8
Russet Norkotah	95	2.8	2.5	3.4	2.0	2.5	1.0
Mean	96	3.3	2.8	3.0	3.1	2.8	2.7
LSD6 (0.05)	6	0.7	0.6	0.5	0.7	0.6	0.6

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference.

Table 7D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Russet Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO05024-11RU	5.0	5.0	5.0	3.8	69	4.2
CO05040-1RU	5.0	5.0	5.0	5.5	90	3.8
CO05068-1RU	5.0	4.8	4.9	3.7	62	2.4
CO05110-6RU	5.0	4.8	4.9	2.4	104	1.8
CO05149-3RU	5.0	5.0	5.0	5.3	55	4.4
CO05152-5RU	5.0	5.0	5.0	3.2	69	3.4
CO05175-1RU	5.0	5.0	5.0	4.0	69	3.0
CO05189-2RU	5.0	5.0	5.0	2.3	83	4.8
CO05189-3RU	5.0	4.9	5.0	4.3	125	3.0
CO05132-2RU	5.0	5.0	5.0	2.7	97	4.2
Canela Russet	5.0	5.0	5.0	3.9	139	4.4
Russet Norkotah	5.0	5.0	5.0	2.5	90	3.0

¹ Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

² Tubers were stored at 45F for 91 days.

³ Days from harvest to first visible growth. Tubers were stored at 45F.

⁴ Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 7E. Specific gravity, french fry color, and texture for Southwest Regional Russet Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
CO05024-11RU	1.086	1	2	3	3
CO05040-1RU	1.081	1	2	5	4
CO05068-1RU	1.097	0	0	4	4
CO05110-6RU	1.081	0	1	4	4
CO05149-3RU	1.087	0	0	4	4
CO05152-5RU	1.085	1	2	4	4
CO05175-1RU	1.083	1	1	3	4
CO05189-2RU	1.084	2	3	3	3
CO05189-3RU	1.075	2	2	3	3
CO05132-2RU	1.086	0	0	4	4
Canela Russet	1.086	2	3	5	4
Russet Norkotah	1.077	1	3	2	2

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 8A. Yield, grade and tuber shape for Southwest Regional Red Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
CO05211-4R	311	96	31	96	0	215	1.25/1.14
CO05228-4R	341	134	39	133	1	207	1.11/1.12
Chieftain	443	402	91	261	141	39	1.26/1.31
Red LaSoda	334	283	85	201	82	46	1.13/1.24
Sangre-S10	479	412	86	234	178	49	1.24/1.23
Mean	382	266	66	185	81	111	1.20/1.21
LSD ² (0.05)	39	51	7	36	36	21	0.05/0.05

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 8B. Grade defects for Southwest Regional Red Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO05211-4R	0.0		0.0
CO05228-4R	0.0		0.0
Chieftain	0.4	GC*, GR*	3.9
Red LaSoda	1.5	GC*, GR*	2.1
Sangre-S10	3.6	MS, GC*, GR	0.3

¹Percent external defects based on the proportion of the total sample weight with significant defects.

²MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 8C. Growth characteristics of Southwest Regional Red Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO05211-4R	99	3.5	2.0	5.4	3.0	3.0	2.8
CO05228-4R	99	3.5	2.5	7.7	3.0	2.8	2.8
Chieftain	99	3.3	3.0	2.0	3.3	3.0	3.0
Red LaSoda	98	3.3	3.5	3.0	2.8	2.3	1.3
Sangre-S10	97	2.5	2.5	2.7	4.3	3.0	3.5
Mean	98	3.2	2.7	4.1	3.3	2.8	2.7
LSD6 (0.05)	3	0.9	0.9	1.1	0.6	0.5	0.6

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference.

Table 8D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Red Trial entries - 2013.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight Loss ²		
CO05211-4R	4.8	4.7	4.8	3.6	111	1.6
CO05228-4R	4.9	4.7	4.8	9.0	75	2.2
Chieftain	5.0	4.9	5.0	3.8	111	4.4
Red LaSoda	5.0	5.0	5.0	4.2	75	2.2
Sangre-S10	5.0	5.0	5.0	2.4	90	2.6

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 8E. Specific gravity, french fry color, and texture for Southwest Regional Red Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
CO05211-4R	1.081	2	2	2	2
CO05228-4R	1.083	0	3	3	3
Chieftain	1.082	2	3	2	3
Red LaSoda	1.076	3	3	2	2
Sangre-S10	1.078	3	4	3	2

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 9A . Yield, grade and tuber shape for Southwest Regional Specialty Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
AC05175-3P/Y	267	135	50	130	5	133	1.10/1.18
ATTX01180-1R/Y	331	185	56	171	14	136	1.44/1.18
CO05037-2R/Y	300	73	25	73	0	226	1.95/1.19
CO05037-3W/Y	415	218	52	215	2	194	1.10/1.32
Chieftain	468	417	89	247	170	40	1.21/1.27
Purple Majesty	358	122	33	108	14	230	1.43/1.23
Mean	357	192	51	157	34	160	1.37/1.23
LSD ² (0.05)	51	49	10	50	19	32	0.08/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 9B. Grade defects for Southwest Regional Specialty Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC05175-3P/Y	0.0		0.0
ATTX01180-1R/Y	2.9	GC*, GR	0.0
CO05037-2R/Y	0.0		0.0
CO05037-3W/Y	0.9	MS, GC, GR*	0.0
Chieftain	2.3	MS*, SG*, GR*	1.5
Purple Majesty	1.6	MS*	0.8

¹Percent external defects based on the proportion of the total sample weight with significant defects.

²MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 9C. Growth characteristics of Southwest Regional Specialty Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC05175-3P/Y	93	3.3	2.8	3.2	2.0	2.5	1.0
ATTX01180-1R/Y	92	3.0	2.5	3.9	3.0	3.0	2.5
CO05037-2R/Y	99	3.3	2.3	5.5	3.3	3.0	3.0
CO05037-3W/Y	93	3.3	3.8	7.4	3.3	3.0	2.8
Chieftain	96	3.8	3.3	2.2	3.3	3.0	3.0
Purple Majesty	97	2.8	3.3	4.8	3.0	2.5	2.3
Mean	95	3.2	3.0	4.5	3.0	2.8	2.4
LSD6 (0.05)	6	0.9	0.6	0.8	0.5	0.4	0.6

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference.

Table 9D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Specialty Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC05175-3P/Y	5.0	5.0	5.0	4.3	75	3.6
ATTX01180-1R/Y	4.8	4.5	4.7	3.3	83	3.0
CO05037-2R/Y	4.8	4.7	4.8	3.1	62	4.4
CO05037-3W/Y	5.0	5.0	5.0	2.8	83	3.2
Chieftain	5.0	5.0	5.0	3.3	111	3.6
Purple Majesty	---	---	---	2.1	62	---

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 9E. Specific gravity, french fry color, and texture for Southwest Regional Specialty Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
AC05175-3P/Y	1.069	1	0	3	3
ATTX01180-1R/Y	1.083	2	4	2	2
CO05037-2R/Y	1.085	1	1	3	3
CO05037-3W/Y	1.079	1	3	3	3
Chieftain	1.081	2	3	3	3
Purple Majesty	1.084	---	---	3	2

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 10A. Yield, grade and tuber shape for Southwest Regional Chipping Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1			<4 oz		
		Total	%	4-10 oz			
AC05153-1W	337	204	60	190	14	129	1.07/1.29
CO05061-6W	362	267	74	245	22	93	1.13/1.13
Atlantic	441	340	77	195	145	74	1.11/1.25
Chipeta	522	437	83	223	214	53	1.24/1.21
Mean	416	312	73	213	99	87	1.13/1.22
LSD ² (0.05)	48	64	7	47	44	23	0.05/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference; NS=not significant.

Table 10B. Grade defects for Southwest Regional Chipping Trial entries - 2013.

Clone	% External Defects		% Hollow Heart ³
	Defects ¹	Defects Observed ²	
AC05153-1W	1.1	MS*	0.0
CO05061-6W	0.5	MS*, GC	0.0
Atlantic	6.5	MS, GC*, GR	7.7
Chipeta	6.4	MS, GC*, GR	2.4

¹Percent external defects based on the proportion of the total sample weight with significant defects.

²MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 10C. Growth characteristics of Southwest Regional Chipping Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC05153-1W	96	3.8	3.5	4.8	2.8	3.0	2.8
CO05061-6W	97	3.5	3.8	2.9	3.3	3.0	3.0
Atlantic	100	3.5	3.5	2.7	4.0	3.0	3.0
Chipeta	99	4.0	4.8	3.0	5.0	3.0	3.8
Mean	98	3.7	3.9	3.3	3.8	3.0	3.1
LSD ⁶ (0.05)	4	NS	0.5	0.6	0.5	NS	0.6

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference; NS=not significant.

Table 10D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Chipping Trial entries - 2013.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight Loss ²		
AC05153-1W	4.8	4.7	4.8	5.3	83	2.0
CO05061-6W	5.0	4.0	4.5	2.8	83	3.4
Atlantic	4.5	4.1	4.3	3.9	90	4.8
Chipeta	5.0	4.7	4.9	2.7	97	4.4

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 10E. Chip color¹ after various storage regimes and specific gravity of Southwest Regional Chipping Trial entries - 2013.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
AC05153-1W	1.087	3.5	3.5	1.5	2.0
CO05061-6W	1.088	3.0	3.0	1.5	1.5
Atlantic	1.096	5.0	4.5	3.0	2.0
Chipeta	1.086	5.0	5.0	2.5	3.5

¹ Chip color was rated using the Snack Food Association 1-5 scale. Ratings of ≤ 2.0 are acceptable.

