

2020 Research Progress Report

Potato Breeding and Selection

Submitted by

David G. Holm, Caroline Gray and Beth Niebaum

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 **2020 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
- Chakradhar Mattupalli - Disease Screening of Advanced Selections for PVY
- 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 2021 production season!

Sincerely,

Dave Holm, Caroline Gray and Beth Niebaum

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 2019.

- ✓ 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
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 - *United States Potato Board* - National Chip Processing Trial (NCPT) and National Fry Processing Trial (NFPT)
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- ✓ 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	Kamryn Holland
Makayla Larimore		

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	Chakradhar Mattupalli	Vamsi Nalam	
- ✓ Staff - San Luis Valley Research Center

Jeff Bishop	Zach Czarnecki	Michelle Leckler	Ron Price
Drew Sala	Sharon Yust		
- ✓ Potato Certification Service

Andrew Houser	Teresa Almeida	Rick Haslar (retired)	Carolyn Keller
Sarah Noller	Sarah Hensley	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.

2020 Research Progress Report

Potato Breeding and Selection

Submitted by

David G. Holm, Caroline Gray and Beth Niebaum

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 95 parental clones in 2020 in two separate crossing blocks. The emphasis of the first crossing block was russet (fresh and processing) and yellow cultivar development with emphasis on disease resistance, particularly to PVY. The second crossing block also emphasized russet (fresh and processing) and red cultivar development with a major emphasis on incorporating PVY resistance. Seed from 411 combinations was obtained. A subset of these and previous crosses will be planted in the greenhouse in 2021 to produce seedling tubers.

Approximately 89,466 first-size seedling tubers representing 224 families were produced from selected greenhouse crosses made in 2019-2020. These seedlings will undergo initial field selection in 2021.

These seedlings represent crosses segregating primarily for russets, reds, and chippers and disease resistance, including PVY, PCN, corky ringspot, common scab, late blight, Fusarium and Verticillium wilt. Second through fourth size seedling tubers will be distributed to Idaho (USDA-ARS), Maine, Oregon, Texas, Minnesota, and Alberta, Canada (Agriculture Canada).

Seedling Selection and Clonal Development

Colorado grew 89,466 first-year seedlings representing 462 families in 2020, with 503 selected for subsequent planting, evaluation, and increase in future years. A portion of these seedlings were obtained from the USDA-ARS (Aberdeen, Idaho), Texas A&M University, Oregon State University, and the University of Maine. Another 841 clones were in 12-hill, preliminary, and intermediate stages of selection. At harvest, 217 were saved for further increase and evaluation in 2021. Sixty-five advanced selections were saved and will be increased in 2021 pending further evaluation. Another 228 selections and cultivars were maintained for germplasm development, breeding, and other experimental purposes including seed increase/maintenance.

Field trials conducted in 2020 included: Preliminary Trial, Intermediate Yield Trial, Intermediate Yield Chip Trial, Intermediate Specialty Yield Trial, Advanced Yield Trial, Advanced Fingerling Yield Trial, Southwestern Regional Russet Trial, Southwest Regional Chip Trial, Southwest Regional Specialty 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 2-16 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 2020. It should be noted that the fertility was half of the typical rate on these trials.

A total of 153 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 2020 representing russets, specialties, and chipping selections. Advanced Colorado selections evaluated in the Southwest Regional Trials and Western Regional Trials were six russets (CO10085-1RU, CO10087-4RUsto, CO10091-1RUsto, CO11009-3RU CO12152-1RU, and CO12378-1RU), four yellows (CO10064-1W/Y, CO10098-5W/Y, CO11250-1W/Y, CO11266-1W/Y), and eight chippers (AC11494-6W, CO10073-7W, CO10076-4W, CO11023-2W, CO11023-9W, CO11037-5W, CO12235-3W, and CO12293-1W).

Advanced selections available to growers for on-farm trials were four russets (CO12152-1RU, CO12378-1RU, CO10085-1RU, and CO11009-3RU), three yellows and specialties (CO08062-3PF/P, CO011250-1W/Y, and CO11266-1W/Y), and six chip selections (AC11494-6W, CO12235-3W, CO12293-1W, CO11023-2W, CO11023-9W, and CO11037-5W).

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’.

With cooperators, we have determined via marker analysis, that the following selections should have extreme resistance to PVY: CO03367-1RU_{sto}, CO03371-4RU_{sto}, CO03371-6RU_{sto}, CO03371-7RU_{sto}, CO12226-3RU_{sto}, CO13405-2RU_{sto}, CO14016-1RU_{sto}, CO15006-1RU_{sto}, CO15016-1RU_{sto}, CO15019-1W_{sto}, CO15024-1RU_{sto}, AC13126-1W_{adg}.

In 2020, certificates of Plant Variety Protection were issued in the US and Plant Breeders’ Rights in Canada for Nonpareil Russet (CO98067-7RU), Maritime Russet (CO97087-2RU) and Canada Rose (CO00277-2R). Plant Variety Protection applications were submitted for Rocky Mountain Russet (CO05068-1RU), Vista Gold (CO05037-5W/Y) and Columbine Gold (AC05175-3P/Y).

Table 17 summarizes the performance of advanced selections that are available for growers to evaluate in 2020. Detailed data summaries for each of the advanced selections are presented in Tables 18A-18AA. 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 19A compiles the grower return data for advanced russet selections and Figure 2 is a graphical representation of the data. Similarly, Table 19B 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 20 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 20. 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 CO14105-1R, AFC6041-1R, CO14035-4R, and CO14032-6R. Colorado Rose was next in order of darkness. The lightest colored reds (lightest first) were Red LaSoda, Chieftain, Sangre S-10, and CO14040-3R. 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 2020:

- 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 (16 selections).

- We collaborated with Vamsi Nalam and Chakradhar Mattupalli to screen several selections in our program for the PVY resistance genes, *Rysto*, *Ryadg*, and *Rychc*. Clones selected were based on pedigree analysis, where one or both parents had been identified as being PVY resistant. In 2020 we identified markers in 50 of 103 selections screened in our breeding program. We currently have several selections, some advanced, that are coming through the pipeline that have markers present for extreme resistance to PVY.
- 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.
- Thirteen 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.
- Four 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.
- Seven 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

Jeremy Logrono. Jeremy's project focused on screening carotenoids in potato germplasm using the new technology of Rapid Evaporative Ionization Mass Spectrometry (REIMS)/iknife and using the HPLC analytical method. Evaluating the potential of REIMS/iknife to screen carotenoids may improve the efficiency and precision of selecting high carotenoid potato lines.

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 - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC11436-1RU	5.0	5.0	5.0	3.3	68	4.0
AC11561-2W/Y	4.9	4.3	4.6	4.3	47	3.8
AC11573-3R/Y	4.8	3.8	4.3	3.3	61	4.4
CO14371-3RU	5.0	5.0	5.0	2.1	75	3.2
CO15016-1RUsto	4.7	4.4	4.6	2.7	54	3.8
CO15084-2R	5.0	4.4	4.7	3.2	82	3.2
CO15084-4R	5.0	4.8	4.9	3.4	61	1.4
CO15121-3R	5.0	4.8	4.9	3.6	47	2.6
CO15155-1RU	4.9	3.9	4.4	2.7	75	4.4
CO15205-4R	5.0	4.5	4.8	3.3	61	2.2
CO15206-1R	5.0	4.4	4.7	6.9	40	3.6
CO15206-7R	4.9	4.7	4.8	10.0	40	4.6
CO15211-1R	4.8	3.9	4.4	5.2	54	4.4
CO15211-5R	4.7	4.0	4.4	9.2	47	3.6
CO15219-3R	4.6	5.0	4.8	8.0	61	3.0
Canela Russet	5.0	5.0	5.0	2.7	133	4.6
Centennial Russet	4.8	5.0	4.9	3.4	62	3.6
Russet Burbank	4.7	4.6	4.7	1.2	83	1.8
Russet Norkotah	5.0	5.0	5.0	1.9	84	4.6
Sangre-S10	5.0	5.0	5.0	1.8	69	1.8
Shepody	5.0	4.8	4.9	2.9	55	3.0
Yukon Gold	5.0	4.6	4.8	1.3	83	4.8

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 - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 55F+ 8 wks 45F	At Harvest	3 wks 55F+ 8 wks 45F
AC11436-1RU	1.079	4	4	3	4
AC11561-2W/Y	1.075	4	4	3	4
AC11573-3R/Y	1.083	3	3	3	3
CO14371-3RU	1.076	4	3	3	3
CO15016-1RUsto	1.079	4	4	3	3
CO15084-2R	1.073	4	4	2	3
CO15084-4R	1.079	4	3	1	2
CO15121-3R	1.086	4	4	2	2
CO15155-1RU	1.084	3	3	1	2
CO15205-4R	1.086	4	4	2	2
CO15206-1R	1.083	3	2	3	2
CO15206-7R	1.080	3	3	3	2
CO15211-1R	1.079	4	3	2	2
CO15211-5R	1.077	4	3	1	2
CO15219-3R	1.085	4	4	2	2
Canela Russet	1.079	2	3	3	4
Centennial Russet	1.080	4	4	1	2
Russet Burbank	1.083	3	3	3	3
Russet Norkotah	1.076	3	4	2	2
Sangre-S10	1.069	4	4	3	3
Shepody	1.085	4	4	2	2
Yukon Gold	1.084	3	4	3	3

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

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

Table 3A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley Chipping study entries - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC11494-6W	2.9	2.1	2.5	2.9	53	4.6
AC13124-1W	3.5	2.6	3.1	3.1	68	2.6
AC13125-4W	4.1	3.7	3.9	2.4	54	3.8
AC13125-5W	3.9	3.5	3.7	2.8	54	4.2
AC13126-1Wadg	3.0	2.1	2.6	2.8	68	4.2
AC13133-2W	5.0	2.3	3.6	3.4	47	5.0
CO03243-3W	4.6	3.1	3.9	2.2	69	4.4
CO10073-7W	4.5	3.3	3.9	3.5	84	3.0
CO10076-4W	4.2	3.9	4.1	3.4	43	3.0
CO11023-2W	5.0	5.0	5.0	4.4	52	3.8

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 - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO11023-9W	4.2	3.1	3.7	4.6	74	3.8
CO11037-5W	5.0	4.5	4.8	2.3	87	3.6
CO12235-3W	4.8	3.9	4.4	4.2	74	3.0
CO12293-1W	5.0	5.0	5.0	2.7	74	4.8
CO13232-5W	4.4	3.0	3.7	2.0	95	4.4
CO13232-11W	4.7	4.1	4.4	2.3	88	4.4
CO13232-25W	3.9	3.3	3.6	3.1	74	4.8
Atlantic	3.9	2.2	3.1	3.1	62	4.6
Chipeta	4.7	3.5	4.1	1.5	90	4.6
Snowden	3.3	1.9	2.6	2.0	90	2.6

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 3B. Chip color¹ after various storage regimes, and specific gravity of San Luis Valley Chipping study entries - 2020.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
AC11494-6W	1.090	2.0	2.0	1.0	2.5
AC13124-1W	1.074	4.0	4.0	2.0	3.5
AC13125-4W	1.089	2.5	3.0	2.5	1.0
AC13125-5W	1.080	3.0	3.5	2.5	2.0
AC13126-1W ^{adg}	1.091	4.0	4.0	3.0	1.0
AC13133-2W	1.082	4.0	4.0	2.5	2.0
AC15304-4W	1.092	3.5	3.0	2.5	2.5
AC16153-5W	1.086	3.5	3.5	2.5	2.0
AC16156-1W	1.085	4.5	3.5	2.5	3.5
AC16156-5W	1.092	3.0	3.0	2.5	3.5
CO03243-3W	1.089	3.5	4.0	1.5	3.5
CO10073-7W	1.083	3.0	3.5	3.0	3.5
CO10076-4W	1.080	4.0	4.0	2.5	3.5
CO11023-2W	1.089	3.5	3.5	2.5	3.0
CO11023-9W	1.088	3.5	3.0	2.5	3.5

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 - 2020.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
CO11037-5W	1.079	3.0	2.5	2.5	4.0
CO12235-3W	1.084	3.5	3.0	3.0	4.0
CO12293-1W	1.072	4.5	3.5	3.0	4.0
CO13232-5W	1.077	3.5	3.0	2.5	3.0
CO13232-11W	1.081	3.5	2.0	3.0	4.0
CO13232-25W	1.082	2.5	1.0	3.0	3.0
CO16014-1W	1.077	4.0	2.0	2.5	3.5
CO16014-2W	1.083	3.0	3.0	3.0	4.0
CO16018-1W	1.087	3.5	3.0	2.5	3.5
CO16028-1W	1.085	3.5	3.0	2.5	3.5
CO16038-6W	1.076	4.0	3.5	2.5	3.5
CO16038-7W	1.079	2.5	3.0	1.5	3.0
CO16041-4W	1.080	3.5	3.0	2.0	3.0
CO16083-3W	1.084	3.5	1.5	2.5	3.5
CO16133-1W	1.076	4.0	3.0	3.0	3.5
Atlantic	1.099	4.5	3.5	2.0	2.0
Chipeta	1.087	4.5	4.5	3.0	3.0
Snowden	1.102	4.5	1.0	1.5	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 - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC13260-1RU	265	221	83	202	19	40	1.72/1.23
CO14062-2RU	301	253	84	218	35	42	1.71/1.25
CO14137-2RU	281	246	88	193	54	31	1.88/1.17
Canela Russet	384	337	88	158	179	38	1.88/1.23
Russet Norkotah	261	216	83	162	55	35	2.36/1.20
Mean	299	255	85	186	68	37	1.91/1.22
LSD ³ (0.05)	42	56	NS	NS	46	NS	0.16/0.05

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 - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC13260-1RU	1.5	MS*	0.0
CO14062-2RU	1.4	MS*,GC	0.0
CO14137-2RU	1.3	MS*	0.0
Canela Russet	9.4	MS*,SG,GC	0.0
Russet Norkotah	2.6	MS*,GR	0.0

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

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

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

Table 4C. Growth characteristics of Intermediate Yield Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC13260-1RU	96	4.0	3.0	2.2	2.5	2.5	2.5
CO14062-2RU	98	3.0	3.0	3.1	3.0	2.5	3.0
CO14137-2RU	92	2.0	3.0	2.0	3.0	3.5	3.5
Canela Russet	100	2.0	3.0	1.6	4.0	3.0	3.5
Russet Norkotah	96	3.0	3.0	2.4	2.5	3.0	2.0
Mean	96	2.8	3.0	2.2	3.0	2.9	2.9
LSD ⁷ (0.05)	NS	NS	NS	0.4	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 calculation.

