

2022 Potato Cultivar Yield and Postharvest Quality Evaluations



WSU Potato Research Group



WASHINGTON STATE
UNIVERSITY

2022 Potato Cultivar Yield and Postharvest Quality Evaluations

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On the cover: Planting 2022 Seed lot trial
with snow covered soil.

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INTRODUCTION

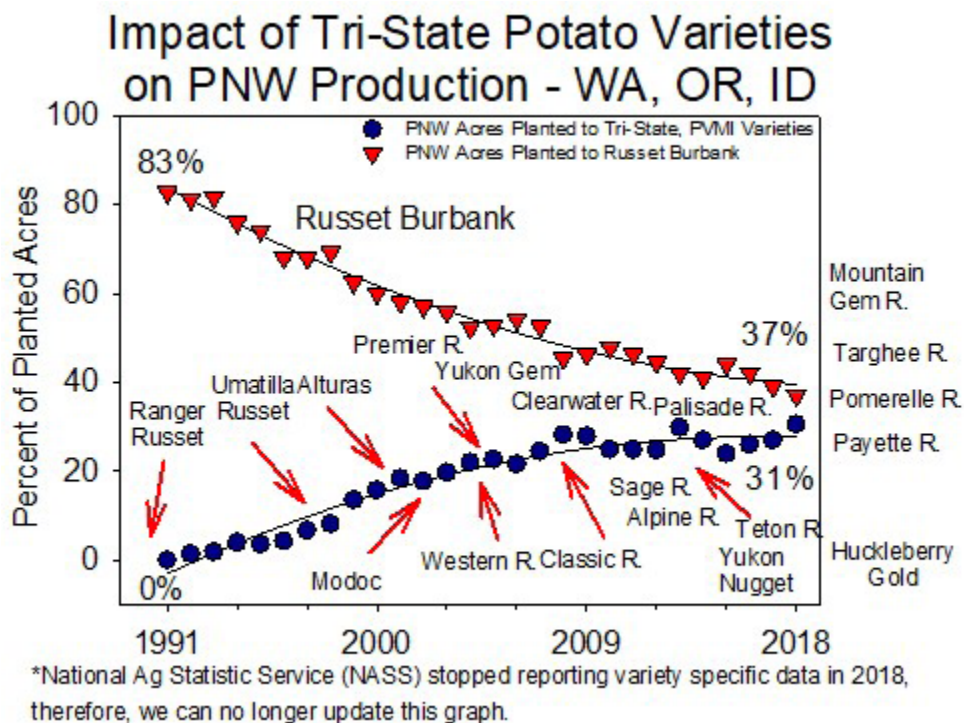
The 2022 Washington “Potato Cultivar Yield and Postharvest Quality Evaluations” is an annual report providing detailed information about promising new potato clones and cultivars grown in Washington conducted by the **Washington State University (WSU) Potato Research Group**. **Our mission:**

to identify and release new potato varieties that will provide profitable, sustainable production for the grower, improved competitiveness for the Washington and NW US potato industry, a healthy, inexpensive food supply for American consumers, and contributions towards a healthy environment.

Tri-State trials include the newest clones which are created and evaluated in ID, OR, and WA by the USDA/ARS of Aberdeen, ID & Prosser, WA, Univ. of ID, OR State U., and WA State U. **Regional trials** include advanced clones from, and evaluated by, ID, OR, WA, CO, TX, and CA. Potato Commissions from the Tri-State area support and fund much of the variety development efforts.

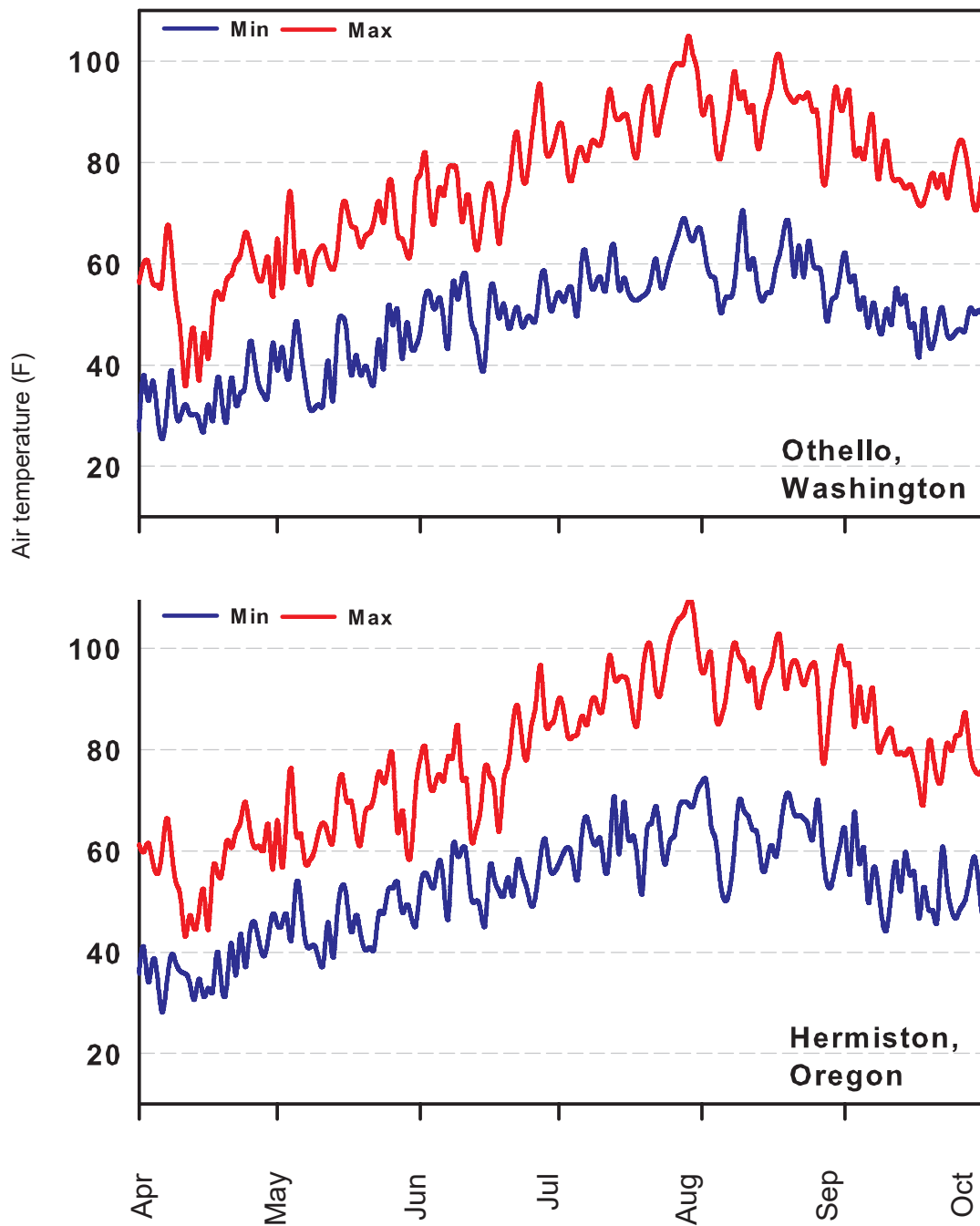
Potato Variety Management Institute (PVMI) is a nonprofit organization that licenses and promotes Tri-State varieties. PVMI collects royalties from the varieties which are then distributed among the Tri-State research programs to support the ongoing development efforts. Learn more at www.pvmi.org.

Recent Accomplishments: The NWPVD program has produced a number of widely adopted varieties, among these varieties, **Umatilla Russet, Ranger Russet, Clearwater Russet, and Alturas** have greatly benefited the United States and Northwest potato industry and as such, were the **3rd, 4th, 7th, and 15th** most widely grown cultivars in the United States in 2022. Varieties released by the NWPVD Program are now produced on approximately 165,000 acres in the Pacific Northwest with value to growers estimated at approximately \$740 million. NWPVD varieties represented 38%, or 349,000 acres, of the 2022 fall crop nationally. The estimated 2022 US farm-gate value of NWPVD varieties was more than \$1.57 billion (values extrapolated from 2022 certified seed acres (<https://potatoassociation.org/seed-acres-reports/>) and NASS 2022).



*National Ag Statistic Service (NASS) stopped reporting variety specific data in 2018, therefore, we can no longer update this graph.

