

2018 Research Progress Report

Potato Breeding and Selection

Submitted by

David G. Holm, Caroline Gray and Katie Gaudreau

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 **2018 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), Potatoes USA, and PVP royalties. These funds collectively continue to allow us to strengthen our overall collaborative research efforts with colleagues at CSU and 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 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, and powdery scab, as well as 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:

- Samuel Y. C. Essah - Cultivar Specific Production Management
- Sastry S. Jayanty - Cultivar Specific Postharvest Management and Physiology
- Adam Heuberger - Nutritional Characteristics and Health Attributes
- Andrew J. Houser - Potato Certification Service and Disease Screening of Advanced Selections for PVY and Ringrot.
- Amy Charkowski - Disease Screening of Advanced Selections for Powdery Scab, PMTV, and soft rot (*Dickeya dianthicola* and *Pectobacterium atrosepticum*).
- 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 2019 production season!

Sincerely,

Dave Holm, Caroline Gray and Katie Gaudreau

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 2018.

- ✓ 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 2017-34141-27336.
 - *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 and Graduate Students*

Nikki Jo Albert	Mitzi Cisneros	Megan Gylling	Kristine Hoffner
Jamie Reed-Briggs	Lexi Shawcroft	Sam Teti	Jeremy Logrono*

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

- ✓ Research Collaborators - Colorado State University

Samuel Essah	Sastry Jayanty	Adam Heuberger	Andrew Houser
Amy Charkowski			

- ✓ Staff - San Luis Valley Research Center

Tyler Thompson	Sharon Yust	Michelle Leckler	Stan Price
Ron Price	Tim Poe		

- ✓ Potato Certification Service

Andrew Houser	Teresa Almeida	Rick Haslar (retired)	Carolyn Keller
Sarah Noller	Sarah Shawcroft	Jeff Shawcroft	

- ✓ 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 the 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.

2018 Research Progress Report

Potato Breeding and Selection

Submitted by

David G. Holm, Caroline Gray and Katie Gaudreau

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 interstate and international export.

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

Besides the major objectives, specific breeding emphasis is 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/PMTV; (8) corky ringspot, and (9) improved nutritional quality, health attributes, and other “consumer” characteristics such as improved red skin color retention and shelf life. A continuing priority is breeding/selecting for “low input” cultivars, primarily for reduced nitrogen and fungicide input, and for improved postharvest and processing qualities such as lengthened dormancy. Cultivars with these characteristics will help insure that the potato industry in Colorado remains productive and competitive.

Cultivar development is a five-step process, encompassing first, the generation of segregating populations and evaluation for visual agronomic traits. Second, superior progeny are identified, then these selections undergo additional evaluation for a number of economically important characteristics. Third, a profile of cultivar specific management criteria - production and postharvest guidelines are developed, which a grower, shipper, processor, and/or marketer may fine tune for his/her operation. Fourth, a basic seed source is developed to facilitate further seed increase and commercial testing of advanced selections. Fifth, market development takes place to

determine consumer acceptance and recognition in the intended market. Finally, the new cultivar must be introduced to the intended market. These steps provide the base for successful cultivar release. Without all components, fruition is difficult to attain.

The process of cultivar development takes 14 or more years. Years 1 and 2 are the potato breeding phase of the development process. Parents are selected and crossed to produce true potato seed. Seedling tubers are then produced from the true seed in year 2. Year 3 and later years represent the selection phase of the development process. Each year represents another round of field selection. As each year is completed, fewer and fewer clones remain and the amount of seed per selection is increased. Clones remaining after eight years 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 (MAS) provide opportunities, in concert with existing and new collaborators, to facilitate accelerated and focused breeding for high priority characteristics. MAS has value to identify suitable parental material, to facilitate the selection of progeny with these traits, and to generally inform a breeding program on trait specific progress. Expansion of MAS is dependent on increases in future funding and identifying additional appropriate cooperators.

A priority of the potato cultivar development process is to provide a 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 with late blight resistance, virus resistance (PVX, PVY, and PLRV), nematode resistance, and other characteristics of importance is continually being acquired from various sources. Primary sources are the USDA-ARS in Aberdeen, Idaho; Prosser, Washington, Sturgeon Bay, Wisconsin (NRSP-6), and Madison, Wisconsin; and Oregon State University. Other sources are Asia, Europe, and South America. All of these materials are incorporated into our germplasm in the breeding program.

Crossing. The Colorado Potato Breeding and Selection Program intercrossed 101 parental clones in 2017 in two separate crossing blocks. The emphasis of the first crossing block was russet and specialty (fingerling) cultivar development and disease resistance. The second crossing block emphasized russet and chip cultivar development, and disease resistance. Seed from 331 combinations was obtained. A subset of these and previous crosses will be planted in the greenhouse in 2018 to produce seedling tubers.

Approximately 49,565 first-size seedling tubers representing 224 families were produced from selected greenhouse crosses made in 2015-2016. These seedlings will undergo initial field selection in 2018. These seedlings represent crosses segregating primarily for russets, yellows, reds, chippers, specialty

types, and resistance to Verticillium wilt, late blight, PVY, corky ringspot, and nematodes. Second through fourth size seedling tubers will be distributed to Idaho (USDA-ARS), North Dakota, Maine, Oregon, Texas, and Alberta, Canada (Agriculture Canada).

Seedling Selection and Clonal Development

Colorado grew 89,935 first-year seedlings representing 463 families in 2017, with 564 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, North Dakota State University, and the University of Maine. Another 722 clones were in 12-hill, preliminary, and intermediate stages of selection. At harvest, 194 were saved for further increase and evaluation in 2018. Sixty-eight advanced selections were saved and will be increased in 2018 pending further evaluation. Another 271 selections and cultivars were maintained for germplasm development, breeding, and other experimental purposes including seed increase/maintenance.

Field trials conducted in 2017 included: Preliminary Trial, Intermediate Yield Trial, Intermediate Specialty Yield Trial, Advanced Yield Trial, Advanced Fingerling Yield Trial, Southwestern Regional Russet Trial, Western Regional Russet Trial, Western Regional Red Trial, Western Regional Specialty Trial, Western Regional Chipping Trial, and the San Luis Valley Chipping Trial. All trials are grown under "low input" conditions, primarily reduced nitrogen and fungicide. Tables 2-12 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 2017.

A total of 188 samples are in the process of being 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, chip color, and red color retention. Appendix 2 lists the procedures used for the postharvest evaluations for the trials.

Several advanced selections were evaluated in the Southwest Regional Trials, Western Regional Trials, or by potato growers in 2017 representing russets, specialties, and chipping selections. Advanced Colorado selections evaluated in the Southwest Regional Trials and Western Regional Trials were seven russets (CO08065-2RU, CO08155-2RU/Y, CO08231-1RU, CO09036-2RU, CO09076-3RU, CO09165-6W, and CO09205-2RU), eight yellows and specialties (AC03534-2R/Y, CO05035-1PW/Y, CO08037-2P/P, CO09079-5PW/Y, CO09127-3W/Y, CO09128-3W/Y, CO09128-4W/Y, and CO09218-5W/Y), and one chip selection (AC01144-1W).

Advanced selections available to growers for on-farm trials were seven russets (AC05039-2RU, CO03187-1RU, CO03202-1RU, CO04220-7RU, CO05068-1RU, CO07015-4RU, and CO07049-1RU), eight yellows and specialties (AC05175-3P/Y, CO04056-3P/PW, CO04067-8R/Y, CO05035-1PW/Y, CO05037-2R/Y, CO05037-3W/Y, and CO07131-1W/Y), and ten chip selections (AC00206-2W, AC01144-1W, AC01151-5W, AC03433-1W, AC03452-2W, AC05153-1W, CO02033-1W, CO02321-4W, CO03243-3W, and CO07070-13W).

Several selections that have been discontinued from grower evaluations are available for exclusive release. Anyone interested in further information about how exclusive releases are developed may contact David Holm for further information. Included are russets - AC96052-1RU, AC00395-2RU, CO97087-2RU, CO98067-7RU, CO99053-4RU, CO03276-5RU, and CO05175-1RU; reds - CO98012-5R, CO99076-6R, CO99256-2R, CO00277-2R, and CO00291-5R; chippers CO02024-9W; and specialties (including yellows) - AC97521-1R/Y, ATC00293-1W/Y, CO97215-2P/P, CO97226-2R/R,

CO97227-2P/PW, CO97232-1R/Y, CO97232-2R/Y, CO99045-1W/Y, CO00405-1RF, CO00412-5W/Y, CO00415-1RF, CO04099-3W/Y, CO05028-4P/PY, CO05028-11P/RWP, VC0967-2R/Y, VC1002-3W/Y, and VC1009-1W/Y. Data summaries and photographs for all clones are available at potatoes.colostate.edu/programs/potato-breeding/cultivars/ under the section heading ‘Advanced Selections Available for Exclusive Release’.

In 2017, a certificate of Plant Variety Protection was issued for Crimson King (CO97222-1R/R). This new cultivar has been marketed for processing into colored potato chips. A Plant Variety Protection application was submitted for Winterset (CO02321-4W), a chipping cultivar.

Table 13 summarizes the performance of advanced selections that are available for growers to evaluate in 2018. Detailed data summaries for each of the advanced selections are presented in Tables 14A-14AH. Figure 1 includes photographs of these selections. Data summaries for additional selections that are available for exclusive release are available upon request.

Grower Gross Returns

This report also includes information on grower gross returns (\$/acre) for russets and yellow-fleshed selections. Table 15A compiles the grower return data for advanced russet selections and Figure 2 is a graphical representation of the data. Similarly, Table 15B presents the grower return data for yellow flesh selections and Figure 3 graphically presents the data.

Red Color Retention Study

This was the second year for a red color retention study. Table 16 presents color data collected at three-week intervals over a 15 week period. Figure 4 graphically presents the data for a subset of nine entries listed in Table 16. Graphical representation of red skin color retention over a fifteen week interval. Lower reflective values are associated with darker skin color.

The darkest colored reds (in order of darkness) were CO05211-4R, CO00291-5R, CO05228-4R, and CO99076-6R. Other dark reds were CO99256-2R, CO04159-1R, AC03534-2R/Y. Colorado Rose was next in order of darkness. The lightest colored reds (lightest first) were CO04067-8R/Y, Red LaSoda, CO05037-2R/Y, Chieftain, Sangre S-10, and CO04021-2R/Y. Overall there was not a significant decrease in color during storage. These results are consistent to those of last year.

Collaborative Studies

The following collaborative studies were conducted in 2017:

- Several advanced selections were evaluated for disease symptom expression screening trials in Colorado. These trials were conducted in cooperation with Andrew Houser. Diseases included were bacterial ring rot and PVY (20 selections).
- 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.

- Fourteen 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.
- Three 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 and that have suitable QSR attributes.
- Nine 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, Oregon, Michigan, Missouri, New York, Texas, North Dakota, and Wisconsin (plus a scab trial). Another twenty-six selections were included in the Early Generation South pre-NCPT trial in North Carolina.
- Two 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.
- Several selections were provided to Adam Heuberger. His research program focuses on using metabolomics to evaluate nutrition and health traits in advanced selections in our breeding program.

Graduate Students

Greg Hess, Ph.D. student. Greg is coadvised by Sastry Jayanty and David Holm. His thesis is focused on understanding PVY resistance in CSU potato germplasm. He will be screening select progeny for genetic markers associated with PVY resistance. Up to 300 progeny for a selected cross will be molecularly screened using markers targeting the Ryadg (andigena), Rysto (stoloniferum), Rychc (chacoense) genes. These resistant genes provide complete resistance to the various strains of PVY. Also three recently named cultivars from our program [Fortress Russet, Masquerade, and AC99330-1P/Y (aka Harvest Moon)] have complete resistance to PVY as determined via seed certification of the cultivars over a period of years. Part of Greg's project is oriented to determining the source of the resistance genes in these materials. Earlier marker analysis for Ryadg and Rysto indicated that they are not present in Fortress Russet, Masquerade, or Harvest Moon. This suggests that these selections may have Rychc genes or some other source of resistance.

Jeremy Logrono. Jeremy started a M.S. program last September. His research will focus on health attributes of potato.

Colorado State University Potato Program Website

We invite you to visit our website. To access the potato breeding program section of the potato program website go to potatoes.colostate.edu/potato-breeding/. This has been a valuable resource for people with inquiries wanting detailed information about advanced selections in our program. Please let us know if you have any suggestions or recommendations for improving our website or if you would like us to include additional information.

San Luis Valley Research Center Facebook Page

A Facebook page for the San Luis Valley Research Center (facebook.com/SLVRC.potatoes/) was developed to inform the public about various activities at the SLV Research Center including the potato breeding program. We encourage you to 'Like' our page to receive posts.

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	80,000-90,000 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 year of field selection.
4	Twelve-hills of each single-hill selection are planted. Second of field selection.
5	Preliminary Selections Tier 1 (PT1). Third year 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 year 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 year 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 year of 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 year 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 year 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 - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC10376-1W/Y	5.0	5.0	5.0	2.0	91	4.8
AC10454-1RU	5.0	4.1	4.6	4.7	56	3.4
AC10500-1RU	5.0	4.3	4.7	4.6	56	4.0
AC12080-4RU	4.7	3.3	4.0	2.9	98	3.6
AC12090-3RU	5.0	5.0	5.0	1.9	126	3.8
AFC6041-1R	3.9	4.4	4.2	6.6	56	3.0
CO13003-1RU	4.6	4.1	4.4	2.2	105	3.4
CO13007-2RU	5.0	5.0	5.0	2.0	98	4.0
CO13007-8RU	5.0	5.0	5.0	2.7	63	3.2
CO13008-6RU	5.0	5.0	5.0	5.0	70	3.6
CO13033-4W/Y	4.8	5.0	4.9	5.6	49	3.6
CO13055-4RU	4.8	4.6	4.7	2.8	98	2.8
CO13127-2RW/Y	5.0	5.0	5.0	6.3	42	3.8
CO13413-2RU	5.0	5.0	5.0	4.4	84	4.4
Canela Russet	5.0	5.0	5.0	2.3	168	4.6
Centennial Russet	5.0	5.0	5.0	4.5	89	3.6
Russet Burbank	5.0	4.9	5.0	1.1	124	3.6
Russet Norkotah-S3	5.0	4.8	4.9	2.0	95	3.2
Sangre-S10	4.3	5.0	4.7	1.8	98	3.2
Shepody	5.0	5.0	5.0	1.4	112	4.4
Yukon Gold	4.7	4.3	4.5	2.1	105	4.6

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

² Tubers were stored at 45F for 92 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 2B. Specific gravity, french fry color, and texture for Preliminary Trial clones - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
AC10376-1W/Y	1.057	4	3	3	2
AC10454-1RU	1.087	2	3	4	3
AC10500-1RU	1.085	2	3	3	3
AC12080-4RU	1.077	2	3	4	3
AC12090-3RU	1.073	3	3	3	3
AFC6041-1R	1.067	2	2	3	3
CO13003-1RU	1.078	1	0	3	3
CO13007-2RU	1.083	0	2	4	3
CO13007-8RU	1.074	2	1	3	3
CO13008-6RU	1.084	0	1	4	4
CO13033-4W/Y	1.083	0	1	4	4
CO13055-4RU	1.086	0	1	4	4
CO13127-2RW/Y	1.084	3	3	1	2
CO13413-2RU	1.087	3	3	2	3
Canela Russet	1.082	1	1	3	3
Centennial Russet	1.078	3	3	3	3
Russet Burbank	1.071	1	1	3	3
Russet Norkotah-S3	1.075	3	2	4	3
Sangre-S10	1.068	3	3	3	3
Shepody	1.074	4	3	3	3
Yukon Gold	1.092	2	1	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 3A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley Chipping study entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss ²	Dormancy ³ (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC00206-2W	4.9	4.6	4.8	4.0	81	5.0
AC01151-5W	3.8	3.4	3.6	3.7	89	2.6
AC03433-1W	4.7	4.4	4.6	5.9	61	4.8
AC03452-2W	5.0	5.0	5.0	3.7	69	5.0
AC05153-1W	5.0	5.0	5.0	5.4	69	4.2
AC11453-7W	4.3	4.1	4.2	3.2	84	5.0
AC11467-4W	5.0	4.3	4.7	2.9	105	3.6
AC11494-6W	3.2	3.2	3.2	1.8	105	4.6
AFC5687-2W	4.7	5.0	4.9	2.7	147	4.2
CO02321-4W	4.8	3.5	4.2	5.9	61	4.4
CO03243-3W	5.0	4.5	4.8	3.0	68	3.4
CO10073-7W	5.0	4.4	4.7	3.8	83	4.0
CO10076-4W	3.1	2.5	2.8	3.5	90	3.6
CO11023-2W	4.9	4.6	4.8	2.7	77	4.2
CO11023-9W	5.0	4.0	4.5	3.1	98	4.2