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

Table 4D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Yield Trial entries - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic ⁴ Browning
	Bud End	Stem End	Average			
AC13260-1RU	5.0	5.0	5.0	3.0	45	4.2
CO14062-2RU	5.0	5.0	5.0	2.9	80	4.8
CO14137-2RU	5.0	5.0	5.0	2.7	66	4.8
Canela Russet	5.0	4.8	4.9	2.4	129	4.8
Russet Norkotah	5.0	5.0	5.0	2.8	80	3.6

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

²Tubers were stored at 45F for 91 days.

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

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

Table 4E. Specific gravity, french fry color, and texture for Intermediate Yield Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
AC13260-1RU	1.085	0	1	4	3
CO14062-2RU	1.077	0	0	4	4
CO14137-2RU	1.096	0	0	5	4
Canela Russet	1.091	1	0	5	4
Russet Norkotah-S3	1.069	1	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 5A. Yield, grade, and tuber shape for Intermediate Red Yield Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
CO14032-6R	373	248	66	241	7	122	1.07/1.19
CO14035-4R	280	171	61	169	2	104	1.07/1.17
CO14040-3R	324	65	20	65	0	257	1.07/1.16
CO14074-1R	323	163	50	158	4	157	1.15/1.17
CO14076-1R	348	255	73	207	48	91	0.96/1.17
CO14105-1R	381	225	59	221	4	157	1.01/1.27
Chieftain	388	350	90	209	141	28	1.15/1.29
Red LaSoda	471	409	87	264	145	36	1.04/1.38
Mean	361	236	63	192	44	119	1.07/1.22
LSD ² (0.05)	38	51	10	43	24	37	0.10/0.07

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 5B. Grade defects for Intermediate Red Yield Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO14032-6R	0.0		0.0
CO14035-4R	1.6	MS*	0.0
CO14040-3R	0.7	MS*	0.0
CO14074-1R	0.8	GC*	0.0
CO14076-1R	0.7	GR*	6.5
CO14105-1R	0.0		0.0
Chieftain	2.3	MS,SG,GR*	0.0
Red LaSoda	5.8	MS,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 5C. Growth characteristics of Intermediate Red Yield Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO14032-6R	98	4.0	4.0	3.1	3.5	4.0	2.5
CO14035-4R	94	3.0	3.0	4.6	3.0	3.0	2.5
CO14040-3R	100	3.5	3.5	3.8	3.0	3.5	3.0
CO14074-1R	100	3.0	3.0	4.5	4.0	3.5	3.5
CO14076-1R	94	2.5	2.5	4.1	4.0	4.0	4.0
CO14105-1R	100	3.5	3.5	4.2	3.0	2.5	3.0
Chieftain	100	3.0	3.0	1.9	3.0	3.5	3.0
Red LaSoda	100	4.0	4.0	2.5	4.0	3.0	3.0
Mean	98	3.3	3.5	3.6	3.4	3.4	3.1
LSD ⁶ (0.05)	NS	NS	0.8	NS	0.6	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 5D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Red Yield Trial entries - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic ⁴ Browning
	Bud End	Stem End	Average			
CO14032-6R	5.0	4.1	4.6	4.8	66	1.2
CO14035-4R	4.9	4.2	4.6	6.3	59	3.0
CO14040-3R	4.4	4.0	4.2	7.1	59	1.6
CO14074-1R	4.9	3.8	4.4	4.6	66	2.6
CO14076-1R	4.3	3.0	3.7	6.7	45	2.2
CO14105-1R	5.0	5.0	5.0	6.7	45	3.8
Chieftain	4.2	4.7	4.5	2.6	94	3.6
Red LaSoda	5.0	4.6	4.8	2.5	80	1.0

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 5E. Specific gravity, french fry color, and texture for Intermediate Red
Yield Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
CO14032-6R	1.092	1	0	4	4
CO14035-4R	1.087	1	1	2	2
CO14040-3R	1.094	0	0	3	2
CO14074-1R	1.098	0	0	4	5
CO14076-1R	1.103	1	2	4	4
CO14105-1R	1.083	0	1	2	2
Chieftain	1.083	1	2	2	2
Red LaSoda	1.089	0	1	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 Specialty Yield Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
CO14206-1W/Y	465	320	69	280	39	130	0.87/1.21
CO14226-1W/Y	360	94	26	94	0	266	0.82/1.17
CO14226-2W/Y	390	97	25	97	0	292	1.09/1.20
CO14226-3W/Y	236	52	22	52	0	184	1.06/1.19
CO14479-4W/Y	301	84	28	84	0	216	1.04/1.26
Yukon Gold	297	268	90	131	137	26	1.04/1.33
Mean	341	153	43	123	23	186	0.99/1.23
LSD ² (0.05)	93	83	14	72	32	53	0.10/0.07

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 Specialty Yield Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO14206-1W/Y	2.1	SG,GR*	0.0
CO14226-1W/Y	0.0		0.0
CO14226-2W/Y	0.2	GR*	0.0
CO14226-3W/Y	0.0		0.0
CO14479-4W/Y	0.3	GR*	0.0
Yukon Gold	0.3	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 6C. Growth characteristics of Intermediate Specialty Yield Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO14206-1W/Y	96	3.0	4.0	2.5	5.0	4.0	5.0
CO14226-1W/Y	100	4.5	4.0	5.7	3.0	2.5	2.0
CO14226-2W/Y	100	4.0	5.0	5.4	4.0	4.0	3.0
CO14226-3W/Y	96	3.0	4.0	4.7	3.0	3.0	1.5
CO14479-4W/Y	100	3.0	4.0	6.0	2.5	2.0	2.0
Yukon Gold	96	3.0	4.0	1.7	3.0	3.0	2.0
Mean	98	3.4	4.2	4.3	3.4	3.1	2.6
LSD ⁶ (0.05)	NS	0.7	NS	1.0	0.7	0.7	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 Specialty Yield Trial entries - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic ⁴ Browning
	Bud End	Stem End	Average			
CO14206-1W/Y	4.4	4.5	4.5	1.9	73	2.0
CO14226-1W/Y	4.0	3.8	3.9	4.5	38	3.2
CO14226-2W/Y	3.9	3.2	3.6	4.6	45	1.4
CO14226-3W/Y	4.4	4.2	4.3	5.7	38	4.4
CO14479-4W/Y	4.1	3.7	3.9	4.4	38	4.6
Yukon Gold	4.8	5.0	4.9	1.7	59	4.6

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

²Tubers were stored at 45F for 91 days.

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

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

Table 6E. Specific gravity, french fry color, and texture for Intermediate Specialty Yield Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
CO14206-1W/Y	1.091	0	1	2	3
CO14226-1W/Y	1.091	0	0	3	3
CO14226-2W/Y	1.096	0	0	4	4
CO14226-3W/Y	1.098	0	1	3	3
CO14479-4W/Y	1.084	0	2	2	3
Yukon Gold	1.088	1	3	4	4

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

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

Table 7A. Yield, grade, and tuber shape for Intermediate Chipping Yield Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC12178-2W	349	274	79	161	113	32	0.87/1.29
AC12184-1W	354	258	73	222	36	76	1.03/1.38
AC13126-1Wadg	178	151	85	99	51	14	0.92/1.31
Atlantic	387	294	76	260	34	57	1.03/1.31
Chipeta	415	263	64	173	90	61	1.20/1.24
Snowden	380	231	62	199	32	106	0.94/1.32
Mean	345	245	73	186	59	58	1.0/1.3
LSD ² (0.05)	NS	65	NS	64	NS	37	0.1/0.07

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 7B. Grade defects for Intermediate Chipping Yield Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC12178-2W	11.7	GC,GR*	0.0
AC12184-1W	5.1	GR*	0.0
AC13126-1Wadg	7.7	GR*	0.0
Atlantic	9.3	GC,GR*	0.0
Chipeta	20.6	MS,SG,GC,GR*	0.0
Snowden	10.7	SG,GR*	0.0

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

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

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

Table 7C. Growth characteristics of Intermediate Chipping Yield Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC12178-2W	90	2.0	3.0	2.2	3.5	3.5	4.0
AC12184-1W	98	4.0	4.0	2.2	3.0	3.0	2.5
AC13126-1Wadg	74	2.5	3.0	1.7	2.0	2.0	3.0
Atlantic	100	4.0	4.0	3.3	3.0	3.0	2.5
Chipeta	96	3.0	4.0	2.1	3.5	3.5	3.5
Snowden	98	3.0	4.0	3.7	3.0	3.0	3.0
Mean	93	3.1	3.7	2.5	3.7	3.0	3.1
LSD ⁶ (0.05)	NS	0.7	NS	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.

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

Table 7D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Chipping Yield Trial entries - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC12178-2W	4.8	3.8	4.3	2.6	66	3.6
AC12184-1W	4.9	4.4	4.7	2.7	59	2.6
AC13126-1Wadg	3.2	2.1	2.7	2.5	66	3.8
Atlantic	3.3	3.6	3.5	3.1	73	5.0
Chipeta	5.0	3.4	4.2	1.7	80	4.0
Snowden	3.3	2.7	3.0	3.3	73	2.2

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

²Tubers were stored at 45F for 91 days.

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

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

Table 7E. Specific gravity, french fry color, and texture for Intermediate Chipping Yield Trial entries - 2020.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
AC12178-2W	1.093	3.5	1.5	3.0	1.0
AC12184-1W	1.091	4.0	1.5	3.0	2.5
AC13126-1Wadg	1.096	4.0	3.0	2.5	3.5
Atlantic	1.105	4.5	3.5	3.0	3.0
Chipeta	1.100	4.5	3.0	3.0	2.5
Snowden	1.096	4.5	2.0	2.5	3.5

¹ Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color 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 8A. Yield, grade, and tuber shape for Advanced Yield Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC12080-4RU	257	222	86	195	27	34	2.01/1.11
AC12090-3RU	328	295	90	202	94	26	1.74/1.20
CO09036-2RU	405	316	78	227	89	82	2.13/1.18
CO09076-3RU	223	159	71	113	47	61	2.23/1.22
CO13003-1RU	309	262	84	203	60	45	1.73/1.26
Canela Russet	288	254	88	146	108	30	1.99/1.27
Russet Norkotah	194	124	63	112	12	63	2.20/1.21
Mean	286	233	80	171	62	49	2.01/1.21
LSD ³ (0.05)	54	59	9	41	49	15	0.14/0.06

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.

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

³LSD=least significant difference.; NS=not significant.

Table 8B. Grade defects for Advanced Yield Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC12080-4RU	0.4	MS*,GR*	0.0
AC12090-3RU	2.0	MS,SG,GR*	0.0
CO09036-2RU	0.9	MS*,SG,GR	0.0
CO09076-3RU	1.3	MS,GC*	0.0
CO13003-1RU	0.4	MS*	0.0
Canela Russet	0.9	MS*,SG,GR	0.0
Russet Norkotah	2.4	MS*,SG,	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 Yield Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC12080-4RU	98	3.5	3.8	1.6	2.5	3.5	1.8
AC12090-3RU	99	3.0	2.8	1.7	2.3	3.5	2.8
CO09036-2RU	97	2.8	4.0	2.2	4.0	2.5	3.3
CO09076-3RU	97	3.0	3.0	2.1	2.5	2.5	1.8
CO13003-1RU	98	3.0	3.3	1.9	2.8	2.8	3.0
Canela Russet	93	2.5	2.8	1.4	3.0	3.8	2.5
Russet Norkotah	100	3.3	2.8	2.2	2.0	3.3	1.0
Mean	97	3.0	3.2	1.9	2.7	3.1	2.3
LSD ⁷ (0.05)	6	NS	0.6	0.6	0.6	0.7	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.

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

⁷LSD=least significant difference.

Table 8D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced Yield Trial entries - 2020.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight Loss ²		
AC12080-4RU	5.0	4.4	4.7	2.0	66	2.4
AC12090-3RU	4.9	5.0	5.0	1.8	108	3.6
CO09036-2RU	5.0	4.9	5.0	2.4	80	3.8
CO09076-3RU	5.0	5.0	5.0	3.2	59	4.6
CO13003-1RU	4.9	5.0	5.0	2.5	80	2.6
Canela Russet	5.0	5.0	5.0	2.6	129	4.4
Russet Norkotah	5.0	5.0	5.0	2.9	87	4.2

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

²Tubers were stored at 45F for 91 days.