Table 11A. Yield, grade and tuber shape for Western Regional Main Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1			<4 oz		
		Total	%	4-10 oz			
A02062-1TE	220	199	91	136	63	19	2.23/1.17
A02138-2	299	236	79	212	24	60	1.66/1.17
A02424-83LB	394	288	73	267	21	97	2.07/1.19
A02507-2LB	312	274	87	184	89	28	1.81/1.18
A03158-2TE	418	375	90	286	89	35	1.89/1.14
AC00395-2RU	393	344	88	214	129	38	1.90/1.25
AO01114-4	279	225	79	192	33	40	1.74/1.16
AO02060-3	233	142	59	136	7	90	1.77/1.14
AOTX98152-3RU	221	140	65	122	18	70	1.77/1.16
CO03276-5RU	310	175	54	165	10	128	2.00/1.15
OR05039-4	274	248	90	173	75	24	2.06/1.17
POR06V12-3	321	265	82	194	71	52	1.88/1.20
Canela Russet	222	182	83	151	32	32	1.91/1.23
Ranger Russet	361	305	84	184	122	32	1.98/1.23
Russet Burbank	303	200	66	158	42	87	1.91/1.28
Russet Norkotah	171	108	61	86	22	55	1.83/1.19
Shepody	225	123	53	100	24	79	2.35/1.28
Mean	291	225	76	174	51	57	1.93/1.19
LSD ² (0.05)	61	55	10	51	33	18	0.11/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 11B. Grade defects for Western Regional Main Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
A02062-1TE	1.0	MS*, GR	0.0
A02138-2	1.1	GC, GR*	0.0
A02424-83LB	2.1	MS*, GR	0.0
A02507-2LB	3.2	MS*, GR	0.0
A03158-2TE	1.7	MS, GC*, GR	0.0
AC00395-2RU	2.8	MS, GC, GR*	0.4
AO01114-4	5.1	GC*, GR	0.0
AO02060-3	0.4	MS*, GR*	0.0
AOTX98152-3RU	4.2	MS, GC*, GR	0.0
CO03276-5RU	1.8	GC, GR*	0.0
OR05039-4	2.1	MS*, GC, GR	0.0
POR06V12-3	1.2	MS, GR*	0.0
Canela Russet	3.0	MS, GC, GR*	0.0
Ranger Russet	6.8	MS*, GR*	0.0
Russet Burbank	5.0	MS*, SG, GR	0.0
Russet Norkotah	4.4	MS*, GC, GR	0.0
Shepody	9.2	MS, SG*, GR	0.0

¹ Percent external defects based on the proportion of the total sample weight with significant defects.

² MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³ Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 11C. Growth characteristics of Western Regional Main Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
A02062-1TE	96	2.8	1.8	1.5	2.5	3.5	3.0
A02138-2	100	3.5	2.3	3.5	3.0	3.0	2.8
A02424-83LB	99	3.5	3.0	3.4	4.8	3.0	4.0
A02507-2LB	98	3.3	1.3	2.9	3.3	4.0	4.0
A03158-2TE	97	3.3	2.5	2.9	3.8	3.3	3.8
AC00395-2RU	99	3.3	2.3	2.3	4.3	3.0	4.0
AO01114-4	99	3.3	2.3	2.3	3.8	3.5	3.8
AO02060-3	97	3.0	2.3	3.2	2.0	3.0	2.5
AOTX98152-3RU	99	3.0	3.0	4.6	2.5	2.0	1.5
CO03276-5RU	93	3.0	2.8	3.4	2.8	2.8	3.0
OR05039-4	98	3.0	2.8	2.2	2.8	4.0	3.3
POR06V12-3	96	3.0	2.3	1.8	4.0	3.8	4.0
Canela Russet	92	3.8	1.0	1.1	3.0	4.3	3.5
Ranger Russet	99	3.5	2.5	2.3	3.8	3.3	3.3
Russet Burbank	100	3.5	3.0	2.7	3.0	3.0	3.3
Russet Norkotah	97	3.3	2.3	3.0	1.5	2.8	1.0
Shepody	96	3.5	1.8	2.9	3.0	2.5	2.5
Mean	97	3.3	2.3	2.7	3.1	3.2	3.1
LSD ⁶ (0.05)	5	0.7	0.7	0.5	0.7	0.6	0.5

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference.

Table 11D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Main Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
A02062-1TE	5.0	5.0	5.0	2.7	97	5.0
A02138-2	4.9	4.7	4.8	3.7	55	4.0
A02424-83LB	5.0	5.0	5.0	4.0	75	5.0
A02507-2LB	5.0	4.9	5.0	3.4	104	4.6
A03158-2TE	5.0	5.0	5.0	3.5	69	5.0
AC00395-2RU	5.0	5.0	5.0	2.8	90	4.8
AO01114-4	5.0	5.0	5.0	2.7	104	5.0
AO02060-3	5.0	5.0	5.0	2.9	69	4.6
AOTX98152-3RU	5.0	5.0	5.0	2.6	69	4.2
CO03276-5RU	4.8	5.0	4.9	2.3	97	4.4
OR05039-4	5.0	5.0	5.0	3.6	90	3.6
POR06V12-3	5.0	5.0	5.0	2.9	69	4.4
Canela Russet	5.0	5.0	5.0	4.2	132	4.6
Ranger Russet	4.8	4.9	4.9	3.1	69	2.4
Russet Burbank	5.0	4.5	4.8	2.1	125	4.0
Russet Norkotah	5.0	4.8	4.9	2.7	90	4.0
Shepody	5.0	5.0	5.0	2.3	62	4.8

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 11E. Specific gravity, french fry color, and texture for Western Regional Main Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
A02062-1TE	1.078	0	1	3	4
A02138-2	1.092	0	0	4	3
A02424-83LB	1.087	0	1	4	5
A02507-2LB	1.087	0	1	4	4
A03158-2TE	1.085	1	2	3	3
AC00395-2RU	1.093	1	3	4	4
AO01114-4	1.088	2	3	4	4
AO02060-3	1.092	1	2	3	3
AOTX98152-3RU	1.082	2	2	4	4
CO03276-5RU	1.085	2	2	4	4
OR05039-4	1.088	0	0	4	4
POR06V12-3	1.092	0	1	4	4
Canela Russet	1.088	2	3	4	5
Ranger Russet	1.086	1	2	3	4
Russet Burbank	1.083	1	2	4	4
Russet Norkotah	1.078	2	2	3	3
Shepody	1.084	0	3	4	4

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 12A. Yield, grade and tuber shape for Advanced and Western Regional Red Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1			<4 oz		
		Total	%	4-10 oz			
CO04159-1R	224	157	69	136	22	62	1.08/1.24
CO06215-2R	449	339	75	276	64	108	1.16/1.24
CO06215-11R	342	249	73	220	28	89	1.26/1.16
NDTX5438-11R	404	319	79	251	68	78	1.13/1.22
Chieftain	547	489	89	299	190	54	1.25/1.29
Red LaSoda	426	362	85	252	111	49	1.12/1.27
Sangre-S10	494	443	90	249	194	42	1.15/1.22
Mean	412	337	80	240	97	69	1.16/1.23
LSD ² (0.05)	69	74	6	68	57	19	0.05/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 12B. Grade defects for Advanced and Western Regional Red Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO04159-1R	2.1	MS, GC*, GR	2.7
CO06215-2R	0.3	MS*, GR*	0.0
CO06215-11R	1.2	MS*, GC*, GR*	0.0
NDTX5438-11R	1.8	MS, GC*	0.0
Chieftain	1.0	GR*	4.0
Red LaSoda	3.6	MS, GC*, GR*	6.0
Sangre-S10	1.7	GC*, GR*	0.8

¹ Percent external defects based on the proportion of the total sample weight with significant defects.

² MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³ Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 12C. Growth characteristics of Advanced and Western Regional Red Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO04159-1R	91	3.0	2.8	2.4	3.0	3.0	2.0
CO06215-2R	97	3.3	3.0	3.0	4.0	3.0	3.0
CO06215-11R	95	2.8	2.3	3.6	3.3	3.0	3.0
NDTX5438-11R	95	3.3	2.3	2.1	3.3	3.0	3.0
Chieftain	98	3.8	3.5	2.4	3.8	3.0	3.0
Red LaSoda	97	3.5	3.5	2.7	3.0	3.0	2.0
Sangre-S10	93	2.5	2.3	2.7	4.3	3.0	4.0
Mean	95	3.1	2.8	2.7	3.5	3.0	2.9
LSD ⁶ (0.05)	6	0.8	0.7	0.6	0.5	NS	0.5

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference; NS=not significant.

Table 12D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Red Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO04159-1R	5.0	5.0	5.0	5.6	97	2.2
CO06215-2R	4.9	5.0	5.0	5.7	83	2.8
CO06215-11R	5.0	5.0	5.0	7.0	111	2.6
NDTX5438-11R	5.0	4.7	4.9	5.6	83	2.4
Chieftain	5.0	5.0	5.0	4.1	97	4.8
Red LaSoda	4.9	5.0	5.0	3.6	83	1.6
Sangre-S10	5.0	4.9	5.0	2.3	90	4.4

¹ Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

² Tubers were stored at 45F for 91 days.

³ Days from harvest to first visible growth. Tubers were stored at 45F.

⁴ Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 12E. Specific gravity, french fry color, and texture for Advanced and Western Regional Red Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
CO04159-1R	1.074	3	4	2	2
CO06215-2R	1.083	0	2	2	3
CO06215-11R	1.081	2	3	3	3
NDTX5438-11R	1.065	4	4	1	1
Chieftain	1.076	3	3	3	2
Red LaSoda	1.075	2	2	2	2
Sangre-S10	1.072	3	3	2	2

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 13A. Yield, grade and tuber shape for Advanced and Western Regional Specialty Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
A02267-1Y	424	293	69	259	34	125	1.20/1.26
CO04056-3P/PW	306	69	22	69	0	237	1.35/1.18
CO04063-4R/R	230	41	18	41	0	189	1.32/1.14
CO04067-8R/Y	369	221	60	206	14	143	1.18/1.21
CO04099-3W/Y	368	177	48	173	4	187	1.15/1.27
CO05028-4P/PW	448	319	70	279	39	127	1.27/1.30
CO05028-6P/PW	362	144	40	140	3	215	1.13/1.26
CO05028-11P/RW	361	235	65	228	7	112	1.16/1.31
CO05030-5W/Y	241	86	32	84	2	148	1.09/1.20
CO05035-1PW/Y	416	369	89	198	171	39	1.28/1.27
CO05035-5PW/Y	410	361	88	155	206	33	1.30/1.22
CO05035-8PW/Y	364	280	77	231	49	80	1.41/1.23
CO05079-4P/PW	320	154	46	150	4	164	1.49/1.18
TC05276-7P/PW	162	16	10	16	0	146	2.93/1.08
Purple Majesty	251	57	23	57	0	191	1.43/1.25
Yukon Gold	308	257	83	202	55	37	1.29/1.20
Mean	334	192	53	156	37	136	1.37/1.22
LSD ² (0.05)	73	56	10	46	39	39	0.09/0.04

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 13B. Grade defects for Advanced and Western Regional Specialty Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
A02267-1Y	1.5	MS, GR*	0.0
CO04056-3P/PW	0.0		0.0
CO04063-4R/R	0.0		0.0
CO04067-8R/Y	1.5	GC*, GR	0.0
CO04099-3W/Y	1.0	MS*, GR*	0.6
CO05028-4P/PW	0.4	MS*, GR	0.0
CO05028-6P/PW	0.7	MS*, GC, GR	0.0
CO05028-11P/RW	3.8	MS, GC*, GR	1.1
CO05030-5W/Y	2.7	GR*	0.0
CO05035-1PW/Y	2.0	MS, GC*, GR*	0.0
CO05035-5PW/Y	4.0	MS, GC*, GR*	0.8
CO05035-8PW/Y	1.0	MS*, GR*	0.0
CO05079-4P/PW	1.2	MS*	0.0
TC05276-7P/PW	0.2	SG*	0.0
Purple Majesty	1.0	MS*	0.0
Yukon Gold	4.6	MS, GC*, GR	0.0

¹Percent external defects based on the proportion of the total sample weight with significant defects.

²MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 13C. Growth characteristics of Advanced and Western Regional Specialty Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
A02267-1Y	92	2.5	3.8	2.9	4.3	3.0	3.0
CO04056-3P/PW	98	3.0	1.8	3.8	3.5	3.0	3.0
CO04063-4R/R	99	2.8	2.0	4.6	2.3	3.0	3.0
CO04067-8R/Y	92	2.8	3.3	4.2	4.0	3.0	3.0
CO04099-3W/Y	96	3.8	3.3	4.8	4.0	3.0	3.0
CO05028-4P/PW	96	3.5	3.5	3.7	4.0	3.0	3.3
CO05028-6P/PW	95	3.3	3.3	3.1	3.0	2.3	3.0
CO05028-11P/RW	99	3.3	2.8	3.6	3.5	3.0	3.0
CO05030-5W/Y	88	2.5	3.8	3.5	3.0	2.3	1.8
CO05035-1PW/Y	96	2.8	2.8	4.1	4.0	3.0	3.3
CO05035-5PW/Y	96	3.5	2.5	3.2	4.3	3.5	4.0
CO05035-8PW/Y	94	3.0	3.3	4.8	3.3	3.0	3.0
CO05079-4P/PW	95	3.0	2.5	3.8	3.0	3.0	3.0
TC05276-7P/PW	100	2.8	1.3	3.7	2.3	2.8	2.8
Purple Majesty	96	3.0	2.3	4.4	3.3	2.8	2.5
Yukon Gold	97	3.0	3.5	2.8	3.5	2.8	2.8
Mean	96	3.0	2.8	3.8	3.4	2.9	3.0
LSD ⁶ (0.05)	6	0.8	0.8	0.8	0.5	0.4	0.4

¹Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

²Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶LSD=least significant difference.

Table 13D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Specialty Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
A02267-1Y	4.9	4.2	4.6	2.1	69	3.4
CO04056-3P/PW	---	---	---	2.0	90	---
CO04063-4R/R	---	---	---	4.8	62	---
CO04067-8R/Y	4.8	3.9	4.4	3.2	55	4.6
CO04099-3W/Y	4.7	4.2	4.5	2.4	90	4.0
CO05028-4P/PW	---	---	---	3.9	55	4.8
CO05028-6P/PW	---	---	---	3.7	69	4.4
CO05028-11P/RW	---	---	---	2.5	83	5.0
CO05030-5W/Y	5.0	4.7	4.9	4.9	55	3.2
CO05035-1PW/Y	5.0	5.0	5.0	3.1	41	4.6
CO05035-5PW/Y	5.0	5.0	5.0	4.1	90	4.6
CO05035-8PW/Y	5.0	5.0	5.0	3.4	41	4.6
CO05079-4P/PW	---	---	---	3.6	83	---
TC05276-7P/PW	4.9	4.6	4.8	2.9	75	---
Purple Majesty	---	---	---	2.9	62	---
Yukon Gold	4.9	4.8	4.9	1.6	90	5.0

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 13E. Specific gravity, french fry color, and texture for Advanced and Western Regional Speciality Trial entries - 2013.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
A02267-1Y	1.071	1	1	3	3
CO04056-3P/PW	1.083	---	---	2	3
CO04063-4R/R	1.069	---	---	2	3
CO04067-8R/Y	1.079	1	1	2	2
CO04099-3W/Y	1.094	0	1	4	4
CO05028-4P/PW	1.081	1	0	3	3
CO05028-6P/PW	1.071	1	2	3	3
CO05028-11P/RW	1.079	3	3	3	3
CO05030-5W/Y	1.082	1	1	2	3
CO05035-1PW/Y	1.079	2	4	3	3
CO05035-5PW/Y	1.078	2	4	3	3
CO05035-8PW/Y	1.068	1	3	3	3
CO05079-4P/PW	1.087	1	2	4	4
TC05276-7P/PW	1.083	0	1	3	4
Purple Majesty	1.082	---	---	4	3
Yukon Gold	1.087	1	3	3	3

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 14A. Yield, grade and tuber shape for Advanced and Western Regional Chipping Trial entries - 2013.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
A00188-3C	440	303	69	249	54	131	1.08/1.20
AC00206-2W	362	299	83	250	48	52	1.06/1.13
AC01151-5W	402	303	75	242	62	84	1.07/1.24
AC03433-1W	340	251	74	206	44	55	1.05/1.21
AC03452-2W	446	375	84	290	86	63	1.07/1.17
AC07116-2W	367	273	74	229	44	89	1.06/1.24
CO02024-9W	395	298	75	256	42	95	1.13/1.31
CO02033-1W	386	317	82	259	59	65	1.09/1.30
CO02321-4W	351	250	71	180	70	73	1.09/1.18
CO03243-3W	439	357	81	281	76	71	1.11/1.16
CO07070-10W	379	249	65	214	35	123	1.09/1.22
CO07070-13W	342	240	70	202	38	101	1.09/1.13
Atlantic	430	356	83	193	163	49	1.15/1.24
Chipeta	448	374	84	208	167	41	1.24/1.21
Mean	395	303	76	233	71	78	1.10/1.21
LSD ² (0.05)	74	68	7	52	37	24	0.04/0.05

¹L=length, W=width, T=thickness. For L:W <1.00=compressed; 1.00-1.15=round; 1.16-1.55=oval; 1.56-1.95=oblong; 1.96-2.35=long; >2.35=very long. For W:T, the larger the value, the flatter the tuber.

²LSD=least significant difference.

Table 14B. Grade defects for Advanced and Western Regional Chipping Trial entries - 2013.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
A00188-3C	1.5	MS*, SG*, GC*, GR*	0.6
AC00206-2W	3.3	MS, GC*, GR	2.5
AC01151-5W	3.6	MS, GC, GR*	0.3
AC03433-1W	10.1	MS, GC*, GR	1.0
AC03452-2W	1.5	MS*, SG*, GR*	0.6
AC07116-2W	1.3	MS, GC*, GR	1.0
CO02024-9W	0.3	MS*	0.3
CO02033-1W	0.9	MS*, GR*	2.1
CO02321-4W	5.6	MS, GR*	0.0
CO03243-3W	2.8	MS, GC*, GR*	0.9
CO07070-10W	1.7	GC, GR*	0.9
CO07070-13W	0.2	GR*	0.4
Atlantic	5.9	MS, GC, GR*	13.1
Chipeta	7.3	MS, SG, GC*, GR	0.4

¹ Percent external defects based on the proportion of the total sample weight with significant defects.

² MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

³ Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 14C. Growth characteristics of Advanced and Western Regional Chipping Trial entries - 2013.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
A00188-3C	100	3.3	3.8	5.7	3.8	3.0	3.3
AC00206-2W	97	3.3	3.0	2.2	2.8	3.0	3.0
AC01151-5W	96	2.8	3.0	3.0	3.8	3.0	3.3
AC03433-1W	91	2.3	2.5	2.8	3.8	3.0	4.0
AC03452-2W	98	4.0	3.8	3.2	3.3	3.0	3.3
AC07116-2W	94	3.3	2.8	3.2	3.5	3.0	3.0
CO02024-9W	97	3.0	3.5	3.0	3.8	3.0	3.0
CO02033-1W	96	3.0	3.0	2.7	3.3	3.0	3.0
CO02321-4W	91	3.0	3.5	2.6	3.5	2.8	3.0
CO03243-3W	92	2.8	3.3	2.9	4.0	3.0	4.0
CO07070-10W	97	3.3	4.0	3.4	4.0	3.0	3.3
CO07070-13W	97	3.5	4.0	4.6	2.3	2.5	2.3
Atlantic	96	3.3	3.8	2.6	3.8	3.0	3.5
Chipeta	99	3.5	3.8	2.7	5.0	3.0	4.0
Mean	96	3.1	3.4	3.2	3.6	2.9	3.3
LSD ⁶ (0.05)	6	0.7	0.6	0.9	0.6	0.3	0.4

¹ Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

² Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

³ Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

⁴ Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

⁵ Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

⁶ LSD=least significant difference.

Table 14D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Chipping Trial entries - 2013.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
A00188-3C	5.0	5.0	5.0	3.9	69	4.8
AC00206-2W	5.0	4.6	4.8	4.4	83	4.2
AC01151-5W	4.5	4.3	4.4	2.6	97	1.2
AC03433-1W	5.0	4.8	4.9	5.5	69	4.2
AC03452-2W	5.0	5.0	5.0	2.0	69	4.8
AC07116-2W	4.9	4.7	4.8	3.2	97	4.2
CO02024-9W	5.0	4.3	4.7	3.7	97	4.2
CO02033-1W	5.0	4.5	4.8	4.8	97	4.4
CO02321-4W	4.8	4.1	4.5	4.3	75	4.4
CO03243-3W	4.8	4.4	4.6	3.6	75	3.8
CO07070-10W	3.9	3.1	3.5	3.1	83	3.8
CO07070-13W	4.7	4.2	4.5	5.1	62	4.4
Atlantic	4.7	4.1	4.4	3.9	83	4.2
Chipeta	4.9	4.8	4.9	2.6	97	4.4

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45F for 91 days.

³Days from harvest to first visible growth. Tubers were stored at 45F.

⁴Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 14E. Chip color¹ after various storage regimes and specific gravity of Advanced and Western Regional Chipping Trial entries - 2013.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
A00188-3C	1.089	4.5	4.0	2.0	2.0
AC00206-2W	1.087	2.5	2.0	1.0	1.5
AC01151-5W	1.085	5.0	4.0	2.5	2.0
AC03433-1W	1.078	5.0	4.0	1.5	2.0
AC03452-2W	1.075	3.5	4.0	1.5	2.5
AC07116-2W	1.088	3.5	3.0	2.0	2.0
CO02024-9W	1.084	3.5	3.5	1.5	2.5
CO02033-1W	1.096	2.5	3.5	2.0	3.5
CO02321-4W	1.098	4.0	3.0	2.0	3.0
CO03243-3W	1.086	5.0	4.0	2.0	1.5
CO07070-10W	1.105	4.0	3.0	2.5	2.0
CO07070-13W	1.089	3.0	3.0	1.0	1.5
Atlantic	1.099	5.0	5.0	3.0	2.5
Chipeta	1.082	5.0	5.0	2.5	3.0

¹ Chip color was rated using the Snack Food Association 1-5 scale. Ratings of ≤ 2.0 are acceptable.

Table 15. Summary comparison of advanced selections and named cultivars for yield, grade, maturity, specific gravity, and grade defects.