Table 3A continued on next page

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 3A (cont'd). Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley Chipping study entries - 2018.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight ² Loss		
CO11037-5W	5.0	5.0	5.0	1.8	98	3.0
CO12235-3W	4.8	4.5	4.7	2.2	105	4.2
CO12293-1W	5.0	5.0	5.0	3.1	104	4.6
CO12428-2W	4.7	4.0	4.4	5.0	83	4.6
CO13196-6W	5.0	5.0	5.0	8.4	70	4.8
CO13232-5W	3.7	2.8	3.3	2.3	105	4.4
CO13232-11W	5.0	4.4	4.7	1.9	119	4.6
CO13232-25W	4.7	4.6	4.7	3.2	105	5.0
CO13233-1W	3.4	3.3	3.4	2.3	105	4.2
CO13428-9W	3.5	2.6	3.1	4.4	84	3.4
FC16796-3W	5.0	5.0	5.0	2.5	77	5.0
Atlantic	3.4	4.0	3.7	4.1	61	4.6
Chipeta	4.7	4.9	4.8	2.0	98	4.4
Snowden	4.6	3.6	4.1	3.0	82	4.0

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 3B. Chip color¹ after various storage regimes, and specific gravity of San Luis Valley Chipping study entries - 2018.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
AC00206-2W	1.078	2.5	1.5	2.5	1.5
AC01151-5W	1.088	4.0	3.0	3.5	3.0
AC03433-1W	1.092	3.0	2.0	2.0	1.0
AC03452-2W	1.072	3.0	2.5	2.0	2.0
AC05153-1W	1.085	3.5	3.5	2.0	1.0
AC11453-7W	1.096	3.5	4.0	3.0	2.0
AC11467-4W	1.079	3.5	3.5	3.5	2.0
AC11494-6W	1.088	4.0	4.0	3.5	1.5
AC12178-2W	1.080	2.5	3.0	3.0	1.5
AC12184-1W	1.087	4.0	3.5	2.5	3.0
AC13126-1W	1.093	4.0	4.0	2.5	2.0
AC13127-2W	1.089	3.5	3.5	2.5	1.5
AC13127-5W	1.096	3.0	2.5	2.5	1.0
AC13127-9W	1.085	3.5	3.0	3.0	1.0
AFC5687-2W	1.077	4.5	4.0	2.5	2.0
CO02321-4W	1.104	2.5	3.0	3.0	3.0
CO03243-3W	1.079	3.0	3.0	2.5	3.0
CO10073-7W	1.083	4.5	3.0	2.0	3.0
CO10076-4W	1.074	4.5	1.5	2.5	2.0

Table 3B continued on the next page

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

Table 3B (cont'd). Chip color¹ after various storage regimes, and specific gravity of San Luis Valley Chipping study entries - 2018.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
CO11023-2W	1.085	3.5	3.0	2.5	2.0
CO11023-9W	1.080	3.0	3.0	3.0	1.0
CO11037-5W	1.077	4.0	2.5	2.5	1.5
CO12235-3W	1.083	5.0	3.5	2.5	1.0
CO12293-1W	1.074	5.0	3.5	3.5	2.5
CO12428-2W	1.090	3.5	2.5	1.5	1.0
CO13196-6W	1.087	4.5	4.0	3.5	3.0
CO13232-5W	1.078	4.0	2.5	1.5	1.5
CO13232-11W	1.078	4.5	3.5	3.5	2.0
CO13232-25W	1.079	2.5	2.0	2.0	3.0
CO13233-1W	1.088	2.5	2.0	3.0	2.5
CO13428-9W	1.089	4.5	3.5	2.5	2.0
FC16796-3W	1.079	5.0	4.0	4.0	3.0
Atlantic	1.093	5.0	3.5	2.5	3.0
Chipeta	1.087	3.5	2.5	3.0	1.0
Snowden	1.085	4.0	2.0	2.0	1.0

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 Yield Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AFC5726-1RU	494	439	89	256	183	42	1.66/1.15
AFC5730-3RU	412	383	93	198	184	15	1.72/1.20
CO11062-3RU	525	477	91	219	258	29	1.68/1.20
CO12152-1RU	371	303	82	231	72	50	1.89/1.24
CO12246-1RU	313	283	91	130	153	26	1.61/1.26
CO12254-15RU	329	229	70	85	144	26	1.56/1.21
CO12254-17RU	606	559	92	142	418	21	1.86/1.19
CO12267-1RU	505	462	92	281	182	30	1.86/1.19
CO12305-2RU	309	283	91	198	85	24	1.74/1.18
CO12377-2RU	337	236	69	214	22	95	1.81/1.23
CO12378-1RU	378	272	72	251	21	102	1.57/1.25
Canela Russet	472	441	93	204	236	26	1.78/1.22
Russet Norkotah-S3	613	559	91	92	467	13	2.05/1.26
Mean	436	379	86	192	186	38	1.76/1.22
LSD ³ (0.05)	128	122	12	82	151	23	0.16/0.07

¹ L=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.

² Russet Norkotah yield data not included in mean or LSD calculations.

³ LSD=least significant difference.

Table 4B. Grade defects for Intermediate Yield Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AFC5726-1RU	2.7	MS*, SG, GC	2.1
AFC5730-3RU	3.4	MS*	0.0
CO11062-3RU	3.6	MS*, SG, GR	7.7
CO12152-1RU	5.4	MS*	0.0
CO12246-1RU	1.2	MS*	0.0
CO12254-15RU	22.4	MS*, SG, GR*	0.0
CO12254-17RU	4.2	MS, GR*	0.7
CO12267-1RU	2.4	MS*, SG, GC	0.0
CO12305-2RU	0.7	GR*	0.0
CO12377-2RU	1.8	MS, SG*, GR	0.0
CO12378-1RU	1.1	MS*	0.0
Canela Russet	1.1	GR	0.0
Russet Norkotah-S3	6.8	MS*, SG, GC, GR	7.9

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 Yield Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AFC5726-1RU	78	3.0	3.0	2.2	4.5	3.0	4.0
AFC5730-3RU	100	3.0	2.5	2.6	2.0	3.0	3.0
CO11062-3RU	96	2.5	3.0	1.8	3.0	3.0	3.0
CO12152-1RU	98	3.5	2.0	2.6	2.0	3.0	3.0
CO12246-1RU	44	3.0	3.5	2.3	2.5	3.0	2.5
CO12254-15RU	60	2.0	2.0	1.8	2.5	3.0	3.5
CO12254-17RU	82	2.5	4.0	2.6	4.5	3.0	3.0
CO12267-1RU	100	3.0	3.0	2.3	3.5	3.0	3.0
CO12305-2RU	94	3.0	2.5	2.6	2.0	2.0	2.0
CO12377-2RU	90	3.0	2.5	2.6	2.0	3.0	2.5
CO12378-1RU	100	3.0	3.0	2.2	3.0	3.0	3.0
Canela Russet	100	3.0	2.0	1.8	3.0	3.0	3.5
Russet Norkotah-S3	100	3.5	2.0	2.3	4.5	3.0	4.0
Mean	88	2.9	2.7	2.3	3.0	3.0	3.1
LSD ⁷ (0.05)	22	1.4	NS	0.6	1.3	NS	1.1

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.

⁶Russet Norkotah % stand data not included in mean or LSD calculation.

⁷LSD=least significant difference.

Table 4D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Yield Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AFC5726-1RU	4.8	4.3	4.6	7.3	39	2.8
AFC5730-3RU	5.0	4.6	4.8	5.8	39	4.8
CO11062-3RU	5.0	5.0	5.0	6.2	46	4.6
CO12152-1RU	3.7	2.3	3.0	2.9	67	3.0
CO12246-1RU	5.0	4.0	4.5	5.2	53	3.4
CO12254-15RU	5.0	5.0	5.0	3.9	74	4.2
CO12254-17RU	5.0	3.7	4.4	3.4	39	2.2
CO12267-1RU	5.0	5.0	5.0	8.3	67	4.4
CO12305-2RU	5.0	4.9	5.0	2.6	67	4.0
CO12377-2RU	4.7	5.0	4.9	4.7	32	3.8
CO12378-1RU	5.0	4.8	4.9	3.7	81	2.8
Canela Russet	5.0	3.6	4.3	2.9	123	4.2
Russet Norkotah-S3	4.4	4.3	4.4	3.1	102	3.4

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 4E. Specific gravity, french fry color, and texture for Intermediate Yield Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
AFC5726-1RU	1.097	1	2	4	5
AFC5730-3RU	1.092	0	0	4	5
CO11062-3RU	1.084	2	3	3	3
CO12152-1RU	1.104	0	0	4	5
CO12246-1RU	1.084	0	1	3	4
CO12254-15RU	1.080	3	2	2	2
CO12254-17RU	1.095	1	1	3	3
CO12267-1RU	1.089	0	1	3	4
CO12305-2RU	1.077	1	1	3	3
CO12377-2RU	1.078	0	0	3	4
CO12378-1RU	1.095	0	0	5	4
Canela Russet	1.099	1	2	5	5
Russet Norkotah-S3	1.089	3	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 5A. Yield, grade, and tuber shape for Intermediate Specialty Yield Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
AC08116-1P/Y	342	275	80	185	89	60	1.00/1.33
CO12117-4RF/R	518	382	75	165	217	48	2.88/1.03
CO12125-3PF/P	548	380	65	170	210	18	2.62/1.17
Banana	425	233	55	134	99	27	3.62/1.10
LaRatte	338	187	56	95	93	13	3.57/1.13
Purple Majesty	420	195	46	148	48	217	1.21/1.23
Yukon Gold	414	358	86	196	162	38	1.20/1.25
Mean	435	287	66	156	131	60	2.30/1.18
LSD ² (0.05)	157	136	26	58	91	51	0.26/0.06

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 - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC08116-1P/Y	2.3	MS, GC*, GR	1.3
CO12117-4RF/R	4.1	MS*, GC, GR	0.0
CO12125-3PF/P	2.5	MS, SG*	0.0
Banana	28.2	MS, SG, GR*	0.0
LaRatte	26.1	MS, SG, GR*	0.0
Purple Majesty	2.0	MS*, SG	0.4
Yukon Gold	4.3	SG, GR*	1.4

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 5C. Growth characteristics of Intermediate Specialty Yield Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC08116-1P/Y	98	2.5	3.0	2.3	3.0	3.0	3.0
CO12117-4RF/R	86	3.0	2.5	3.2	5.0	3.0	4.5
CO12125-3PF/P	44	2.5	4.0	2.9	5.0	3.0	4.0
Banana	100	3.0	2.5	2.9	4.0	3.0	3.0
LaRatte	84	2.5	1.5	2.3	4.0	3.0	3.0
Purple Majesty	86	3.0	3.5	3.1	3.5	3.0	3.0
Yukon Gold	100	3.0	4.0	1.9	3.0	3.0	2.5
Mean	85	2.8	3.0	2.6	3.9	3.0	3.3
LSD ⁶ (0.05)	31	1.5	1.7	0.8	0.8	NS	1.1

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 - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC08116-1P/Y	3.4	1.6	2.5	6.3	67	1.0
CO12117-4RF/R	---	---	---	3.3	74	---
CO12125-3PF/P	---	---	---	8.4	67	---
Banana	5.0	5.0	5.0	4.1	67	4.4
LaRatte	5.0	4.4	4.7	3.8	67	3.8
Purple Majesty	---	---	---	12.6	46	---
Yukon Gold	4.8	4.7	4.8	1.6	67	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 5E. Specific gravity, french fry color, and texture for Intermediate Specialty Yield Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
AC08116-1P/Y	1.093	2	0	5	5
CO12117-4RF/R	1.086	-	-	5	5
CO12125-3PF/P	1.074	-	-	2	2
Banana	1.084	1	2	4	4
LaRatte	1.084	1	2	3	3
Purple Majesty	1.086	-	-	2	2
Yukon Gold	1.088	2	2	2	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 6A. Yield, grade, and tuber shape for Intermediate Chipping Yield Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC11453-2W	439	383	86	282	100	43	1.11/1.16
AC11453-7W	445	374	84	258	116	56	0.96/1.20
AC11467-4W	505	471	93	249	222	21	1.08/1.20
AC11494-6W	497	451	91	339	112	39	0.90/1.23
CO11047-3W	594	466	78	158	308	26	1.06/1.22
CO11047-7W	408	363	89	192	170	21	0.99/1.14
CO11079-3W	513	475	93	257	217	22	1.00/1.34
CO12235-3W	392	338	86	241	97	47	0.96/1.20
CO12235-5W	402	369	92	218	151	13	0.97/1.19
CO12235-11W	300	269	90	223	47	30	1.12/1.20
CO12236-4W	471	448	95	188	260	14	1.02/1.19
CO12248-4W	435	357	82	272	875	54	1.05/1.23
CO12293-1W	570	522	92	203	319	20	1.15/1.16
CO12428-1W	443	355	80	307	48	75	0.93/1.20
CO12428-2W	330	256	78	230	26	70	1.12/1.20
NDC12138C-1W	431	381	88	301	80	50	1.05/1.18
Atlantic	468	422	90	250	172	38	1.13/1.27
Chipeta	675	584	86	204	379	31	1.22/1.21
Snowden	529	482	91	277	205	32	1.07/1.27
Mean	466	409	88	245	164	37	1.05/1.21
LSD ² (0.05)	116	127	11	100	132	36	0.09/0.07

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 Intermediate Chipping Yield Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC11453-2W	2.8	MS, SG, GC, GR*	0.0
AC11453-7W	3.3	MS, GR*	0.0
AC11467-4W	2.8	MS*, SG, GR*	0.0
AC11494-6W	1.3	GR*	0.0
CO11047-3W	17.4	MS, SG, GC*, GR	6.0
CO11047-7W	6.0	SG, GR*	0.0
CO11079-3W	3.0	GC, GR*	4.6
CO12235-3W	1.9	GC*, GR*	1.0
CO12235-5W	4.9	MS, GC, GR*	0.8
CO12235-11W	0.0		2.0
CO12236-4W	2.1	SG, GR*	0.0
CO12248-4W	5.4	MS, GR*	0.0
CO12293-1W	4.9	MS, GC, GR*	0.0
CO12428-1W	3.1	GC*, GR	0.0
CO12428-2W	1.2	MS*, GR*	0.0
NDC12138C-1W	0.2	MS*, GR*	0.6
Atlantic	1.7	SG, GR*	2.7
Chipeta	9.0	MS, SG*, GR*	0.9
Snowden	2.6	MS, GR*	1.8