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

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

Table 8E. Specific gravity, french fry color, and texture for Advanced Yield Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
AC12080-4RU	1.085	0	0	3	3
AC12090-3RU	1.086	1	2	4	3
CO09036-2RU	1.088	1	0	3	3
CO09076-3RU	1.083	2	2	2	3
CO13003-1RU	1.091	1	0	3	3
Canela Russet	1.088	1	0	3	3
Russet Norkotah	1.070	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 9A. Yield, grade, and tuber shape for Advanced Fingerling Yield Trial entries - 2020.

Clone	Total (Cwt/A)	Tuber Length				Tuber Shape ¹ L:W/W:T
		<2"	2-4"	4-6"	>6"	
CO08062-3PF/P	335	42	213	71	4	2.65/1.10
PORTX03PG25-2R/R	225	50	165	6	0	1.91/1.08
Banana	295	19	152	78	8	3.01/1.18
LaRatte	311	17	164	85	9	3.45/1.10
Mean	292	32	174	61	5	2.78/1.12
LSD ² (0.05)	38	11	30	18	4	0.44/0.08

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 9B. Grade defects for Advanced Fingerling Yield Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO08062-3PF/P	1.4	MS*,SG	0.0
PORTX03PG25-2R/R	1.6	GC*,GR	0.0
Banana	12.9	MS,SG,GR*	0.0
LaRatte	11.8	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 9C. Growth characteristics of Advanced Fingerling Yield Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO08062-3PF/P	99	3.0	3.5	2.8	3.5	2.8	3.3
PORTX03PG25-2R/R	92	2.3	2.3	4.4	3.3	2.0	2.3
Banana	100	3.0	3.0	3.7	4.0	2.8	3.0
LaRatte	100	3.0	3.0	3.9	4.0	3.0	3.0
Mean	98	2.8	3.0	3.7	3.7	2.6	2.9
LSD6 (0.05)	4	NS	0.8	0.8	0.5	0.5	0.5

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

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

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

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

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

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

Table 9D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced Fingerling Yield Trial entries - 2020.

Clone	Blackspot Index ¹			%		
	Bud End	Stem End	Average	Weight Loss ²	Dormancy (Days) ³	Enzymatic Browning ⁴
CO08062-3PF/P	---	---	---	2.4	45	---
PORTX03PG25-2R/R	5.0	2.2	3.6	1.4	73	---
Banana	4.8	4.4	4.6	2.6	52	5.0
LaRatte	4.4	4.1	4.3	2.2	80	5.0

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 Advanced Fingerling Yield Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
CO08062-3PF/P	1.088	-	-	4	3
PORTX03PG25-2R/R	1.078	-	-	1	2
Banana	1.086	2	3	4	4
LaRatte	1.083	1	2	4	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 10A . Yield, grade, and tuber shape for Southwest Regional Russet Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
CO12152-1RU	236	157	67	153	4	75	1.99/1.21
CO12378-1RU	300	199	66	185	14	100	1.80/1.25
COTX08063-2RU	299	263	88	162	101	25	1.87/1.24
Canela Russet	336	298	88	199	98	34	1.93/1.27
Russet Norkotah	226	158	70	152	6	63	2.38/1.17
Mean	279	215	76	170	45	59	1.10/1.23
LSD ³ (0.05)	36	32	6	29	26	17	0.15/0.08

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 Russet Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
CO12152-1RU	1.6	MS*	0.0
CO12378-1RU	0.4	MS*	0.0
COTX08063-2RU	3.4	MS,SG,GR*	0.0
Canela Russet	1.0	MS*,GR	0.0
Russet Norkotah	1.9	MS*,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 10C. Growth characteristics of Southwest Regional Russet Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
CO12152-1RU	98	3.3	3.0	1.7	2.0	3.3	2.5
CO12378-1RU	100	3.3	3.3	2.3	3.3	3.0	3.0
COTX08063-2RU	100	2.8	3.3	2.2	3.3	3.5	3.0
Canela Russet	99	2.5	3.0	1.8	3.3	3.5	3.8
Russet Norkotah	100	3.0	3.0	2.3	2.0	3.0	1.0
Mean	99	3.0	3.1	2.0	2.8	3.3	2.7
LSD ⁷ (0.05)	NS	0.5	NS	NS	0.4	NS	0.5

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

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

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

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

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

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

⁷LSD=least significant difference.

Table 10D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Russet Trial entries - 2020.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
CO12152-1RU	4.7	3.0	3.9	2.7	59	3.0
CO12378-1RU	5.0	4.6	4.8	3.7	80	5.0
COTX08063-2RU	5.0	3.4	4.2	3.1	80	4.0
Canela Russet	5.0	4.6	4.8	3.5	129	4.8
Russet Norkotah	5.0	5.0	5.0	3.0	80	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 10E. Specific gravity, french fry color, and texture for Southwest Regional Russet Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
CO12152-1RU	1.099	0	0	3	3
CO12378-1RU	1.096	0	0	4	4
COTX08063-2RU	1.109	0	0	4	4
Canela Russet	1.098	1	1	4	4
Russet Norkotah	1.071	0	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 11A. Yield, grade, and tuber shape for Southwest Regional Specialty Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
AORTX09037-1W/Y	462	339	73	291	48	111	1.18/1.19
Yukon Gold	302	266	88	152	114	29	1.06/1.28
Mean	382	302	81	222	81	70	1.13/1.24
LSD ² (0.05)	108	103	NS	53	64	28	0.13/0.06

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 - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AORTX09037-1W/Y	1.7	MS,SG,GC,GR*	0.0
Yukon Gold	2.2	MS,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 - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AORTX09037-1W/Y	99	4.0	4.0	3.1	3.5	2.0	3.0
Yukon Gold	96	3.3	4.0	1.8	2.8	2.5	2.0
Mean	98	3.6	4.0	2.4	3.1	2.3	2.5
LSD6 (0.05)	NS	NS	NS	1.2	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.

⁶LSD=least significant difference.

Table 11D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Specialty Trial entries - 2020.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight Loss ²		
AORTX09037-1W/Y	4.8	3.4	4.1	2.7	73	3.4
Yukon Gold	5.0	5.0	5.0	2.1	52	4.8

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 11E. Specific gravity, french fry color, and texture for Southwest Regional Specialty Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
AORTX09037-1W/Y	1.090	0	0	4	1
Yukon Gold	1.090	0	1	4	4

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 - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC11494-6W	354	223	63	207	16	129	0.93/1.33
ATTX07042-3W	275	162	58	154	8	104	0.97/1.17
CO12235-3W	285	193	69	167	26	69	1.07/1.20
CO12293-1W	338	299	88	150	149	20	1.13/1.24
TX09403-21W	261	199	76	164	35	53	1.07/1.22
Atlantic	301	241	80	188	53	56	0.97/1.30
Chipeta	439	343	78	175	168	30	1.18/1.28
Snowden	355	262	74	246	16	86	0.92/1.28
Mean	326	240	73	181	59	68	1.03/1.26
LSD ² (0.05)	85	66	8	56	35	28	0.09/0.08

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 - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC11494-6W	0.6	GR*	0.0
ATTX07042-3W	2.1	GC*,GR	0.0
CO12235-3W	6.2	SG,GR*	0.0
CO12293-1W	5.6	MS,SG,GC,GR*	0.0
TX09403-21W	2.9	GC,GR*	0.0
Atlantic	1.0	GR*	0.0
Chipeta	13.5	MS,SG,GC,GR*	0.7
Snowden	1.9	MS,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 12C. Growth characteristics of Southwest Regional Chipping Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC11494-6W	90	2.8	3.8	1.9	3.5	3.5	3.3
ATTX07042-3W	99	3.3	3.0	2.9	2.0	3.5	1.5
CO12235-3W	94	3.3	4.0	2.2	3.3	2.8	3.5
CO12293-1W	99	3.5	3.8	2.6	3.5	3.3	4.3
TX09403-21W	99	3.0	3.0	2.0	2.0	3.0	2.0
Atlantic	98	3.3	3.8	2.6	3.0	3.0	2.8
Chipeta	100	3.8	4.0	1.9	4.5	3.5	4.0
Snowden	100	3.8	3.8	3.3	3.0	3.3	3.0
Mean	97	3.3	3.6	2.4	3.1	3.2	3.0
LSD6 (0.05)	4	NS	0.5	0.6	0.6	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 12D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Chipping Trial entries - 2020.

Clone	Blackspot Index ¹			%	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average	Weight ² Loss		
AC11494-6W	2.2	2.6	2.4	3.0	31	5.0
ATTX07042-3W	4.1	4.3	4.2	2.6	80	4.8
CO12235-3W	4.0	2.6	3.3	5.2	59	4.2
CO12293-1W	4.8	4.0	4.4	3.3	66	5.0
TX09403-21W	4.9	4.3	4.6	3.3	52	4.4
Atlantic	3.5	2.7	3.1	3.2	73	4.8
Chipeta	4.2	2.6	3.4	1.9	80	4.2
Snowden	2.5	1.8	2.2	3.5	80	3.6

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 12E. Specific gravity, french fry color, and texture for Southwest Regional Chipping Trial entries - 2020.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
AC11494-6W	1.098	3.5	3.0	3.5	4.0
ATTX07042-3W	1.087	5.0	3.0	2.5	3.0
CO12235-3W	1.097	4.0	3.5	2.5	3.5
CO12293-1W	1.094	3.5	3.0	3.0	3.5
TX09403-21W	1.081	4.5	4.0	3.0	3.5
Atlantic	1.099	4.5	3.5	3.0	3.5
Chipeta	1.097	4.5	4.0	3.0	3.0
Snowden	1.094	5.0	2.0	2.0	1.5

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 - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
A071012-4BF	392	323	82	137	186	21	1.75/1.17
A07769-4	360	307	85	187	119	34	1.86/1.19
A10021-5TE	309	250	81	142	108	39	2.17/1.16
AOR08540-1	354	265	75	130	134	37	1.91/1.18
AOR10204-3	391	320	82	211	109	32	2.05/1.11
CO10085-1RU	301	230	76	174	56	61	2.14/1.23
CO10087-4RU	222	167	75	158	9	53	1.95/1.18
CO10091-1RU	137	102	72	82	20	33	1.75/1.25
CO11009-3RU	374	318	85	214	104	41	1.98/1.17
OR12133-10	397	336	85	239	97	42	2.15/1.21
POR12NCK50-1	342	293	85	229	64	48	2.11/1.20
TX13590-9RU	369	271	74	207	64	56	1.62/1.16
Canela Russet	260	217	84	163	54	35	1.91/1.23
Clearwater Russet	320	245	76	186	59	57	1.88/1.22
Russet Burbank	365	275	75	209	66	61	2.00/1.22
Russet Norkotah	218	136	62	124	12	80	2.07/1.15
Shepody	305	152	50	130	22	84	2.26/1.34
Mean	319	247	77	172	76	48	1.98/1.20
LSD ³ (0.05)	50	52	9	40	43	15	0.16/0.07

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 - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
A071012-4BF	9.9	SG*,GR	0.0
A07769-4	4.7	SG,GR*	0.3
A10021-5TE	4.1	MS,SG*,GR	1.4
AOR08540-1	11.8	MS,SG,GR*	0.7
AOR10204-3	7.6	MS,SG,GC,GR*	0.0
CO10085-1RU	1.2	MS,SG,GR*	0.4
CO10087-4RU	0.1	GR*	0.0
CO10091-1RU	1.0	GC*	0.0
CO11009-3RU	2.7	MS,GC,GR*	0.0
OR12133-10	3.1	MS,SG,GC,GR*	0.0
POR12NCK50-1	0.0	GR*	0.0
TX13590-9RU	8.6	MS,SG,GR*	0.0
Canela Russet	2.4	MS,SG*,GC,GR	0.0
Clearwater Russet	4.8	MS,SG,GC,GR*	0.0
Russet Burbank	7.0	MS,SG*,GR	0.0
Russet Norkotah	7.6	MS*,GR	0.0
Shepody	21.9	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 13C. Growth characteristics of Western Regional Main Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
A071012-4BF	100	3.3	3.8	1.9	3.8	3.0	3.5
A07769-4	96	2.3	3.5	2.6	3.8	2.5	3.3
A10021-5TE	98	2.5	2.3	2.1	3.0	3.8	3.0
AOR08540-1	100	3.3	2.8	2.2	3.8	3.8	3.5
AOR10204-3	100	3.3	3.8	2.9	3.0	2.8	3.0
CO10085-1RU	100	3.5	3.3	2.4	3.0	3.0	3.0
CO10087-4RU	100	2.8	2.8	2.5	2.3	2.5	2.5
CO10091-1RU	100	2.0	2.3	1.7	3.3	2.8	3.0
CO11009-3RU	99	3.8	4.0	2.2	4.0	3.3	3.3
OR12133-10	99	3.3	3.5	2.3	4.0	3.5	4.0
POR12NCK50-1	99	2.8	3.3	1.8	4.0	3.5	3.0
TX13590-9RU	89	3.0	4.0	3.1	3.8	2.5	3.0
Canela Russet	98	2.3	2.5	1.6	3.0	3.8	3.0
Clearwater Russet	96	2.0	3.0	2.5	3.8	3.5	3.5
Russet Burbank	100	3.3	3.5	2.7	4.0	2.3	2.8
Russet Norkotah	100	3.3	2.8	2.5	2.0	3.5	1.0
Shepody	98	3.0	3.0	2.6	3.5	2.5	2.5
Mean	98	2.9	3.2	2.3	3.4	3.1	3.0
LSD ⁷ (0.05)	4	0.7	0.6	0.4	0.5	0.7	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.