Clone	Usage ¹	# Trials	Total Yield (Cwt/A)	% US #1	Vine Maturity ²	Specific Gravity	% External Defects ³	% Hollow Heart ⁴
Russets								
AC99375-1RU	Dual	7	500	83	3.1	1.099	1.7	0.0
AC00395-2RU	Dual	6	478	87	3.9	1.101	1.5	0.6
Canela Russet	FM	27	352	90	3.2	1.096	1.1	0.1
Centennial Russet	FM	35	294	77	3.0	1.079	0.8	0.3
Crestone Russet	Dual	7	501	89	3.3	1.089	3.6	0.7
Mercury Russet	Dual	7	358	85	1.4	1.084	3.9	0.2
Mesa Russet	Dual	10	419	86	2.9	1.082	1.8	2.5
Rio Grande Russet	FM	22	533	80	3.0	1.086	2.8	0.4
Russet Norkotah	FM	94	371	84	1.8	1.079	2.2	0.4
Specialties								
AC99330-1P/Y	Spec	7	495	58	2.9	1.082	0.0	0.2
CO97233-3R/Y	Spec	7	477	73	3.3	1.082	4.0	2.3
CO04056-3P/PW	Spec	4	330	27	2.8	1.086	0.1	0.0
CO04063-4R/R	Spec	4	262	19	2.4	1.071	0.2	0.0
CO04067-8R/Y	Spec	4	426	64	2.8	1.083	2.3	0.0
CO04099-3W/Y	Spec	4	379	50	2.7	1.091	0.6	0.3
Mountain Rose	Spec	8	383	68	2.2	1.081	1.1	0.0
Purple Majesty	Spec	23	467	52	2.2	1.085	0.6	0.9
Yukon Gold	Spec	37	402	89	1.9	1.087	1.8	0.5

Table 15 continued on next page

Table 15 (cont'd). Summary comparison of advanced selections and named cultivars for yield, grade, maturity, specific gravity, and grade defects.

Clone	Usage ¹	# Trials	Total Yield (Cwt/A)	% US #1	Vine Maturity ²	Specific Gravity	% External Defects ³	% Hollow Heart ⁴
Chippers								
AC01151-5W	Chip	6	465	79	3.1	1.090	2.6	0.2
CO02024-9W	Chip	6	416	79	3.0	1.088	1.5	0.2
CO02033-1W	Chip	6	426	85	2.7	1.098	0.8	1.6
CO02321-4W	Chip	6	423	80	2.8	1.101	3.6	0.0
AC03433-1W	Chip	5	414	80	3.5	1.086	6.8	0.2
CO03243-3W	Chip	5	464	86	3.3	1.089	2.0	0.5
AC00206-2W	Chip	4	324	79	2.8	1.086	2.3	1.7
AC03452-2W	Chip	4	446	85	3.1	1.078	1.4	0.6
Atlantic	Chip	45	459	86	3.2	1.098	2.7	5.1
Chipeta	Chip	42	536	85	3.3	1.090	5.3	0.6

¹ FM=fresh market; Dual= fresh market and processing potential; SPEC=specialty.

² Vine maturity: 1=very early; 2=early; 3=medium; 4=late; 5=very late.

³ Includes defects such as second growth, growth crack, misshapen, and green.

⁴ Based on tubers greater than 10 ounces.

Several selections that have been discontinued from grower evaluations are available for exclusive release through CSU. Data summaries for all clones are available on request. Please contact David Holm for further information. Included are russets - AC96052-1RU, CO97087-2RU, CO98067-7RU, CO99053-4RU, and CO03276-5RU; reds - CO98012-5R, CO99076-6R, CO99256-2R, CO00277-2R, and CO00291-5R; chippers - CO95051-7W, CO00188-4W, CO00197-3W, and CO00270-7W; and specialties (including yellows) - AC97521-1R/Y, ATC00293-1W/Y, CO97215-2P/P, CO97222-1R/R, CO97226-2R/R, CO97227-2P/PW, CO97232-1R/Y, CO97232-2R/Y, CO99045-1W/Y, CO00405-1RF, CO00412-5W/Y, CO00415-1RF, VC0967-2R/Y, VC1002-3W/Y, and VC1009-1W/Y.

Figure 1. Photographs of advanced selections.



Figure 1 (cont'd). Photographs of advanced selections.



Figure 1 (cont'd). Photographs of advanced selections.



Table 16A. Detailed data summary for AC99375-1RU.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	7	500	435-545	
Yield US #1 (Cwt/A)	7	415	377-457	
% US #1	7	83	77-91	
Yield >10 oz (Cwt/A)	7	105	74-148	
Yield <4 oz (Cwt/A)	7	75	32-118	
% External Defects ¹	7	1.7	0.3-3.5	
% Hollow Heart ²	7	0.0	0.0-0.2	
% Stand	7	97	94-100	
Emergence Uniformity	7	3.4	2.8-4.3	
Vine Vigor ³	7	3.7	2.5-4.8	
Stems/Plant	7	3.7	2.1-6.3	
Vine Size ⁴	7	4.4	3.0-5.0	
Vine Type ⁵	7	3.1	3.0-3.5	
Vine Maturity ⁶	7	3.1	3.0-3.5	
Blackspot ⁷	Bud End	8	4.6	3.8-5.0
	Stem End	8	4.4	3.7-5.0
	Average	8	4.5	
Weight Loss ⁸	8	2.3	1.4-2.8	
Dormancy ⁹	8	94	82-132	
Enzymatic Browning ¹⁰	8	2.8	1.4-4.6	
Specific Gravity	8	1.099	1.090-1.104	
Fry Color ¹¹	Harvest	8	0.8	0.0-2.0
	Storage	8	1.1	0.0-2.0
Fry Texture ¹²	Harvest	8	3.9	3.0-5.0
	Storage	8	4.0	3.0-5.0

Refer to footnotes on page 100.

Table 16B. Detailed data summary for AC00395-2RU.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	6	478	393-574	
Yield US #1 (Cwt/A)	6	412	344-478	
% US #1	6	87	80-91	
Yield >10 oz (Cwt/A)	6	110	73-129	
Yield <4 oz (Cwt/A)	6	59	28-97	
% External Defects ¹	6	1.5	0.0-3.0	
% Hollow Heart ²	6	0.6	0.0-2.0	
% Stand	6	99	98-100	
Emergence Uniformity	6	3.3	2.8-3.8	
Vine Vigor ³	6	3.4	2.3-4.3	
Stems/Plant	6	2.8	1.9-3.4	
Vine Size ⁴	6	4.7	4.3-5.0	
Vine Type ⁵	6	3.2	3.0-4.0	
Vine Maturity ⁶	6	3.9	3.8-4.0	
Blackspot ⁷	Bud End	7	4.9	4.6-5.0
	Stem End	7	4.9	4.7-5.0
	Average	7	4.9	
Weight Loss ⁸	7	2.3	2.0-2.8	
Dormancy ⁹	7	100	70-155	
Enzymatic Browning ¹⁰	7	4.7	4.6-4.8	
Specific Gravity	7	1.101	1.092-1.108	
Fry Color ¹¹	Harvest	7	1.7	1.0-3.0
	Storage	7	2.6	2.0-3.0
Fry Texture ¹²	Harvest	7	4.0	3.0-5.0
	Storage	7	4.0	3.0-5.0

Refer to footnotes on page 100.

Table 16C. Detailed data summary for Canela Russet.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	27	352	214-468	
Yield US #1 (Cwt/A)	27	316	182-421	
% US #1	27	90	77-96	
Yield >10 oz (Cwt/A)	27	104	28-203	
Yield <4 oz (Cwt/A)	27	31	14-61	
% External Defects ¹	27	1.1	0.0-6.0	
% Hollow Heart ²	27	0.1	0.0-0.9	
% Stand	26	95	82-99	
Emergence Uniformity	26	2.8	1.5-3.8	
Vine Vigor ³	26	2.5	1.0-3.3	
Stems/Plant	26	1.9	1.1-4.2	
Vine Size ⁴	26	3.8	3.0-5.0	
Vine Type ⁵	26	3.6	3.0-4.3	
Vine Maturity ⁶	26	3.2	2.8-3.8	
Blackspot ⁷	Bud End	34	4.8	3.7-5.0
	Stem End	34	4.4	2.5-5.0
	Average	34	4.6	
Weight Loss ⁸	34	3.5	1.3-7.0	
Dormancy ⁹	34	142	83-195	
Enzymatic Browning ¹⁰	34	4.5	3.4-5.0	
Specific Gravity	34	1.096	1.075-1.111	
Fry Color ¹¹	Harvest	34	1.8	0.0-3.0
	Storage	34	2.2	0.0-4.0
Fry Texture ¹²	Harvest	34	3.8	3.0-5.0
	Storage	34	3.8	3.0-5.0

Refer to footnotes on page 100.

Table 16D. Detailed data summary for Centennial Russet.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	35	294	177-392	
Yield US #1 (Cwt/A)	35	229	129-320	
% US #1	35	77	62-89	
Yield >10 oz (Cwt/A)	35	26	4-72	
Yield <4 oz (Cwt/A)	35	62	32-102	
% External Defects ¹	35	0.8	0.0-3.3	
% Hollow Heart ²	35	0.3	0.0-3.3	
% Stand	35	97	90-99	
Emergence Uniformity	15	3.2	3.0-3.5	
Vine Vigor ³	15	2.2	1.0-3.0	
Stems/Plant	27	3.0	2.2-3.6	
Vine Size ⁴	15	2.6	2.0-3.0	
Vine Type ⁵	15	3.2	2.8-3.8	
Vine Maturity ⁶	35	3.0	2.5-3.5	
Blackspot ⁷	Bud End	46	4.9	3.7-5.0
	Stem End	46	4.8	4.2-5.0
	Average	49	4.8	
Weight Loss ⁸	49	6.0	1.6-9.0	
Dormancy ⁹	42	88	57-123	
Enzymatic Browning ¹⁰	44	4.0	3.2-5.0	
Specific Gravity	56	1.079	1.068-1.092	
Fry Color ¹¹	Harvest	48	3.7	3.0-4.0
	Storage	48	3.9	3.0-5.0
Fry Texture ¹²	Harvest	48	2.3	1.0-4.0
	Storage	48	2.3	1.0-3.0

Refer to footnotes on page 100.