2022 Growing Season Temperatures



Guide to Clone Designations

Example: ATX91137-1Ru	ATX91137-1Ru	Breeding Program (A berdeen, ID)
	ATX91137-1Ru	Selection Site (T exas)
	ATX 9 1137-1Ru	Year of Cross (1991)
	ATX91 137 -1Ru	Cross Number (137)
	ATX91137- 1 Ru	Tuber Selection (1)
	ATX91137-1 Ru	Russet (Ru)

Location Codes

Designation		Breeding Program	Selection Program	Other
A	=	A berdeen, Idaho	A berdeen, Idaho	
AO	=	A berdeen, Idaho	O regon	
AOA	=	A berdeen, Idaho	O regon	A berdeen, Idaho
ATX	=	A berdeen, Idaho	T exas	
BTX	=	B eltsville, Maryland	T exas	
CO	=	C olorado		
MWTX	=	M adison W isconsin	T exas	
NDA	=	N orth D akota	A berdeen, Idaho	
NY	=	N ew Y ork		
PA	=	P rosser, WA	A berdeen, Idaho	
POR	=	P rosser, WA	O regon	
TC	=	T exas	C olorado	
TXA	=	T exas	A berdeen, Idaho	
TXNS	=	T exas		N orkotah S train
OR	=	Hermiston, O regon	O regon	

Miscellaneous Designations

A93157-6 LS	LS	=	L ow S ugar
CO94165-3 P/P	P/P	=	P urple skin & P urple flesh
A96741-2 R	R	=	R ed skin
CO94183-1 R/R	R/R	=	R ed skin / R ed flesh
VC0967-2 R/Y	R/Y	=	R ed skin / Y ellow flesh
ATX92230-1 Ru	Ru	=	R usset skin
VC1009-1 W/Y	W/Y	=	W hite skin & Y ellow flesh
A97066-42 LB	LB	=	L ate B light resistance
AC9923 PW/Y	PW/Y	=	P urple skin with W hite eyes/ Y ellow flesh
AC9653 P/Y	P/Y	=	P urple skin/ Y ellow flesh
CO977-2 P/PW	P/PW	=	P urple skin/ P urple & W hite flesh
A99029-3 E	E	=	E arly maturing
A0008-1 TE	TE	=	T etonia, ID Selection, E arly maturing
A07008-4 T	T	=	T etonia, ID Selection, L ate maturing
A06914-3 CR	CR	=	C orky R ingspot resistance
A06862-18 VR	VR	=	V irus R esistance

OVERALL CULTIVAR & CLONE PERFORMANCE

Merit Score Methods

Overview: Overall performance for each entry was rated on a scale of 1 to 5; 5 indicating the best performance possible. The methods are explained below. Economic analysis methods are explained on pages 16 (Fresh) and 17 (Process).

FRESH MARKET MERIT SCORE METHODS:

75% Fresh market economic value

25% Internal quality – blackspot bruise, shatter bruise, hollow heart, internal brown spot, and brown center. An average merit value is taken. Of the five internal categories listed above, the worst internal defect or bruise rating for each cultivar is weighted 50% so serious bruise or defect problems are reflected in the final merit score.

Researcher's Discretion: The overall merit score may be reduced by up to 50% for any unacceptable trait not quantified in the data (e.g. poor appearance or poor flavor).

EARLY PROCESS MARKET MERIT SCORE METHODS:

75% Early harvest process market economic value

25% Internal quality – blackspot bruise, shatter bruise, hollow heart, internal brown spot, and brown center. An average merit value is taken. Of the five internal categories listed above, the worst internal defect or bruise rating for each cultivar is weighted 50% so serious bruise or defect problems are reflected in the final merit score.

Researcher's Discretion: The overall merit score may be reduced by up to 50% for any unacceptable trait not quantified in the data.

LATE PROCESS MARKET MERIT SCORE METHODS:

For the late process market, a merit score is listed for both field and post-harvest performance.

Field/Economic Performance – methods are the same as “Early Process Market Merit Score Methods” shown above, with the exception that a late harvest economic analysis is conducted.

Post-Harvest Performance – see “Postharvest Procedures” section near front of book.

Researcher's Discretion:

The overall merit score may be reduced by up to 50% for any unacceptable trait not quantified in the data.

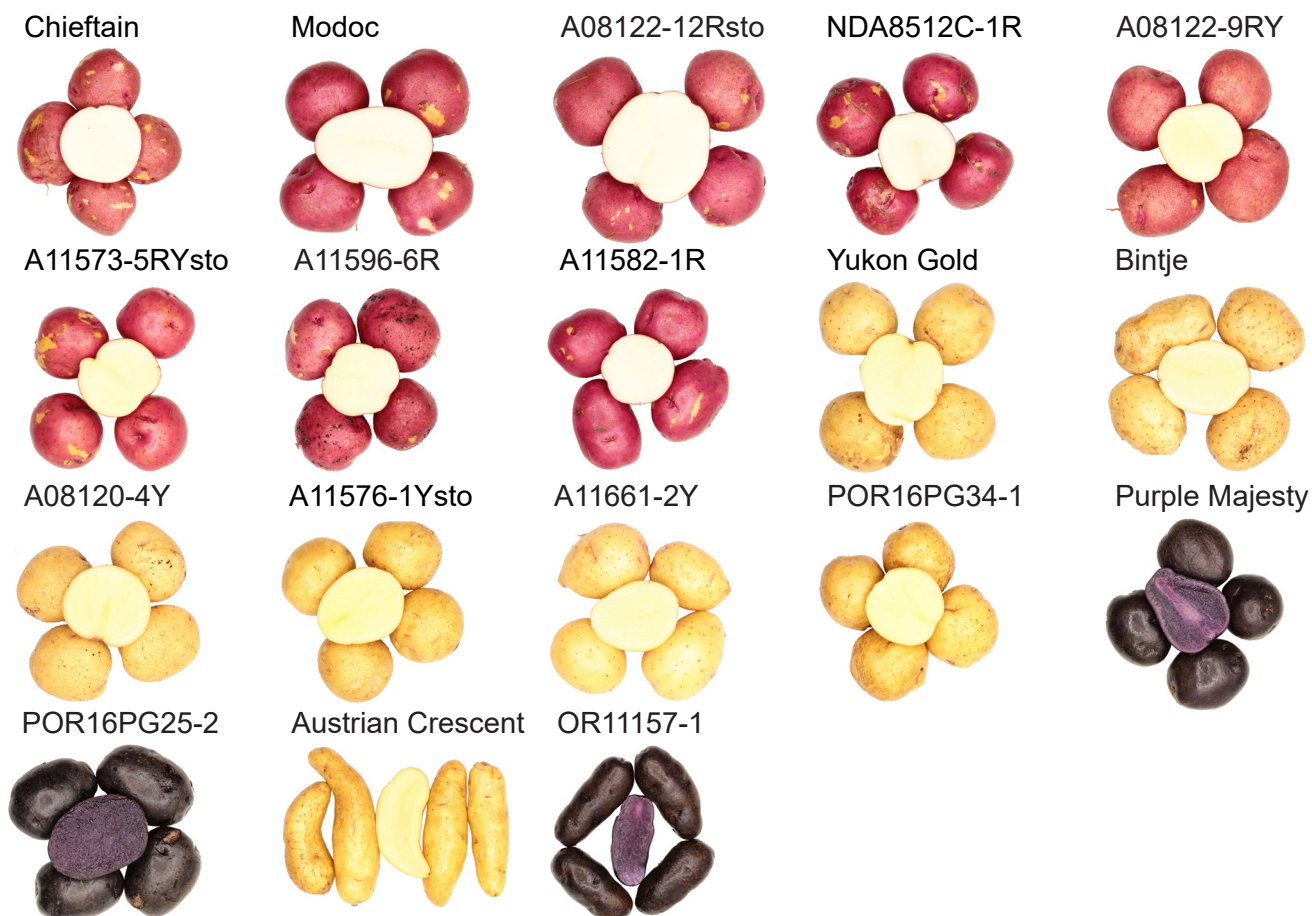
WA Multi-Year Summaries of Graduating Russet Entries and Reference Varieties