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 - 2020.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
A071012-4BF	5.0	3.3	4.2	2.1	45	2.0
A07769-4	5.0	4.9	5.0	2.4	59	4.2
A10021-5TE	5.0	4.6	4.8	2.8	59	4.8
AOR08540-1	5.0	4.1	4.6	1.8	66	2.8
AOR10204-3	5.0	4.8	4.9	3.6	45	3.4
CO10085-1RU	4.8	4.0	4.4	3.3	38	4.8
CO10087-4RU	5.0	4.1	4.6	3.2	45	4.0
CO10091-1RU	5.0	5.0	5.0	2.0	73	5.0
CO11009-3RU	5.0	3.9	4.5	2.2	73	2.4
OR12133-10	4.6	3.1	3.9	4.6	38	2.8
POR12NCK50-1	5.0	4.3	4.7	2.1	80	5.0
TX13590-9RU	4.1	3.2	3.7	2.3	59	2.4
Canela Russet	4.7	4.4	4.6	2.5	129	5.0
Clearwater Russet	5.0	4.1	4.6	1.7	73	4.2
Russet Burbank	4.8	3.6	4.2	1.2	108	3.6
Russet Norkotah	5.0	5.0	5.0	2.6	80	5.0
Shepody	5.0	5.0	5.0	2.2	73	5.0

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 13E. Specific gravity, french fry color, and texture for Western Regional Main Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
A071012-4BF	1.098	0	1	3	3
A07769-4	1.091	0	0	4	4
A10021-5TE	1.094	0	0	4	4
AOR08540-1	1.095	0	0	3	3
AOR10204-3	1.089	1	2	3	3
CO10085-1RU	1.095	1	1	3	3
CO10087-4RU	1.092	0	1	4	4
CO10091-1RU	1.085	1	1	4	3
CO11009-3RU	1.104	0	0	4	4
OR12133-10	1.098	1	0	4	5
POR12NCK50-1	1.096	0	0	4	5
TX13590-9RU	1.098	0	0	4	5
Canela Russet	1.093	1	1	3	4
Clearwater Russet	1.096	0	0	3	4
Russet Burbank	1.083	1	1	4	3
Russet Norkotah	1.071	1	2	2	2
Shepody	1.087	1	1	3	4

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

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

Table 14A. Yield, grade, and tuber shape for Western Regional Red Trial entries - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1				<4 oz	
		Total	%	4-10 oz	>10 oz		
A08112-7R	383	116	30	113	3	262	1.33/1.12
AFC6041-1R	390	303	77	244	58	83	1.06/1.31
Chieftain	352	309	88	208	100	40	1.19/1.35
Modoc	277	159	57	152	6	116	1.13/1.19
Red LaSoda	474	405	86	254	151	51	1.01/1.48
Mean	375	258	68	194	64	110	1.15/1.30
LSD ² (0.05)	50	48	9	30	41	31	0.07/0.12

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

²LSD=least significant difference.

Table 14B. Grade defects for Western Regional Red Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
A08112-7R	0.3	MS*	0.0
AFC6041-1R	0.7	GC,GR*	0.0
Chieftain	0.5	GR*	0.0
Modoc	0.7	MS*	0.0
Red LaSoda	1.0	MS*GR*	1.6

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 - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
A08112-7R	99	3.3	3.8	3.8	3.0	3.5	3.3
AFC6041-1R	99	3.8	4.0	4.1	4.0	2.8	3.0
Chieftain	99	3.3	3.8	2.0	3.0	3.5	3.0
Modoc	95	2.8	3.0	3.7	2.0	2.5	1.0
Red LaSoda	100	3.3	4.0	2.7	3.5	2.8	3.0
Mean	98	3.3	3.7	3.3	3.1	3.0	2.7
LSD6 (0.05)	NS	NS	0.5	0.6	0.4	NS	0.3

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 - 2020.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
A08112-7R	5.0	4.6	4.8	3.2	73	4.2
AFC6041-1R	4.6	4.8	4.7	4.1	38	1.8
Chieftain	5.0	4.0	4.5	2.6	87	4.2
Modoc	4.8	4.7	4.8	2.5	73	3.6
Red LaSoda	4.8	4.6	4.7	2.4	73	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 14E. Specific gravity, french fry color, and texture for Western Regional Red Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
A08112-7R	1.092	0	1	3	3
AFC6041-1R	1.081	1	1	2	3
Chieftain	1.082	1	1	2	2
Modoc	1.075	1	1	2	2
Red LaSoda	1.090	1	1	2	2

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 - 2020.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AC10376-1-2012W/Y	339	236	69	205	31	86	1.13/1.24
ATX06264s-4R/Y	283	144	51	131	13	138	1.05/1.33
CO09128-3W/Y	195	5	2	5	0	190	1.21/1.16
CO09128-5W/Y	247	29	12	29	0	216	0.94/1.21
CO09218-4W/Y	317	191	60	179	12	116	1.13/1.32
CO10064-1W/Y	331	186	56	171	15	141	1.07/1.35
CO10098-5W/Y	235	46	19	46	0	189	1.26/1.28
CO11250-1W/Y	414	247	60	238	10	158	1.17/1.24
CO11266-1W/Y	347	166	48	156	10	176	1.22/1.19
CO13033-4W/Y	424	125	29	123	2	297	1.14/1.24
POR14PG22-3	385	69	18	69	0	314	1.30/1.20
Yukon Gold	270	236	87	121	115	31	1.03/1.27
Mean	315	140	43	123	17	171	1.14/1.25
LSD ² (0.05)	48	48	8	42	22	29	0.11/0.07

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 15B. Grade defects for Advanced and Western Regional Specialty Trial entries - 2020.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AC10376-1-2012W/Y	4.8	MS,SG,GR*	0.0
ATX06264s-4R/Y	0.3	GC*	0.0
CO09128-3W/Y	0.0		0.0
CO09128-5W/Y	0.2	GR*	0.0
CO09218-4W/Y	1.5	MS,GC,GR*	0.0
CO10064-1W/Y	0.9	GR*	0.0
CO10098-5W/Y	0.0		0.0
CO11250-1W/Y	1.9	MS*,GR	0.0
CO11266-1W/Y	1.1	GC,GR*	0.0
CO13033-4W/Y	0.0		0.0
POR14PG22-3	0.4	GC*,GR	0.0
Yukon Gold	0.6	MS,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 15C. Growth characteristics of Advanced and Western Regional Specialty Trial entries - 2020.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/ Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AC10376-1-2012W/Y	100	3.0	3.0	2.1	3.3	3.0	3.3
ATX06264s-4R/Y	86	3.5	3.3	3.3	3.0	3.5	2.3
CO09128-3W/Y	100	3.5	3.0	4.8	2.5	2.0	1.8
CO09128-5W/Y	100	3.8	4.0	4.8	3.0	2.0	1.0
CO09218-4W/Y	96	1.8	3.0	3.7	3.5	3.8	4.0
CO10064-1W/Y	97	2.8	3.8	3.5	4.0	3.0	3.0
CO10098-5W/Y	99	2.5	3.3	4.2	3.3	2.0	2.3
CO11250-1W/Y	100	4.0	4.3	5.1	3.8	3.0	3.0
CO11266-1W/Y	100	3.5	3.5	3.7	3.8	2.8	4.0
CO13033-4W/Y	100	4.0	5.0	4.5	4.0	2.8	3.3
POR14PG22-3	88	2.8	3.5	3.1	4.0	3.0	2.8
Yukon Gold	94	3.3	4.0	1.5	2.8	2.3	2.0
Mean	97	3.2	3.6	3.7	3.4	2.8	2.7
LSD ⁶ (0.05)	6	0.7	0.5	0.8	0.6	0.5	0.5

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

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

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

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

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

⁶LSD=least significant difference.

Table 15D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Specialty Trial entries - 2020.

Clone	Blackspot Index ¹			% Weight ² Loss ²	Dormancy ³ (Days) ³	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AC10376-1-2012W/Y	5.0	5.0	5.0	2.3	108	2.0
ATX06264s-4R/Y	5.0	4.5	4.8	4.7	38	2.2
CO09128-3W/Y	4.5	4.7	4.6	2.0	38	3.8
CO09128-5W/Y	3.5	3.8	3.7	4.5	24	4.0
CO09218-4W/Y	3.0	3.2	3.1	2.8	73	3.2
CO10064-1W/Y	4.8	4.3	4.6	3.0	87	4.6
CO10098-5W/Y	4.6	4.1	4.4	3.0	45	4.6
CO11250-1W/Y	5.0	3.6	4.3	3.7	38	3.0
CO11266-1W/Y	4.8	5.0	4.9	3.7	45	4.8
CO13033-4W/Y	4.8	4.1	4.5	7.4	10	3.6
POR14PG22-3	4.1	5.0	4.6	3.5	38	4.8
Yukon Gold	5.0	4.7	4.9	1.6	66	4.8

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 15E. Specific gravity, french fry color, and texture for Advanced and Western Regional Speciality Trial entries - 2020.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	2 wks 55F+ 9 wks 45F	At Harvest	2 wks 55F+ 9 wks 45F
AC10376-1-2012W/Y	1.083	1	3	3	3
ATX06264s-4R/Y	1.085	0	1	3	2
CO09128-3W/Y	1.070	1	2	2	2
CO09128-5W/Y	1.083	0	0	2	2
CO09218-4W/Y	1.082	1	0	2	2
CO10064-1W/Y	1.097	0	0	2	3
CO10098-5W/Y	1.105	0	0	3	3
CO11250-1W/Y	1.098	0	0	4	4
CO11266-1W/Y	1.093	1	0	3	4
CO13033-4W/Y	1.093	1	2	2	2
POR14PG22-3	1.087	0	1	2	2
Yukon Gold	1.089	1	1	3	3

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 - 2019.

Clone	Yield (Cwt/A)						Tuber Shape ¹ L:W/W:T
	Total	US #1					
		Total	%	4-10 oz	>10 oz	<4 oz	
AOR12197-4	413	306	74	236	70	73	0.95/1.29
CO10073-7W	309	198	64	193	5	101	1.02/1.24
CO10076-4W	329	238	72	220	17	83	0.88/1.32
CO11023-2W	307	223	72	185	38	77	1.00/1.24
CO11023-9W	339	228	67	210	18	105	0.98/1.27
CO11037-5W	387	285	73	250	36	85	1.03/1.29
CO13232-5W	279	215	76	197	18	60	1.05/1.17
CO13232-11W	279	216	77	201	15	60	0.93/1.29
CO13232-25W	367	297	81	252	44	62	0.95/1.23
TX09403-15W	244	171	70	156	15	66	1.06/1.22
Atlantic	282	216	77	189	27	61	1.01/1.26
Chipeta	364	259	71	143	116	50	1.15/1.19
Snowden	384	207	54	186	21	156	0.91/1.34
Mean	330	235	71	201	34	80	1.00/1.26
LSD ³ (0.05)	61	58	9	50	31	29	0.07/0.07

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 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 - 2019.

Clone	% External Defects ¹	External Defects Observed ²	% Hollow Heart ³
AOR12197-4	7.9	MS,GC,GR*	0.0
CO10073-7W	3.1	GC,GR*	0.0
CO10076-4W	2.3	GR*	0.0
CO11023-2W	2.2	MS,GR*	0.0
CO11023-9W	1.6	MS,GR*	0.5
CO11037-5W	4.2	MS,GR*	0.0
CO13232-5W	1.3	SG*,GR*	0.0
CO13232-11W	1.3	MS,GC*,GR*	0.0
CO13232-25W	2.3	MS,GR*	0.0
TX09403-15W	2.1	GC*,GR	0.8
Atlantic	1.4	MS,GR*	0.0
Chipeta	13.4	SG*,GC,GR	1.6
Snowden	4.9	MS,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 16C. Growth characteristics of Advanced and Western Regional Chipping Trial entries - 2019.

Clone	% Stand	Emergence Uniformity ¹	Vine Vigor ²	Stems/Plant	Vine Size ³	Vine Type ⁴	Vine Maturity ⁵
AOR12197-4	94	3.5	4.5	2.6	4.5	3.5	2.5
CO10073-7W	93	3.0	3.8	3.4	2.8	2.0	2.5
CO10076-4W	94	2.5	3.3	3.0	3.0	3.3	3.0
CO11023-2W	100	3.5	3.0	2.3	3.0	3.8	2.8
CO11023-9W	99	3.8	4.0	1.7	4.0	3.0	3.8
CO11037-5W	100	3.3	3.8	2.7	3.8	2.5	2.5
CO13232-5W	100	3.8	3.0	1.9	3.3	3.0	3.0
CO13232-11W	96	3.5	3.0	1.9	2.0	3.0	4.0
CO13232-25W	100	3.0	3.5	3.0	3.3	3.0	2.8
TX09403-15W	95	2.8	3.0	2.1	2.3	2.5	1.3
Atlantic	93	3.3	3.8	2.5	3.0	3.0	2.3
Chipeta	97	3.0	4.3	1.9	4.8	3.3	3.3
Snowden	100	4.0	4.0	3.7	3.8	2.3	2.8
Mean	97	3.3	3.6	2.5	3.3	2.9	2.8
LSD ⁷ (0.05)	4	0.7	0.6	0.6	0.5	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.