Table 16E. Detailed data summary for Crestone Russet.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	7	501	454-559	
Yield US #1 (Cwt/A)	7	447	384-517	
% US #1	7	89	85-93	
Yield >10 oz (Cwt/A)	7	233	159-299	
Yield <4 oz (Cwt/A)	7	37	22-58	
% External Defects ¹	7	3.6	0.7-8.9	
% Hollow Heart ²	7	0.7	0.0-2.9	
% Stand	7	99	95-100	
Emergence Uniformity	7	3.2	3.0-4.0	
Vine Vigor ³	7	3.3	2.8-3.8	
Stems/Plant	7	3.9	2.5-5.2	
Vine Size ⁴	7	4.0	3.8-4.3	
Vine Type ⁵	7	3.1	2.8 3.8	
Vine Maturity ⁶	7	3.3	3.0-4.0	
Blackspot ⁷	Bud End	8	4.8	4.3-5.0
	Stem End	8	4.3	2.8-5.0
	Average	8	4.5	
Weight Loss ⁸	8	2.7	1.2-7.6	
Dormancy ⁹	8	84	54-132	
Enzymatic Browning ¹⁰	8	4.0	3.2-4.6	
Specific Gravity	8	1.089	1.077-1.096	
Fry Color ¹¹	Harvest	8	1.0	0.0-2.0
	Storage	8	1.9	1.0-3.0
Fry Texture ¹²	Harvest	8	3.4	3.0-4.0
	Storage	8	3.3	2.0-4.0

Refer to footnotes on page 100.

Table 16F. Detailed data summary for Mercury Russet.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	7	358	308-409	
Yield US #1 (Cwt/A)	7	304	271-377	
% US #1	7	85	76-92	
Yield >10 oz (Cwt/A)	7	80	48-121	
Yield <4 oz (Cwt/A)	7	40	25-82	
% External Defects ¹	7	3.9	0.0-9.1	
% Hollow Heart ²	7	0.2	0.0-0.7	
% Stand	7	99	97-100	
Emergence Uniformity	7	3.2	3.0-3.5	
Vine Vigor ³	7	3.4	2.8-4.0	
Stems/Plant	7	3.4	2.6-4.2	
Vine Size ⁴	7	2.4	2.3-2.5	
Vine Type ⁵	9	2.4	2.0-3.0	
Vine Maturity ⁶	7	1.4	1.0-2.0	
Blackspot ⁷	Bud End	8	4.6	3.8-5.0
	Stem End	8	4.8	4.5-5.0
	Average	8	4.7	
Weight Loss ⁸	8	3.5	1.4-5.7	
Dormancy ⁹	8	62	49-77	
Enzymatic Browning ¹⁰	8	3.8	3.4-4.6	
Specific Gravity	8	1.084	1.078-1.088	
Fry Color ¹¹	Harvest	8	0.4	0.0-1.0
	Storage	8	1.4	1.0-2.0
Fry Texture ¹²	Harvest	8	3.0	2.0-4.0
	Storage	8	3.3	3.0-4.0

Refer to footnotes on page 100.

Table 16G. Detailed data summary for Mesa Russet.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	10	419	345 - 478	
Yield US #1 (Cwt/A)	10	360	279 - 406	
% US #1	10	86	81 - 92	
Yield >10 oz (Cwt/A)	10	97	54 - 144	
Yield <4 oz (Cwt/A)	10	51	23 - 61	
% External Defects ¹	10	1.8	0.2 - 2.3	
% Hollow Heart ²	10	2.5	0.0 - 5.4	
% Stand	10	96	91 - 99	
Emergence Uniformity	10	3.3	3.0 - 3.8	
Vine Vigor ³	10	3.7	2.8 - 4.0	
Stems/Plant	10	3.0	2.2 - 3.7	
Vine Size ⁴	10	3.5	3.0 - 4.0	
Vine Type ⁵	10	3.0	2.3 - 3.8	
Vine Maturity ⁶	10	2.9	2.8 - 3.0	
Blackspot ⁷	Bud End	12	4.0	2.9 - 5.0
	Stem End	12	3.8	2.7 - 5.0
	Average	12	3.9	
Weight Loss ⁸	12	3.6	1.2 - 6.8	
Dormancy ⁹	12	94	83 - 105	
Enzymatic Browning ¹⁰	12	4.6	4.0 - 5.0	
Specific Gravity	12	1.082	1.074 - 1.090	
Fry Color ¹¹	Harvest	12	1.3	0.0 - 2.0
	Storage	12	1.8	1.0 - 4.0
Fry Texture ¹²	Harvest	12	2.9	2.0 - 4.0
	Storage	12	3.1	3.0 - 4.0

Refer to footnotes on page 100.

Table 16H. Detailed data summary for Rio Grande Russet.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	22	533	367-683	
Yield US #1 (Cwt/A)	22	426	255-603	
% US #1	22	80	65-91	
Yield >10 oz (Cwt/A)	22	123	14-275	
Yield <4 oz (Cwt/A)	22	92	33-202	
% External Defects ¹	22	2.8	0.1-8.7	
% Hollow Heart ²	22	0.4	0.0-4.1	
% Stand	22	99	96-100	
Emergence Uniformity	22	3.5	3.0-4.0	
Vine Vigor ³	22	3.6	2.0-4.5	
Stems/Plant	22	3.4	2.0-4.8	
Vine Size ⁴	22	4.1	3.5-5.0	
Vine Type ⁵	22	3.1	3.0-3.5	
Vine Maturity ⁶	22	3.0	2.5 -3.5	
Blackspot ⁷	Bud End	31	4.8	4.1-5.0
	Stem End	31	4.6	3.0-5.0
	Average	31	4.7	
Weight Loss ⁸	31	3.8	1.5-7.1	
Dormancy ⁹	31	93	68-123	
Enzymatic Browning ¹⁰	31	3.9	3.0-5.0	
Specific Gravity	31	1.086	1.067-1.094	
Fry Color ¹¹	Harvest	31	2.3	1.0-4.0
	Storage	31	2.8	2.0-4.0
Fry Texture ¹²	Harvest	31	3.1	2.0-4.0
	Storage	31	3.0	2.0-4.0

Refer to footnotes on page 100.

Table 16I. Detailed data summary for Russet Norkotah.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	94	371	159-557	
Yield US #1 (Cwt/A)	94	312	101-480	
% US #1	94	84	59-94	
Yield >10 oz (Cwt/A)	94	105	10-247	
Yield <4 oz (Cwt/A)	94	51	13-131	
% External Defects ¹	94	2.2	0.0-5.3	
% Hollow Heart ²	94	0.4	0.0-2.8	
% Stand	93	98	88-100	
Emergence Uniformity	84	3.2	1.0-4.0	
Vine Vigor ³	84	2.9	1.0-4.0	
Stems/Plant	89	3.7	2.3-5.7	
Vine Size ⁴	84	2.4	1.0-4.0	
Vine Type ⁵	84	2.7	2.0-3.5	
Vine Maturity ⁶	93	1.8	1.0-3.0	
Blackspot ⁷	Bud End	93	4.7	2.9-5.0
	Stem End	93	4.4	2.6-5.0
	Average	94	4.6	
Weight Loss ⁸	94	3.5	1.0-7.1	
Dormancy ⁹	93	98	70-140	
Enzymatic Browning ¹⁰	93	3.4	2.2-4.8	
Specific Gravity	97	1.079	1.066-1.091	
Fry Color ¹¹	Harvest	94	2.1	1.0-4.0
	Storage	94	2.4	1.0-4.0
Fry Texture ¹²	Harvest	94	2.7	1.0-4.0
	Storage	94	2.7	1.0-4.0

Refer to footnotes on page 100.

Table 16J. Detailed data summary for AC99330-1P/Y.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	7	495	441-531	
Yield US #1 (Cwt/A)	7	288	208-376	
% US #1	7	58	43-74	
Yield >10 oz (Cwt/A)	7	24	3-69	
Yield <4 oz (Cwt/A)	7	207	129-271	
% External Defects ¹	7	0.0	0.0-0.2	
% Hollow Heart ²	7	0.2	0.0-0.6	
% Stand	7	98	96-99	
Emergence Uniformity	7	3.2	2.8-3.8	
Vine Vigor ³	7	3.7	3.0-4.5	
Stems/Plant	7	4.9	3.0-6.7	
Vine Size ⁴	7	3.4	2.8-4.0	
Vine Type ⁵	7	2.5	2.0-3.0	
Vine Maturity ⁶	7	2.9	2.0-3.0	
Blackspot ⁷	Bud End	8	4.7	4.0-5.0
	Stem End	8	4.4	3.7-4.8
	Average	8	4.6	
Weight Loss ⁸	8	3.3	1.4-5.0	
Dormancy ⁹	8	60	49-66	
Enzymatic Browning ¹⁰	8	2.9	2.2-3.6	
Specific Gravity	8	1.082	1.075-1.090	
Fry Color ¹¹	Harvest	8	1.9	1.0-4.0
	Storage	8	3.1	3.0-4.0
Fry Texture ¹²	Harvest	8	2.9	2.0-4.0
	Storage	8	3.1	3.0-4.0

Refer to footnotes on page 100.

Table 16K. Detailed data summary for CO97233-3R/Y.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	7	477	409-524	
Yield US #1 (Cwt/A)	7	351	294-425	
% US #1	7	73	61-82	
Yield >10 oz (Cwt/A)	7	83	42-133	
Yield <4 oz (Cwt/A)	7	108	67-162	
% External Defects ¹	7	4.0	2.5-6.1	
% Hollow Heart ²	7	2.3	0.3-5.2	
% Stand	7	90	80-95	
Emergence Uniformity	7	3.1	3.0-3.5	
Vine Vigor ³	7	3.6	3.3- 4.0	
Stems/Plant	7	3.8	2.6-4.6	
Vine Size ⁴	7	3.0	2.8-3.3	
Vine Type ⁵	7	2.0	2.0-2.3	
Vine Maturity ⁶	7	3.3	2.8-4.0	
Blackspot ⁷	Bud End	8	4.7	4.2-5.0
	Stem End	8	4.0	3.2-5.0
	Average	8	4.4	
Weight Loss ⁸	8	3.1	1.6-6.0	
Dormancy ⁹	8	74	61-94	
Enzymatic Browning ¹⁰	8	4.1	3.6-4.6	
Specific Gravity	8	1.082	1.077-1.090	
Fry Color ¹¹	Harvest	8	1.3	0.0-2.0
	Storage	8	2.0	1.0-3.0
Fry Texture ¹²	Harvest	8	2.8	2.0-3.0
	Storage	8	2.6	2.0-3.0

Refer to footnotes on page 100.