Entry	Year	Average Tuber						Merit Scores (5 = Best)		
		Early/Late*	US # 1 & 2		Weight/ Number	Bruise Blackspot/ Shatter	Internal**	Field Performance		Postharvest***
		Harvest Total Yield	Yield > 6 oz	Specific Gravity	per Plant			Early/Late Fresh	Early/Late Process	Processing Performance
AOR08540-1		CWT/A	% of Total		oz/number	%				
	2022	653/712	66	1.084	6.4/9.9	3/68	none	3.2/1.9	3.5/3.6	2.6
	2021	606/1137	69	1.074	8.3/12.3	0/41	8% HH	1.3/1.1	3.2/2.4	2.1
	2020	754/880	84	1.076	10.2/7.7	8/85	none	3.8/1.1	4.3/2.4	2.7
	2019	789/1044	82	1.080	11.0/9.1	5/46	none	3.0/2.3	4.0/1.9	na
	2018	510/1113	81	1.079	10.4/10.2	3/68	none	3.0/1.3	3.9/2.5	na
Good length for processing, tuber shape is variable, some tubers pointy, extreme tuber greening, high yields, hollow heart potential										
AOR10204-3	2022	541/734	71	1.074	7.7/8.5	0/60	3% IBS	2.4/3.2	3.9/3.0	na
	2021	671/1073	84	1.070	9.3/10.3	0/8	none	3.5/2.5	3.9/3.4	na
	2020	680/941	79	1.072	11.3/7.4	3/58	none	2.1/0.9	2.7/2.1	na
	2019	749/1016	84	1.072	13.4/7.2	3/59	none	2.5/1.9	4.0/3.1	na
	2018	532/1087	85	1.074	12.6/8.3	15/53	none	3.8/1.5	3.4/1.9	na
Good Length for processing, tubers often pointy or shape irregular, larger tubers, may work for early or direct processing, high yields										
Ranger R.	2022	573/698	73	1.082	7.0/9.0	25/40	none	-	3.0/4.4	3.6
	2021	587/1087	64	1.081	8.1/12.1	24/18	3% IBS	-	2.4/2.8	2.4
	2020	567/911	86	1.078	10.7/7.6	28/45	3% BC	-	2.7/2.7	2.8
	2019	599/1051	86	1.078	11.5/8.8	19/19	none	-	3.4/3.2	3.2
	2018	491/899	86	1.082	11.8/7.3	60/30	3% IBS	-	3.7/3.6	4.0
Long, shape variable, but often uniform; 7 to 9 tubers per plant typical.										
R. Burbank	2022	614/622	67	1.073	6.9/8.1	8/68	3%HH, 5%BC, 5%IBS	1.0/1.6	1.8/1.0	2.2
	2021	529/1026	59	1.070	8.8/10.5	6/28	6% BC, 3% IBS	0.7/0.6	1.2/1.1	1.4
	2020	667/1052	72	1.076	8.7/10.9	15/70	18% BC, 3% IBS	1.3/1.3	2.7/2.2	1.3
	2019	584/1085	77	1.077	11.4/9.1	6/64	12% IBS	1.6/1.3	3.3/2.5	1.5
	2018	633/863	81	1.080	10.4/7.9	48/58	3% IBS	2.4/1.3	2.5/2.2	2.2
Shape typically variable, often with many growth cracks and knobs; 7 to 9 tubers per plant typical, long storage variety.										
Clearwater R.	2022	476/638	60	1.086	5.7/10.1	0/60	none	1.5/2.3	2.1/4.0	3.9
	2021	526/1010	74	1.080	7.4/12.3	7/27	7% IBS	2.8/2.5	3.0/4.2	3.0
	2020	684/979	80	1.079	8.3/10.5	0/58	none	2.8/2.1	4.5/3.8	2.5
Typy, dark russetting, uniform shape, susceptible to fusarium dry rot.										
R. Norkotah (Fresh Market) only	2022	626/561	66	1.071	6.6/7.6	5/48	none	3.2/2.5	-	na
	2021	563/895	72	1.064	7.3/11.0	0/13	3% IBS	3.4/3.1	-	na
	2020	500/661	75	1.066	8.0/7.4	15/38	none	1.8/1.3	-	na
	2019	575/814	79	1.065	9.0/8.6	0/15	none	3.4/2.6	-	na
	2018	511/785	86	1.071	10.4/7.1	25/25	none	2.8/2.0	-	na
Shape and skin typically very uniform, size profile typically on the small side; 7 to 8 tubers per plant typical.										
Shepody (Early Harvest) only	2022	635	83	1.071	11.2/5.6	3/0	none	-	3.0/na	na
	2021	508	46	1.068	5.1/9.9	0/10	3% IBS	-	1.4/na	na
	2020	621	85	1.078	9.5/6.4	0/0	3% IBS	-	3.2/na	na
	2019	788	83	1.076	9.8/8.4	0/10	none	-	3.9/na	na
	2018	621	87	1.072	12.6/5.1	3/0	none	-	3.9/na	na
Early-harvest processing variety. Early-harvest post-harvest merit not evaluated as this and most varieties typically produce acceptable fries directly from the field. 5-6 tubers per plant typical.										
*Early Harvest ~ 110 days after planting, Late Harvest ~ 150 DAP. ***na indicates variety not intended for out of storage processing. **HH = Hollow heart, BC = brown center, IBS = internal brown spot. A dash - indicates the variety is not considered for that market.										

2022 Tri-State Specialty Potato Clones - Washington State University

2022 Tri-State Specialty Trial					
US #1 Yield			Fresh Market Appearance	(See also Tri-State Specialty Section near end of book) Comments	
2022					
US#1 Yield	0-6 oz	6-10oz			
CWT/A	-----%	-----	5 = best		
<u>Red Skin/White Flesh*</u>					
Chieftain	862	39	36	3.0	Shape a bit irregular, somewhat flat.
Modoc	591	70	23	3.7	Deep red, nice skin set, various sizes.
A11582-1R	501	84	14	4.0	Nice deep red color, smaller.
A11596-6R	266	100	0	4.0	Nice, round, uniform size, smaller.
A08122-9RY	572	91	8	3.7	Lighter red, smaller, some feathery skin.
A08122-12Rsto	605	81	16	4.0	Nice deep red, larger, lots of growth cracks. Discard.
NDA8512C-1R	479	59	36	1.0	Severe growth cracks, discard.
<u>Red-Purple/Yellow Flesh</u>					
A11573-5RYsto	377	96	4	4.0	Deep red, nice deep eyes, with some scab.
<u>Yellow Flesh</u>					
Yukon Gold	514	22	27	3.0	Larger, variable size, nice skin.
Bintje	611	54	38	1.0	Heat sprouts, irregular shapes.
A11576-1Ysto	529	92	8	3.3	Mostly nice skin, smooth, pink eyes.
A11661-2Y	574	91	9	2.0	Pointy, with heat sprouts. Discard.
A08120-4Y	367	98	2	1.0	Very small, bad Rhizoc and other skin issues.
POR16PG34-1	485	83	16	1.0	Bad growth cracks, Rhizoc. Discard.
<u>Purple/Purple Flesh</u>					
Purple Majesty	571	81	17	2.7	Deep purple, lumpy, flat river rocks.
POR16PG25-2	575	77	19	3.3	Dark purple, deep eyes, feathery skin.
<u>Fingerling</u>					
Austrian Crescent	202	92	8	2.0	Fingerling, curved, skinny, odd shapes.
OR11157-1	132	93	0	3.0	Deep purple fingerling, with some bronzing.

*Skin/Flesh Color: R = Red, W = White, Y = Yellow, P = Purple, Rus = Russet, Buff = off-white with or without light russetting.



At-Harvest Grading Comments & Fresh Market Appearance

Newest Lines - 2022 Tri-State Trials			
Clone	Fresh Market Appearance 1-5 (5 = Best)		Tuber Appearance Comments*
	2022	2021	
Early Harvest Tri-State			
Clearwater Russet	4.0	4.0	Small, not early. Dark skin.
Ranger Russet	2.0	3.0	Good length, shape a bit irregular
Russet Burbank	1.0	1.7	Larger, skin non-uniform. Shape irregular.
Russet Norkotah	2.3	4.0	Mostly typy, dark skin, some bumpy ones.
Shepody	1.0	1.0	Large, white, non-uniform shape.
A09136-9LB	2.0	2.3	Smaller, short, irregular shapes.
A12169-5	1.3	-	Feathery, ugly spotty skin.
A13036-12	1.3	-	Round, lenticils, ugly skin.
A13072-7	2.0	-	Deep eyes, lumpy, large, bad skin.
A13091-5	2.0	-	Not early, short, plump, light russet.
AFA6346-2	1.0	-	Ugly, spotty, feathery skin, lots of greening!
A10071-1	2.0	-	Good length, thick skin, irregular shape.
A11381-3	2.0	-	Small, not early, light russet, short.
A12304-1sto	3.0	-	Not early, small, light russet.
COA13241-3	3.0	-	Good length, poor skin set.
COA14185-3	2.7	-	Good length, small, poor skin set.
AOR13064-2	3.0	3.3	Nice, long tubers, but poor skin set.
Late Harvest Tri-State			
Clearwater Russet	3.0	4.0	Smaller, mostly typy, but short.
Ranger Russet	2.8	1.0	Mostly typy, deeper eyes. Longer, a bit irregular shaped.
Russet Burbank	2.0	1.0	Irregular shapes, good length.
Russet Norkotah	3.3	4.0	Typy, good length, good size
A09136-9LB	2.0	1.3	River rocks, oval to round, ugly skin.
A11175-12TE	2.0	2.5	Mostly round, deeper eyes, plump, smaller.
A11326-1	2.0	2.0	Many round ones, plump, lumpy, deeper eyes.
A12169-5	1.5	-	Deep eyes, shape irregular, lots of US #2's.
A13036-12	2.0	-	River rock, lumpy, round to oval. Deep eyes.
A13072-7	2.0	-	Lumpy, shorter, points, lots of scab.
A13091-5	2.5	-	Smaller, round.
AFA6346-2	1.7	-	Severe greening. Low yield, smaller.
A10071-1	2.0	-	Heavy dark russet, pears. Scab.
A11381-3	2.8	-	Plump, very short, mostly round.
A12304-1sto	3.5	-	Typy, light to medium russet. Smaller.
COA13241-3	3.3	-	Long, plump, typy. Light russetting.
COA14185-3	2.8	-	Lumpy, mostly typy, some points.
AOR13064-2	2.3	2.3	Smaller ones, short, oval, scab.