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

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

Table 16D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Chipping Trial entries - 2019.

Clone	Blackspot Index ¹			% Weight ² Loss	Dormancy ³ (Days)	Enzymatic Browning ⁴
	Bud End	Stem End	Average			
AOR12197-4	4.4	3.2	3.8	3.3	45	2.2
CO10073-7W	5.0	3.5	4.3	7.8	45	4.0
CO10076-4W	4.4	3.4	3.9	3.9	59	2.2
CO11023-2W	4.6	4.3	4.5	1.4	45	3.0
CO11023-9W	4.1	2.9	3.5	4.7	59	5.0
CO11037-5W	5.0	4.7	4.9	2.2	73	3.4
CO13232-5W	3.4	3.9	3.7	3.0	80	3.2
CO13232-11W	4.7	4.1	4.4	3.0	87	5.0
CO13232-25W	4.5	3.5	4.0	2.8	80	3.6
TX09403-15W	4.4	3.5	4.0	3.2	38	4.6
Atlantic	3.4	3.0	3.2	4.0	59	4.6
Chipeta	5.0	4.1	4.6	1.4	66	3.6
Snowden	4.1	3.4	3.8	3.2	73	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 16E. Chip color¹ after various storage regimes, and specific gravity of Advanced and Western Regional Chipping Trial entries - 2019.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
AOR12197-4	1.101	4.0	3.0	3.5	3.5
CO10073-7W	1.089	3.0	3.0	3.5	2.5
CO10076-4W	1.090	3.5	3.0	3.5	3.0
CO11023-2W	1.095	3.0	3.0	2.0	3.0
CO11023-9W	1.102	3.5	3.0	3.5	3.5
CO11037-5W	1.096	3.5	2.5	2.5	2.0
CO13232-5W	1.091	3.5	2.5	3.0	2.5
CO13232-11W	1.095	3.5	3.0	2.0	2.0
CO13232-25W	1.098	2.0	3.0	2.0	2.0
TX09403-15W	1.086	4.0	3.5	1.5	2.0
Atlantic	1.103	4.0	3.5	2.5	2.5
Chipeta	1.096	4.0	4.0	3.0	2.5
Snowden	1.102	4.0	3.5	2.5	3.0

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
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	6	400	74	3.3	1.091	1.6	1.0
CO09076-3RU	FM	6	366	79	2.5	1.082	4.1	0.1
CO09205-2RU	Dual	5	346	82	2.6	1.076	2.1	0.1
CO10087-4RU	Dual	5	290	88	2.4	1.091	0.8	0.8
CO10091-1RU	Dual	5	307	79	3.2	1.086	0.7	0.0
CO10085-1RU	Dual	4	361	81	3.3	1.092	1.2	0.1
CO11009-3RU	Dual	4	416	84	3.4	1.096	3.7	2.6
Canela Russet	FM	55	354	90	3.3	1.095	1.4	0.0
Russet Norkotah	FM	110	364	83	1.7	1.079	2.4	0.4
Specialties								
CO09128-3W/Y	FM	6	246	10	2.2	1.072	1.4	0.0
CO09128-5W/Y	FM	6	315	19	1.9	1.086	0.2	0.0
CO09218-4W/Y	FM	6	366	59	4.0	1.074	1.3	0.1
AC10376-1-2012W/Y	FM	5	416	71	3.4	1.082	2.3	0.0
CO10064-1W/Y	FM	5	391	64	3.2	1.095	1.2	0.0
CO10098-5W/Y	FM	5	284	30	2.8	1.104	0.6	0.0
CO11250-1W/Y	FM	4	432	70	3.4	1.097	2.0	0.2
CO11266-1W/Y	FM	4	372	60	4.0	1.087	0.9	0.0
Yukon Gold	FM	58	381	87	2.0	1.087	2.4	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								
CO03243-3W	Chip	7	462	87	3.4	1.086	2.1	0.9
CO11023-2W	Chip	4	319	74	3.1	1.088	3.6	0.2
CO11023-9W	Chip	4	326	72	4.0	1.086	3.1	1.0
CO11037-5W	Chip	4	378	79	3.1	1.087	4.9	0.3
Atlantic	Chip	62	434	86	3.1	1.098	2.6	4.2
Chipeta	Chip	57	520	84	3.4	1.090	6.1	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.



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 112.

Table 18B. 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	6	0.0	0.0 - 0.0
	Storage	6	0.2	0.0 - 1.0
Fry Texture ¹²	Harvest	6	4.0	3.0 - 5.0
	Storage	6	3.8	3.0 - 5.0

Refer to footnotes on Page 112.

Table 18C. 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	6	1.7	0.0 - 3.0
	Storage	6	2.2	1.0 - 3.0
Fry Texture ¹²	Harvest	6	3.0	2.0 - 4.0
	Storage	6	3.3	3.0 - 4.0

Refer to footnotes on Page 112.

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

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	400	308 - 505
Yield US #1 (Cwt/A)		6	302	208 - 424
% US #1		6	74	66 - 84
Yield >10 oz (Cwt/A)		6	62	8 - 139
Yield <4 oz (Cwt/A)		6	91	70 - 119
% External Defects ¹		6	1.6	0.4 - 3.1
% Hollow Heart ²		6	1.0	0.0 - 4.4
% Stand		6	98	96 - 100
Emergence Uniformity		6	3.0	2.3 - 4.0
Vine Vigor ³		6	3.4	2.8 - 4.0
Stems/Plant		6	3.0	2.2 - 4.0
Vine Size ⁴		6	4.1	3.5 - 5.0
Vine Type ⁵		6	2.9	2.5 - 3.3
Vine Maturity ⁶		6	3.3	3.0 - 3.8
Blackspot ⁷	Bud End	7	5.0	4.9 - 5.0
	Stem End	7	4.8	4.4 - 5.0
	Average	7	4.9	
Weight Loss ⁸		7	2.4	1.9 - 2.9
Dormancy ⁹		7	79	48 - 103
Enzymatic Browning ¹⁰		7	4.1	3.0 - 4.8
Specific Gravity		7	1.091	1.082 - 1.099
Fry Color ¹¹	Harvest	7	0.9	0.0 - 1.0
	Storage	7	0.7	0.0 - 2.0
Fry Texture ¹²	Harvest	7	4.3	3.0 - 5.0
	Storage	7	3.9	3.0 - 5.0

Refer to footnotes on Page 112.

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

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	366	223 - 492
Yield US #1 (Cwt/A)		6	295	159 - 418
% US #1		6	79	68 - 85
Yield >10 oz (Cwt/A)		6	104	21 - 170
Yield <4 oz (Cwt/A)		6	54	40 - 67
% External Defects ¹		6	4.1	1.3 - 6.7
% Hollow Heart ²		6	0.1	0.0 - 0.3
% Stand		6	99	96 - 100
Emergence Uniformity		6	3.6	3.0 - 4.0
Vine Vigor ³		6	3.3	3.0 - 4.0
Stems/Plant		6	2.9	2.1 - 4.0
Vine Size ⁴		6	3.3	2.3 - 5.0
Vine Type ⁵		6	2.8	2.5 - 3.0
Vine Maturity ⁶		6	2.5	1.8 - 3.5
Blackspot ⁷	Bud End	7	5.0	4.8 - 5.0
	Stem End	7	4.9	4.6 - 5.0
	Average	7	4.9	
Weight Loss ⁸		7	3.5	2.8 - 4.8
Dormancy ⁹		7	66	41 - 77
Enzymatic Browning ¹⁰		7	4.3	3.4 - 5.0
Specific Gravity		7	1.082	1.075 - 1.087
Fry Color ¹¹	Harvest	7	1.7	1.0 - 3.0
	Storage	7	2.3	1.0 - 3.0
Fry Texture ¹²	Harvest	7	2.7	2.0 - 3.0
	Storage	7	3.0	2.0 - 4.0

Refer to footnotes on Page 112.

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

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	346	253 - 416
Yield US #1 (Cwt/A)		5	288	172 - 361
% US #1		5	82	68 - 89
Yield >10 oz (Cwt/A)		5	39	8 - 75
Yield <4 oz (Cwt/A)		5	50	33 - 77
% External Defects ¹		5	2.1	0.8 - 3.9
% Hollow Heart ²		5	0.1	0.0 - 0.5
% Stand		5	100	99 - 100
Emergence Uniformity		5	2.9	2.5 - 3.3
Vine Vigor ³		5	2.5	2.0 - 3.0
Stems/Plant		5	3.2	2.4 - 4.0
Vine Size ⁴		5	2.7	2.0 - 3.0
Vine Type ⁵		5	2.9	2.0 - 4.0
Vine Maturity ⁶		5	2.6	2.0 - 3.0
Blackspot ⁷	Bud End	6	4.9	4.6 - 5.0
	Stem End	6	4.5	4.2 - 4.8
	Average	6	4.7	
Weight Loss ⁸		6	2.2	1.7 - 3.1
Dormancy ⁹		6	50	35 - 67
Enzymatic Browning ¹⁰		6	4.2	2.8 - 5.0
Specific Gravity		6	1.076	1.074 - 1.080
Fry Color ¹¹	Harvest	6	0.5	0.0 - 1.0
	Storage	6	1.0	0.0 - 2.0
Fry Texture ¹²	Harvest	6	3.3	2.0 - 5.0
	Storage	6	3.5	3.0 - 4.0

Refer to footnotes on Page 112.

Table 18G. Detailed data summary for CO10087-4RUsto.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	290	222 - 330
Yield US #1 (Cwt/A)		5	257	167 - 311
% US #1		5	88	75 - 94
Yield >10 oz (Cwt/A)		5	56	9 - 108
Yield <4 oz (Cwt/A)		5	30	14 - 53
% External Defects ¹		5	0.8	0.1 - 1.4
% Hollow Heart ²		5	0.8	0.0 - 3.9
% Stand		5	96	90 - 100
Emergence Uniformity		5	3.4	2.8 - 4.0
Vine Vigor ³		5	3.3	2.5 - 4.3
Stems/Plant		5	2.7	2.1 - 3.3
Vine Size ⁴		5	2.7	2.1 - 3.3
Vine Type ⁵		5	2.5	2.0 - 3.0
Vine Maturity ⁶		5	2.4	2.0 - 3.0
Blackspot ⁷	Bud End	6	4.9	4.6 - 5.0
	Stem End	6	4.5	4.1 - 4.9
	Average	6	4.7	
Weight Loss ⁸		6	3.6	3.2 - 4.3
Dormancy ⁹		6	80	45 - 110
Enzymatic Browning ¹⁰		6	4.0	3.6 - 4.2
Specific Gravity		6	1.091	1.088 - 1.097
Fry Color ¹¹	Harvest	5	1.6	1.0 - 3.0
	Storage	5	1.2	1.0 - 2.0
Fry Texture ¹²	Harvest	5	4.2	3.0 - 5.0
	Storage	5	4.2	3.0 - 5.0

Refer to footnotes on Page 112.

Table 18H. Detailed data summary for CO10091-1RUsto.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	307	137 - 409
Yield US #1 (Cwt/A)		5	252	102 - 372
% US #1		5	79	69 - 91
Yield >10 oz (Cwt/A)		5	44	10 - 124
Yield <4 oz (Cwt/A)		5	53	33 - 81
% External Defects ¹		5	0.7	0.0 - 1.3
% Hollow Heart ²		5	0.0	0.0 - 0.0
% Stand		5	99	97 - 100
Emergence Uniformity		5	3.0	2.0 - 3.5
Vine Vigor ³		5	2.7	2.3 - 3.0
Stems/Plant		5	2.3	1.7 - 2.8
Vine Size ⁴		5	3.3	2.8 - 3.5
Vine Type ⁵		5	3.1	2.8 - 3.5
Vine Maturity ⁶		5	3.2	3.0 - 3.5
Blackspot ⁷	Bud End	6	5.0	4.9 - 5.0
	Stem End	6	5.0	4.8 - 5.0
	Average	6	5.0	
Weight Loss ⁸		6	2.5	2.0 - 3.2
Dormancy ⁹		6	81	60 - 103
Enzymatic Browning ¹⁰		6	4.7	4.2 - 5.0
Specific Gravity		6	1.086	1.083 - 1.090
Fry Color ¹¹	Harvest	5	0.8	0.0 - 1.0
	Storage	5	1.0	0.0 - 2.0
Fry Texture ¹²	Harvest	5	3.8	2.0 - 5.0
	Storage	5	4.2	4.0 - 5.0

Refer to footnotes on Page 112.

Table for 18I. Detailed data summary for CO10085-1RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	361	301 - 446
Yield US #1 (Cwt/A)		4	293	230 - 387
% US #1		4	81	76 - 87
Yield >10 oz (Cwt/A)		4	66	26 - 149
Yield <4 oz (Cwt/A)		4	61	49 - 71
% External Defects ¹		4	1.2	0.0 - 2.3
% Hollow Heart ²		4	0.1	0.0 - 0.4
% Stand		4	99	98 - 100
Emergence Uniformity		4	3.0	2.8 - 3.5
Vine Vigor ³		4	2.9	2.5 - 3.3
Stems/Plant		4	2.7	2.4 - 3.1
Vine Size ⁴		4	3.3	3.0 - 4.0
Vine Type ⁵		4	3.1	3.0 - 3.3
Vine Maturity ⁶		4	3.3	3.0 - 3.5
Blackspot ⁷	Bud End	5	4.9	4.8 - 5.0
	Stem End	5	4.4	4.0 - 5.0
	Average	5	4.7	
Weight Loss ⁸		5	4.3	2.5 - 8.9
Dormancy ⁹		5	47	38 - 60
Enzymatic Browning ¹⁰		5	4.4	3.8 - 5.0
Specific Gravity		5	1.092	1.082 - 1.099
Fry Color ¹¹	Harvest	5	1.8	1.0 - 3.0
	Storage	5	2.0	1.0 - 3.0
Fry Texture ¹²	Harvest	5	3.6	3.0 - 4.0
	Storage	5	3.4	3.0 - 4.0

Refer to footnotes on Page 112.