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 6C. Growth characteristics of Intermediate Chipping Yield Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC11453-2W	96	3.0	3.0	3.1	3.0	3.0	3.0
AC11453-7W	98	2.5	3.5	3.8	4.0	3.0	4.0
AC11467-4W	98	3.5	3.0	2.1	3.0	3.0	3.0
AC11494-6W	86	2.5	3.0	2.6	4.0	3.0	3.5
CO11047-3W	94	3.0	3.5	3.0	5.0	3.0	5.0
CO11047-7W	88	3.0	4.0	2.7	3.0	3.0	4.0
CO11079-3W	88	4.0	4.0	2.7	4.0	3.0	3.5
CO12235-3W	94	4.0	4.0	2.7	3.0	3.0	3.0
CO12235-5W	94	2.0	2.0	1.8	3.5	3.0	3.0
CO12235-11W	88	3.0	2.5	1.8	1.0	2.0	3.0
CO12236-4W	84	3.0	3.0	2.2	3.0	3.0	3.0
CO12248-4W	94	3.0	3.0	3.0	3.0	3.0	3.0
CO12293-1W	100	3.0	4.0	4.4	4.0	3.0	3.5
CO12428-1W	100	3.0	3.0	3.3	3.0	3.0	4.0
CO12428-2W	92	2.0	2.5	3.1	2.5	3.0	3.0
NDC12138C-1W	98	4.0	4.0	2.5	3.5	3.0	3.0
Atlantic	98	4.0	3.5	2.4	2.5	3.0	3.0
Chipeta	96	4.5	5.0	2.5	4.5	3.0	4.0
Snowden	100	3.0	4.0	3.1	4.0	3.0	3.0
Mean	94	3.2	3.4	2.7	3.3	2.9	3.4
LSD ⁶ (0.05)	14	NS	1.3	1.3	0.9	NS	0.7

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 Intermediate Chipping Yield Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC11453-2W	4.1	3.1	3.6	5.6	67	4.0
AC11453-7W	2.6	4.0	3.3	4.9	46	4.0
AC11467-4W	4.8	3.2	4.0	5.5	53	3.0
AC11494-6W	3.0	1.8	2.4	3.8	53	4.2
CO11047-3W	3.8	4.1	4.0	4.2	88	4.6
CO11047-7W	4.9	3.9	4.4	4.3	67	4.2
CO11079-3W	4.6	3.7	4.2	4.4	39	3.0
CO12235-3W	4.4	3.7	4.1	5.7	74	4.0
CO12235-5W	4.7	4.0	4.4	3.9	74	5.0
CO12235-11W	5.0	4.9	5.0	3.2	81	5.0
CO12236-4W	4.8	4.3	4.6	5.5	39	4.8
CO12248-4W	4.8	3.4	4.1	4.4	81	3.8
CO12293-1W	4.4	4.3	4.4	5.7	74	3.0
CO12428-1W	4.4	2.4	3.4	4.8	67	4.0
CO12428-2W	4.8	2.9	3.9	10.9	32	4.6
NDC12138C-1W	4.1	2.9	3.5	4.0	46	3.4
Atlantic	3.2	3.6	3.4	4.5	67	4.4
Chipeta	5.0	5.0	5.0	2.4	88	3.2
Snowden	4.1	3.2	3.7	3.6	74	2.0

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 6E. Specific gravity, french fry color, and texture for Intermediate Chipping Yield Trial entries - 2018.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
AC11453-2W	1.094	3.0	2.5	2.5	1.0
AC11453-7W	1.097	3.5	2.5	3.5	1.5
AC11467-4W	1.085	4.0	2.0	3.5	2.0
AC11494-6W	1.095	4.0	1.5	1.5	3.0
CO11047-3W	1.082	3.0	1.5	2.0	2.0
CO11047-7W	1.090	2.5	3.0	2.0	2.0
CO11079-3W	1.090	5.0	3.0	2.5	2.0
CO12235-3W	1.087	4.0	3.0	1.5	2.5
CO12235-5W	1.091	5.0	4.0	3.5	2.5
CO12235-11W	1.074	3.5	2.0	1.0	1.5
CO12236-4W	1.088	4.0	3.0	2.5	2.5
CO12248-4W	1.091	3.5	2.5	3.0	1.5
CO12293-1W	1.089	4.5	3.5	3.0	2.0
CO12428-1W	1.094	3.0	2.5	2.5	1.0
CO12428-2W	1.099	3.0	2.0	3.0	2.0
NDC12138C-1W	1.091	3.0	2.0	3.5	1.5
Atlantic	1.099	5.0	3.5	3.0	3.0
Chipeta	1.087	5.0	3.5	2.5	2.0
Snowden	1.096	4.5	1.5	2.5	2.5

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 Advanced Yield Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
CO07015-4RU	333	267	80	247	20	64	1.58/1.17
CO07049-1RU	383	315	82	265	50	67	1.53/1.25
CO08065-2RU	433	364	84	256	108	38	1.68/1.20
CO10085-1RU	446	387	87	239	149	49	1.57/1.23
CO10094-5RU	365	332	91	162	170	23	2.04/1.09
CO11009-3RU	574	464	81	182	283	87	1.72/1.11
Canela Russet	441	414	94	232	182	22	1.70/1.26
Russet Norkotah-S3	476	447	94	198	249	18	1.79/1.15
Mean	445	385	86	213	172	46	1.71/1.18
LSD ³ (0.05)	61	86	13	56	97	NS	0.17/0.05

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.

² Russet Norkotah yield data not included in mean or LSD calculations.

³LSD=least significant difference.

Table 7B. Grade defects for Advanced Yield Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO07015-4RU	0.6	GC*	0.0
CO07049-1RU	0.3	MS*, GC*	0.4
CO08065-2RU	5.7	MS, GC*	1.0
CO10085-1RU	2.3	MS*, GC*, GR*	0.0
CO10094-5RU	2.7	MS*, SG, GR	0.0
CO11009-3RU	4.0	MS*, SG, GC, GR*	1.8
Canela Russet	1.1	MS*, GC, GR	0.0
Russet Norkotah-S3	2.0	MS*, SG, GR	0.6

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 7C. Growth characteristics of Advanced Yield Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO07015-4RU	100	3.0	2.5	2.5	2.0	3.0	3.0
CO07049-1RU	99	3.0	2.5	2.1	2.5	3.0	3.0
CO08065-2RU	100	4.0	3.8	2.4	2.8	3.0	4.0
CO10085-1RU	98	2.8	3.0	2.5	3.0	3.0	3.5
CO10094-5RU	99	4.0	3.3	2.6	2.0	2.5	3.0
CO11009-3RU	98	3.0	4.0	2.4	4.0	3.0	3.0
Canela Russet	97	3.0	3.0	2.6	4.0	3.0	3.5
Russet Norkotah-S3	99	3.0	2.8	2.6	4.0	3.0	3.8
Mean	99	3.3	3.1	2.4	3.0	2.9	3.4
LSD ⁷ (0.05)	NS	0.6	0.8	NS	0.4	0.3	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.

⁶Russet Norkotah % stand data not included in mean or LSD calculations.

⁷LSD=least significant difference; NS=not significant.

Table 7D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced Yield Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss ²	Dormancy ³ (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO07015-4RU	4.5	4.4	4.5	3.4	74	4.0
CO07049-1RU	4.8	4.7	4.8	4.1	74	4.0
CO08065-2RU	3.6	3.6	3.6	4.9	74	3.6
CO10085-1RU	4.9	4.3	4.6	8.9	39	3.8
CO10094-5RU	4.1	3.7	3.9	6.1	67	3.6
CO11009-3RU	4.7	4.3	4.5	2.9	81	3.0
Canela Russet	5.0	5.0	5.0	2.9	123	3.6
Russet Norkotah-S3	4.4	5.0	4.7	2.9	102	1.6

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 Advanced Yield Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
CO07015-4RU	1.082	1	0	3	3
CO07049-1RU	1.081	1	2	2	3
CO08065-2RU	1.103	0	0	3	4
CO10085-1RU	1.099	2	2	4	4
CO10094-5RU	1.083	0	0	3	4
CO11009-3RU	1.097	0	0	4	4
Canela Russet	1.097	2	2	4	4
Russet Norkotah-S3	1.084	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 8A. Yield, grade, and tuber shape for Advanced Fingerling Yield Trial entries - 2018.

Clone	Total (Cwt/A)	Tuber Length				Tuber Shape ¹ L:W/W:T
		<2"	2-4"	4-6"	>6"	
CO08029-1RF/R	501	20	262	161	26	2.95/1.06
CO08062-3PF/P	413	42	283	73	6	2.78/1.10
Banana	351	37	169	63	14	3.36/1.20
LaRatte	339	30	164	64	18	3.69/1.16
Mean	405	31	224	91	15	3.20/1.13
LSD ² (0.05)	32	NS	46	20	16	0.33/0.06

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 8B. Grade defects for Advanced Fingerling Yield Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO08029-1RF/R	6.3	GR*	0.0
CO08062-3PF/P	2.2	MS*, GR	0.0
Banana	18.9	MS, SG, GR*	0.0
LaRatte	18.5	MS, SG, 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 8C. Growth characteristics of Advanced Fingerling Yield Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO08029-1RF/R	99	2.8	2.5	3.3	4.3	3.0	3.5
CO08062-3PF/P	100	3.0	2.5	3.0	3.5	3.0	3.0
Banana	100	2.8	2.3	4.3	4.0	3.0	2.8
LaRatte	100	2.5	1.8	3.5	4.0	3.0	2.5
Mean	100	2.8	2.3	3.4	3.9	3.0	2.9
LSD6 (0.05)	NS	0.8	1.0	1.2	0.7	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 8D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced Fingerling Yield Trial entries - 2018.

Clone	Blackspot Index ¹			%	Dormancy (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight Loss ²		
CO08029-1RF/R	---	---	---	2.3	95	---
CO08062-3PF/P	---	---	---	4.1	53	---
Banana	4.8	5.0	4.9	3.0	81	3.8
LaRatte	5.0	4.7	4.9	3.1	81	4.0

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 8E. Specific gravity, french fry color, and texture for Advanced Fingerling Yield Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
CO08029-1RF/R	1.089	-	-	1	2
CO08062-3PF/P	1.075	-	-	2	3
Banana	1.085	2	2	3	3
LaRatte	1.078	1	2	4	5

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 Russet Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
CO10087-4RU	330	311	94	221	90	18	1.70/1.17
CO10091-1RU	409	372	91	248	124	35	1.43/1.20
Canela Russet	417	391	94	170	221	19	1.63/1.22
Russet Norkotah ^{-S3}	604	551	91	90	462	20	1.88/1.17
Mean	440	407	93	182	224	23	1.66/1.20
LSD ³ (0.05)	105	98	NS	48	84	9	0.16/NS

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.

²Russet Norkotah yield data not included in mean or LSD calculations.

³LSD=least significant difference.

Table 9B. Grade defects for Southwest Regional Russet Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO10087-4RU	0.4	SG, GC, GR*	0.0
CO10091-1RU	0.6	GR*	0.0
Canela Russet	1.5	MS*, GC, GR*	0.0
Russet Norkotah-S3	4.9	MS*, SG*, GC, GR*	7.1

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 9C. Growth characteristics of Southwest Regional Russet Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO10087-4RU	95	3.5	3.8	2.1	2.3	2.8	2.0
CO10091-1RU	97	3.0	2.8	1.8	2.8	3.0	3.0
Canela Russet	93	3.3	2.0	1.8	3.5	3.0	3.0
Russet Norkotah ^{-S3}	100	4.0	2.0	2.3	4.8	4.0	4.0
Mean	96	3.4	2.6	2.0	3.3	2.9	3.0
LSD ⁷ (0.05)	NS	0.7	0.8	NS	0.8	0.4	NS

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.

⁶Russet Norkotah % stand data not included in mean or LSD calculations.

⁷LSD=least significant difference; NS=not significant.

Table 9D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Russet Trial entries - 2018.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight Loss ²		
CO10087-4RU	5.0	4.2	4.6	4.3	67	3.6
CO10091-1RU	5.0	5.0	5.0	2.8	60	4.2
Canela Russet	5.0	4.6	4.8	3.3	123	4.2
Russet Norkotah-S3	5.0	5.0	5.0	3.2	109	2.0

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 9E. Specific gravity, french fry color, and texture for Southwest Regional Russet Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
CO10087-4RU	1.097	1	2	5	5
CO10091-1RU	1.088	1	2	4	4
Canela Russet	1.096	2	2	5	5
Russet Norkotah-S3	1.083	4	2	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 Red Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
ATX02263-1R/Y	396	304	77	265	39	90	1.30/1.12
CO06215-2R	440	357	81	305	51	82	1.08/1.27
Chieftain	458	434	95	211	222	21	1.20/1.26
Red LaSoda	640	578	90	151	427	33	1.05/1.38
Sangre-S10	546	467	86	224	244	54	1.29/1.25
Mean	505	427	83	236	190	65	1.19/1.26
LSD ³ (0.05)	124	127	7	69	121	24	0.09/0.07

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.

²Russet Norkotah yield data not included in mean or LSD calculations.

³LSD=least significant difference.

Table 10B. Grade defects for Southwest Regional Red Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
ATX02263-1R/Y	0.4	SG, GC, GR*	0.3
CO06215-2R	0.3	SG, GR*	0.3
Chieftain	0.8	SG*, GR*	0.9
Red LaSoda	5.1	MS, SG*, GC, GR*	10.6
Sangre-S10	4.3	MS, GC*, GR	2.6

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 10C. Growth characteristics of Southwest Regional Red Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
ATX02263-1R/Y	73	3.0	2.8	2.9	2.8	3.0	3.0
CO06215-2R	96	3.3	3.0	2.8	2.8	3.3	3.0
Chieftain	83	3.3	3.8	2.5	3.3	3.0	3.3
Red LaSoda	98	3.0	3.8	2.7	3.5	3.0	3.0
Sangre-S10	100	2.8	2.8	2.9	3.8	3.0	3.3
Mean	92	3.0	3.1	2.8	3.2	3.1	3.1
LSD ⁷ (0.05)	11	NS	0.5	NS	NS	NS	NS

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.

⁶Russet Norkotah % stand data not included in mean or LSD calculations.

⁷LSD=least significant difference; NS=not significant.

Table 10D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Red Trial entries - 2018.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight ² Loss		
ATX02263-1R/Y	5.0	3.8	4.4	3.5	81	2.6
CO06215-2R	4.9	4.7	4.8	5.3	67	1.8
Chieftain	4.6	2.9	3.8	2.6	88	3.2
Red LaSoda	4.0	3.5	3.8	3.5	74	1.4
Sangre-S10	4.2	4.5	4.4	2.0	53	1.4

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. Specific gravity, french fry color, and texture for Southwest Regional Red Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
ATX02263-1R/Y	1.086	5	3	2	2
CO06215-2R	1.094	1	1	2	2
Chieftain	1.076	3	3	1	1
Red LaSoda	1.085	2	3	3	3
Sangre-S10	1.080	4	4	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 11A. Yield, grade, and tuber shape for Southwest Regional Specialty Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
AC10376-1W/Y	446	332	74	276	56	101	1.18/1.23
CO10064-1W/Y	473	328	69	305	22	136	1.03/1.35
CO10097-2W/Y	464	363	78	323	40	99	1.16/1.11
CO10098-4W/Y	400	140	35	137	4	256	1.03/1.28
CO10098-5W/Y	352	153	43	136	17	192	1.16/1.26
Yukon Gold	350	315	90	189	127	30	1.14/1.17
Mean	414	272	65	228	44	136	1.12/1.23
LSD ² (0.05)	35	57	7	62	32	32	0.09/0.06

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 Southwest Regional Specialty Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC10376-1W/Y	3.0	MS, GC, GR*	0.0
CO10064-1W/Y	2.0	SG, GR*	0.0
CO10097-2W/Y	0.6	GR*	0.0
CO10098-4W/Y	1.0	GR*	0.3
CO10098-5W/Y	1.9	SG*, GR*	0.0
Yukon Gold	1.2	SG, GC*, 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 Southwest Regional Specialty Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC10376-1W/Y	100	2.8	2.0	2.7	3.0	3.3	3.5
CO10064-1W/Y	100	3.5	2.8	4.1	4.0	3.0	3.0
CO10097-2W/Y	99	3.3	2.8	4.0	2.8	3.0	2.8
CO10098-4W/Y	100	3.5	2.5	5.5	2.8	2.3	3.0
CO10098-5W/Y	92	3.0	3.3	5.1	2.3	2.5	3.0
Yukon Gold	96	3.3	3.3	2.2	2.5	2.5	1.5
Mean	98	3.2	2.8	3.9	2.9	2.8	2.8
LSD6 (0.05)	3	NS	0.9	1.7	0.7	0.9	0.7