*Typy - Visually appealing, uniform tuber shape.

AOR13064-2



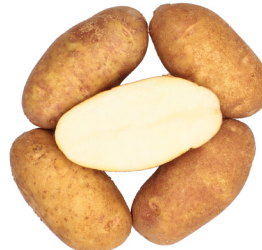
EARLY

Clearwater Russet



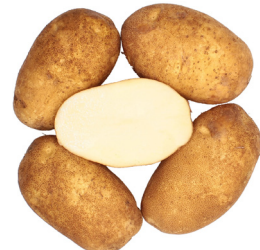
EARLY

COA13241-3



LATE

A12304-1sto



LATE

At-Harvest Grading Comments & Fresh Market Appearance

Advanced Lines - 2022 Regional Trials				
Fresh Market Appearance 1-5 (5 = Best)				
Clone	2022	2021	2020	Tuber Appearance Comments*
Early Harvest Regional				
Clearwater Russet	4.0	4.0	4.0	Small, not early, but typy.
Ranger Russet	3.0	2.0	2.5	Mostly typy, good length, skin not uniform.
Russet Burbank	2.0	1.0	2.7	Larger, shape irregular. Lots of knobs.
Russet Norkotah	3.0	4.0	3.0	Skin not uniform. Mostly typy.
Shepody	2.0	1.0	2.0	Larger, slightly irregular shape. Green sprouts.
A09086-1LB	2.0	1.7	-	Light russet, with poor skin set, ok shape, scab.
A10594-4sto	3.0	3.3	3.0	Not early, some points, some typy.
A12305-2adg	3.0	3.0	3.3	Poor skin set, somewhat typy.
AFA5661-8	3.0	3.0	2.0	Light russet, plump, not early.
AOR11217-3	4.0	4.0	3.7	Good length, dark skin, typy, poor skin set on some.
AOR08540-1	3.3	2.3	3.0	Typy, smaller, not early.
AC12090-3RU	2.7	-	-	Not early, rough skin type, some typy.
AOR10204-3	2.3	4.0	2.7	Larger, poor skin set, some pointy tubers.
CO13003-1RU	3.7	-	-	Typy, dark skin, not early.
CO10085-1RU	2.7	3.0	2.0	Not early, some lenticils, a lot of rot.
CO11009-3RU	3.7	3.0	4.0	Ok size and length, poor skin set, darker skin.
Late Harvest Regional				
Clearwater Russet	3.3	4.0	3.5	Typy, short, some round, smaller.
Ranger Russet	2.8	1.0	2.3	Mostly typy, long, a few irregular shapes.
Russet Burbank	2.3	1.0	2.3	Larger, shape a bit irregular. Knobs.
Russet Norkotah	3.0	4.0	3.0	Mostly typy, ok length and skin.
A09086-1LB	2.3	2.5	-	Spotty russetting, some oval shaped, short.
A10594-4sto	2.3	3.0	3.0	Severe greening, light russetting, plump.
A12305-2adg	2.3	1.8	2.3	Ugly, spotty skin, shape is irregular.
AFA5661-8	2.3	1.5	2.3	Light russetting, scab, irregular shape.
AOR11217-3	3.3	3.0	3.3	Shape a bit irregular, smaller. Short.
AOR08540-1	2.5	1.0	1.3	Some points, irregular shapes, greening an issue.
AC12090-3RU	3.5	-	-	Mostly typy, red tint to skin, severe greening.
AOR10204-3	3.3	2.0	2.0	Pointy, good length, irregular shapes.
CO13003-1RU	3.3	-	-	Shorter, mostly typy, some elephant hide.
CO10085-1RU	2.8	2.0	2.5	Short, small ones, round.
CO11009-3RU	3.8	3.3	3.5	Typy, good skin. Tubers a bit lumpy.

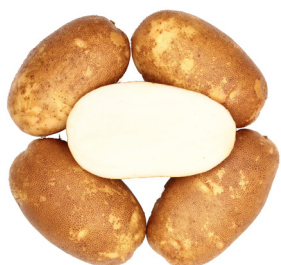
*Typy - Visually appealing, uniform tuber shape

AOR11217-3



EARLY

Clearwater Russet



EARLY

CO11009-3RU



LATE

Clearwater Russet



LATE

FRESH MARKET MERIT - NEWEST LINES

2020-2022

(5 = best) - Entries ranked by means

EARLY HARVEST - Fresh Market Merit Scores				
Entry	Mean	2022	2021	2020
1 Russet Norkotah	2.7	2.1	4.3	1.7
2 AOR13064-2	2.7	2.0	3.4	-
3 Ranger Russet	2.4	1.9	3.5	1.8
4 Clearwater Russet	2.1	1.9	2.4	2.0
5 COA13241-3	2.1	2.1	-	-
6 A1007-1	2.1	2.1	-	-
7 A12169-5	2.0	2.0	-	-
8 A11381-3	1.8	1.8	-	-
9 A13072-7	1.8	1.8	-	-
10 A09136-9LB	1.6	1.2	1.9	-
11 Russet Burbank	1.4	2.0	1.0	1.3
12 A13036-12	1.4	1.4	-	-
13 A12304-1sto	1.3	1.3	-	-
14 AFA6346-2	1.3	1.3	-	-
15 A13091-5	1.2	1.2	-	-
16 COA14185-3	1.2	1.2	-	-

LATE HARVEST - Fresh Market Merit Scores				
Entry	Mean	2022	2021	2020
1 A12304-1sto	3.7	3.7	-	-
2 Russet Norkotah	3.0	2.1	3.5	3.5
3 A11381-3	2.9	2.9	-	-
4 Clearwater Russet	2.5	2.4	2.5	2.5
5 A11326-1	2.3	2.5	2.0	-
6 A13036-12	2.2	2.2	-	-
7 A12169-5	2.1	2.1	-	-
8 A10071-1	2.1	2.1	-	-
9 COA13241-3	1.8	1.8	-	-
10 Ranger Russet	1.6	2.0	1.2	1.6
11 A11175-12TE	1.4	1.1	1.7	-
12 AOR13064-2	1.3	0.9	1.6	-
13 COA14185-3	1.3	1.3	-	-
14 A13072-7	1.2	1.2	-	-
15 Russet Burbank	1.1	1.4	0.6	1.3
16 A09136-9LB	1.0	1.1	1.0	-
17 AFA6346-2	0.9	0.9	-	-
18 A13091-5	0.7	0.7	-	-

For more information on these cultivars, see the Early and Late Harvest Regional Trial Sections in this Book. The dash (" - ") indicates the clone was not yet entered into the trial.