Table for 18J. Detailed data summary for CO11009-3RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	416	298 - 574
Yield US #1 (Cwt/A)		4	348	236 - 464
% US #1		4	84	79 - 90
Yield >10 oz (Cwt/A)		4	176	75 - 283
Yield <4 oz (Cwt/A)		4	51	31 - 87
% External Defects ¹		4	3.7	2.5 - 5.6
% Hollow Heart ²		4	2.6	0.0 - 7.7
% Stand		4	94	88 - 99
Emergence Uniformity		4	3.0	2.5 - 3.8
Vine Vigor ³		4	3.6	2.5 - 4.0
Stems/Plant		4	2.5	2.2 - 2.7
Vine Size ⁴		4	4.0	4.0 - 4.0
Vine Type ⁵		4	3.1	3.0 - 3.3
Vine Maturity ⁶		4	3.4	3.0 - 4.3
Blackspot ⁷	Bud End	5	4.8	4.6 - 5.0
	Stem End	5	4.5	3.9 - 5.0
	Average	5	4.7	
Weight Loss ⁸		5	2.6	1.9 - 3.2
Dormancy ⁹		5	82	73 - 95
Enzymatic Browning ¹⁰		5	3.1	2.4 - 4.0
Specific Gravity		5	1.096	1.083 - 1.104
Fry Color ¹¹	Harvest	5	0.4	0.0 - 2.0
	Storage	5	0.4	0.0 - 1.0
Fry Texture ¹²	Harvest	5	3.8	3.0 - 4.0
	Storage	5	3.6	3.0 - 4.0

Refer to footnotes on Page 112.

Table 18K. Detailed data summary for Canela Russet.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		55	354	214-472
Yield US #1 (Cwt/A)		55	319	182-441
% US #1		55	90	77-96
Yield >10 oz (Cwt/A)		55	104	25-236
Yield <4 oz (Cwt/A)		55	31	14-61
% External Defects ¹		55	1.4	0.0-9.4
% Hollow Heart ²		55	0.0	0.0-0.9
% Stand		54	96	82-100
Emergence Uniformity		54	2.9	1.0-4.0
Vine Vigor ³		54	2.5	1.0-3.8
Stems/Plant		54	2.1	1.1-4.2
Vine Size ⁴		54	3.8	3.0-5.0
Vine Type ⁵		54	3.5	3.0-4.3
Vine Maturity ⁶		54	3.3	2.5-4.0
Blackspot ⁷	Bud End	69	4.8	3.7-5.0
	Stem End	69	4.5	2.5-5.0
	Average	69	4.7	
Weight Loss ⁸		69	3.3	1.3-7.0
Dormancy ⁹		69	138	83-195
Enzymatic Browning ¹⁰		69	4.5	3.4-5.0
Specific Gravity		69	1.095	1.075-1.111
Fry Color ¹¹	Harvest	69	1.8	0.0-3.0
	Storage	69	2.1	0.0-4.0
Fry Texture ¹²	Harvest	69	3.9	2.0-5.0
	Storage	69	3.9	3.0-5.0

Refer to footnotes on Page 112.

Table 18L. Detailed data summary for Russet Norkotah.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		110	364	159-557
Yield US #1 (Cwt/A)		110	306	101-480
% US #1		110	83	59-94
Yield >10 oz (Cwt/A)		110	101	6-247
Yield <4 oz (Cwt/A)		110	49	13-131
% External Defects ¹		110	2.4	0.0-9.6
% Hollow Heart ²		110	0.4	0.0-2.8
% Stand		109	98	88-100
Emergence Uniformity		104	3.2	1.0-4.0
Vine Vigor ³		104	2.8	1.0-4.0
Stems/Plant		109	3.6	2.2-5.7
Vine Size ⁴		104	2.4	1.0-4.0
Vine Type ⁵		104	2.7	2.0-3.5
Vine Maturity ⁶		113	1.7	1.0-3.0
Blackspot ⁷	Bud End	118	4.8	2.9-5.0
	Stem End	118	4.5	2.6-5.0
	Average	119	4.6	
Weight Loss ⁸		119	3.3	1.0-7.1
Dormancy ⁹		118	96	70-140
Enzymatic Browning ¹⁰		118	3.5	2.2-5.0
Specific Gravity		122	1.079	1.066-1.091
Fry Color ¹¹	Harvest	119	2.1	0.0-4.0
	Storage	119	2.4	1.0-4.0
Fry Texture ¹²	Harvest	119	2.7	1.0-4.0
	Storage	119	2.7	1.0-5.0

Refer to footnotes on Page 112.

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

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	246	194 - 323
Yield US #1 (Cwt/A)		6	28	2 - 60
% US #1		6	10	1 - 19
Yield >10 oz (Cwt/A)		6	0	0 - 0
Yield <4 oz (Cwt/A)		6	217	190 - 259
% External Defects ¹		6	1.4	0.0 - 6.3
% Hollow Heart ²		6	0.0	0.0 - 0.0
% Stand		6	94	82 - 100
Emergence Uniformity		6	2.8	2.3 - 3.5
Vine Vigor ³		6	2.8	2.3 - 3.3
Stems/Plant		6	5.0	4.2 - 5.7
Vine Size ⁴		6	2.3	2.0 - 3.0
Vine Type ⁵		6	2.1	2.0 - 2.5
Vine Maturity ⁶		6	2.2	1.5 - 3.0
Blackspot ⁷	Bud End	7	4.6	3.5 - 5.0
	Stem End	7	4.8	4.5 - 5.0
	Average	7	4.7	
Weight Loss ⁸		7	2.4	1.8 - 3.2
Dormancy ⁹		7	83	38 - 104
Enzymatic Browning ¹⁰		7	4.1	3.4 - 4.8
Specific Gravity		7	1.072	1.069 - 1.077
Fry Color ¹¹	Harvest	7	2.9	1.0 - 4.0
	Storage	7	2.6	1.0 - 3.0
Fry Texture ¹²	Harvest	7	2.0	1.0 - 3.0
	Storage	7	1.9	1.0 - 3.0

Refer to footnotes on Page 112.

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

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	315	235 - 379
Yield US #1 (Cwt/A)		6	62	14 - 110
% US #1		6	19	6 - 36
Yield >10 oz (Cwt/A)		6	0.2	0 - 1
Yield <4 oz (Cwt/A)		6	252	187 - 300
% External Defects ¹		6	0.2	0.0 - 0.5
% Hollow Heart ²		6	0.0	0.0 - 0.0
% Stand		6	99	98 - 100
Emergence Uniformity		6	3.9	3.5 - 4.5
Vine Vigor ³		6	3.8	3.3 - 4.3
Stems/Plant		6	6.0	4.8 - 6.9
Vine Size ⁴		6	2.7	2.0 - 3.5
Vine Type ⁵		6	2.1	2.0 - 2.5
Vine Maturity ⁶		6	1.9	1.0 - 2.8
Blackspot ⁷	Bud End	7	4.1	3.3 - 4.8
	Stem End	7	3.7	3.1 - 4.7
	Average	7	3.9	
Weight Loss ⁸		7	3.4	2.1 - 4.5
Dormancy ⁹		7	37	24 - 54
Enzymatic Browning ¹⁰		7	4.0	3.2 - 5.0
Specific Gravity		7	1.086	1.083 - 1.091
Fry Color ¹¹	Harvest	7	0.6	0.0 - 1.0
	Storage	7	1.0	0.0 - 2.0
Fry Texture ¹²	Harvest	7	2.4	1.0 - 4.0
	Storage	7	2.4	2.0 - 3.0

Refer to footnotes on Page 112.

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

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	366	214 - 496
Yield US #1 (Cwt/A)		6	226	89 - 375
% US #1		6	59	40 - 76
Yield >10 oz (Cwt/A)		6	17	5 - 48
Yield <4 oz (Cwt/A)		6	134	100 - 193
% External Defects ¹		6	1.3	0.6 - 2.5
% Hollow Heart ²		6	0.0	0.0 - 0.3
% Stand		6	93	81 - 100
Emergence Uniformity		6	2.3	1.5 - 3.0
Vine Vigor ³		6	2.3	1.8 - 3.0
Stems/Plant		6	4.0	3.5 - 4.9
Vine Size ⁴		6	3.7	3.0 - 4.3
Vine Type ⁵		6	3.2	2.5 - 3.8
Vine Maturity ⁶		6	4.0	3.5 - 4.5
Blackspot ⁷	Bud End	7	3.9	2.8 - 5.0
	Stem End	7	3.5	2.8 - 4.8
	Average	7	3.7	
Weight Loss ⁸		7	3.0	2.2 - 3.8
Dormancy ⁹		7	71	55 - 88
Enzymatic Browning ¹⁰		7	3.3	2.2 - 4.4
Specific Gravity		7	1.074	1.064 - 1.082
Fry Color ¹¹	Harvest	7	2.0	1.0 - 3.0
	Storage	7	2.0	0.0 - 3.0
Fry Texture ¹²	Harvest	7	2.1	2.0 - 3.0
	Storage	7	2.1	1.0 - 3.0

Refer to footnotes on Page 112.

Table 18P. Detailed data summary for AC10376-1-2012W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	416	339 - 533
Yield US #1 (Cwt/A)		5	300	222 - 417
% US #1		5	71	64 - 78
Yield >10 oz (Cwt/A)		5	46	20 - 90
Yield <4 oz (Cwt/A)		5	106	86 - 123
% External Defects ¹		5	2.3	0.6 - 4.8
% Hollow Heart ²		5	0.0	0.0 - 0.2
% Stand		5	99	96 - 100
Emergence Uniformity		5	3.1	2.8 - 3.5
Vine Vigor ³		5	3.2	2.0 - 4.0
Stems/Plant		5	2.6	2.1 - 3.0
Vine Size ⁴		5	3.5	3.0 - 4.0
Vine Type ⁵		5	3.2	3.0 - 3.3
Vine Maturity ⁶		5	3.4	3.0 - 4.0
Blackspot ⁷	Bud End	6	4.9	4.7 - 5.0
	Stem End	6	4.7	4.4 - 5.0
	Average	6	4.8	
Weight Loss ⁸		6	2.5	2.2 - 3.3
Dormancy ⁹		6	115	102 - 145
Enzymatic Browning ¹⁰		6	3.0	2.0 - 3.8
Specific Gravity		6	1.082	1.074 - 1.089
Fry Color ¹¹	Harvest	6	2.3	1.0 - 3.0
	Storage	6	3.3	3.0 - 4.0
Fry Texture ¹²	Harvest	6	2.7	2.0 - 3.0
	Storage	6	3.0	2.0 - 4.0

Refer to footnotes on Page 112

Table 18Q. Detailed data summary for CO10064-1W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	391	328 - 473
Yield US #1 (Cwt/A)		5	252	186 - 328
% US #1		5	64	56 - 71
Yield >10 oz (Cwt/A)		5	28	10 - 48
Yield <4 oz (Cwt/A)		5	134	101 - 161
% External Defects ¹		5	1.2	0.3 - 2.0
% Hollow Heart ²		5	0.0	0.0 - 0.0
% Stand		5	99	97 - 100
Emergence Uniformity		5	3.2	2.8 - 3.5
Vine Vigor ³		5	3.4	2.8 - 4.0
Stems/Plant		5	4.0	3.5 - 4.6
Vine Size ⁴		5	4.0	4.0 - 4.0
Vine Type ⁵		5	3.1	3.0 - 3.5
Vine Maturity ⁶		5	3.2	3.0 - 3.8
Blackspot ⁷	Bud End	6	4.6	4.4 - 4.8
	Stem End	6	4.0	2.9 - 4.6
	Average	6	4.3	
Weight Loss ⁸		6	2.6	1.7 - 3.5
Dormancy ⁹		6	88	62 - 124
Enzymatic Browning ¹⁰		6	3.9	2.6 - 4.8
Specific Gravity		6	1.095	1.084 - 1.101
Fry Color ¹¹	Harvest	6	0.2	0.0 - 1.0
	Storage	6	0.7	0.0 - 1.0
Fry Texture ¹²	Harvest	6	3.2	2.0 - 4.0
	Storage	6	3.3	3.0 - 4.0