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 11D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Specialty Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC10376-1W/Y	5.0	4.7	4.9	2.2	102	2.6
CO10064-1W/Y	4.5	3.8	4.2	3.5	67	3.4
CO10097-2W/Y	4.4	2.9	3.7	3.8	81	4.4
CO10098-4W/Y	2.4	1.6	2.0	5.1	25	3.0
CO10098-5W/Y	4.5	2.9	3.7	5.5	32	4.8
Yukon Gold	5.0	5.0	5.0	1.7	74	4.6

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 11E. Specific gravity, french fry color, and texture for Southwest Regional Specialty Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
AC10376-1W/Y	1.082	1	3	3	3
CO10064-1W/Y	1.098	0	1	3	4
CO10097-2W/Y	1.078	1	2	3	3
CO10098-4W/Y	1.101	0	0	1	1
CO10098-5W/Y	1.107	1	1	2	3
Yukon Gold	1.090	2	3	2	3

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

Table 12A. Yield, grade, and tuber shape for Southwest Regional Chipping Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
CO10073-7W	364	297	81	251	46	58	1.08/1.25
CO10076-4W	413	361	88	307	54	47	0.99/1.24
Atlantic	376	343	91	214	129	26	1.13/1.17
Chipeta	616	518	84	212	305	30	1.20/1.19
Snowden	458	391	85	329	62	56	1.02/1.25
Mean	445	382	86	263	119	43	1.09/1.23
LSD ² (0.05)	85	85	8	58	53	23	0.07/0.06

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 Southwest Regional Chipping Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO10073-7W	2.6	GC, GR*	0.0
CO10076-4W	1.3	GC, GR*	0.0
Atlantic	1.4	MS, GC, GR*	1.5
Chipeta	11.2	MS, SG, GR*	0.5
Snowden	2.5	SG, 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 12C. Growth characteristics of Southwest Regional Chipping Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO10073-7W	89	2.8	2.5	3.5	2.5	2.8	3.0
CO10076-4W	93	3.5	2.5	2.9	2.3	3.0	3.0
Atlantic	86	3.3	2.8	2.4	2.5	3.0	3.0
Chipeta	99	3.8	4.8	3.0	5.0	3.0	4.0
Snowden	100	3.5	4.0	3.4	3.8	3.0	3.0
Mean	93	3.4	3.3	3.0	3.2	3.0	3.2
LSD6 (0.05)	13	NS	1.1	0.7	0.8	NS	NS

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 Southwest Regional Chipping Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO10073-7W	4.8	2.5	3.7	5.3	67	4.0
CO10076-4W	2.9	2.1	2.5	4.8	74	2.4
Atlantic	2.8	2.8	2.8	3.6	67	4.4
Chipeta	3.3	3.9	3.6	2.0	81	3.4
Snowden	3.1	2.5	2.8	3.4	74	2.4

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 Southwest Regional Chipping Trial entries - 2018.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
CO10073-7W	1.086	3.5	1.5	2.0	1.5
CO10076-4W	1.084	3.5	1.5	2.0	2.5
Atlantic	1.098	5.0	3.5	3.5	3.0
Chipeta	1.090	5.0	4.0	3.5	1.0
Snowden	1.094	4.0	2.0	2.0	1.0

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

Table 13A. Yield, grade, and tuber shape for Western Regional Main Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
A06030-23	400	326	81	280	46	69	1.62/1.11
A07061-6	589	510	86	261	249	51	1.56/1.18
A071012-4BF	622	505	82	158	347	29	1.55/1.09
A07769-4	507	242	84	199	225	37	1.69/1.17
A08433-4VR	608	499	81	174	325	46	1.70/1.32
A10021-5TE	247	451	86	205	246	42	1.90/1.20
AO02183-2	518	437	84	301	136	60	2.04/1.15
AO06191-1	459	400	88	184	216	27	1.78/1.15
AOR06576-1	555	491	88	214	277	31	1.80/1.14
AOR07781-5	462	408	88	252	156	26	1.79/1.23
AOR07821-1	512	451	88	174	277	30	1.78/1.31
AOTX05043-1RU	387	346	89	153	192	30	1.71/1.19
CO08155-2RU/Y	479	414	87	269	145	43	1.86/1.21
CO08231-1RU	501	445	89	185	260	33	1.66/1.18
CO09036-2RU	505	424	84	285	139	70	1.83/1.14
CO09076-3RU	424	356	84	186	170	45	1.86/1.14
CO09205-2RU	416	361	87	285	75	42	1.84/1.18
COTX05095-2RU/Y	400	339	85	284	55	47	1.58/1.17
Canela Russet	416	382	91	224	158	27	1.75/1.27
Ranger Russet	428	372	87	208	164	28	1.87/1.22
Russet Burbank	406	342	85	184	158	27	1.99/1.21
Russet Norkotah ^{-S3}	428	358	84	180	178	28	1.84/1.18
Shepody	436	365	83	188	177	28	1.72/1.28
Mean	487	416	85	215	200	40	1.78/1.20
LSD ³ (0.05)	93	94	9	73	80	17	0.17/0.07

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.

²Russet Norkotah yield data not included in mean or LSD calculations.

³LSD=least significant difference.

Table 13B. Grade defects for Western Regional Main Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
A06030-23	1.1	MS*, SG, GC*, GR*	0.0
A07061-6	5.1	MS, SG, GC, GR*	0.0
A071012-4BF	13.4	MS, SG, GC, GR*	0.0
A07769-4	8.8	MS, SG, GC*, GR*	0.0
A08433-4VR	11.2	MS, GC*, GR	0.0
A10021-5TE	6.5	MS, SG, GC*, GR	0.0
AO02183-2	4.0	MS*, SG, GR*	0.0
AO06191-1	6.4	MS, SG, GC*, GR	0.0
AOR06576-1	6.1	MS, SG, GC, GR*	0.0
AOR07781-5	6.3	MS, SG, GC*, GR	1.5
AOR07821-1	6.1	MS, SG, GC, GR*	0.4
AOTX05043-1RU	3.1	MS, GC*, GR*	0.0
CO08155-2RU/Y	4.3	MS*, GC, GR	0.0
CO08231-1RU	4.6	MS, GC, GR*	0.9
CO09036-2RU	2.2	MS, SG, GR*	4.4
CO09076-3RU	5.2	MS*, SG, GC, GR*	0.0
CO09205-2RU	2.7	MS, GR*	0.0
COTX05095-2RU/Y	3.1	MS, GC*, GR	0.4
Canela Russet	1.9	MS, GC, GR*	0.0
Ranger Russet	6.6	MS*, SG, GC, GR	0.0
Russet Burbank	8.7	MS, SG*, GR	0.3
Russet Norkotah-S3	9.4	MS, SG*, GC, GR	0.3
Shepody	10.0	MS, SG, GC, GR*	0.3

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 13C. Growth characteristics of Western Regional Main Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
A06030-23	100	3.8	2.0	2.9	2.0	2.3	3.0
A07061-6	96	2.8	4.3	2.8	3.3	2.5	3.8
A071012-4BF	97	3.5	3.8	2.7	4.0	3.0	4.3
A07769-4	95	2.3	3.3	3.0	3.0	2.8	3.3
A08433-4VR	94	2.3	2.8	1.8	5.0	3.5	4.0
A10021-5TE	99	2.5	1.8	2.6	4.0	3.0	4.0
AO02183-2	100	3.8	3.3	3.1	4.8	3.0	3.8
AO06191-1	100	3.8	2.3	2.2	4.0	3.3	3.3
AOR06576-1	92	3.0	3.5	2.2	4.3	3.3	3.5
AOR07781-5	99	4.0	4.3	3.6	3.0	3.0	3.3
AOR07821-1	96	2.8	2.8	2.5	3.8	3.0	3.3
AOTX05043-1RU	97	3.0	2.5	2.1	2.3	3.0	3.0
CO08155-2RU/Y	94	3.3	4.3	2.2	2.8	2.3	3.0
CO08231-1RU	97	3.3	3.5	2.2	3.5	3.0	3.0
CO09036-2RU	100	2.8	2.8	2.6	3.5	2.8	3.8
CO09076-3RU	100	3.3	3.0	2.7	2.3	2.5	2.0
CO09205-2RU	99	2.8	2.0	2.8	2.0	2.3	2.5
COTX05095-2RU/Y	99	4.0	3.5	2.6	2.5	3.0	1.8
Canela Russet	95	3.3	1.8	2.3	4.0	3.0	3.3
Ranger Russet	95	3.0	2.0	2.1	4.0	3.0	3.3
Russet Burbank	91	2.8	2.0	2.2	4.0	3.0	3.3
Russet Norkotah ^{-S3}	93	2.8	2.5	2.4	3.8	3.0	3.3
Shepody	91	2.5	3.0	2.6	3.5	3.0	3.5
Mean	96	3.1	3.0	2.5	3.4	2.9	3.2
LSD ⁷ (0.05)	9	1.0	1.0	0.7	0.9	0.6	0.7

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.

⁶Russet Norkotah % stand data not included in mean or LSD calculations.

⁷LSD=least significant difference.

Table 13D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Main Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
A06030-23	4.1	3.9	4.0	2.6	74	2.4
A07061-6	4.7	4.6	4.7	3.9	46	3.6
A071012-4BF	4.1	2.8	3.5	2.7	67	1.8
A07769-4	5.0	4.8	4.9	3.6	60	3.8
A08433-4VR	4.9	5.0	5.0	2.0	81	2.8
A10021-5TE	4.0	2.5	3.3	4.9	60	3.8
AO02183-2	5.0	5.0	5.0	2.8	60	2.4
AO06191-1	4.4	3.7	4.1	3.2	117	3.8
AOR06576-1	5.0	4.0	4.5	3.7	60	3.2
AOR07781-5	5.0	5.0	5.0	4.3	46	2.6
AOR07821-1	3.2	2.6	2.9	2.3	88	1.4
AOTX05043-1RU	4.9	3.9	4.4	2.0	88	3.4
CO08155-2RU/Y	5.0	4.8	4.9	3.3	53	3.0
CO08231-1RU	5.0	3.9	4.5	4.4	60	2.2
CO09036-2RU	5.0	5.0	5.0	2.9	67	3.0
CO09076-3RU	5.0	5.0	5.0	3.8	67	3.4
CO09205-2RU	5.0	4.8	4.9	3.1	39	2.8
COTX05095-2RU/Y	4.9	3.7	4.3	3.2	60	3.0
Canela Russet	4.6	3.8	4.2	2.7	123	3.8
Ranger Russet	3.8	3.3	3.6	3.2	60	2.6
Russet Burbank	3.6	2.3	3.0	1.4	117	1.8
Russet Norkotah-S3	5.0	4.3	4.7	2.3	102	2.4
Shepody	5.0	5.0	5.0	2.4	67	3.2

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 13E. Specific gravity, french fry color, and texture for Western Regional Main Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
A06030-23	1.089	0	0	3	3
A07061-6	1.081	1	2	3	3
A071012-4BF	1.094	0	2	4	4
A07769-4	1.087	1	0	3	2
A08433-4VR	1.083	3	2	2	2
A10021-5TE	1.091	1	0	5	4
AO02183-2	1.091	1	1	4	4
AO06191-1	1.096	2	1	4	4
AOR06576-1	1.085	3	2	3	3
AOR07781-5	1.093	2	0	3	3
AOR07821-1	1.091	3	2	3	3
AOTX05043-1RU	1.086	1	2	4	4
CO08155-2RU/Y	1.089	1	2	3	3
CO08231-1RU	1.085	1	2	3	4
CO09036-2RU	1.090	1	1	4	3
CO09076-3RU	1.082	2	2	3	3
CO09205-2RU	1.074	1	1	3	3
COTX05095-2RU/Y	1.082	2	2	4	4
Canela Russet	1.098	1	1	4	4
Ranger Russet	1.089	1	2	4	5
Russet Burbank	1.089	1	1	5	4
Russet Norkotah-S3	1.083	3	2	3	3
Shepody	1.085	2	2	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 Western Regional Red Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
NDTX071258BS-1R	323	177	54	169	8	134	1.09/1.25
Chieftain	458	434	95	211	222	21	1.20/1.26
Red LaSoda	642	576	90	152	424	31	1.04/1.30
Sangre-S10	570	520	91	204	316	38	1.18/1.25
Mean	498	427	82	184	243	56	1.13/1.27
LSD ² (0.05)	99	104	12	NS	131	31	0.13/NS

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 14B. Grade defects for Western Regional Red Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
NDTX071258BS-1R	3.8	MS, SG*, GR	0.0
Chieftain	0.8	SG*, GR*	0.9
Red LaSoda	5.3	MS, GC, GR*	13.4
Sangre-S10	2.3	MS, GC*, GR*	5.4

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 14C. Growth characteristics of Western Regional Red Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
NDTX071258BS-1R	97	2.5	2.8	5.1	1.8	2.3	1.3
Chieftain	83	3.3	3.8	2.5	3.3	3.0	3.3
Red LaSoda	100	3.3	3.8	2.7	4.0	3.0	3.0
Sangre-S10	95	2.5	3.0	2.8	3.5	3.0	3.5
Mean	94	2.9	3.3	3.3	3.1	2.8	2.8
LSD6 (0.05)	NS	NS	NS	0.7	1.0	0.5	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 14D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Red Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
NDTX071258BS-1R	3.8	3.3	3.6	4.2	67	1.6
Chieftain	4.6	2.9	3.8	2.6	88	3.2
Red LaSoda	4.4	3.8	4.1	3.0	67	1.2
Sangre-S10	4.6	4.2	4.4	1.9	53	1.8

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 14E. Specific gravity, french fry color, and texture for Western Regional Red Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
NDTX071258BS-1R	1.081	2	2	3	2
Chieftain	1.076	3	3	1	1
Red LaSoda	1.087	2	3	3	3
Sangre-S10	1.082	4	4	3	3

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

Table 15A. Yield, grade, and tuber shape for Advanced and Western Regional Specialty Specialty Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC08121-1P/Y	439	237	54	220	17	201	1.21/1.20
AFC5633-2P/P	380	251	66	217	34	125	1.53/1.25
ATTX05175s-1R/Y	518	186	36	178	8	328	0.88/1.34
CO08037-2P/P	422	336	80	286	51	85	1.40/1.07
CO09079-5PW/Y	417	171	41	164	8	240	1.30/1.23
CO09128-3W/Y	323	60	19	60	0	259	1.41/1.13
CO09128-5W/Y	379	86	23	86	0	291	1.07/1.18
CO09218-4W/Y	496	375	76	327	48	108	1.12/1.36
CO11250-1W/Y	515	386	75	290	96	115	1.32/1.25
CO11252-1W/Y	631	408	65	354	54	210	1.24/1.21
CO11266-1W/Y	445	250	56	232	18	190	1.28/1.20
CO11324-2W/Y	441	276	63	250	26	159	1.05/1.18
POR11PG62-3	384	325	85	260	66	38	2.40/1.19
TC12472-1R/Y	599	514	86	347	167	73	1.11/1.31
LaRatte	453	262	58	159	103	30	3.75/1.21
Purple Majesty	493	373	76	331	42	113	1.41/1.19
Yukon Gold	383	353	92	209	144	25	1.08/1.26
Mean	454	285	62	233	52	152	1.45/1.23
LSD ² (0.05)	62	56	9	49	32	47	0.18/0.10

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 15B. Grade defects for Advanced and Western Regional Specialty Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC08121-1P/Y	0.1	SG*	0.0
AFC5633-2P/P	0.9	MS*, SG*, GC	0.0
ATTX05175s-1R/Y	0.9	MS, SG*, GC, GR	0.0
CO08037-2P/P	0.0		0.0
CO09079-5PW/Y	1.5	MS, GR*	0.0
CO09128-3W/Y	1.0	SG*, GR*	0.0
CO09128-5W/Y	0.5	SG, GR*	0.0
CO09218-4W/Y	2.5	MS, SG, GC, GR*	0.0
CO11250-1W/Y	2.9	MS, GR*	0.0
CO11252-1W/Y	2.2	MS, SG, GR*	0.0
CO11266-1W/Y	1.0	SG, GR*	0.0
CO11324-2W/Y	1.5	GR*	0.0
POR11PG62-3	5.7	MS, SG*, GC, GR*	0.0
TC12472-1R/Y	2.4	MS, SG, GC, GR*	0.4
LaRatte	26.6	MS, SG, GC, GR*	0.0
Purple Majesty	4.3	MS, SG, GR*	2.4
Yukon Gold	1.2	SG*, GR	0.9