FRESH MARKET MERIT - ADVANCED LINES **2018-2022**

(5 = best) - Entries ranked by means

EARLY HARVEST - Fresh Market Merit Scores						
Entry	Mean	2022	2021	2020	2019	2018
1 AOR11217-3	3.5	3.0	4.1	4.3	2.7	-
2 Russet Norkotah	2.9	3.2	3.4	1.8	3.4	2.8
3 AOR10204-3	2.8	2.4	3.5	2.1	2.5	3.8
4 AOR08540-1	2.8	3.2	1.3	3.8	3.0	3.0
5 A12305-2adg	2.8	2.4	3.0	3.0	-	-
6 AFA5661-8	2.6	3.2	3.8	0.9	-	-
7 A10594-4sto	2.5	2.7	3.7	1.3	-	-
8 Clearwater Russet	2.4	1.5	2.8	2.8	-	-
9 CO11009-3RU	2.2	2.2	2.5	1.9	-	-
10 CO13003-1RU	2.1	2.1	-	-	-	-
11 Ranger Russet	1.9	2.5	1.4	1.4	1.7	2.6
12 Russet Burbank	1.4	1.0	0.7	1.3	1.6	2.4
13 AC12090-3RU	1.4	1.4	-	-	-	-
14 A09086-1LB	1.2	1.1	1.3	-	-	-
15 CO10085-1RU	0.9	1.0	0.7	1.0	-	-

LATE HARVEST - Fresh Market Merit Scores						
Entry	Mean	2022	2021	2020	2019	2018
1 AOR11217-3	3.1	2.6	2.8	3.1	3.9	-
2 Russet Norkotah	2.4	2.5	3.1	1.8	2.6	2.0
3 CO11009-3RU	2.4	2.8	2.4	2.0	-	-
4 A10594-4sto	2.4	2.0	2.7	2.3	-	-
5 Clearwater Russet	2.3	2.3	2.5	2.1	-	-
6 AC12090-3RU	2.2	2.2	-	-	-	-
7 A12305-2adg	2.2	2.4	2.1	2.3	-	-
8 AOR10204-3	2.0	3.2	2.5	0.9	1.9	1.5
9 A09086-1LB	2.0	1.7	2.3	-	-	-
10 AFA5661-8	1.6	1.6	1.6	1.5	-	-
11 AOR08540-1	1.5	1.9	1.1	1.1	2.3	1.3
12 CO10085-1RU	1.4	1.4	1.3	1.5	-	-
13 CO13003-1RU	1.2	1.2	-	-	-	-
14 Ranger Russet	1.2	2.2	0.6	1.1	1.4	0.9
15 Russet Burbank	1.2	1.6	0.6	1.3	1.3	1.3

For more information on these cultivars, see the Early and Late Harvest Regional Trial Sections in this Book. The dash (" - ") indicates the clone was not yet entered into the trial.

PROCESS MARKET MERIT - NEWEST LINES

2020-2022

(5 = best) - Entries ranked by Field Performance means

EARLY HARVEST - Process Market Merit Scores					
Field Performance Mean			Field Performance Only*		
Entry		Mean	2022	2021	2020
1	A10071-1	3.3	3.3	-	-
2	A12169-5	3.2	3.2	-	-
3	AOR13064-2	3.2	2.1	4.2	-
4	COA14185-3	3.1	3.1	-	-
5	Ranger Russet	3.0	3.2	4.0	1.8
6	A09136-9LB	3.0	2.8	3.2	-
7	A13072-7	3.0	3.0	-	-
8	A11381-3	2.8	2.8	-	-
9	COA13241-3	2.7	2.7	-	-
10	Shepody	2.5	2.7	1.5	3.3
11	A13091-5	2.4	2.4	-	-
12	Russet Burbank	2.1	3.4	1.2	1.6
13	Clearwater Russet	1.9	2.0	1.4	2.2
14	A13036-12	1.6	1.6	-	-
15	A12304-1sto	1.5	1.5	-	-
16	AFA6346-2	1.4	1.4	-	-

*Postharvest values are not given for the Early Harvest Trial because all varieties typically fry well when delivered directly from the field and cold storage is not typical. The dash (" - ") indicates the clone was not yet entered into the trial.

LATE HARVEST - Process Market Merit Scores									
Field & Postharvest Processing Performance									
Entry		All Years							
		Post		2022		2021		2020	
		Field Mean	Harvest Mean	Field	Post Harv	Field	Post Harv	Field	Post Harv
1	A12304-1sto	4.9	3.5	4.9	3.5	-	-	-	-
2	A11326-1	4.7	2.6	5.0	2.8	4.4	2.4	-	-
3	A13072-7	4.4	3.4	4.4	3.4	-	-	-	-
4	COA13241-3	4.0	2.9	4.0	2.9	-	-	-	-
5	A13036-12	3.9	4.1	3.9	4.1	-	-	-	-
6	A12169-5	3.9	3.9	3.9	3.9	-	-	-	-
7	COA14185-3	3.7	3.7	3.7	3.7	-	-	-	-
8	Ranger Russet	3.6	3.0	3.8	3.5	3.4	2.6	3.8	2.8
9	Clearwater Russet	3.6	2.9	3.4	3.9	3.4	2.5	4.1	2.4
10	AOR13064-2	3.4	4.4	3.1	4.7	3.8	4.0	-	-
11	A10071-1	3.3	3.3	3.3	3.3	-	-	-	-
12	A11381-3	3.2	3.4	3.2	3.4	-	-	-	-
13	A13091-5	2.4	3.9	2.4	3.9	-	-	-	-
14	A09136-9LB	2.2	3.6	1.7	4.0	2.8	3.1	-	-
15	Russet Burbank	1.9	1.7	2.4	2.1	1.7	1.3	1.6	1.8
16	A11175-12TE	1.9	3.5	1.7	3.6	2.1	3.4	-	-
17	AFA6346-2	1.5	2.8	1.5	2.8	-	-	-	-

For more information on these cultivars, see the Early and Late Harvest Regional Trial sections in this book. Varieties with 'fresh' were designated for direct processing or fresh market only and are indicated with "na".

PROCESS MARKET MERIT - ADVANCED LINES 2018-2022

(5 = best) - Entries ranked by Field Performance means

EARLY HARVEST - Process Market Merit Scores						
Entry	Field Performance Mean	Field Performance Only*				
		2022	2021	2020	2019	2018
1 AOR11217-3	4.5	3.5	4.7	4.8	4.9	-
2 A12305-2adg	4.0	3.1	4.5	4.4	-	-
3 AOR08540-1	3.8	3.5	3.2	4.3	4.0	3.9
4 AOR10204-3	3.6	3.9	3.9	2.7	4.0	3.4
5 Clearwater Russet	3.2	2.1	3.0	4.5	-	-
6 A09086-1LB	3.1	3.2	3.0	-	-	-
7 Shepody	3.0	3.0	1.4	3.2	3.9	3.7
8 Ranger Russet	2.9	3.0	2.4	2.7	3.4	3.2
9 CO11009-3RU	2.7	2.3	3.7	2.0	-	-
10 A10594-4sto	2.5	1.3	3.9	2.4	-	-
11 AFA5661-8	2.4	2.8	2.8	1.5	-	-
12 Russet Burbank	2.3	1.8	1.2	2.7	3.3	2.5
13 CO10085-1RU	2.2	2.4	2.0	2.1	-	-
14 AC12090-3RU	1.6	1.6	-	-	-	-

*Postharvest values are not given for the Early Harvest Trial because all varieties typically fry well when delivered directly from the field and cold storage is not typical. The dash (" - ") indicates the clone was not yet entered into the trial.

PROCESS MARKET MERIT - ADVANCED LINES 2018-2022

(5 = best) - Entries ranked by Field Performance means

LATE HARVEST - Process Market Merit Scores													
Field & Postharvest Processing Performance													
All Years													
Post			2022		2021		2020		2019		2018		
Entry	Field Mean	Harvest Mean	Field	Post Harv	Field	Post Harv	Field	Post Harv	Field	Post Harv	Field	Post Harv	
1	A09086-1LB	4.5	2.5	4.3	2.8	4.7	2.1	-	-	-	-	-	-
2	AFA5661-8	4.2	2.7	4.9	3.2	3.8	2.3	4.1	2.7	-	-	-	-
3	Clearwater Russet	4.0	3.1	4.0	3.9	4.2	3.0	3.8	2.5	-	-	-	-
4	AOR11217-3	4.0	3.5	3.3	4.0	3.6	2.8	4.5	3.4	4.5	3.9	-	-
5	CO11009-3RU	4.0	4.4	3.9	4.6	4.4	4.6	3.6	3.9	-	-	-	-
6	A12305-2adg	3.8	2.3	3.8	3.1	3.3	1.4	4.2	2.4	-	-	-	-
7	Ranger Russet	3.3	3.2	4.4	3.6	2.8	2.4	2.7	2.8	3.2	3.2	3.6	4.0
8	A10594-4sto	2.9	3.5	3.0	3.8	3.5	3.4	2.3	3.3	-	-	-	-
9	AOR10204-3	2.7	na	3.0	na	3.4	na	2.1	na	3.1	na	1.9	na
10	AOR08540-1	2.6	2.5	3.6	2.6	2.4	2.1	2.4	2.7	1.9	na	2.5	na
11	CO10085-1RU	2.5	2.3	2.2	2.9	1.6	1.9	3.8	2.1	-	-	-	-
12	AC12090-3RU	1.9	2.8	1.9	2.8	-	-	-	-	-	-	-	-
13	CO13003-1RU	1.9	2.1	1.9	2.1	-	-	-	-	-	-	-	-
14	Russet Burbank	1.8	1.7	1.0	2.2	1.1	1.4	2.2	1.3	2.5	1.5	2.2	2.2

For more information on these cultivars, see the Early and Late Harvest Regional Trial sections in this book. Varieties with 'fresh' were designated for direct processing or fresh market only and are indicated with "na".