Table 16L. Detailed data summary for CO04056-3P/PW.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	4	330	281-421
Yield US #1 (Cwt/A)	4	95	61-184
% US #1	4	27	20-44
Yield >10 oz (Cwt/A)	4	1	0-5
Yield <4 oz (Cwt/A)	4	235	216-249
% External Defects ¹	4	0.1	0.0-0.3
% Hollow Heart ²	4	0.0	0.0-0.0
% Stand	4	98	97-99
Emergence Uniformity	4	2.5	1.8-3.0
Vine Vigor ³	4	2.7	1.8-3.3
Stems/Plant	4	4.2	3.6-5.6
Vine Size ⁴	4	3.6	3.0-4.0
Vine Type ⁵	4	3.0	3.0-3.0
Vine Maturity ⁶	4	2.8	2.0-3.0
Blackspot ⁷	Bud End	---	---
	Stem End	---	---
	Average	---	---
Weight Loss ⁸	5	2.3	1.7-3.1
Dormancy ⁹	5	87	70-102
Enzymatic Browning ¹⁰	---	---	---
Specific Gravity	5	1.086	1.077-1.094
Fry Color ¹¹	Harvest	---	---
	Storage	---	---
Fry Texture ¹²	Harvest	5	2.6
	Storage	5	3.0

Refer to footnotes on page 100.

Table 16M. Detailed data summary for CO04063-4R/R.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	4	262	230-303
Yield US #1 (Cwt/A)	4	52	28-77
% US #1	4	19	12-25
Yield >10 oz (Cwt/A)	4	1	0-2
Yield <4 oz (Cwt/A)	4	211	189-227
% External Defects ¹	4	0.2	0.0-0.6
% Hollow Heart ²	4	0.0	0.0-0.0
% Stand	4	99	98-100
Emergence Uniformity	4	1.9	1.5-2.8
Vine Vigor ³	4	2.8	2.0-3.3
Stems/Plant	4	5.3	4.4-7.0
Vine Size ⁴	4	2.5	2.3-2.8
Vine Type ⁵	4	2.9	2.8-3.0
Vine Maturity ⁶	4	2.4	2.0-3.0
Blackspot ⁷	Bud End	---	---
	Stem End	---	---
	Average	---	---
Weight Loss ⁸	5	4.3	2.7-5.5
Dormancy ⁹	5	65	56-81
Enzymatic Browning ¹⁰	---	---	---
Specific Gravity	5	1.071	1.068-1.075
Fry Color ¹¹	Harvest	---	---
	Storage	---	---
Fry Texture ¹²	Harvest	5	1.8
	Storage	5	2.2

Refer to footnotes on page 100.

Table 16N. Detailed data summary for CO04067-8R/Y.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	4	426	369-504	
Yield US #1 (Cwt/A)	4	277	221-372	
% US #1	4	64	60-74	
Yield >10 oz (Cwt/A)	4	21	10-46	
Yield <4 oz (Cwt/A)	4	139	121-158	
% External Defects ¹	4	2.3	1.5-3.9	
% Hollow Heart ²	4	0.0	0.0-0.0	
% Stand	4	95	92-96	
Emergence Uniformity	4	3.0	2.8-3.3	
Vine Vigor ³	4	3.1	2.8-3.3	
Stems/Plant	4	4.6	3.3-6.6	
Vine Size ⁴	4	4.1	4.0-4.3	
Vine Type ⁵	4	3.1	3.0-3.5	
Vine Maturity ⁶	4	2.8	2.3-3.0	
Blackspot ⁷	Bud End	5	4.6	4.3-4.8
	Stem End	5	3.1	2.6-3.9
	Average	5	3.9	
Weight Loss ⁸	5	3.2	1.5-5.1	
Dormancy ⁹	5	58	49-74	
Enzymatic Browning ¹⁰	5	3.8	2.8-4.6	
Specific Gravity	5	1.083	1.079-1.089	
Fry Color ¹¹	Harvest	5	1.2	1.0-2.0
	Storage	5	1.0	1.0-1.0
Fry Texture ¹²	Harvest	5	2.4	2.0-3.0
	Storage	5	2.4	2.0-3.0

Refer to footnotes on page 100.

Table 160. Detailed data summary for C004099-3W/Y.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	4	379	335-429	
Yield US #1 (Cwt/A)	4	191	168-246	
% US #1	4	50	44-58	
Yield >10 oz (Cwt/A)	4	6	2-11	
Yield <4 oz (Cwt/A)	4	186	160-214	
% External Defects ¹	4	0.6	0.0-1.1	
% Hollow Heart ²	4	0.3	0.0-0.6	
% Stand	4	98	96-100	
Emergence Uniformity	4	3.5	3.3-3.8	
Vine Vigor ³	4	3.2	3.0-3.5	
Stems/Plant	4	4.5	3.3-5.7	
Vine Size ⁴	4	3.6	3.0-4.0	
Vine Type ⁵	4	2.9	2.8-3.0	
Vine Maturity ⁶	4	2.7	1.8-3.0	
Blackspot ⁷	Bud End	5	4.3	4.0-4.7
	Stem End	5	3.7	2.3-4.6
	Average	5	4.0	
Weight Loss ⁸	5	2.0	1.7-2.4	
Dormancy ⁹	5	82	63-116	
Enzymatic Browning ¹⁰	5	3.7	2.8-4.6	
Specific Gravity	5	1.091	1.085-1.095	
Fry Color ¹¹	Harvest	5	1.0	0.0-2.0
	Storage	5	0.8	0.0-1.0
Fry Texture ¹²	Harvest	5	3.8	3.0-4.0
	Storage	5	3.8	3.0-5.0

Refer to footnotes on page 100.

Table 16P. Detailed data summary for Mountain Rose.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	8	383	288-449
Yield US #1 (Cwt/A)	8	262	150-354
% US #1	8	68	52-79
Yield >10 oz (Cwt/A)	8	23	4-63
Yield <4 oz (Cwt/A)	8	116	91-148
% External Defects ¹	8	1.1	0.0-2.4
% Hollow Heart ²	8	0.0	0.0-0.0
% Stand	8	98	94-100
Emergence Uniformity	8	3.6	3.0-4.3
Vine Vigor ³	8	2.7	2.0-3.0
Stems/Plant	8	3.7	2.9-4.9
Vine Size ⁴	8	2.7	2.3-3.0
Vine Type ⁵	8	2.9	2.5-3.0
Vine Maturity ⁶	8	2.2	1.5-3.0
Blackspot ⁷	Bud End	---	---
	Stem End	---	---
	Average	---	---
Weight Loss ⁸	11	4.1	1.3-6.3
Dormancy ⁹	11	102	77-153
Enzymatic Browning ¹⁰	---	---	---
Specific Gravity	11	1.081	1.074-1.086
Fry Color ¹¹	Harvest	---	---
	Storage	---	---
Fry Texture ¹²	Harvest	6	2.5
	Storage	6	2.7

Refer to footnotes on page 100.

Table 16Q. Detailed data summary for Purple Majesty.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	23	467	251-606
Yield US #1 (Cwt/A)	23	252	57-401
% US #1	23	52	23-72
Yield >10 oz (Cwt/A)	23	26	0-61
Yield <4 oz (Cwt/A)	23	212	122-326
% External Defects ¹	23	0.6	0.0-1.7
% Hollow Heart ²	23	0.9	0.0-3.4
% Stand	23	97	92-100
Emergence Uniformity	23	3.4	2.5-4.0
Vine Vigor ³	23	3.4	2.3-4.5
Stems/Plant	23	4.4	3.2-6.1
Vine Size ⁴	23	3.1	2.3-4.0
Vine Type ⁵	23	2.8	2.3-3.0
Vine Maturity ⁶	23	2.2	1.5-3.0
Blackspot ⁷	Bud End	---	---
	Stem End	---	---
	Average	---	---
Weight Loss ⁸	32	3.5	1.1-6.8
Dormancy ⁹	32	62	42-85
Enzymatic Browning ¹⁰	---	---	---
Specific Gravity	32	1.085	1.074-1.094
Fry Color ¹¹	Harvest	---	---
	Storage	---	---
Fry Texture ¹²	Harvest	27	2.7
	Storage	27	2.7

Refer to footnotes on page 100.

Table 16R. Detailed data summary for Yukon Gold.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	37	402	308-513	
Yield US #1 (Cwt/A)	37	357	257-444	
% US #1	37	89	78-94	
Yield >10 oz (Cwt/A)	37	153	55-248	
Yield <4 oz (Cwt/A)	37	37	22-66	
% External Defects ¹	37	1.8	0.0-5.6	
% Hollow Heart ²	37	0.5	0.0-2.2	
% Stand	37	96	90-104	
Emergence Uniformity	37	3.4	2.5-5.0	
Vine Vigor ³	37	3.6	3.0-4.3	
Stems/Plant	37	2.5	1.6-3.8	
Vine Size ⁴	37	3.1	2.5-4.0	
Vine Type ⁵	37	2.7	2.0-3.5	
Vine Maturity ⁶	37	1.9	1.0-3.0	
Blackspot ⁷	Bud End	47	4.3	2.0-5.0
	Stem End	47	4.1	2.4-5.0
	Average	47	4.2	
Weight Loss ⁸	47	2.1	1.0-4.3	
Dormancy ⁹	47	90	63-132	
Enzymatic Browning ¹⁰	47	4.4	3.4-5.0	
Specific Gravity	47	1.087	1.079-1.093	
Fry Color ¹¹	Harvest	47	1.7	1.0-4.0
	Storage	47	2.7	1.0-4.0
Fry Texture ¹²	Harvest	47	3.1	1.0-4.0
	Storage	47	3.1	1.0-4.0

Refer to footnotes on page 100.

Table 16S. Detailed data summary for AC01151-5W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	6	465	402-557	
Yield US #1 (Cwt/A)	6	368	303-430	
% US #1	6	79	67-90	
Yield >10 oz (Cwt/A)	6	68	53-115	
Yield <4 oz (Cwt/A)	6	85	45-134	
% External Defects ¹	6	2.6	0.6-7.4	
% Hollow Heart ²	6	0.2	0.0-0.6	
% Stand	6	97	96-99	
Emergence Uniformity	6	3.1	2.8-4.0	
Vine Vigor ³	6	3.2	3.0-3.5	
Stems/Plant	6	3.5	2.3-4.8	
Vine Size ⁴	6	3.4	3.0-3.8	
Vine Type ⁵	6	3.0	3.0-3.0	
Vine Maturity ⁶	6	3.1	3.0-3.3	
Blackspot ⁷	Bud End	13	4.5	3.2-5.0
	Stem End	13	3.2	1.7-5.0
	Average	13	3.9	
Weight Loss ⁸	13	2.3	1.6-3.3	
Dormancy ⁹	13	97	70-127	
Enzymatic Browning ¹⁰	13	1.8	1.2-3.2	
Specific Gravity	14	1.090	1.078-1.103	
Chip Color ¹¹	40	14	4.4	3.0-5.0
	40R	14	3.8	2.5-4.5
	50	14	2.3	1.0-3.0
	50R	14	2.3	1.0-3.5

Refer to footnotes on page 100.