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 15C. Growth characteristics of Advanced and Western Regional Specialty Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC08121-1P/Y	94	3.5	2.8	3.9	3.3	3.0	3.0
AFC5633-2P/P	97	3.3	2.8	2.7	1.8	2.3	2.0
ATTX05175s-1R/Y	100	3.5	3.5	4.6	3.3	3.0	3.3
CO08037-2P/P	96	3.0	1.8	4.2	3.0	3.0	3.0
CO09079-5PW/Y	95	3.3	3.3	3.5	3.8	3.0	2.8
CO09128-3W/Y	89	2.3	2.3	4.2	2.3	2.5	3.0
CO09128-5W/Y	99	4.0	3.8	6.5	2.0	2.3	2.5
CO09218-4W/Y	97	3.0	1.8	3.9	4.3	3.0	4.0
CO11250-1W/Y	98	3.3	4.3	4.8	4.0	3.0	3.3
CO11252-1W/Y	85	3.5	4.0	5.0	5.0	3.0	4.0
CO11266-1W/Y	93	2.5	2.8	3.9	3.0	3.0	4.0
CO11324-2W/Y	77	2.5	3.0	4.9	3.3	3.0	3.0
POR11PG62-3	97	3.3	1.8	3.2	3.5	3.0	3.8
TC12472-1R/Y	96	2.8	3.8	4.4	5.0	3.3	4.0
LaRatte	98	3.0	2.3	5.0	3.8	3.0	3.0
Purple Majesty	94	2.3	2.8	4.0	3.3	3.0	3.0
Yukon Gold	98	3.5	3.8	2.4	2.5	3.0	2.0
Mean	94	3.1	2.9	4.2	3.3	2.9	3.1
LSD ⁶ (0.05)	10	1.0	0.8	1.0	1.1	0.4	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 15D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Specialty Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss ²	Dormancy ³ (Days) ³	Enzymatic ⁴ Browning ⁴
	Bud End	Stem End	Average			
AC08121-1P/Y	4.8	3.9	4.4	6.0	53	1.4
AFC5633-2P/P	---	---	---	4.0	60	---
ATTX05175s-1R/Y	4.0	3.6	3.8	6.1	53	1.2
CO08037-2P/P	---	---	---	5.6	60	---
CO09079-5PW/Y	5.0	5.0	5.0	2.9	102	3.0
CO09128-3W/Y	5.0	5.0	5.0	1.8	102	3.4
CO09128-5W/Y	4.4	4.7	4.6	4.3	32	3.2
CO09218-4W/Y	4.6	2.8	3.7	3.4	60	2.2
CO11250-1W/Y	4.7	4.4	4.6	4.4	39	2.0
CO11252-1W/Y	4.9	4.1	4.5	10.3	25	3.2
CO11266-1W/Y	5.0	5.0	5.0	3.4	53	2.8
CO11324-2W/Y	4.9	4.1	4.5	10.3	25	3.2
POR11PG62-3	5.0	5.0	5.0	3.1	67	1.6
TC12472-1R/Y	4.1	2.4	3.3	5.9	53	1.6
LaRatte	5.0	4.5	4.8	4.4	81	3.4
Purple Majesty	---	---	---	11.2	39	---
Yukon Gold	5.0	4.0	4.5	1.8	74	3.4

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 15E. Specific gravity, french fry color, and texture for Advanced and Western Regional Speciality Trial entries - 2018.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 55F+ 9 wks 45F	At Harvest	4 wks 55F+ 9 wks 45F
AC08121-1P/Y	1.086	2	2	4	3
AFC5633-2P/P	1.078	-	-	3	3
ATTX05175s-1R/Y	1.088	1	2	5	5
CO08037-2P/P	1.089	-	-	2	2
CO09079-5PW/Y	1.072	4	4	2	2
CO09128-3W/Y	1.077	4	3	2	2
CO09128-5W/Y	1.091	0	0	2	2
CO09218-4W/Y	1.078	3	2	3	3
CO11250-1W/Y	1.099	1	1	3	4
CO11252-1W/Y	1.096	2	2	3	3
CO11266-1W/Y	1.087	1	1	4	4
CO11324-2W/Y	1.092	2	3	3	3
POR11PG62-3	1.088	2	1	4	4
TC12472-1R/Y	1.096	3	3	3	3
LaRatte	1.080	4	4	4	3
Purple Majesty	1.088	-	-	2	3
Yukon Gold	1.091	2	3	4	4

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

² Fry 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 16A. Yield, grade, and tuber shape for Advanced and Western Regional Chipping Trial entries - 2018.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC01144-1W	479	395	83	283	112	63	0.89/1.24
AFC5687-2W	447	365	81	107	258	17	1.07/1.25
AOR09034-3	467	377	80	248	129	59	0.96/1.15
CO11023-2W	399	311	78	213	99	64	0.93/1.26
CO11023-9W	411	315	77	196	119	67	1.04/1.19
CO11037-5W	472	381	81	201	179	45	0.99/1.22
NDA081453CAB-2C	394	315	80	228	87	61	0.97/1.30
Atlantic	447	395	89	239	159	40	1.07/1.21
Chipeta	568	468	82	175	292	35	1.19/1.24
Snowden	441	361	82	291	70	60	0.97/1.24
Mean	452	368	81	218	150	51	1.01/1.24
LSD ³ (0.05)	73	82	9	70	68	23	0.09/0.10

¹ L=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.

² Atlantic yield data not included in mean or LSD calculations.

³ LSD=least significant difference.

Table 16B. Grade defects for Advanced and Western Regional Chipping Trial entries - 2018.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC01144-1W	4.6	MS, SG, GR*	0.0
AFC5687-2W	14.8	SG, GC, GR*	2.3
AOR09034-3	6.5	MS, GC, GR*	0.0
CO11023-2W	5.8	GC, GR*	0.3
CO11023-9W	6.9	GC, GR*	0.0
CO11037-5W	9.8	GR*	0.5
NDA081453CAB-2C	4.2	MS, GC, GR*	0.0
Atlantic	2.2	MS, GC, GR*	2.4
Chipeta	11.5	SG, GR*	0.9
Snowden	4.8	SG, GC, GR*	0.3

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 16C. Growth characteristics of Advanced and Western Regional Chipping Trial entries - 2018.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC01144-1W	95	3.3	3.3	2.4	3.5	2.8	3.0
AFC5687-2W	84	3.3	3.0	1.2	5.0	3.8	4.0
AOR09034-3	88	3.3	4.0	2.1	3.5	2.8	3.0
CO11023-2W	97	3.0	2.5	2.4	2.8	3.0	3.3
CO11023-9W	81	2.5	2.8	1.7	3.3	2.8	4.0
CO11037-5W	85	1.8	3.0	2.6	3.5	3.0	3.0
NDA081453CAB-2C	93	2.5	2.8	2.8	2.3	2.5	3.0
Atlantic	99	3.5	3.3	2.4	2.3	3.0	3.0
Chipeta	99	3.5	4.5	2.6	4.8	3.0	4.0
Snowden	98	2.8	3.3	3.0	3.3	2.8	3.0
Mean	92	2.9	3.2	2.3	3.4	2.9	3.3
LSD ⁷ (0.05)	10	0.8	1.0	0.5	0.6	0.5	0.2

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.

⁶Atlantic % stand data not included in mean or LSD calculations.

⁷LSD=least significant difference.

Table 16D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Chipping Trial entries - 2018.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC01144-1W	4.2	3.2	3.7	2.3	74	2.4
AFC5687-2W	4.6	3.2	3.9	3.8	117	1.4
AOR09034-3	4.0	2.5	3.3	5.2	67	3.4
CO11023-2W	4.5	3.3	3.9	4.6	53	2.8
CO11023-9W	4.9	2.8	3.9	4.7	81	2.8
CO11037-5W	4.5	4.0	4.3	2.4	81	2.2
NDA081453CAB-2C	4.4	4.1	4.3	3.9	81	3.8
Atlantic	3.2	3.1	3.2	3.9	60	3.8
Chipeta	4.4	4.1	4.3	2.0	88	2.4
Snowden	3.2	2.3	2.8	2.5	81	2.0

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 16E. Chip color¹ after various storage regimes, and specific gravity of Advanced and Western Regional Chipping Trial entries - 2018.

Clone	Specific Gravity	6 wks 40F	6 wks/40F +3 wks/60F	6 wks 50F	6 wks/50F +3 wks/60F
AC01144-1W	1.078	4.0	3.0	2.5	2.0
AFC5687-2W	1.090	4.5	3.0	3.5	3.0
AOR09034-3	1.091	4.5	3.5	3.0	3.0
CO11023-2W	1.095	3.5	3.0	2.5	2.5
CO11023-9W	1.089	3.0	3.5	3.0	3.0
CO11037-5W	1.094	4.0	1.5	1.0	1.0
NDA081453CAB-2C	1.090	4.5	3.5	2.5	2.5
Atlantic	1.100	4.5	3.5	3.0	3.5
Chipeta	1.092	5.0	4.0	3.0	2.0
Snowden	1.089	4.5	1.5	1.5	1.5

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

Table 17. 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								
AC05039-2RU	Dual	6	312	89	2.1	1.087	1.7	0.1
CO05068-1RU	Dual	6	461	89	3.7	1.098	3.6	1.5
CO04220-7RU	Dual	4	400	79	2.3	1.088	1.4	0.5
CO07015-4RU	Dual	6	342	80	2.3	1.083	1.4	0.1
CO08065-2RU	Dual	5	379	84	3.4	1.102	3.0	0.7
CO08231-1RU	FM	5	441	87	3.6	1.087	1.8	0.4
CO09036-2RU	Dual	4	421	75	3.3	1.092	1.4	1.5
CO09076-3RU	FM	4	434	84	2.8	1.083	5.1	0.1
CO09205-2RU	Dual	4	370	86	2.5	1.076	2.4	0.0
Canela Russet	FM	47	358	90	3.3	1.096	1.2	0.1
Russet Norkotah	FM	106	369	84	1.7	1.079	2.4	0.4
Specialties								
AC05175-3P/Y	Spec	6	330	66	1.0	1.071	0.1	0.0
CO05035-1PW/Y	Spec	6	488	91	3.5	1.083	1.6	0.4
CO05037-2R/Y	Spec	5	314	32	2.9	1.089	0.0	0.0
CO05037-3W/Y	Spec	5	435	55	2.2	1.079	1.0	0.0
CO09079-5PW/Y	Spec	4	349	32	2.4	1.072	0.5	0.0
CO09128-3W/Y	Spec	4	271	14	2.3	1.073	0.5	0.0
CO09128-5W/Y	Spec	4	352	24	2.1	1.087	0.3	0.0
CO09218-4W/Y	Spec	4	417	64	3.9	1.074	1.4	0.1
Masquerade	Spec	7	522	79	3.1	1.092	1.6	0.4
Purple Majesty	Spec	32	454	55	2.3	1.085	0.9	0.9
Yukon Gold	Spec	51	395	88	1.9	1.087	2.2	0.4

Table 17 continued on next page

Table 17 (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	1.088	2.6	0.2
AC03433-1W	Chip	6	396	80	3.6	1.085	7.1	0.2
CO02033-1W	Chip	6	426	85	2.7	1.098	0.8	1.6
CO03243-3W	Chip	7	462	87	3.4	1.086	2.1	0.9
AC00206-2W	Chip	6	321	79	2.8	1.087	2.2	1.1
AC03452-2W	Chip	7	444	85	3.2	1.077	1.5	0.5
AC05153-1W	Chip	6	340	66	1.8	1.089	1.5	0.1
AC01144-1W	Chip	5	480	73	3.1	1.081	1.7	0.0
Atlantic	Chip	56	447	87	3.2	1.098	2.7	4.6
Chipeta	Chip	51	535	84	3.4	1.090	5.6	0.6

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

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

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

⁴Based on tubers greater than 10 ounces.

Several selections that have been discontinued from grower evaluations are available for exclusive release. Data summaries for all clones are available at potatoes.colostate.edu/programs/potato-breeding/cultivars/. Please contact David Holm for further information. Included are **russets** - AC96052-1RU, AC00395-2RU, CO97087-2RU, CO98067-7RU, CO99053-4RU, CO03276-5RU, and CO05175-1RU; **reds** - CO98012-5R, CO99076-6R, CO99256-2R, CO00277-2R, and CO00291-5R; **chippers** CO02024-9W; and **specialties** (including yellows) - AC97521-1R/Y, ATC00293-1W/Y, CO97215-2P/P, CO97226-2R/R, CO97227-2P/PW, CO97232-1R/Y, CO97232-2R/Y, CO99045-1W/Y, CO00405-1RF, CO00412-5W/Y, CO00415-1RF, CO04056-3P/PW, CO04067-8R/Y, CO04099-3W/Y, CO05028-4P/PY, CO05028-11P/RWP, VC0967-2R/Y, VC1002-3W/Y, and VC1009-1W/Y.

Figure 1. Photographs of advanced selections.



CO04220-7RU Image Unavailable



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



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



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



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



Table 18A. Detailed data summary for AC05039-2RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	312	271-366
Yield US #1 (Cwt/A)		6	279	243-341
% US #1		6	89	85-93
Yield >10 oz (Cwt/A)		6	66	44-97
Yield <4 oz (Cwt/A)		6	28	19-44
% External Defects ¹		6	1.7	0.5-3.8
% Hollow Heart ²		6	0.1	0.0-0.6
% Stand		6	98	92-100
Emergence Uniformity		6	3.4	3.0-4.0
Vine Vigor ³		6	3.3	3.0-4.0
Stems/Plant		6	2.9	2.3-3.8
Vine Size ⁴		6	2.3	1.0-3.0
Vine Type ⁵		6	2.3	2.0-3.0
Vine Maturity ⁶		6	2.1	1.5-2.8
Blackspot ⁷	Bud End	7	5.0	4.8-5.0
	Stem End	7	4.8	4.3-5.0
	Average	7	4.9	
Weight Loss ⁸		7	2.3	1.8-3.0
Dormancy ⁹		7	83	55-101
Enzymatic Browning ¹⁰		7	4.5	4.2-5.0
Specific Gravity		7	1.087	1.084-1.089
Fry Color ¹¹	Harvest	7	1.0	0.0-2.0
	Storage	7	2.1	1.0-3.0
Fry Texture ¹²	Harvest	7	3.3	3.0-4.0
	Storage	7	3.1	3.0-4.0

Refer to footnotes on page 118

Table 18B. Detailed data summary for CO05068-1RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	461	420-531
Yield US #1 (Cwt/A)		6	409	357-485
% US #1		6	89	83-92
Yield >10 oz (Cwt/A)		6	135	87-188
Yield <4 oz (Cwt/A)		6	36	28-54
% External Defects ¹		6	3.6	1.4-7.2
% Hollow Heart ²		6	1.5	0.3-3.4
% Stand		6	99	96-100
Emergence Uniformity		6	3.4	3.0-3.8
Vine Vigor ³		6	3.3	2.5-3.8
Stems/Plant		6	3.1	2.7-3.7
Vine Size ⁴		6	4.4	4.0-5.0
Vine Type ⁵		6	3.1	3.0-3.5
Vine Maturity ⁶		6	3.7	3.0-4.0
Blackspot ⁷	Bud End	7	4.6	3.2-5.0
	Stem End	7	4.2	3.4-4.8
	Average	7	4.4	
Weight Loss ⁸		7	3.0	2.5-3.7
Dormancy ⁹		7	62	41-84
Enzymatic Browning ¹⁰		7	2.5	2.0-4.2
Specific Gravity		7	1.098	1.093-1.106
Fry Color ¹¹	Harvest	7	0.3	0.0-1.0
	Storage	7	0.6	0.0-1.0
Fry Texture ¹²	Harvest	7	3.4	3.0-4.0
	Storage	7	3.7	3.0-4.0