Fresh Market Value - Methods

Economic Potential

The gross return in U.S. dollars per acre for each trial entry was calculated using WA (Columbia Basin) four-year average fresh potato prices. Production costs per acre were not applied. All assumptions are listed in the table below. Assessing the fresh value of a given lot of potatoes is difficult because the actual market allows fresh-pack sheds to utilize a mix of tuber sizes, packaging, and marketing opportunities to maximize income potential. Following discussions with actual pack-sheds and complying with USDA standards, the packaging and size ranges described below provide a good base for variety comparison. A packaging and handling fee (pack-shed operating fee) of \$4.00 was assessed on each CWT of potatoes. This economic evaluation does not fully account for consumer preferences for each trial entry.

Fresh-pack market 4-year average shipping point prices per tuber size and grade with associated pack-fees.

Markets/Packaging ^a	Range of Tuber Sizes for Each Package Type and USDA Grade		Four Year WA State Columbia Basin Average Prices ^c	Pack-Shed Fee: Packaging and Handling	Adjusted Value
	U.S. No. 1 ^b	U.S. No. 2			
	oz	oz	\$/CWT	\$/CWT	\$/CWT
<u>50 lb cartons</u>					
100 Count	7 to 8.5		\$13.54	\$4.00	\$9.54
90 Count	8.5 to 9.5		\$14.71	\$4.00	\$10.71
80 Count	9.5 to 10.5		\$17.02	\$4.00	\$13.02
70 Count	10.5 to 12.5		\$17.62	\$4.00	\$13.62
60 Count	12.5 to 14		\$17.61	\$4.00	\$13.61
50 Count	14 to 18		\$17.06	\$4.00	\$13.06
<u>10 lb Film Bags</u>					
Non-size A	4 to 7		\$9.15	\$4.00	\$5.15
100 lb Burlap Sacks					
10 oz Min. Size U.S. No. 2		10 to 20	\$8.60	\$4.00	\$4.60
10 oz Min. Size U.S. No. 2	18 to 20		\$8.60	\$4.00	\$4.60
<u>Bulk</u>					
Process-Culls	< 4	< 10	\$4.00	\$4.00	\$0.00
Process-Culls	> 20	> 20	\$4.00	\$4.00	\$0.00

^aCount = tuber number per 50 lb carton.

^b18 to 20 oz U.S. No. 1 tubers are typically of marginal value on the fresh market due to their large size. They were therefore priced as U.S. No. 2, 10 oz minimum size.

^cSales F.O.B. Shipping Point, market periods 2008-2011 (USDA Federal-State Market News Service 2008-2011). Process-culls priced at regional process-cull market value.

Process Value - Methods

Early Harvest

Economic Potential

The gross return in U.S. dollars per acre for each trial entry was calculated using an early harvest mock processing contract similar to those used by Washington State processors. All assumptions are listed below.

Contract Assumptions:

1. Base price of \$160/ton.
 - a. Base price is an average of early-harvest Ranger Russet contracts from Washington processors.
2. To compensate for yield loss due to early harvest, the base price was increased by \$1.00/ton per day for each day potatoes were harvested earlier than Sept. 1.
3. Early harvest quality parameters were identical to those mentioned below in the Late Harvest Process Value – Methods.

Late Harvest

Economic Potential

The gross return in U.S. dollars per acre for each trial entry was calculated using a late-harvest mock processing contract. Process-market values are based on criteria (below) similar to that used by WA potato processors. Production costs per acre were not applied. Direct delivery contract assumptions are listed below.

Contract Assumptions:

1. **Base price:** \$160/ton for market (U.S. #1 & 2) grade tubers.
2. **Six oz clause:** Premiums for market grade tubers 6 oz or greater of \$0.80/ton for each percentage point >53% of the total tuber yield composite, with premium maximum not to exceed a total of \$12.00/ton. Penalties were \$1.00/ton for each percentage point below 53% > 6 oz tubers; below 40% > 6 oz, lots were penalized \$20/ton.
3. **US #1 clause:** Premiums for US #1 grade tubers 6 oz or greater of \$0.40/ton for each percentage point >60% of the total tuber yield composite, with premium maximum not to exceed a total of \$10.00/ton. Penalties were \$0.20/ton for each percentage point below 60% > 6 oz US #1 tubers, with the penalty maximum not to exceed a total of \$4.20/ton.
4. **Undersized clause:** Market grade potatoes <4 oz (process culls) were valued at \$60.00/ton.
5. **Specific Gravity clause:** Premiums per ton were \$1.00 at 1.078, \$3.00 at 1.079, \$5.00 at 1.080, \$7.00 at 1.081, \$8.00 at 1.082, \$9.00 at 1.083, with a maximum of \$10.00 for 1.084 through 1.088. Above 1.088 premiums were as follows: \$9.00 at 1.089, \$8.00 at 1.090, \$7.00 at 1.091, \$6.00 at 1.092, \$5.00 at 1.093, \$4.00 at 1.094, \$3.00 at 1.095, \$2.00 at 1.096, \$1.00 at 1.097. \$0.00 at 1.098 and \$0.00 at 1.099. Above 1.099, lots were penalized \$1.00/ton with no ceiling. No premium or penalty for a value of 1.077. Penalties per ton were \$5.00 at 1.076, \$10.00 at 1.075, and \$15.00 at 1.074. Below 1.074, lots were penalized \$20.00/ton with no rejection minimum.
6. No premiums or penalties were applied for bruise, tuber fry color, sugar content, or internal defects.

2022 Postharvest Procedures

Early Harvest

Culinary and quality characteristics of clones from the Red/Specialty Trial were evaluated after oven-baking, microwaving and boiling. Four- to six-ounce tubers were selected for the cooking protocols described below. After cooking, each tuber was halved from stem to bud end. One half was immediately tasted and evaluated on a scale from 1 to 5 (5 is best) for texture, flavor, tuber center, and skin characteristics. The remaining half was incubated for 30 minutes at room temperature and after-cooking-darkening was then graded on a 1 to 5 scale based on a color chart for white- and yellow-fleshed clones (1 = excessive graying, 5 = no discoloration).

Oven Baking - Tubers were pierced twice with a fork on each side and baked at 400°F for 1 hour.

Boiling - Tubers were cooked in a sieved double-boiler for 1 hour after coming to a boil.

Microwaving - Tubers were pierced twice with a fork on each side and cooked for 10 minutes at the outer edge of a microwave oven (high setting). The tubers were then turned over and moved to the center of the microwave where they were cooked an additional 10 minutes. Four-tuber samples from each of two clones (eight tubers total) were cooked simultaneously.

Cooking Time – was determined on 0.5-inch x 0.5-inch cores of tuber tissue cut from the stem (2 cores) and bud (2 cores) ends of 4 tubers of each clone. To prepare the cores, a 0.5-inch-thick longitudinal section was removed from the center of each tuber. Two cores were then cut from each end, one from the cortical area just beneath the periderm and one from the center region. The cores were placed in boiling water and timed until a weighted (90-g) pin penetrated the tissue.

Chipping - Tubers were cut longitudinally from stem to bud end. One half was sliced into 0.05-inch thick chips. The first slice was discarded to ensure uniform thickness of the second slice, which was processed as a chip. The chip samples (12 tubers/clone; 1 chip per tuber) were rinsed with water and fried in 375°F vegetable oil for 2 minutes. The chips were drained on paper towels and chip color was graded using the potato chip Snack Food Association (SFA) color chart (1 = light, 5 = dark).

Late Harvest

Testing of clones in the late harvest trials involved the following postharvest quality evaluations. As soon as possible after harvest, tuber specific gravity and fry color (Photovolt readings) were measured on 12 tubers from each clone. Clones designated as fresh processing were French fried and Photovolt readings compared at harvest only. Additional tubers of each clone were placed in storage at 40, 44 and 48°F. Tubers stored at 48°F were evaluated for bruise potential, soft rot susceptibility, consumer acceptance of French fries, and cooking time in October and November. Reducing sugar content and French fry color were assessed in early December. The extent of sprouting was recorded in late December. Tubers stored at 44°F were also evaluated for sugar accumulation in December. Storage of tubers at 40°F until mid December was done to determine the “cold-frying” potential of clones. Fry color was assessed as described below.