Refer to footnotes on Page 112

Table 18R. Detailed data summary for CO10098-5W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		5	284	219 - 352
Yield US #1 (Cwt/A)		5	92	34 - 153
% US #1		5	30	15 - 43
Yield >10 oz (Cwt/A)		5	4	0 - 17
Yield <4 oz (Cwt/A)		5	189	177 - 205
% External Defects ¹		5	0.6	0.0 - 1.9
% Hollow Heart ²		5	0.0	0.0 - 0.0
% Stand		5	96	92 - 99
Emergence Uniformity		5	3.0	2.5 - 3.5
Vine Vigor ³		5	3.5	3.3 - 4.0
Stems/Plant		5	4.7	4.2 - 5.2
Vine Size ⁴		5	3.0	2.3 - 3.5
Vine Type ⁵		5	2.3	2.0 - 2.5
Vine Maturity ⁶		5	2.8	2.3 - 3.0
Blackspot ⁷	Bud End	6	4.5	3.6 - 4.9
	Stem End	6	3.4	2.8 - 4.1
	Average	6	3.9	
Weight Loss ⁸		6	3.9	2.3 - 5.5
Dormancy ⁹		6	52	32 - 103
Enzymatic Browning ¹⁰		6	4.2	3.6 - 4.8
Specific Gravity		6	1.104	1.097 - 1.107
Fry Color ¹¹	Harvest	6	0.3	0.0 - 1.0
	Storage	6	0.7	0.0 - 1.0
Fry Texture ¹²	Harvest	6	2.8	1.0 - 4.0
	Storage	6	3.2	1.0 - 5.0

Refer to footnotes on Page 112

Table 18S. Detailed data summary for CO11250-1W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	432	315 - 515
Yield US #1 (Cwt/A)		4	304	205 - 386
% US #1		4	70	60 - 79
Yield >10 oz (Cwt/A)		4	56	6 - 110
Yield <4 oz (Cwt/A)		4	118	90 - 158
% External Defects ¹		4	2.0	0.7 - 2.9
% Hollow Heart ²		4	0.2	0.0 - 0.9
% Stand		4	99	98 - 100
Emergence Uniformity		4	3.6	3.0 - 4.0
Vine Vigor ³		4	4.2	3.8 - 4.5
Stems/Plant		4	4.6	4.1 - 5.1
Vine Size ⁴		4	3.9	3.8 - 4.0
Vine Type ⁵		4	3.2	3.0 - 3.5
Vine Maturity ⁶		4	3.4	3.0 - 4.0
Blackspot ⁷	Bud End	5	4.6	3.6 - 5.0
	Stem End	5	3.9	3.1 - 4.4
	Average	5	4.3	
Weight Loss ⁸		5	3.0	1.1 - 4.4
Dormancy ⁹		5	41	35 - 53
Enzymatic Browning ¹⁰		5	3.6	2.0 - 4.8
Specific Gravity		5	1.097	1.086 - 1.102
Fry Color ¹¹	Harvest	5	1.4	0.0 - 3.0
	Storage	5	1.0	0.0 - 2.0
Fry Texture ¹²	Harvest	5	3.4	3.0 - 4.0
	Storage	5	3.6	3.0 - 4.0

Refer to footnotes on Page 112

Table 18T. Detailed data summary for CO11266-1W/Y.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	372	265 - 445
Yield US #1 (Cwt/A)		4	229	156 - 343
% US #1		4	60	48 - 79
Yield >10 oz (Cwt/A)		4	18	2 - 40
Yield <4 oz (Cwt/A)		4	140	84 - 190
% External Defects ¹		4	0.9	0.5 - 1.1
% Hollow Heart ²		4	0.0	0.0 - 0.0
% Stand		4	94	92 - 100
Emergence Uniformity		4	2.8	2.3 - 3.5
Vine Vigor ³		4	2.9	2.3 - 3.5
Stems/Plant		4	3.4	2.7 - 3.9
Vine Size ⁴		4	3.5	3.0 - 4.0
Vine Type ⁵		4	3.3	2.8 - 4.0
Vine Maturity ⁶		4	4.0	4.0 - 4.0
Blackspot ⁷	Bud End	5	4.9	4.8 - 5.0
	Stem End	5	5.0	4.8 - 5.0
	Average	5	4.9	
Weight Loss ⁸		5	3.2	2.5 - 3.7
Dormancy ⁹		5	61	45 - 74
Enzymatic Browning ¹⁰		5	4.4	2.8 - 5.0
Specific Gravity		5	1.087	1.080 - 1.093
Fry Color ¹¹	Harvest	5	1.0	0.0 - 2.0
	Storage	5	1.2	0.0 - 3.0
Fry Texture ¹²	Harvest	5	3.6	3.0 - 4.0
	Storage	5	3.6	2.0 - 4.0

Refer to footnotes on Page 112.

Table 18U. Detailed data summary for Yukon Gold.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		58	381	226-513
Yield US #1 (Cwt/A)		58	333	161-444
% US #1		58	87	64-94
Yield >10 oz (Cwt/A)		58	138	28-248
Yield <4 oz (Cwt/A)		58	38	21-124
% External Defects ¹		58	2.4	0.0-15.4
% Hollow Heart ²		58	0.4	0.0-2.2
% Stand		58	96	87-100
Emergence Uniformity		58	3.3	2.5-4.8
Vine Vigor ³		58	3.7	3.0-5.0
Stems/Plant		58	2.4	1.5-3.8
Vine Size ⁴		58	3.1	2.5-4.5
Vine Type ⁵		58	2.7	2.0-3.5
Vine Maturity ⁶		58	2.0	1.0-3.0
Blackspot ⁷	Bud End	75	4.6	2.0-5.0
	Stem End	75	4.3	2.4-5.0
	Average	75	4.4	
Weight Loss ⁸		75	2.0	0.9-4.3
Dormancy ⁹		75	88	47-132
Enzymatic Browning ¹⁰		75	4.4	3.4-5.0
Specific Gravity		75	1.087	1.072-1.094
Fry Color ¹¹	Harvest	75	1.7	0.0-4.0
	Storage	75	2.6	1.0-4.0
Fry Texture ¹²	Harvest	75	3.2	1.0-5.0
	Storage	75	3.2	1.0-5.0

Refer to footnotes on Page 112

Table 18V. 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	20	4.4	3.4-5.0
	Stem End	20	3.8	2.8-4.8
	Average	20	4.1	
Weight Loss ⁸		20	3.2	2.2-4.9
Dormancy ⁹		20	80	60-101
Enzymatic Browning ¹⁰		20	3.4	2.4-4.4
Specific Gravity		21	1.086	1.069-1.095
Chip Color ¹¹	40	21	3.8	2.5-5.0
	40R	21	2.9	1.0-4.0
	50	21	2.0	1.0-3.0
	50R	21	2.1	1.0-3.5

Refer to footnotes on Page 112

Table 18W. Detailed data summary for CO11023-2W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	319	254-399
Yield US #1 (Cwt/A)		4	239	174-311
% US #1		4	74	68-78
Yield >10 oz (Cwt/A)		4	44	6-99
Yield <4 oz (Cwt/A)		4	68	58-77
% External Defects ¹		4	3.6	2.2-5.8
% Hollow Heart ²		4	0.2	0.0-0.5
% Stand		4	97	94-100
Emergence Uniformity		4	3.1	2.8-3.5
Vine Vigor ³		4	2.8	2.5-3.3
Stems/Plant		4	2.7	2.3-3.2
Vine Size ⁴		4	3.1	2.8-3.5
Vine Type ⁵		4	3.4	3.0-4.0
Vine Maturity ⁶		4	3.1	2.8-3.5
Blackspot ⁷	Bud End	9	4.7	4.2-5.0
	Stem End	9	4.3	2.9-5.0
	Average	9	4.5	
Weight Loss ⁸		9	3.1	1.4-4.6
Dormancy ⁹		9	66	45-87
Enzymatic Browning ¹⁰		9	3.9	2.8-5.0
Specific Gravity		10	1.088	1.081-1.101
Chip Color ¹¹	40	10	3.4	3.0-4.0
	40R	10	3.2	2.5-3.5
	50	10	2.5	1.0-3.5
	50R	10	2.7	2.0-3.5

Refer to footnotes on Page 112

Table 18X. Detailed data summary for CO11023-9W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	326	256-411
Yield US #1 (Cwt/A)		4	236	151-315
% US #1		4	72	59-84
Yield >10 oz (Cwt/A)		4	42	8-119
Yield <4 oz (Cwt/A)		4	79	44-105
% External Defects ¹		4	3.1	1.4-6.9
% Hollow Heart ²		4	0.0	0.0-0.0
% Stand		4	90	81-99
Emergence Uniformity		4	2.9	2.3-3.8
Vine Vigor ³		4	2.9	2.0-4.0
Stems/Plant		4	1.9	1.7-2.1
Vine Size ⁴		4	3.5	3.0-4.0
Vine Type ⁵		4	3.0	2.8-3.3
Vine Maturity ⁶		4	4.0	3.8-4.3
Blackspot ⁷	Bud End	9	4.6	3.6-5.0
	Stem End	9	3.6	2.8-5.0
	Average	9	4.1	
Weight Loss ⁸		9	4.2	2.7-5.8
Dormancy ⁹		9	84	59-104
Enzymatic Browning ¹⁰		9	4.3	2.8-5.0
Specific Gravity		10	1.086	1.077-1.102
Chip Color ¹¹	40	10	3.1	2.0-3.5
	40R	10	2.8	1.0-3.5
	50	10	2.3	1.0-3.5
	50R	10	2.6	1.0-3.5

Refer to footnotes on Page 112

Table 18Y. Detailed data summary for CO11037-5W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	378	314-472
Yield US #1 (Cwt/A)		4	297	248-381
% US #1		4	79	73-87
Yield >10 oz (Cwt/A)		4	79	34-179
Yield <4 oz (Cwt/A)		4	61	35-85
% External Defects ¹		4	4.9	1.4-9.8
% Hollow Heart ²		4	0.3	0.0-0.5
% Stand		4	96	85-100
Emergence Uniformity		4	2.8	1.8-3.3
Vine Vigor ³		4	3.3	3.0-3.8
Stems/Plant		4	3.0	2.6-3.5
Vine Size ⁴		4	3.8	3.5-4.0
Vine Type ⁵		4	2.9	2.5-3.0
Vine Maturity ⁶		4	3.1	2.5-3.8
Blackspot ⁷	Bud End	9	4.9	4.4-5.0
	Stem End	9	4.5	4.0-5.0
	Average	9	4.7	
Weight Loss ⁸		9	2.1	1.3-2.7
Dormancy ⁹		9	90	73-105
Enzymatic Browning ¹⁰		9	3.5	2.2-5.0
Specific Gravity		10	1.087	1.077-1.099
Chip Color ¹¹	40	10	3.8	3.0-4.5
	40R	10	2.3	1.2-4.0
	50	10	2.2	1.0-3.5
	50R	10	2.2	1.0-4.0

Refer to footnotes on Page 112

Table 18Z. Detailed data summary for Atlantic.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		62	434	172-597
Yield US #1 (Cwt/A)		62	374	149-512
% US #1		62	86	76-93
Yield >10 oz (Cwt/A)		62	133	27-290
Yield <4 oz (Cwt/A)		62	47	19-109
% External Defects ¹		62	2.6	0.1-9.3
% Hollow Heart ²		62	4.2	0.0-16.4
% Stand		62	96	63-100
Emergence Uniformity		56	3.6	2.0-4.8
Vine Vigor ³		56	3.6	2.8-4.3
Stems/Plant		62	3.0	1.8-4.9
Vine Size ⁴		56	3.1	2.2-4.0
Vine Type ⁵		56	3.0	2.8-3.8
Vine Maturity ⁶		62	3.1	2.3-4.0
Blackspot ⁷	Bud End	89	3.3	1.8-5.0
	Stem End	89	2.9	1.4-4.3
	Average	90	3.1	
Weight Loss ⁸		90	4.2	1.1-7.9
Dormancy ⁹		87	82	56-119
Enzymatic Browning ¹⁰		88	4.5	3.8-5.0
Specific Gravity		91	1.098	1.083-1.120
Chip Color ¹¹	40	91	4.2	2.0-5.0
	40R	91	3.6	1.5-5.0
	50	91	2.8	1.0-4.5
	50R	91	2.7	1.0-5.0

Refer to footnotes on Page 112

Table 18AA. Detailed data summary for Chipeta.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		57	520	355-757
Yield US #1 (Cwt/A)		57	438	249-606
% US #1		57	84	64-92
Yield >10 oz (Cwt/A)		57	174	52-388
Yield <4 oz (Cwt/A)		57	50	21-119
% External Defects ¹		57	6.1	1.1-20.6
% Hollow Heart ²		57	0.6	0.0-4.0
% Stand		57	98	91-100
Emergence Uniformity		50	3.6	3.0-5.0
Vine Vigor ³		50	4.2	3.2-5.0
Stems/Plant		56	3.2	1.9-4.9
Vine Size ⁴		50	4.5	4.0-5.0
Vine Type ⁵		50	3.1	2.5-4.0
Vine Maturity ⁶		57	3.4	3.0-4.5
Blackspot ⁷	Bud End	83	4.1	2.2-5.0
	Stem End	83	3.8	1.4-5.0
	Average	85	4.0	
Weight Loss ⁸		85	2.8	1.0-8.0
Dormancy ⁹		81	99	66-153
Enzymatic Browning ¹⁰		82	4.0	2.4-5.0
Specific Gravity		85	1.090	1.070-1.108
Chip Color ¹¹	40	85	4.5	3.0-5.0
	40R	85	3.8	1.5-5.0
	50	85	2.7	1.0-5.0
	50R	85	2.5	1.0-4.5

Refer to footnotes on Page 112

Footnotes for Tables 18A-18AA:

- 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 19A. Grower return data for russet selections and standard cultivars - 2020.