Refer to footnotes on page 118

Table 18D. Detailed data summary for CO04220-7RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	400	378 - 424
Yield US #1 (Cwt/A)		4	315	311 - 323
% US #1		4	79	73 - 84
Yield >10 oz (Cwt/A)		4	50	46 - 56
Yield <4 oz (Cwt/A)		4	79	60 - 106
% External Defects ¹		4	1.4	0.7 - 2.3
% Hollow Heart ²		4	0.5	0.0 - 1.2
% Stand		3	99	98 - 99
Emergence Uniformity		3	3.5	3.5 - 3.5
Vine Vigor ³		3	3.7	3.5 - 4.0
Stems/Plant		3	3.3	3.1 - 3.7
Vine Size ⁴		3	3.3	3.0 - 3.5
Vine Type ⁵		3	3.0	3.0 - 3.0
Vine Maturity ⁶		3	2.3	2.0 - 3.0
Blackspot ⁷	Bud End	5	4.9	4.8 - 5.0
	Stem End	5	4.7	4.3 - 5.0
	Average	5	4.8	
Weight Loss ⁸		5	2.3	2.0 - 2.6
Dormancy ⁹		5	85	70 - 109
Enzymatic Browning ¹⁰		5	4.1	3.6 - 4.4
Specific Gravity		5	1.088	1.084 - 1.092
Fry Color ¹¹	Harvest	5	0.8	0.0 - 1.0
	Storage	5	1.8	1.0 - 3.0
Fry Texture ¹²	Harvest	5	3.6	3.0 - 4.0
	Storage	5	3.8	3.0 - 4.0

Refer to footnotes on page 118

Table 18E. Detailed data summary for CO07015-4RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	342	307 - 404
Yield US #1 (Cwt/A)		6	274	219 - 341
% US #1		6	80	71 - 86
Yield >10 oz (Cwt/A)		6	32	9 - 70
Yield <4 oz (Cwt/A)		6	62	32 - 86
% External Defects ¹		6	1.4	0.0 - 3.6
% Hollow Heart ²		6	0.1	0.0 - 0.5
% Stand		6	98	96 - 100
Emergence Uniformity		6	3.2	3.0 - 3.8
Vine Vigor ³		6	3.2	2.5 - 3.8
Stems/Plant		6	3.6	2.5 - 4.3
Vine Size ⁴		6	2.4	2.0 - 3.3
Vine Type ⁵		6	3.0	2.8 - 3.0
Vine Maturity ⁶		6	2.3	1.3 - 3.0
Blackspot ⁷	Bud End	7	4.8	4.5 - 5.0
	Stem End	7	4.5	4.1 - 5.0
	Average	7	4.7	
Weight Loss ⁸		7	2.6	1.6 - 3.4
Dormancy ⁹		7	77	48 - 101
Enzymatic Browning ¹⁰		7	3.8	2.6 - 4.4
Specific Gravity		7	1.083	1.082 - 1.086
Fry Color ¹¹	Harvest	6	1.7	1.0 - 3.0
	Storage	6	2.2	1.0 - 3.0
Fry Texture ¹²	Harvest	6	3.3	3.0 - 4.0
	Storage	6	3.5	3.0 - 4.0

Refer to footnotes on page 118

Table 18F. Detailed data summary for CO08065-2RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	379	331 - 433
Yield US #1 (Cwt/A)		5	317	271 - 364
% US #1		5	84	79 - 89
Yield >10 oz (Cwt/A)		5	79	35 - 118
Yield <4 oz (Cwt/A)		5	50	18 - 70
% External Defects ¹		5	3.0	0.3 - 5.7
% Hollow Heart ²		5	0.7	0.0 - 1.2
% Stand		5	99	98 - 100
Emergence Uniformity		5	3.6	3.0 - 4.3
Vine Vigor ³		5	3.6	3.0 - 4.0
Stems/Plant		5	2.9	2.4 - 3.4
Vine Size ⁴		5	3.6	2.8 - 4.0
Vine Type ⁵		5	3.0	3.0 - 3.0
Vine Maturity ⁶		5	3.4	3.0 - 4.0
Blackspot ⁷	Bud End	6	4.5	3.6 - 5.0
	Stem End	6	4.1	3.6 - 4.8
	Average	6	4.3	
Weight Loss ⁸		6	4.9	4.0 - 6.3
Dormancy ⁹		6	82	71 - 104
Enzymatic Browning ¹⁰		6	4.1	3.4 - 4.6
Specific Gravity		6	1.102	1.098 - 1.110
Fry Color ¹¹	Harvest	5	0.0	0.0 - 0.0
	Storage	5	0.2	0.0 - 1.0
Fry Texture ¹²	Harvest	5	4.2	3.0 - 5.0
	Storage	5	3.8	3.0 - 5.0

Refer to footnotes on page 118

Table 18G. Detailed data summary for CO08231-1RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	441	357 - 501
Yield US #1 (Cwt/A)		5	383	316 - 445
% US #1		5	87	77 - 92
Yield >10 oz (Cwt/A)		5	130	57 - 260
Yield <4 oz (Cwt/A)		5	49	24 - 89
% External Defects ¹		5	1.8	0.8 - 4.6
% Hollow Heart ²		5	0.4	0.0 - 0.9
% Stand		5	97	96 - 99
Emergence Uniformity		5	3.1	2.8 - 3.3
Vine Vigor ³		5	3.2	3.0 - 3.5
Stems/Plant		5	3.2	2.2 - 4.2
Vine Size ⁴		5	3.9	3.0 - 5.0
Vine Type ⁵		5	3.4	3.0 - 4.0
Vine Maturity ⁶		5	3.6	3.0 - 4.0
Blackspot ⁷	Bud End	6	4.9	4.7 - 5.0
	Stem End	6	4.5	3.9 - 5.0
	Average	6	4.7	
Weight Loss ⁸		6	3.6	2.5 - 4.4
Dormancy ⁹		6	66	56 - 83
Enzymatic Browning ¹⁰		6	4.1	2.2 - 4.6
Specific Gravity		6	1.087	1.081 - 1.097
Fry Color ¹¹	Harvest	5	1.8	0.0 - 3.0
	Storage	5	2.2	1.0 - 3.0
Fry Texture ¹²	Harvest	5	3.0	2.0 - 4.0
	Storage	5	3.2	3.0 - 4.0

Refer to footnotes on page 118

Table 18H. Detailed data summary for CO09036-2RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	421	359 - 505
Yield US #1 (Cwt/A)		4	322	241 - 424
% US #1		4	75	66 - 84
Yield >10 oz (Cwt/A)		4	69	39 - 139
Yield <4 oz (Cwt/A)		4	94	70 - 119
% External Defects ¹		4	1.4	0.4 - 2.2
% Hollow Heart ²		4	1.5	0.0 - 4.4
% Stand		4	98	96 - 100
Emergence Uniformity		4	3.0	2.3 - 4.0
Vine Vigor ³		4	3.3	2.8 - 3.8
Stems/Plant		4	3.2	2.6 - 4.0
Vine Size ⁴		4	4.2	3.5 - 5.0
Vine Type ⁵		4	2.9	2.8 - 3.0
Vine Maturity ⁶		4	3.3	3.0 - 3.8
Blackspot ⁷	Bud End	5	5.0	4.9 - 5.0
	Stem End	5	4.7	4.4 - 5.0
	Average	5	4.9	
Weight Loss ⁸		5	2.3	1.9 - 2.9
Dormancy ⁹		5	77	48 - 103
Enzymatic Browning ¹⁰		5	4.1	3.0 - 4.8
Specific Gravity		5	1.092	1.082 - 1.099
Fry Color ¹¹	Harvest	4	1.0	1.0 - 1.0
	Storage	4	0.8	0.0 - 2.0
Fry Texture ¹²	Harvest	4	4.8	4.0 - 5.0
	Storage	4	4.3	4.0 - 5.0

Refer to footnotes on page 118

Table 18I. Detailed data summary for CO09076-3RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	434	358 - 492
Yield US #1 (Cwt/A)		4	363	303 - 418
% US #1		4	84	80 - 85
Yield >10 oz (Cwt/A)		4	139	101 - 170
Yield <4 oz (Cwt/A)		4	50	40 - 61
% External Defects ¹		4	5.1	4.2 - 6.7
% Hollow Heart ²		4	0.1	0.0 - 0.3
% Stand		4	99	96 - 100
Emergence Uniformity		4	3.4	3.0 - 4.0
Vine Vigor ³		4	3.5	3.0 - 4.0
Stems/Plant		4	2.8	2.4 - 3.2
Vine Size ⁴		4	3.7	2.3 - 5.0
Vine Type ⁵		4	2.9	2.5 - 3.0
Vine Maturity ⁶		4	2.8	2.0 - 3.5
Blackspot ⁷	Bud End	5	5.0	5.0 - 5.0
	Stem End	5	4.9	4.6 - 5.0
	Average	5	4.9	
Weight Loss ⁸		5	3.6	2.8 - 4.8
Dormancy ⁹		5	66	41 - 77
Enzymatic Browning ¹⁰		5	4.2	3.4 - 5.0
Specific Gravity		5	1.083	1.075 - 1.087
Fry Color ¹¹	Harvest	4	1.8	1.0 - 3.0
	Storage	4	2.5	1.0 - 3.0
Fry Texture ¹²	Harvest	4	2.8	2.0 - 3.0
	Storage	4	2.8	2.0 - 3.0

Refer to footnotes on page 118

Table 18J. Detailed data summary for CO09205-2RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	370	314 - 416
Yield US #1 (Cwt/A)		4	317	272 - 361
% US #1		4	86	80 - 89
Yield >10 oz (Cwt/A)		4	47	35 - 75
Yield <4 oz (Cwt/A)		4	43	33 - 57
% External Defects ¹		4	2.4	1.0 - 3.9
% Hollow Heart ²		4	0.0	0.0 - 0.0
% Stand		4	100	99 - 100
Emergence Uniformity		4	2.9	2.5 - 3.3
Vine Vigor ³		4	2.5	2.0 - 3.0
Stems/Plant		4	3.2	2.4 - 4.0
Vine Size ⁴		4	2.6	2.0 - 3.0
Vine Type ⁵		4	2.6	2.0 - 3.0
Vine Maturity ⁶		4	2.5	2.0 - 3.0
Blackspot ⁷	Bud End	5	4.9	4.6 - 5.0
	Stem End	5	4.5	4.2 - 4.8
	Average	5	4.7	
Weight Loss ⁸		5	2.2	1.7 - 3.1
Dormancy ⁹		5	46	35 - 61
Enzymatic Browning ¹⁰		5	4.1	2.8 - 5.0
Specific Gravity		5	1.076	1.074 - 1.078
Fry Color ¹¹	Harvest	4	0.5	0.0 - 1.0
	Storage	4	1.3	1.0 - 2.0
Fry Texture ¹²	Harvest	4	3.0	2.0 - 4.0
	Storage	4	3.5	3.0 - 4.0

Refer to footnotes on page 118

Table 18K. Detailed data summary for Canela Russet.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		47	358	214-472
Yield US #1 (Cwt/A)		47	324	182-441
% US #1		47	90	77-96
Yield >10 oz (Cwt/A)		47	108	28-236
Yield <4 oz (Cwt/A)		47	30	14-61
% External Defects ¹		47	1.2	0.0-6.9
% Hollow Heart ²		47	0.1	0.0-0.9
% Stand		46	96	82-100
Emergence Uniformity		46	2.9	1.0-4.0
Vine Vigor ³		46	2.4	1.0-3.5
Stems/Plant		46	2.0	1.1-4.2
Vine Size ⁴		46	3.8	3.0-5.0
Vine Type ⁵		46	3.5	3.0-4.3
Vine Maturity ⁶		46	3.3	2.8-4.0
Blackspot ⁷	Bud End	59	4.8	3.7-5.0
	Stem End	59	4.4	2.5-5.0
	Average	59	4.6	
Weight Loss ⁸		59	3.3	1.3-7.0
Dormancy ⁹		59	139	83-195
Enzymatic Browning ¹⁰		59	4.5	3.4-5.0
Specific Gravity		59	1.096	1.075-1.111
Fry Color ¹¹	Harvest	54	1.9	0.0-3.0
	Storage	54	2.3	0.0-4.0
Fry Texture ¹²	Harvest	54	3.9	2.0-5.0
	Storage	54	3.9	3.0-5.0

Refer to footnotes on page 118

Table 18L. Detailed data summary for Russet Norkotah.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		106	369	159-557
Yield US #1 (Cwt/A)		106	312	101-480
% US #1		106	84	59-94
Yield >10 oz (Cwt/A)		106	104	10-247
Yield <4 oz (Cwt/A)		106	49	13-131
% External Defects ¹		106	2.4	0.0-9.6
% Hollow Heart ²		106	0.4	0.0-2.8
% Stand		105	98	88-100
Emergence Uniformity		100	3.2	1.0-4.0
Vine Vigor ³		100	2.8	1.0-4.0
Stems/Plant		105	3.6	2.3-5.7
Vine Size ⁴		100	2.4	1.0-4.0
Vine Type ⁵		100	2.6	2.0-3.5
Vine Maturity ⁶		109	1.7	1.0-3.0
Blackspot ⁷	Bud End	112	4.7	2.9-5.0
	Stem End	112	4.4	2.6-5.0
	Average	113	4.6	
Weight Loss ⁸		113	3.4	1.0-7.1
Dormancy ⁹		112	97	70-140
Enzymatic Browning ¹⁰		112	3.4	2.2-4.8
Specific Gravity		116	1.079	1.066-1.091
Fry Color ¹¹	Harvest	113	2.1	1.0-4.0
	Storage	113	2.4	1.0-4.0
Fry Texture ¹²	Harvest	113	2.7	1.0-4.0
	Storage	113	2.8	1.0-5.0

Refer to footnotes on page 118

Table 18M. Detailed data summary for AC05175-3P/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	330	267-389
Yield US #1 (Cwt/A)		6	222	135-299
% US #1		6	66	48-81
Yield >10 oz (Cwt/A)		6	20	4-43
Yield <4 oz (Cwt/A)		6	108	69-171
% External Defects ¹		6	0.1	0.0-0.5
% Hollow Heart ²		6	0.0	0.0-0.0
% Stand		6	96	93-98
Emergence Uniformity		6	3.3	3.0-3.8
Vine Vigor ³		6	2.8	2.5-3.0
Stems/Plant		6	3.5	2.8-4.4
Vine Size ⁴		6	2.1	1.5-2.5
Vine Type ⁵		6	2.7	2.0-3.0
Vine Maturity ⁶		6	1.0	1.0-1.3
Blackspot ⁷	Bud End	7	4.9	4.6-5.0
	Stem End	7	4.6	4.1-5.0
	Average	7	4.8	
Weight Loss ⁸		7	3.9	2.6-5.3
Dormancy ⁹		7	79	69-95
Enzymatic Browning ¹⁰		7	3.4	2.6-4.0
Specific Gravity		7	1.071	1.068-1.074
Fry Color ¹¹	Harvest	7	1.0	0.0-2.0
	Storage	7	1.1	0.0-3.0
Fry Texture ¹²	Harvest	7	2.1	1.0-5.0
	Storage	7	2.1	1.0-4.0

Refer to footnotes on page 118

Table 18N. Detailed data summary for CO05035-1PW/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	488	416-560
Yield US #1 (Cwt/A)		6	443	369-525
% US #1		6	91	88-94
Yield >10 oz (Cwt/A)		6	208	139-297
Yield <4 oz (Cwt/A)		6	38	31-45
% External Defects ¹		6	1.6	0.0-2.9
% Hollow Heart ²		6	0.4	0.0-2.1
% Stand		6	94	84-98
Emergence Uniformity		6	3.0	2.0-4.0
Vine Vigor ³		6	3.4	2.8-4.0
Stems/Plant		6	3.8	2.9-4.2
Vine Size ⁴		6	4.0	3.5-4.3
Vine Type ⁵		6	2.8	2.0-3.3
Vine Maturity ⁶		6	3.5	3.0-4.0
Blackspot ⁷	Bud End	7	4.9	4.8-5.0
	Stem End	7	4.7	4.5-5.0
	Average	7	4.8	
Weight Loss ⁸		7	2.9	2.3-4.1
Dormancy ⁹		7	44	34-70
Enzymatic Browning ¹⁰		7	4.1	3.2-4.6
Specific Gravity		7	1.083	1.078-1.094
Fry Color ¹¹	Harvest	7	2.3	1.0-3.0
	Storage	7	2.7	2.0-4.0
Fry Texture ¹²	Harvest	7	2.7	2.0-4.0
	Storage	7	2.9	2.0-3.0