Statistical Analysis

Least significant difference (LSD) values are included in the tables to facilitate evaluation of differences in fry color (Photovolt readings), specific gravity, taste panel ratings, bruise, soft rot, and sprouting. Any two means whose difference is greater than or equal to the LSD value are significantly different.

Evaluation of Rated Characteristics

Specific gravity - was measured on a 12-tuber sample from each clone prior to storage by the weight-in-air/weight-in-water method and values were transformed into a 5-point scale as shown below. These same tubers were then used for French fry quality evaluation.

5 = 1.083–1.088
 4 = 1.081–1.082 and 1.089–1.091
 3 = 1.080 and 1.092–1.093
 2 = 1.078–1.079 and 1.094–1.095
 1 = 1.076–1.077 and 1.096 or higher
 0 = 1.075 or lower

Tuber shape - The lengths and widths of up to twenty five 8- to 10-ounce tubers from each clone were measured and length:width (L/W) ratios reported. This was done to reveal the effects (if any) of growing location on tuber shape and to estimate the yield (% by number) of ≥ 3 -inch long fries for each clone. Fry yields were calculated based on algorithms relating tuber shape (L/W) to the number and weight of fries. The following table reflects these relationships.

Visual Shape	Tuber L/W ratio	Percentage of French Fries (≥ 3 in.) (by weight)	(by number)
Round	1.00	53.9	35.2
	1.25	70.3	51.6
Blocky	1.50	82.6	64.1
	1.75	90.8	72.8
	2.00	95.0	77.6
Elongated	2.25	95.1	78.5

A L/W ratio close to one indicates a round tuber which is not ideally suited for French fry production. A ratio in the 1.5-1.8 range represents an oblong, blocky tuber, which is more desirable for processing. A typical L/W ratio for Russet Burbank is about 1.80. A schematic illustrating the relative sizes of potatoes having various ratios is included in the postharvest sections for the Tri-State and Regional Trials. Blocky and elongated tubers result in high French fry yield with less waste. Length to width ratios were transformed into a 5-point rating scale as shown below:

5 = 1.8 L/W and above
 4 = 1.65-1.79 L/W
 3 = 1.5-1.64 L/W
 2 = 1.35-1.49 L/W
 1 = 1.2-1.34 L/W
 0 = Less than 1.2 L/W

French fries - were processed by frying tuber slices (3/8" x 1 1/8" x length of tuber) in 375°F oil for 3.5 minutes. Fry color was measured with a Photovolt meter within 3 minutes of frying. A Photovolt reading of 19 or less was considered unacceptably dark. The stem and bud end Photovolt readings were reported along with the USDA color class (see below). A difference of 9 Photovolt units or more between bud and stem end constitutes non-uniform fry color. A point was either added or subtracted from the total score, based on the uniformity of fry color. A (+) or (-) symbol is included with the Photovolt ratings to indicate that a point has been added or subtracted during tabulation of the total score. The USDA color classes assigned to French fries were based upon Photovolt readings of the darkest ends (usually the stem end) and are for information only; they were not used in determining the final rating.

<u>Photovolt</u>	<u>USDA color</u>	<u>Rating</u>	<u>Photovolt reading</u>
>31	0	5	= 41 or higher
25-30	1	4	= 36 thru 40
20-24	2	3	= 31 thru 35
15-19	3	2	= 25 thru 30
<14	4	1	= 20 thru 24
		0	= 19 or less

Taste panels - were used to determine the consumer acceptance of French fries prepared from tubers of each clone. All of the clones evaluated by the taste panels were produced through classical breeding techniques. Slices (3/8" x 3/8" x length of tuber) from tubers stored at 48°F were fried in 375°F oil for 4.5 minutes. Approximately 12 untrained panelists rated the fries on a 1 to 5 (5=best) scale for taste, texture, internal flesh color, and weak units (limpness). The average rating of the four fry characteristics is reported and was used in calculating the total rating score for each clone.

Calculation of Total Score - The overall postharvest rating for each clone is equal to the sum of the individual ratings for each of the following quality characteristics:

Quality Parameter	Maximum Rating*
Fry color prior to storage (0-5 $\pm$ 1 uniformity)	6**
Specific gravity (0-5)	5
Length to Width Ratio (0-5)	5
Taste panel (avg of 5 pts for taste, texture, internal flesh color and limpness of cooked fries) (1-5)	5
Fry color after 60 days storage at:	
48°F fry color (0-5 $\pm$ 1 uniformity)	6**
44°F fry color (0-5 $\pm$ 1 uniformity)	6**
40°F fry color (0-5)	5
Postharvest rating =	38

*All characteristics are rated from 0-5 or 1-5 as indicated. A rating of 5 is best. **Uniformity of color from bud to stem end is also evaluated. The fry color ratings of samples prior to storage and after 60 days at 44 and 48°F will gain or lose a point, depending on uniformity. For example, if the difference between stem and bud end fry color is <9 photovolt reflectance units, indicating highly uniform fry color, a point is added to determine the overall score. On the other hand, if the difference between stem and bud end fry color is $\geq$ 9 photovolt reflectance units (non-uniform fry color), a point is subtracted to end up with the final score. Hence, a clone can receive a maximum of 38 points.

Evaluations of Non-Rated Characteristics

Reducing sugars - concentrations in tuber stem and bud ends were determined on a percent dry weight basis. Reducing sugars were assayed spectrophotometrically or were estimated based on fry color in tubers stored at 44° and 48°F.

Bruise potential and severity - For each clone, 12 tubers were warmed to room temperature for one day. Each tuber was then held under a device that dropped a 4-ounce weight from a height of 23 inches. Each tuber received four such impacts, two on the stem end and two on the bud end. After 24 hours, the tubers were peeled and the percentage of impacts resulting in a blackspot or shatter bruise was calculated. In addition, the severity of bruise was also rated on a 1-5 scale as indicated below. Bruises that rated 3, 4, or 5 were used in the overall percentage calculation.

Bruise Severity Ratings:

- 1 = No bruise
- 2 = White knot bruise
- 3 = Less than 50% of the impact area darkened
- 4 = Greater than 50% of the impact area darkened, or the whole impact area is light brown
- 5 = 100% of the impact area is dark

Soft rot index - Bacterial soft rot susceptibility was determined by wounding the stem and bud ends of room-temperature tubers, inoculating the wounds with *Pectobacterium carotovorum* subsp. *carotovorum*, and incubating the tubers (6 tubers per clone) for 24 hours at 72°F in a mist chamber. The percentage fresh weight of tissue lost due to rot is reported.

Reconditioning potential - Reconditioning ability of tubers stored at 40°F for approximately 60 days was determined by subsequently storing the tubers at 60°F for 21 days. The change in fry color over the reconditioning interval provides a relative measure of the reconditioning potential for each clone.

Blanching potential - Blanching ability of tubers stored at 40°F for approximately 60 days was determined by placing center-cut potato strips into a water bath of 160°F for 10 min. Strips were then rinsed with fresh water and fried. The change in fry color from the non blanched sample shows the relative potential to leach sugars to recover fry color.

Sprouting - The degree of sprout development in tubers stored at 40 and 48°F was assessed after all other tests had been completed (usually late December). The percentage of tubers that sprouted and the average sprout length per tuber were recorded for 15 tubers of each clone.

Long-term Storage Characteristics of Clones in the Tri-State and Regional Variety Trials

For evaluation of long-term storability, tubers were held at 48°F until late December and then transferred to 44°F. The tubers were processed into French fries, and reducing sugars were measured in late April or early May of the following year. Tubers were not reconditioned prior to frying. Results from clones that were advanced from the Tri-State to the Regional Trial are reported in the Regional Trial section.

2022 Early Harvest Regional Trial

Location: WSU Research Center – Othello, WA

Planting Date: March 30

Vine Kill Date: August 5

Harvest Date: August 16

Days Grown: 128

Regional trials are conducted throughout the western region of the United States, including Washington. Entries in the Regional Trial are chosen by a coordinating committee and are grown for both early (Early Regional) and full (Late Regional) season harvest. The 2022 early harvest trial compared 5 local reference varieties to 11 new clones on the WSU Othello Research Station. The following is a summary of the Washington field and post-harvest results. See also: grading comments and merit scores near front of book

Fresh Market Standout(s): AOR13064-2

Process Market Standout(s): A00071-1 and A12169-5

Yield and Economic Data

➤ Total Yield and U.S. #1 Yield

Highest: AOR10204-3 had the highest total yield (717 CWT/A) and the highest U.S. #1 yield was A12305-2adg (580 CWT/A). A12305-2adg had the second highest total yield (573 CWT/A) and the second highest U.S. #1 yield was A10594-4sto (555 CWT/A).