Clone	Yield >10 oz (cwt/A)	Yield 4-10 oz (cwt/A)	Yield <4 oz (cwt/A)	Grower Returns (\$/Acre) ¹
AC05039-2RU	66	213	28	8,850.00
CO08065-2RU	79	238	50	10,134.00
CO08231-1RU	130	253	49	12,417.00
CO09036-2RU	62	240	91	9,705.00
CO09076-3RU	104	191	54	9,636.00
CO09205-2RU	39	249	50	9,024.00
CO10087-4RUsto	56	201	30	8,136.00
CO10091-1RUsto	44	208	53	7,983.00
CO10085-1RU	66	223	61	9,249.00
CO11009-1RU	176	172	51	11,649.00
Canela Russet	104	215	31	10,287.00
Russet Norkotah	101	205	49	9,933.00

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 July 22nd, 2020 by USDA Potato Report. Tubers >10 oz = \$36/cwt, tubers 4-10 oz = \$30/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 -2020.

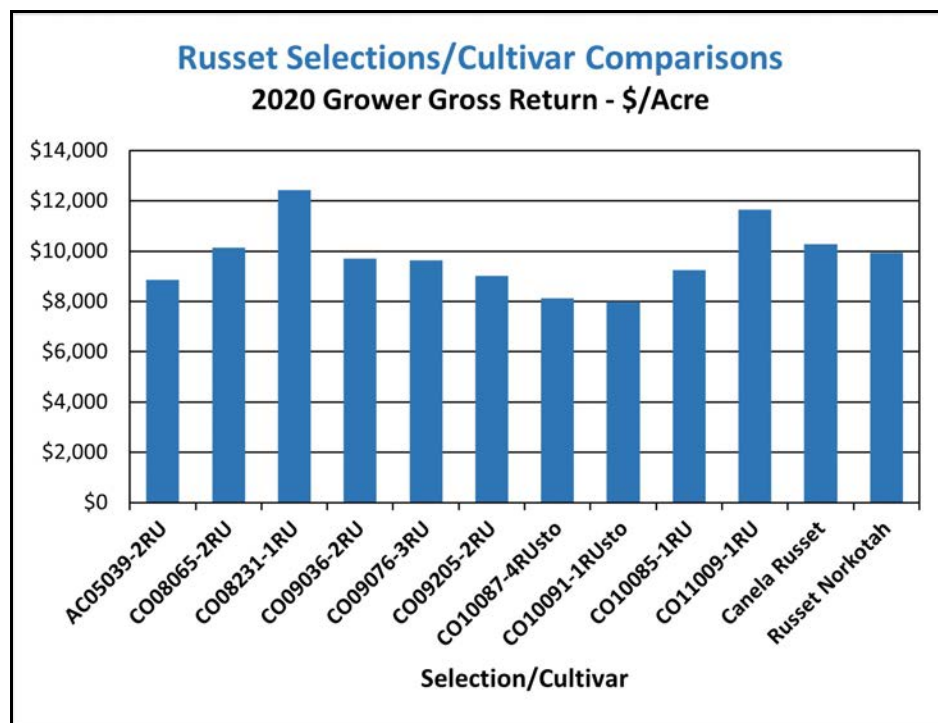


Table 19B. Grower return data for yellow flesh selections and Yukon Gold - 2020.

Clone	Yield >10 oz (cwt/A)	Yield 4-10 oz (cwt/A)	Yield <4 oz (cwt/A)	Grower Returns (\$/Acre) ¹
CO09128-3W/Y	0.0	28.0	217	5,012.00
CO09128-5W/Y	0.2	61.8	252	6,528.00
CO09218-4W/Y	17.0	209.0	134	8,104.00
AC10376-1-2012W/Y	46.0	254.0	106	9,320.00
CO10064-1W/Y	28.0	224.0	134	8,728.00
CO10098-5W/Y	4.0	88.0	189	5,988.00
CO11250-1W/Y	56.0	248.0	118	9,656.00
CO11266-1W/Y	18.0	211.0	140	8,296.00
Yukon Gold	138.0	195.0	38	8,752.00

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 - 2020.

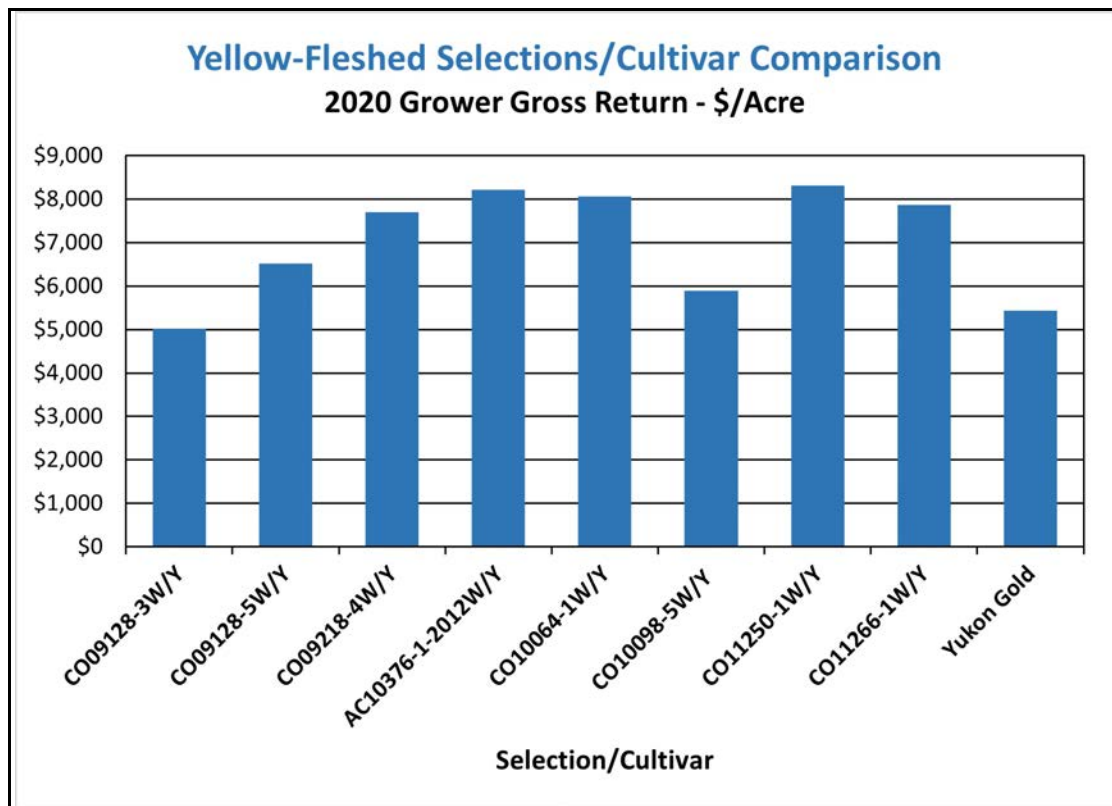
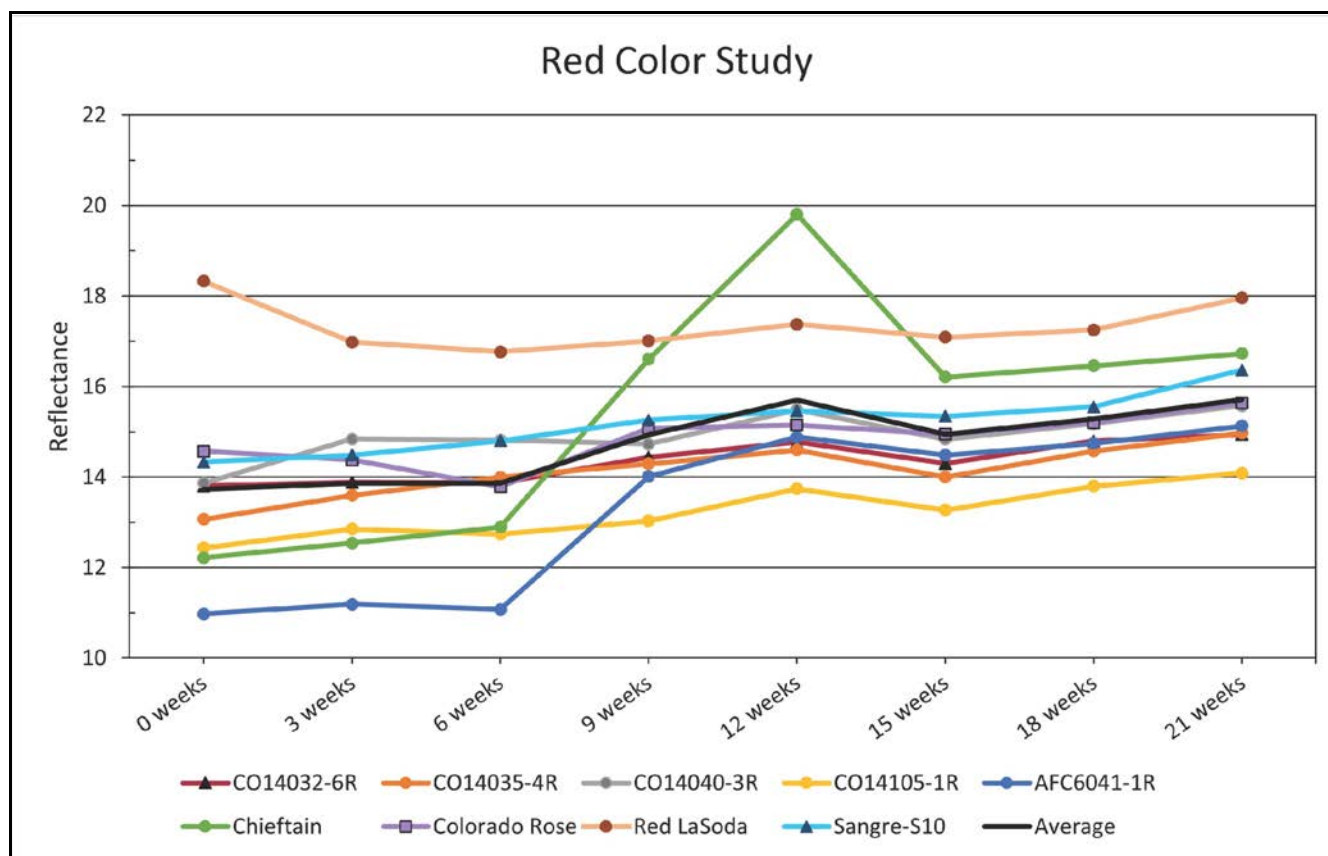


Table 20. 2020 Red color retention study. The entries are ordered from darker to lighter skin color based on the average reflectance values¹ over the twenty-one week interval.

Selection/Cultivar	Weeks of Storage after Harvest							
	0	3	6	9	12	15	18	21
CO14032-6R	13.8	13.9	13.9	14.4	14.8	14.3	14.8	14.9
CO14035-4R	13.1	13.6	14.0	14.3	14.6	14.0	14.6	15.0
CO14040-3R	13.8	14.8	14.8	14.7	15.5	14.8	15.2	15.6
CO14105-1R	12.4	12.9	12.7	13.0	13.7	13.3	13.8	14.1
AFC6041-1R	11.0	11.2	11.1	14.0	14.9	14.5	14.7	15.1
Chieftain	12.2	12.5	12.9	16.6	19.8	16.2	16.5	16.7
Colorado Rose	14.6	14.4	13.8	15.1	15.2	14.9	15.2	15.6
Red LaSoda	18.3	17.0	16.8	17.0	17.4	17.1	17.3	18.0
Sangre-S10	14.3	14.5	14.8	15.3	15.5	15.3	15.6	16.4
Mean	13.7	13.9	13.9	14.9	15.7	14.9	15.3	15.7

¹ Lower reflective values are associated with darker skin color.

Figure 4. Graphical representation of red skin color retention over a twenty-one week interval.



APPENDIX 1. Cultural management information for the Potato Breeding and Selection Program's trials at the San Luis Valley Research Center - 2019.

LOCATION: San Luis Valley Research Center

SOIL TYPE: Sandy Loam (Dunul cobbly sandy loam)

DATE:

Planted - 5/12/20

Hilled - 5/27/20

Vines Killed - 9/3/20 (Reglone 0.25 gal/A) 114 days after planting

Harvested - 9/25/20

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:

5/12/20 - 32 lbs N + 0 lbs P_2O_5 + 0 lbs K_2O + 10 lbs S + 1 lb Zn/A (dual band in-row liquid application)

Total fertilizer applied: 106 lbs N + 76 lbs P_2O_5 + 180 lbs K_2O + 11 lbs S

IRRIGATION:

Center Pivot -17" gross application (application frequency and amount based on ET)

Rainfall - 4.54" (5/12/20 - 9/25/20)

INSECTICIDES APPLIED:

Weekly - mineral oil (1 gal/A)

7/2/20 - Leverage 360 (2.8 oz/A)

7/9/20 - Bravo Weather Stik (24 oz/A)

7/21/20 - Sefina Inscalis (3 oz/A)

8/6/20 - Movento HL (2.5 oz /A)

FUNGICIDES APPLIED:

6/29/20 - Quadris Opti (12 oz /A)

7/23/20 - Revus Top (7 oz/A)

HERBICIDES APPLIED:

6/5/20 - Metribuzin 75 (0.30 lb/A)

6/5/20 - Eptam 7-E (0.64 Gal/A)

7/21/20 - Rifle-D spot treated (1 oz/1 Gal)

7/21/20 - Makaze spot treated (1 oz/1 Gal)

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