Refer to footnotes on page 118

Table 18O. Detailed data summary for CO05037-2R/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	314	234-389
Yield US #1 (Cwt/A)		5	111	55-187
% US #1		5	32	22-47
Yield >10 oz (Cwt/A)		5	6	0-28
Yield <4 oz (Cwt/A)		5	202	179-226
% External Defects ¹		5	0.0	0.0-0.2
% Hollow Heart ²		5	0.0	0.0-0.0
% Stand		5	99	97-100
Emergence Uniformity		5	3.3	3.0-3.5
Vine Vigor ³		5	2.6	1.8-3.3
Stems/Plant		5	4.8	3.8-5.5
Vine Size ⁴		5	3.1	2.5-3.5
Vine Type ⁵		5	3.2	3.0-3.8
Vine Maturity ⁶		5	2.9	2.3-3.3
Blackspot ⁷	Bud End	6	4.8	4.6-5.0
	Stem End	6	4.6	4.2-5.0
	Average	6	4.7	
Weight Loss ⁸		6	2.7	2.0-3.1
Dormancy ⁹		6	60	42-81
Enzymatic Browning ¹⁰		6	4.2	3.8-4.6
Specific Gravity		6	1.089	1.083-1.094
Fry Color ¹¹	Harvest	6	1.2	1.0-2.0
	Storage	6	1.3	1.0-3.0
Fry Texture ¹²	Harvest	6	3.8	3.0-4.0
	Storage	6	3.8	3.0-4.0

Refer to footnotes on page 118

Table 18P. Detailed data summary for CO05037-3W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	435	349-532
Yield US #1 (Cwt/A)		5	240	182-313
% US #1		5	55	51-60
Yield >10 oz (Cwt/A)		5	9	2-19
Yield <4 oz (Cwt/A)		5	190	163-211
% External Defects ¹		5	1.0	0.4-1.4
% Hollow Heart ²		5	0.0	0.0-0.0
% Stand		5	93	88-96
Emergence Uniformity		5	3.4	2.5-4.5
Vine Vigor ³		5	3.8	3.3-5.0
Stems/Plant		5	6.6	5.2-7.5
Vine Size ⁴		5	3.3	3.0-3.5
Vine Type ⁵		5	2.9	2.5-3.0
Vine Maturity ⁶		5	2.2	1.3-2.8
Blackspot ⁷	Bud End	6	4.9	4.7-5.0
	Stem End	6	4.7	4.3-5.0
	Average	6	4.8	
Weight Loss ⁸		6	2.7	2.4-3.2
Dormancy ⁹		6	82	77-88
Enzymatic Browning ¹⁰		6	3.6	3.2-4.2
Specific Gravity		6	1.079	1.077-1.083
Fry Color ¹¹	Harvest	6	1.5	1.0-2.0
	Storage	6	2.5	1.0-3.0
Fry Texture ¹²	Harvest	6	2.5	2.0-3.0
	Storage	6	3.0	2.0-4.0

Refer to footnotes on page 118

Table 18R. Detailed data summary for CO09079-5PW/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	349	279 - 417
Yield US #1 (Cwt/A)		4	116	68 - 171
% US #1		4	32	24 - 41
Yield >10 oz (Cwt/A)		4	7	3 - 10
Yield <4 oz (Cwt/A)		4	232	209 - 248
% External Defects ¹		4	0.5	0.0 - 1.5
% Hollow Heart ²		4	0.0	0.0 - 0.0
% Stand		4	95	90 - 100
Emergence Uniformity		4	2.9	2.5 - 3.3
Vine Vigor ³		4	3.0	2.3 - 3.5
Stems/Plant		4	3.4	3.3 - 3.7
Vine Size ⁴		4	3.1	2.5 - 3.8
Vine Type ⁵		4	2.9	2.5 - 3.0
Vine Maturity ⁶		4	2.4	1.5 - 3.0
Blackspot ⁷	Bud End	5	5.0	5.0 - 5.0
	Stem End	5	4.9	4.7 - 5.0
	Average	5	5.0	
Weight Loss ⁸		5	2.6	2.1 - 3.0
Dormancy ⁹		5	95	48 - 112
Enzymatic Browning ¹⁰		5	4.4	3.0 - 4.8
Specific Gravity		5	1.072	1.070 - 1.074
Fry Color ¹¹	Harvest	4	3.5	3.0 - 4.0
	Storage	4	3.5	3.0 - 4.0
Fry Texture ¹²	Harvest	4	2.0	1.0 - 3.0
	Storage	4	2.3	2.0 - 3.0

Refer to footnotes on page 118

Table 18S. Detailed data summary for CO09128-3W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	271	221 - 323
Yield US #1 (Cwt/A)		4	40	26 - 60
% US #1		4	14	12 - 19
Yield >10 oz (Cwt/A)		4	0	0 - 0
Yield <4 oz (Cwt/A)		4	231	195 - 259
% External Defects ¹		4	0.5	0.2 - 1.0
% Hollow Heart ²		4	0.0	0.0 - 0.0
% Stand		4	92	82 - 100
Emergence Uniformity		4	2.6	2.3 - 3.0
Vine Vigor ³		4	2.6	2.3 - 3.3
Stems/Plant		4	4.8	4.2 - 5.6
Vine Size ⁴		4	2.4	2.0 - 3.0
Vine Type ⁵		4	2.1	2.0 - 2.5
Vine Maturity ⁶		4	2.3	1.5 - 3.0
Blackspot ⁷	Bud End	5	4.8	4.4 - 5.0
	Stem End	5	4.9	4.7 - 5.0
	Average	5	4.9	
Weight Loss ⁸		5	2.5	1.8 - 3.2
Dormancy ⁹		5	90	70 - 104
Enzymatic Browning ¹⁰		5	4.4	4.0 - 4.8
Specific Gravity		4	1.073	1.069 - 1.077
Fry Color ¹¹	Harvest	4	3.3	3.0 - 4.0
	Storage	4	2.5	1.0 - 3.0
Fry Texture ¹²	Harvest	4	1.8	1.0 - 2.0
	Storage	4	1.5	1.0 - 2.0

Refer to footnotes on page 118

Table 18T. Detailed data summary for CO09128-5W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	352	299 - 379
Yield US #1 (Cwt/A)		4	82	54 - 110
% US #1		4	24	15 - 36
Yield >10 oz (Cwt/A)		4	0	0 - 1.0
Yield <4 oz (Cwt/A)		4	269	187 - 300
% External Defects ¹		4	0.3	0.0 - 0.5
% Hollow Heart ²		4	0.0	0.0 - 0.0
% Stand		4	99	98 - 100
Emergence Uniformity		4	4.0	3.5 - 4.5
Vine Vigor ³		4	3.9	3.5 - 4.3
Stems/Plant		4	6.3	5.3 - 6.9
Vine Size ⁴		4	2.7	2.0 - 3.5
Vine Type ⁵		4	2.2	2.0 - 2.5
Vine Maturity ⁶		4	2.1	1.5 - 2.8
Blackspot ⁷	Bud End	5	4.1	3.3 - 4.8
	Stem End	5	3.8	3.1 - 4.7
	Average	5	3.9	
Weight Loss ⁸		5	3.2	2.1 - 4.3
Dormancy ⁹		5	41	32 - 54
Enzymatic Browning ¹⁰		5	4.1	3.2 - 5.0
Specific Gravity		5	1.087	1.085 - 1.091
Fry Color ¹¹	Harvest	4	0.8	0.0 - 1.0
	Storage	4	1.5	1.0 - 2.0
Fry Texture ¹²	Harvest	4	2.5	1.0 - 4.0
	Storage	4	2.5	2.0 - 3.0

Refer to footnotes on page 118

Table 18U. Detailed data summary for CO09218-4W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	417	358 - 496
Yield US #1 (Cwt/A)		4	270	172 - 375
% US #1		4	64	46 - 76
Yield >10 oz (Cwt/A)		4	19	5 - 48
Yield <4 oz (Cwt/A)		4	141	100 - 193
% External Defects ¹		4	1.4	0.6 - 2.5
% Hollow Heart ²		4	0.1	0.0 - 0.3
% Stand		4	96	86 - 100
Emergence Uniformity		4	2.3	1.5 - 3.0
Vine Vigor ³		4	2.1	1.8 - 2.5
Stems/Plant		4	4.2	3.9 - 4.9
Vine Size ⁴		4	4.0	3.5 - 4.3
Vine Type ⁵		4	2.9	2.5 - 3.0
Vine Maturity ⁶		4	3.9	3.5 - 4.0
Blackspot ⁷	Bud End	5	4.3	3.4 - 5.0
	Stem End	5	3.6	2.8 - 4.8
	Average	5	4.0	
Weight Loss ⁸		5	3.0	2.2 - 3.8
Dormancy ⁹		5	67	55 - 84
Enzymatic Browning ¹⁰		5	3.4	2.2 - 4.4
Specific Gravity		5	1.074	1.064 - 1.079
Fry Color ¹¹	Harvest	4	2.0	1.0 - 3.0
	Storage	4	2.3	2.0 - 3.0
Fry Texture ¹²	Harvest	4	2.0	2.0 - 2.0
	Storage	4	2.0	1.0 - 3.0

Refer to footnotes on page 118

Table 18V. Detailed data summary for Masquerade.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		7	522	452-585
Yield US #1 (Cwt/A)		7	410	349-471
% US #1		7	79	71-84
Yield >10 oz (Cwt/A)		7	93	43-141
Yield <4 oz (Cwt/A)		7	104	62-149
% External Defects ¹		7	1.6	0.5-3.7
% Hollow Heart ²		7	0.4	0.0-1.6
% Stand		7	99	98-100
Emergence Uniformity		7	3.5	3.0-4.0
Vine Vigor ³		7	4.3	3.8-5.0
Stems/Plant		7	5.0	3.0-7.4
Vine Size ⁴		7	4.3	4.0-4.8
Vine Type ⁵		7	3.3	3.0-3.5
Vine Maturity ⁶		7	3.1	2.8-3.5
Blackspot ⁷	Bud End	8	4.4	3.1-5.0
	Stem End	8	3.4	2.6-5.0
	Average	8	3.9	
Weight Loss ⁸		8	4.3	2.0-5.9
Dormancy ⁹		8	39	23-52
Enzymatic Browning ¹⁰		8	4.0	3.0-4.6
Specific Gravity		8	1.092	1.081-1.096
Fry Color ¹¹	Harvest	8	2.5	1.0-4.0
	Storage	8	2.8	2.0-3.0
Fry Texture ¹²	Harvest	8	3.0	2.0-4.0
	Storage	8	3.4	3.0-4.0

Refer to footnotes on page 118

Table 18W. Detailed data summary for Purple Majesty.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		32	454	251-606
Yield US #1 (Cwt/A)		32	252	57-401
% US #1		32	55	23-76
Yield >10 oz (Cwt/A)		32	28	0-61
Yield <4 oz (Cwt/A)		32	198	90-326
% External Defects ¹		32	0.9	0.0-4.3
% Hollow Heart ²		32	0.9	0.0-3.4
% Stand		32	96	77-100
Emergence Uniformity		32	3.3	2.3-5.0
Vine Vigor ³		32	3.5	2.3-4.5
Stems/Plant		32	4.3	2.7-6.1
Vine Size ⁴		32	3.2	2.3-4.0
Vine Type ⁵		32	2.7	2.0-3.0
Vine Maturity ⁶		32	2.3	1.0-3.0
Blackspot ⁷	Bud End	---	---	---
	Stem End	---	---	---
	Average	---	---	---
Weight Loss ⁸		42	3.9	1.1-12.6
Dormancy ⁹		42	59	39-85
Enzymatic Browning ¹⁰		---	---	---
Specific Gravity		42	1.085	1.074-1.094
Fry Color ¹¹	Harvest	---	---	---
	Storage	---	---	---
Fry Texture ¹²	Harvest	35	2.7	1.0-4.0
	Storage	35	2.7	1.0-4.0

Refer to footnotes on page 118

Table 18X. Detailed data summary for Yukon Gold.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		51	395	283-513
Yield US #1 (Cwt/A)		51	350	240-444
% US #1		51	88	78-94
Yield >10 oz (Cwt/A)		51	146	48-248
Yield <4 oz (Cwt/A)		51	37	21-66
% External Defects ¹		51	2.2	0.0-8.2
% Hollow Heart ²		51	0.4	0.0-2.2
% Stand		51	96	87-100
Emergence Uniformity		51	3.3	2.5-4.8
Vine Vigor ³		51	3.7	3.0-5.0
Stems/Plant		51	2.5	1.6-3.8
Vine Size ⁴		51	3.2	2.5-4.5
Vine Type ⁵		51	2.7	2.0-3.5
Vine Maturity ⁶		51	1.9	1.0-3.0
Blackspot ⁷	Bud End	66	4.5	2.0-5.0
	Stem End	66	4.3	2.4-5.0
	Average	66	4.4	
Weight Loss ⁸		66	2.0	0.9-4.3
Dormancy ⁹		66	90	63-132
Enzymatic Browning ¹⁰		66	4.4	3.4-5.0
Specific Gravity		66	1.087	1.079-1.093
Fry Color ¹¹	Harvest	62	1.7	1.0-4.0
	Storage	62	2.7	1.0-4.0
Fry Texture ¹²	Harvest	62	3.2	1.0-5.0
	Storage	62	3.2	1.0-5.0

Refer to footnotes on page 118

Table 18Y. 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	3.3	2.8-4.0
Vine Vigor ³	6	3.0	2.8-3.5
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	18	4.4
	Stem End	18	3.1
	Average	18	3.8
Weight Loss ⁸	18	2.6	1.6-4.4
Dormancy ⁹	18	96	70-127
Enzymatic Browning ¹⁰	18	1.9	1.2-3.6
Specific Gravity	19	1.088	1.075-1.103
Chip Color ¹¹	40	18	4.4
	40R	18	3.7
	50	18	2.5
	50R	18	2.4

Refer to footnotes on page 118

Table 18Z. Detailed data summary for AC03433-1W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	396	309-492
Yield US #1 (Cwt/A)		6	320	242-421
% US #1		6	80	74-86
Yield >10 oz (Cwt/A)		6	69	22-95
Yield <4 oz (Cwt/A)		6	50	41-64
% External Defects ¹		6	7.1	3.7-10.1
% Hollow Heart ²		6	0.2	0.0-1.0
% Stand		6	94	89-98
Emergence Uniformity		6	3.0	2.3-4.3
Vine Vigor ³		6	2.8	2.5-3.3
Stems/Plant		6	3.4	2.5-4.6
Vine Size ⁴		6	3.8	3.5-4.0
Vine Type ⁵		6	3.0	3.0-3.0
Vine Maturity ⁶		6	3.6	3.0-4.0
Blackspot ⁷	Bud End	17	4.8	4.3-5.0
	Stem End	17	4.2	2.5-5.0
	Average	17	4.5	
Weight Loss ⁸		17	3.4	1.6-5.9
Dormancy ⁹		17	81	61-101
Enzymatic Browning ¹⁰		17	4.4	3.4-5.0
Specific Gravity		18	1.085	1.076-1.092
Chip Color ¹¹	40	17	3.3	2.5-5.0
	40R	17	2.7	1.5-4.0
	50	17	1.8	1.0-4.0
	50R	17	1.9	1.0-3.0

Refer to footnotes on page 118

Table 18AA. 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	96-101
Emergence Uniformity	6	3.2	3.0-3.5
Vine Vigor ³	6	3.7	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	17	3.7
	Stem End	17	3.4
	Average	17	3.6
Weight Loss ⁸	17	3.2	1.5-5.2
Dormancy ⁹	17	112	70-167
Enzymatic Browning ¹⁰	17	3.7	2.4-4.6
Specific Gravity	18	1.098	1.090-1.106
Chip Color ¹¹	40	18	3.5
	40R	18	2.8
	50	18	2.0
	50R	18	2.0