Table 16T. Detailed data summary for CO02024-9W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	6	416	343-480	
Yield US #1 (Cwt/A)	6	327	295-369	
% US #1	6	79	69-89	
Yield >10 oz (Cwt/A)	6	50	25-71	
Yield <4 oz (Cwt/A)	6	83	39-146	
% External Defects ¹	6	1.5	0.3-3.7	
% Hollow Heart ²	6	0.2	0.0-0.8	
% Stand	6	97	96-98	
Emergence Uniformity	6	3.3	3.0-3.5	
Vine Vigor ³	6	3.4	3.0-4.0	
Stems/Plant	6	3.5	2.6-4.9	
Vine Size ⁴	6	3.2	2.8-3.8	
Vine Type ⁵	6	3.0	2.8-3.0	
Vine Maturity ⁶	6	3.0	3.0-3.0	
Blackspot ⁷	Bud End	13	4.4	3.8-5.0
	Stem End	13	3.0	1.6-4.7
	Average	13	3.7	
Weight Loss ⁸	13	3.0	2.1-3.9	
Dormancy ⁹	13	101	84-134	
Enzymatic Browning ¹⁰	13	3.6	2.0-4.6	
Specific Gravity	14	1.088	1.080-1.095	
Chip Color ¹¹	40	14	3.8	3.0-4.5
	40R	14	2.7	1.5-4.0
	50	14	1.5	1.0-2.5
	50R	14	1.5	1.0-2.5

Refer to footnotes on page 100.

Table 16U. Detailed data summary for CO02033-1W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	6	426	368-484	
Yield US #1 (Cwt/A)	6	361	317-399	
% US #1	6	85	79-89	
Yield >10 oz (Cwt/A)	6	50	15-75	
Yield <4 oz (Cwt/A)	6	61	36-92	
% External Defects ¹	6	0.8	0.2-1.6	
% Hollow Heart ²	6	1.6	0.0-2.6	
% Stand	6	98	96-100	
Emergence Uniformity	6	3.4	3.0-4.0	
Vine Vigor ³	6	3.5	3.0-4.0	
Stems/Plant	6	3.6	2.7-4.7	
Vine Size ⁴	6	3.3	3.0-3.8	
Vine Type ⁵	6	3.0	2.8-3.0	
Vine Maturity ⁶	6	2.7	2.0-3.0	
Blackspot ⁷	Bud End	13	3.6	2.7-5.0
	Stem End	13	3.3	2.0-4.7
	Average	13	3.5	
Weight Loss ⁸	13	3.5	2.3-5.2	
Dormancy ⁹	13	113	70-167	
Enzymatic Browning ¹⁰	13	3.7	2.4-4.6	
Specific Gravity	14	1.098	1.090-1.106	
Chip Color ¹¹	40	14	3.4	2.5-4.0
	40R	14	2.8	1.5-3.5
	50	14	1.9	1.0-2.5
	50R	14	2.0	1.0-3.5

Refer to footnotes on page 100.

Table 16V. Detailed data summary for CO02321-4W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	6	423	351-508	
Yield US #1 (Cwt/A)	6	340	250-397	
% US #1	6	80	71-85	
Yield >10 oz (Cwt/A)	6	76	54-105	
Yield <4 oz (Cwt/A)	6	66	43-95	
% External Defects ¹	6	3.6	2.5-5.6	
% Hollow Heart ²	6	0.0	0.0-0.0	
% Stand	6	96	91-99	
Emergence Uniformity	6	3.8	3.0-4.8	
Vine Vigor ³	6	3.8	3.5-4.5	
Stems/Plant	6	3.2	2.1-4.1	
Vine Size ⁴	6	3.3	3.0-3.5	
Vine Type ⁵	6	2.9	2.8-3.3	
Vine Maturity ⁶	6	2.8	2.5-3.0	
Blackspot ⁷	Bud End	13	4.6	4.0-5.0
	Stem End	13	3.8	3.0-4.5
	Average	13	4.2	
Weight Loss ⁸	13	3.6	2.5-4.5	
Dormancy ⁹	13	83	63-106	
Enzymatic Browning ¹⁰	13	4.2	3.6-4.8	
Specific Gravity	14	1.101	1.092-1.109	
Chip Color ¹¹	40	14	3.8	2.5-4.5
	40R	14	2.6	2.0-3.5
	50	14	1.7	1.0-2.5
	50R	14	1.8	1.0-3.0

Refer to footnotes on page 100.

Table 16W. Detailed data summary for AC03433-1W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	5	414	340-492	
Yield US #1 (Cwt/A)	5	335	251-421	
% US #1	5	80	74-86	
Yield >10 oz (Cwt/A)	5	68	22-95	
Yield <4 oz (Cwt/A)	5	51	41-64	
% External Defects ¹	5	6.8	3.7-10.1	
% Hollow Heart ²	5	0.2	0.0-1.0	
% Stand	5	95	91-98	
Emergence Uniformity	5	2.9	2.3-3.3	
Vine Vigor ³	5	3.1	2.5-4.3	
Stems/Plant	5	3.2	2.5-4.6	
Vine Size ⁴	5	3.8	3.5-4.0	
Vine Type ⁵	5	3.0	3.0-3.0	
Vine Maturity ⁶	5	3.5	3.0-4.0	
Blackspot ⁷	Bud End	11	4.8	4.3-5.0
	Stem End	11	4.1	2.5-4.8
	Average	11	4.4	
Weight Loss ⁸	11	3.5	2.2-5.5	
Dormancy ⁹	11	81	69-101	
Enzymatic Browning ¹⁰	11	4.4	3.4-4.8	
Specific Gravity	12	1.086	1.078-1.092	
Chip Color ¹¹	40	12	3.4	2.5-5.0
	40R	12	2.9	2.0-4.0
	50	12	1.6	1.0-3.0
	50R	12	1.7	1.0-2.5

Refer to footnotes on page 100.

Table 16X. Detailed data summary for CO03243-3W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	5	464	439-501	
Yield US #1 (Cwt/A)	5	400	357-438	
% US #1	5	86	81-88	
Yield >10 oz (Cwt/A)	5	93	76-113	
Yield <4 oz (Cwt/A)	5	56	46-71	
% External Defects ¹	5	2.0	0.6-2.8	
% Hollow Heart ²	5	0.5	0.0-0.9	
% Stand	5	97	92-99	
Emergence Uniformity	5	3.6	2.8-4.3	
Vine Vigor ³	5	3.6	2.8-5.0	
Stems/Plant	5	2.9	2.5-3.5	
Vine Size ⁴	5	4.1	3.8-4.3	
Vine Type ⁵	5	3.0	3.0-3.0	
Vine Maturity ⁶	5	3.3	3.0-4.0	
Blackspot ⁷	Bud End	11	4.4	3.4-5.0
	Stem End	11	3.7	2.9-4.5
	Average	11	4.0	
Weight Loss ⁸	11	3.2	2.3-4.3	
Dormancy ⁹	11	81	63-101	
Enzymatic Browning ¹⁰	11	3.3	2.4-4.2	
Specific Gravity	12	1.089	1.083-1.095	
Chip Color ¹¹	40	12	3.9	2.5-5.0
	40R	12	3.1	2.5-4.0
	50	12	1.8	1.0-3.0
	50R	12	1.7	1.0-3.0

Refer to footnotes on page 100.

Table 16Y. Detailed data summary for AC00206-2W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	4	324	279-362	
Yield US #1 (Cwt/A)	4	257	210-299	
% US #1	4	79	75-83	
Yield >10 oz (Cwt/A)	4	34	16-48	
Yield <4 oz (Cwt/A)	4	60	52-69	
% External Defects ¹	4	2.3	0.8-3.3	
% Hollow Heart ²	4	1.7	0.0-2.5	
% Stand	4	97	94-98	
Emergence Uniformity	4	2.8	2.3-3.3	
Vine Vigor ³	4	3.1	3.0-3.3	
Stems/Plant	4	2.5	2.2-2.9	
Vine Size ⁴	4	2.4	2.0-2.8	
Vine Type ⁵	4	2.8	2.5-3.0	
Vine Maturity ⁶	4	2.8	2.3-3.0	
Blackspot ⁷	Bud End	9	4.6	4.1-5.0
	Stem End	9	4.1	3.3-4.9
	Average	9	4.4	
Weight Loss ⁸	9	3.5	2.7-4.9	
Dormancy ⁹	9	86	63-103	
Enzymatic Browning ¹⁰	9	4.5	3.4-5.0	
Specific Gravity	9	1.086	1.083-1.091	
Chip Color ¹¹	40	10	3.0	2.0-3.5
	40R	10	2.2	1.5-3.0
	50	10	1.5	1.0-2.0
	50R	10	1.8	1.0-2.5

Refer to footnotes on page 100.

Table 16Z. Detailed data summary for AC03452-2W.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	4	446	412-489	
Yield US #1 (Cwt/A)	4	378	333-418	
% US #1	4	85	81-88	
Yield >10 oz (Cwt/A)	4	68	34-91	
Yield <4 oz (Cwt/A)	4	61	46-74	
% External Defects ¹	4	1.4	1.2-1.7	
% Hollow Heart ²	4	0.6	0.0-1.5	
% Stand	4	99	98-99	
Emergence Uniformity	4	3.9	3.8-4.3	
Vine Vigor ³	4	3.5	3.3-3.8	
Stems/Plant	4	3.4	2.7-4.4	
Vine Size ⁴	4	3.5	3.3-3.8	
Vine Type ⁵	4	2.9	2.8-3.0	
Vine Maturity ⁶	4	3.1	3.0-3.3	
Blackspot ⁷	Bud End	9	4.9	4.6-5.0
	Stem End	9	4.8	3.6-5.0
	Average	9	4.8	
Weight Loss ⁸	9	1.8	1.4-2.4	
Dormancy ⁹	9	77	59-95	
Enzymatic Browning ¹⁰	9	4.8	4.4-5.0	
Specific Gravity	10	1.078	1.073-1.087	
Chip Color ¹¹	40	10	3.5	2.5-4.5
	40R	10	3.2	2.0-4.0
	50	10	1.3	1.0-2.0
	50R	10	1.7	1.0-2.5

Refer to footnotes on page 100.

Table 16AA. Detailed data summary for Atlantic.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	45	459	307-597	
Yield US #1 (Cwt/A)	45	396	265-512	
% US #1	45	86	76-93	
Yield >10 oz (Cwt/A)	45	147	58-290	
Yield <4 oz (Cwt/A)	45	50	19-109	
% External Defects ¹	45	2.7	0.1-9.1	
% Hollow Heart ²	45	5.1	0.2-16.4	
% Stand	45	96	88-100	
Emergence Uniformity	39	3.7	3.0-4.3	
Vine Vigor ³	39	3.5	2.8-4.5	
Stems/Plant	45	3.1	2.2-4.9	
Vine Size ⁴	39	3.2	2.2-4.0	
Vine Type ⁵	39	3.0	2.8-3.8	
Vine Maturity ⁶	45	3.2	2.8-4.0	
Blackspot ⁷	Bud End	65	3.3	1.8-5.0
	Stem End	65	2.8	1.4-4.3
	Average	66	3.0	
Weight Loss ⁸	66	4.3	1.1-7.9	
Dormancy ⁹	63	85	56-119	
Enzymatic Browning ¹⁰	64	4.5	3.8-5.0	
Specific Gravity	67	1.098	1.083-1.120	
Chip Color ¹¹	40	67	4.1	2.0-5.0
	40R	67	3.6	1.5-5.0
	50	67	2.7	1.0-4.0
	50R	67	2.5	1.0-5.0

Refer to footnotes on page 100.