Refer to footnotes on page 118

Table 18AB. Detailed data summary for CO03243-3W.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	7	462	439-501
Yield US #1 (Cwt/A)	7	403	357-438
% US #1	7	87	81-93
Yield >10 oz (Cwt/A)	7	111	76-220
Yield <4 oz (Cwt/A)	7	50	20-71
% External Defects ¹	7	2.1	0.6-3.1
% Hollow Heart ²	7	0.9	0.0-3.6
% Stand	7	96	92-99
Emergence Uniformity	7	3.3	2.5-5.0
Vine Vigor ³	7	3.6	3.3-4.3
Stems/Plant	7	2.9	2.1-3.5
Vine Size ⁴	7	3.9	3.0-4.3
Vine Type ⁵	7	3.0	3.0-3.0
Vine Maturity ⁶	7	3.4	3.0-4.0
Blackspot ⁷	Bud End	18	4.4
	Stem End	18	3.8
	Average	18	4.1
Weight Loss ⁸	18	3.3	2.3-4.9
Dormancy ⁹	18	81	60-101
Enzymatic Browning ¹⁰	18	3.3	2.3-4.9
Specific Gravity	19	1.086	1.069-1.095
Chip Color ¹¹	40	17	3.9
	40R	17	2.8
	50	17	2.0
	50R	17	1.9

Refer to footnotes on page 118

Table 18AC. Detailed data summary for AC00206-2W.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	6	321	279-362
Yield US #1 (Cwt/A)	6	255	210-299
% US #1	6	79	75-83
Yield >10 oz (Cwt/A)	6	38	16-69
Yield <4 oz (Cwt/A)	6	60	49-70
% External Defects ¹	6	2.2	0.5-3.4
% Hollow Heart ²	6	1.1	0.0-2.5
% Stand	6	96	89-98
Emergence Uniformity	6	3.1	2.3-3.3
Vine Vigor ³	6	2.6	2.0-3.0
Stems/Plant	6	2.5	2.2-2.9
Vine Size ⁴	6	2.1	1.3-2.8
Vine Type ⁵	6	2.6	2.3-3.0
Vine Maturity ⁶	6	2.8	2.3-3.0
Blackspot ⁷	Bud End	16	4.5
	Stem End	16	3.8
	Average	16	4.2
Weight Loss ⁸	16	3.3	2.3-5.0
Dormancy ⁹	16	85	63-103
Enzymatic Browning ¹⁰	16	4.5	3.4-5.0
Specific Gravity	16	1.086	1.076-1.093
Chip Color ¹¹	40	16	2.8
	40R	16	2.2
	50	16	1.8
	50R	16	1.7

Refer to footnotes on page 118

Table 18AD. Detailed data summary for AC03452-2W.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	7	444	388-505
Yield US #1 (Cwt/A)	7	377	321-428
% US #1	7	85	81-88
Yield >10 oz (Cwt/A)	7	65	34-91
Yield <4 oz (Cwt/A)	7	60	46-74
% External Defects ¹	7	1.5	0.9-2.2
% Hollow Heart ²	7	0.5	0.0-1.5
% Stand	7	98	97-99
Emergence Uniformity	7	3.5	3.3-4.0
Vine Vigor ³	7	3.8	3.3-4.3
Stems/Plant	7	3.3	2.7-4.4
Vine Size ⁴	7	3.4	3.0-3.8
Vine Type ⁵	7	2.8	2.3-3.0
Vine Maturity ⁶	7	3.2	3.0-3.8
Blackspot ⁷	Bud End	17	4.9
	Stem End	17	4.8
	Average	17	4.9
Weight Loss ⁸	17	2.1	1.4-3.7
Dormancy ⁹	17	71	52-95
Enzymatic Browning ¹⁰	17	4.8	4.4-5.0
Specific Gravity	18	1.077	1.071-1.087
Chip Color ¹¹	40	17	3.4
	40R	17	2.8
	50	17	1.8
	50R	17	1.8

Refer to footnotes on page 118

Table 18AE. Detailed data summary for AC05153-1W.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	6	340	301-376
Yield US #1 (Cwt/A)	6	229	161-277
% US #1	6	66	51-74
Yield >10 oz (Cwt/A)	6	18	10-32
Yield <4 oz (Cwt/A)	6	107	75-137
% External Defects ¹	6	1.5	0.1-3.5
% Hollow Heart ²	6	0.1	0.0-0.3
% Stand	6	97	96-99
Emergence Uniformity	6	3.6	3.3-3.8
Vine Vigor ³	6	3.4	3.0-4.0
Stems/Plant	6	4.7	3.8-5.7
Vine Size ⁴	6	2.5	2.0-3.0
Vine Type ⁵	6	2.7	2.0-3.0
Vine Maturity ⁶	6	1.8	1.0-2.8
Blackspot ⁷	Bud End	15	4.6
	Stem End	15	3.9
	Average	15	4.3
Weight Loss ⁸	15	4.7	3.5-6.7
Dormancy ⁹	15	85	60-113
Enzymatic Browning ¹⁰	15	3.3	2.0-4.6
Specific Gravity	16	1.089	1.078-1.099
Chip Color ¹¹	40	15	4.0
	40R	15	3.0
	50	15	2.3
	50R	15	2.1

Refer to footnotes on page 118

Table 18AF. Detailed data summary for AC01144-1W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	480	422-554
Yield US #1 (Cwt/A)		5	351	265-422
% US #1		5	73	56-83
Yield >10 oz (Cwt/A)		5	51	24-112
Yield <4 oz (Cwt/A)		5	121	63-200
% External Defects ¹		5	1.7	0.8-4.6
% Hollow Heart ²		5	0.0	0.0-0.0
% Stand		5	97	94-99
Emergence Uniformity		5	3.6	3.3-4.0
Vine Vigor ³		5	3.8	3.5-4.0
Stems/Plant		5	3.2	2.4-4.3
Vine Size ⁴		5	3.7	3.3-4.0
Vine Type ⁵		5	2.6	2.0-3.0
Vine Maturity ⁶		5	3.1	2.8-3.3
Blackspot ⁷	Bud End	10	4.6	4.2-5.0
	Stem End	10	4.2	3.2-5.0
	Average	10	4.4	
Weight Loss ⁸		10	2.0	1.1-3.4
Dormancy ⁹		10	89	70-108
Enzymatic Browning ¹⁰		10	9.9	2.2-4.6
Specific Gravity		11	1.081	1.074-1.093
Chip Color ¹¹	40	10	3.3	2.0-4.0
	40R	10	2.6	1.5-3.5
	50	10	2.0	1.0-3.5
	50R	10	2.4	1.5-3.0

Refer to footnotes on page 118

Table 18AG. Detailed data summary for Atlantic.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		56	447	172-597
Yield US #1 (Cwt/A)		56	388	149-512
% US #1		56	87	76-93
Yield >10 oz (Cwt/A)		56	143	51-290
Yield <4 oz (Cwt/A)		56	48	19-109
% External Defects ¹		56	2.7	0.1-9.1
% Hollow Heart ²		56	4.6	0.2-16.4
% Stand		56	96	63-100
Emergence Uniformity		50	3.6	2.0-4.8
Vine Vigor ³		50	3.6	2.8-4.3
Stems/Plant		56	3.1	1.8-4.9
Vine Size ⁴		50	3.2	2.2-4.0
Vine Type ⁵		50	3.0	2.8-3.8
Vine Maturity ⁶		56	3.2	2.8-4.0
Blackspot ⁷	Bud End	81	3.3	1.8-5.0
	Stem End	81	2.9	1.4-4.3
	Average	82	3.1	
Weight Loss ⁸		82	4.2	1.1-7.9
Dormancy ⁹		79	83	56-119
Enzymatic Browning ¹⁰		80	4.5	3.8-5.0
Specific Gravity		83	1.098	1.083-1.120
Chip Color ¹¹	40	78	4.1	2.0-5.0
	40R	78	3.6	1.5-5.0
	50	78	2.8	1.0-4.5
	50R	78	2.6	1.0-5.0

Refer to footnotes on page 118

Table 18AH. Detailed data summary for Chipeta.

Variable	# Trials	Mean	Range
Total Yield (Cwt/A)	51	535	355-757
Yield US #1 (Cwt/A)	51	453	249-606
% US #1	51	84	70-92
Yield >10 oz (Cwt/A)	51	178	52-388
Yield <4 oz (Cwt/A)	51	52	22-119
% External Defects ¹	51	5.6	1.1-13.0
% Hollow Heart ²	51	0.6	0.0-4.0
% Stand	51	98	94-100
Emergence Uniformity	44	3.6	3.0-5.0
Vine Vigor ³	44	4.2	3.2-5.0
Stems/Plant	50	3.4	2.0-4.9
Vine Size ⁴	44	4.5	4.0-5.0
Vine Type ⁵	44	3.1	2.5-4.0
Vine Maturity ⁶	51	3.4	3.0-4.0
Blackspot ⁷	Bud End	75	4.0
	Stem End	75	3.8
	Average	77	4.0
Weight Loss ⁸	77	2.9	1.0-8.0
Dormancy ⁹	73	101	70-153
Enzymatic Browning ¹⁰	74	4.0	2.4-5.0
Specific Gravity	77	1.090	1.070-1.108
Chip Color ¹¹	40	73	4.5
	40R	73	3.9
	50	73	2.7
	50R	73	2.5

Refer to footnotes on page 118

Footnotes for Tables 18A-18AH:

- 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.

Table 15A. Grower return data for russet selections and standard cultivars - 2019.

Clone	Yield >10 oz (cwt/A)	Yield 4-10 oz (cwt/A)	Yield <4 oz (cwt/A)	Grower Returns (\$/Acre) ¹
AC05039-2RU	66	190	28	6,426
CO05068-1RU	135	274	36	10,329
CO04220-4RU	50	365	79	10,347
CO07015-4RU	32	242	62	6,858
CO08065-2RU	79	238	50	7,995
CO08231-1RU	130	253	49	9,729
CO09036-2RU	69	253	94	8,217
CO09076-3RU	139	224	50	9,279
CO09205-2RU	47	270	43	7,878
Canela Russet	10	216	30	5,544
Russet Norkotah	14	208	49	5,517

¹Yield data and associated \$ returns is based on multiple year research trials at the the SLVRC. Individual grower results may differ based on management practices. Production costs, packaging, and handling charges were not deducted. Potato prices quoted on April 17, 2019 by Farm Fresh Direct, LLC. Tubers >10 oz = \$27/cwt, tubers 4-10 oz = \$24/cwt, and tubers <4 oz = \$3/cwt, US #2s and culls = no value.

Figure 2. Graphical representation of grower return data for russet selections and standard cultivars -2019.

Table 15B. Grower return data for yellow flesh selections and Yukon Gold - 2019.

Clone	Yield >10 oz (cwt/A)	Yield 4-10 oz (cwt/A)	Yield <4 oz (cwt/A)	Grower Returns (\$/Acre) ¹
AC05175-3P/Y	20	202	108	7,488
CO05035-1PW/Y	208	235	38	11,392
CO05037-2R/Y	6	105	202	6,704
CO05037-3W/Y	9	231	190	9,560
CO09128-3W/Y	0	40	231	5,580
CO09128-5W/Y	0	82	269	7,348
CO06218-4W/Y	19	251	141	9,300
Yukon Gold	146	204	37	9,140

¹Yield data and associated \$ returns is based on multiple year research trials at the SLVRC. Individual grower results may differ based on management practices. Production costs, packaging, and handling charges were not deducted. Potato prices quoted on February 19, 2018 by Farm Fresh Direct, LLC. Size A (tubers > 4 oz) = \$24/cwt and size B (tubers < 4 oz) = \$20/cwt.

Figure 3. Graphical representation of grower return data for yellow-fleshed selections and Yukon Gold - 2019.

Table 16. 2018 Red color retention study. The entries are ordered from darker to lighter skin color based on the average reflectance values¹ over the eighteen week interval.

Selection/Cultivar	Weeks of Storage after Harvest						
	0	3	6	9	12	15	18
CO05211-4R	10.58	10.72	10.78	10.13	11.23	11.53	11.50
CO05228-4R	10.47	10.68	11.25	10.69	11.24	11.82	11.95
CO00277-2R	11.72	11.70	10.72	11.49	11.70	11.72	11.76
CO00291-5R	11.25	11.22	11.00	11.40	11.93	12.11	12.13
CO06215-2R	11.82	11.62	11.83	11.38	12.18	12.41	12.46
CO99076-6R	11.54	12.38	12.32	11.57	12.25	12.44	12.51
CO99256-2R	11.97	12.48	12.83	11.80	12.50	12.71	12.78
CO04159-1R	12.38	12.23	12.27	11.98	12.92	13.42	13.46
CO04021-2R/Y	14.56	13.26	12.34	12.35	13.16	13.45	13.30
TC12472-1R/Y	13.80	13.19	14.10	12.59	13.35	13.51	13.53
Colorado Rose	12.96	13.48	14.03	12.98	13.67	13.80	14.07
CO98012-5R	12.95	13.73	13.83	12.61	13.65	14.03	14.29
Rio Colorado	13.54	13.63	14.23	12.63	14.00	14.02	14.05
CO05037-2R/Y	14.56	13.57	14.23	12.97	14.10	15.55	14.91
Sangre-S10	14.51	14.64	15.29	13.95	14.71	14.99	15.05
CO04067-8R/Y	14.92	14.90	14.97	14.61	15.65	16.29	16.07
Chieftain	16.21	15.91	16.46	15.29	15.53	15.67	15.72
Red LaSoda	16.11	15.92	16.40	14.84	15.81	16.04	15.76
Mean	13.10	13.07	13.27	12.51	13.31	13.64	13.63

¹ Lower reflective values are associated with darker skin color.

Figure 4. Graphical representation of red skin color retention over an eighteen week interval. Selections with the darkest skin color have an asterisk after the clonal designation.

APPENDIX 1. Cultural management information for the Potato Breeding and Selection Program's trials at the San Luis Valley Research Center - 2018.

LOCATION: San Luis Valley Research Center

SOIL TYPE: Sandy Loam (Dunul cobbly sandy loam)

DATE:

Planted - 5/10/18

Hilled - 5/30/18

Vines Killed - 9/1/18 (Reglone 0.25 gal/A + 2.75 oz/A Agri Tin) 114 days after planting

Harvested - 9/27/18

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:

5/10/18 - 50 lbs N + 60 lbs P₂O₅ + 35 lbs K₂O + 20 lbs S + 1 lb Zn/A (dual band in-row liquid application)

6/26/18 - 10 lbs N (fertigated)

7/3/18 - 10 lb N (fertigated)

7/5/18 - 15 lbs N (fertigated)

7/8/18 - 15 lbs N (fertigated)

7/15/18 - 15 lbs N (fertigated)

7/18/18 - 15 lbs N (fertigated)

7/21/18 - 10 lbs N (fertigated)

7/30/18 - 13 lbs N (fertigated)

Total fertilizer applied: 143 lbs N + 35 lbs P₂O₅ + 20 lbs K₂O + 17 lbs S + 1 lb Zn/A

IRRIGATION:

Center Pivot -10.7" gross application (application frequency and amount based on ET)

Rainfall - 3.47" (5/10/18 - 9/27/18)

INSECTICIDES APPLIED:

Weekly - mineral oil (1 gal/A)

FUNGICIDES APPLIED:

6/23/18 - Champ Ion++

7/22/18 - Endura (4.5 oz/A boscalid)

7/12/18 - Quadris Opti (14 oz a.i./A)

HERBICIDES APPLIED:

5/22/18 - Tuscany

5/22/18 - Dual Magnum (2 pt/A S-metolachlor)

5/22/18 - Prowl H20

6/26/18 - Eptam 7E (1.0 lb a.i./A S-ethyl dipropylthiocarbamate)

8/2/18 and 8/7/18 - Agri Tin (3.75 oz/A Triphenyltin)

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 two 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