Table 16AB. Detailed data summary for Chipeta.

Variable	# Trials	Mean	Range	
Total Yield (Cwt/A)	42	536	399-757	
Yield US #1 (Cwt/A)	42	454	306-606	
% US #1	42	85	71-90	
Yield >10 oz (Cwt/A)	42	169	52-388	
Yield <4 oz (Cwt/A)	42	54	22-119	
% External Defects ¹	42	5.3	1.1-13.0	
% Hollow Heart ²	42	0.6	0.0-4.0	
% Stand	42	98	94-100	
Emergence Uniformity	35	3.7	3.0-5.0	
Vine Vigor ³	35	4.0	3.0-5.0	
Stems/Plant	41	3.5	2.0-4.9	
Vine Size ⁴	35	4.4	4.0-5.0	
Vine Type ⁵	35	3.1	2.5-4.0	
Vine Maturity ⁶	42	3.3	3.0-4.0	
Blackspot ⁷	Bud End	61	4.0	2.2-5.0
	Stem End	61	3.7	1.4-5.0
	Average	63	3.9	
Weight Loss ⁸	63	3.1	1.0-8.0	
Dormancy ⁹	59	102	70-153	
Enzymatic Browning ¹⁰	60	4.0	2.8-5.0	
Specific Gravity	63	1.090	1.073-1.107	
Chip Color ¹¹	40	63	4.5	3.0-5.0
	40R	63	3.9	1.5-5.0
	50	63	2.6	1.0-4.0
	50R	63	2.3	1.0-4.0

Refer to footnotes on page 100.

Footnotes for Tables 16A-16AB:

- ¹Percent external defects based on the proportion of the total sample weight with significant defects.
- ²Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.
- ³Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.
- ⁴Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.
- ⁵Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.
- ⁶Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.
- ⁷Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.
- ⁸Tubers were stored at 45F for approximately 3 months.
- ⁹Days from harvest to first visible growth. Tubers were stored at 45F.
- ¹⁰Degree of darkening rated at 60 minutes after slicing tubers lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.
- ¹¹Chip color was rated using the Snack Food Association 1-5 scale. Ratings of ≤ 2.0 are acceptable. Reconditioned samples were stored at 60F for three weeks. Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2.0 are acceptable.
- ¹²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

APPENDIX 1. Cultural management information for the Potato Breeding and Selection Program's trials at the San Luis Valley Research Center - 2013.

LOCATION: San Luis Valley Research Center

SOIL TYPE: Sandy Loam (Dunul cobbly sandy loam)

DATE:

Planted - 5/15/13

Hilled - 6/3/13

Vines Killed - 8/30/13 (sulfuric acid - 25 gal / A) 107 days after planting

Harvested - 9/24/13

PLOT INFORMATION:

Size of Plots - 1 row x 25'

Spacing Between Hills - 12"

Spacing Between Rows - 34"

Hills Per Plot - 25

Number of Reps - 4 except 2 for Intermediate Yield Trials

METHOD OF HARVEST:

Machine (Grimme 1-row)

FERTILIZER:

5/15/13 - 80 lbs N + 60 lbs P₂O₅ + 40 lbs K₂O + 25 lbs S + 2.5 lb Zn/A (dual band in-row liquid application)

7/11/13 - 15 lbs N (fertigated)

7/17/13 - 10 lbs N (fertigated)

7/29/13 - 15 lbs N (fertigated)

Total fertilizer applied: 120 lbs N + 60 lbs P₂O₅ + 40 lbs K₂O + 25 lb S + 2.5 lb Zn/A

IRRIGATION:

Center Pivot -16.55" gross application (application frequency and amount based on ET)

Rainfall - 2.41" (5/15/13 - 8/30/13)

INSECTICIDES APPLIED:

5/15/13 - Platinum 75 SG (0.125 lb a.i./A thiamethoxam in-row application)

7/31/13 - Fulfill (0.172 lb a.i./A pymetrozine)

FUNGICIDES APPLIED:

5/15/13 - Omega 500F (lb a.i./A fluzinam in-row application)

7/10/13 - Quadris (0.202 lb a.i./A)

7/31/13 - Bravo Weather Stik (1.125 lb a.i./A chlorothalonil)

HERBICIDES APPLIED:

6/6/13 - Dual Magnum (1.432 lb a.i./A S-metolachlor)

6/17/13 - Matrix SG (0.094 lb a.i./A rimsulfuron)

6/17/13 - Eptam 7E (1.0 lb a.i./A S-ethyl dipropylthiocarbamate)

APPENDIX 2. General procedures used for postharvest evaluations.

Blackspot. Ten randomly selected tubers for each clone tested are bruised on the stem and bud ends with a 150 g weight dropped from a height of 60 cm. Tubers are stored at 40F prior to bruising and warmed up for 24 hours prior to bruising. After bruising, tubers are stored at room temperature for two days prior to evaluation. Blackspot susceptibility is evaluated by cutting the tubers in half longitudinally and rating the extent of damage. Blackspot is rated on a 1 to 5 scale, with 5 indicating no discoloration.

Storage Weight Loss and Dormancy. Ten randomly selected tubers are weighed and stored at 45F for approximately a three month period under low relative humidity conditions to evaluate storage weight loss potential. These tubers are also observed weekly for sprout growth. Dormancy is reported as days after harvest to first visible sprout growth.

Enzymatic Browning. Five tubers of each clone are cut in half lengthwise and rated for degree of darkening 60 minutes later. Degree of darkening is rated on a 1 to 5 scale, with 5 indicating no discoloration.

Specific Gravity. Specific gravity is determined using the air/water method.

Fry Color and Texture. Fry color and texture is determined at or shortly after harvest and after a minimum of eight weeks of storage at 45F. Fries are cooked for 3 ½ minutes at 375F. Fry color is rated on a 0-4 scale using the USDA color standards. Color ratings ≤ 2 are acceptable. Fry texture is rated on a 1 to 5 scale, with 5 indicating that the cooked flesh was dry and mealy, with 1 representing a soggy, wet texture.

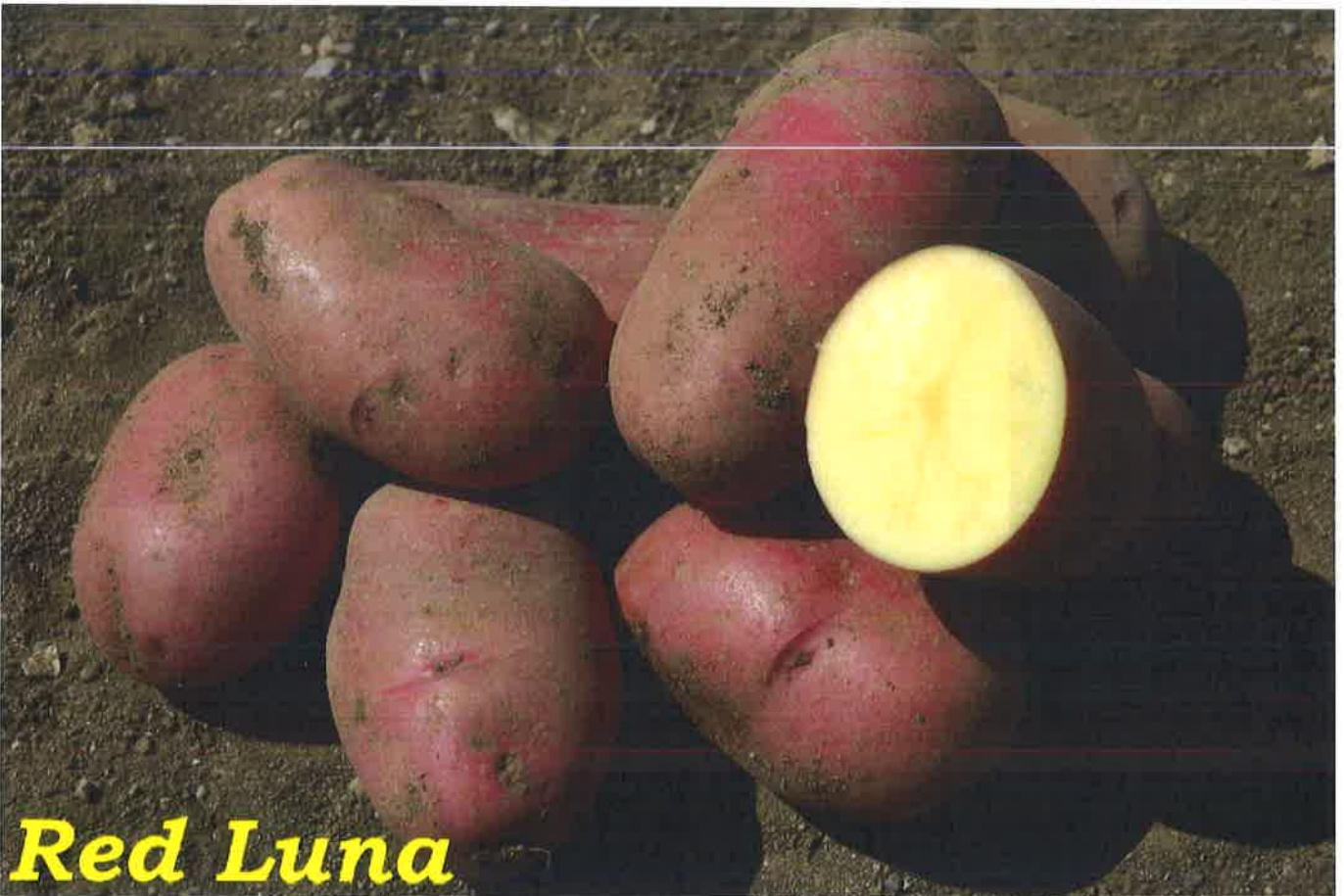
Chip Color. Chip color is determined after an interval of storage at 40 and 50F and after reconditioning for three weeks at 60F. Chips are cooked at 365F until bubbling slows. Chip color is rated using the Snack Food Association 1-5 scale. Ratings ≤ 2.0 are acceptable.

Notes





Midnight Moon



Red Luna