Lowest: CO11009-3RU had the lowest total yield (461 CWT/A). Clearwater Russet had the second lowest total yield (476 CWT/A) and the lowest U.S. #1 yield was CO10085-1RU (323 CWT/A).

➤ % U.S. #1's (greater than 4 oz)

Highest: A10594-4sto (91%) and AFA5661-8 (90%).

Lowest: Clearwater Russet (65%) and Russet Burbank (67%).

➤ Carton Yield (100 to 50 Count (7 to 18 oz U.S. #1 Tubers))

Highest: A10594-4sto (19.1 Tons/A) and A12305-2adg (18.9 Tons/A).

Lowest: Clearwater Russet (6.3 Tons/A) and CO10085-1RU (6.8 Tons/A).

➤ Gross Return (\$/acre)

Fresh Market Highest: A12305-2adg and A10594-4sto.

Fresh Market Lowest: Clearwater Russet, CO10085-1RU, and CO11009-3RU.

Process Market Highest: A10594-4sto, AOR08540-1, and AOR10204-3.

Process Market Lowest: CO10085-1RU, Clearwater Russet, and AC12090-3RU.

2022 Early Harvest Tri-State Trial

Summaries

ENTRY	TOTAL YIELD						CARTON YIELD		PROCESS YIELD	
	CWT/A	STATS**	Tons/A	US # 1's*	US # 2's*	Culls*	100-50 count (US 1's 7-18 oz) % of Total Yield	Tons/A	US 1's and 2's > 6 oz % of Total Yield	Tons/A
				> 4 oz	> 4 oz	& < 4 oz				
Clearwater Russet	488	CD	24.4	69	1	30	24	5.9	39	9.5
Ranger Russet	598	ABC	29.9	75	14	11	51	15.3	74	22.2
Russet Burbank	677	A	33.8	77	7	16	50	16.8	67	22.5
Russet Norkotah	622	AB	31.1	81	6	13	48	15.1	66	20.7
Shepody	509	BCD	25.5	77	12	11	48	12.3	82	20.9
A09136-9LB	524	BCD	26.2	82	6	12	54	14.2	75	19.7
A12169-5	591	ABC	29.5	85	6	8	65	19.2	85	25.1
A13036-12	484	CD	24.2	85	2	13	56	13.6	72	17.8
A13072-7	580	ABC	29.0	85	3	12	51	14.9	76	22.1
A13091-5	501	BCD	25.1	84	0	15	54	13.6	66	16.5
AFA6346-2	503	BCD	25.2	72	8	21	56	14.2	70	17.7
A10071-1	627	AB	31.4	76	5	19	50	15.7	63	20.0
A11381-3	588	ABC	29.4	82	2	16	49	14.5	62	18.4
A12304-1sto	474	CD	23.7	68	2	31	25	5.8	39	9.2
COA13241-3	481	CD	24.0	81	0	19	47	11.3	59	14.3
COA14185-3	528	BCD	26.4	72	7	21	36	9.5	53	14.4
AOR13064-2	426	D	21.3	83	5	12	49	10.5	69	14.7

ENTRY	US # 1 YIELD						> 4 oz SPECIFIC GRAVITY	INTERNAL DEFECTS (%)		
	> 4 oz CWT/A	STATS**	Tons/A	> 4 oz	4-7 oz*	7-14 oz*		(8-12 oz tubers)		
					%	%		% HH	% BC	% IBS
Clearwater Russet	336	D	16.8	66	34	0	1.080	0	0	0
Ranger Russet	446	ABCD	22.3	28	60	12	1.076	0	0	0
Russet Burbank	521	A	26.0	35	57	9	1.076	2	10	0
Russet Norkotah	508	A	25.4	39	50	11	1.071	0	0	0
Shepody	391	ABCD	19.5	16	50	34	1.073	0	0	0
A09136-9LB	434	ABCD	21.7	24	55	21	1.079	0	0	3
A12169-5	505	AB	25.3	15	63	23	1.074	0	0	0
A13036-12	419	ABCD	20.9	28	46	26	1.071	0	0	0
A13072-7	492	ABC	24.6	22	47	31	1.075	0	10	0
A13091-5	423	ABCD	21.1	31	55	14	1.081	0	0	0
AFA6346-2	365	BCD	18.2	18	67	15	1.076	4	0	0
A10071-1	485	ABC	24.3	35	58	7	1.069	0	0	0
A11381-3	484	ABC	24.2	38	54	7	1.076	0	0	0
A12304-1sto	322	D	16.1	64	36	0	1.076	0	0	0
COA13241-3	388	ABCD	19.4	42	51	8	1.079	0	0	0
COA14185-3	383	ABCD	19.1	51	41	8	1.081	0	0	2
AOR13064-2	354	CD	17.7	36	47	17	1.075	0	0	0

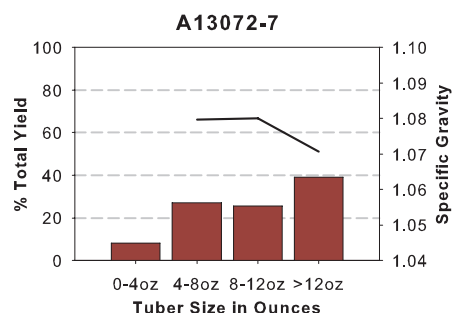
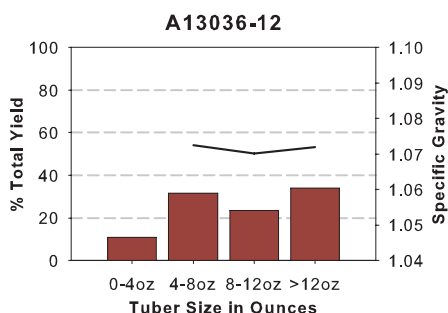
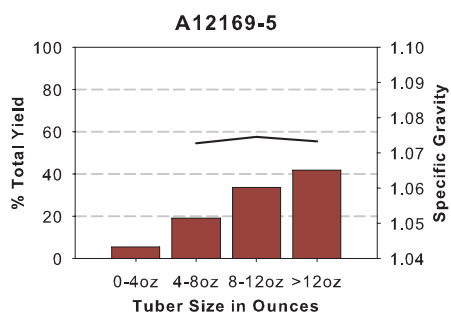
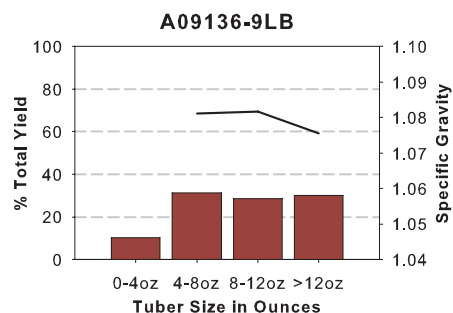
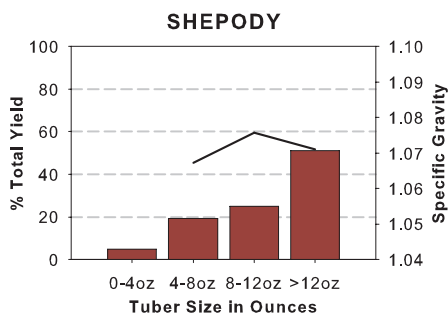
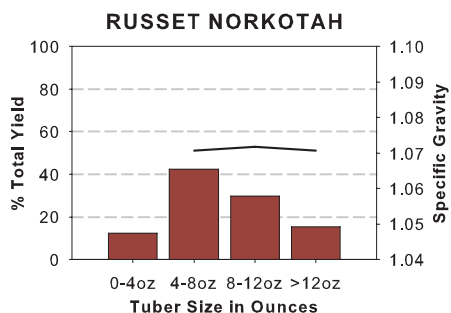
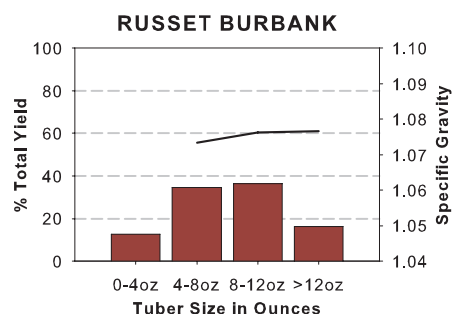
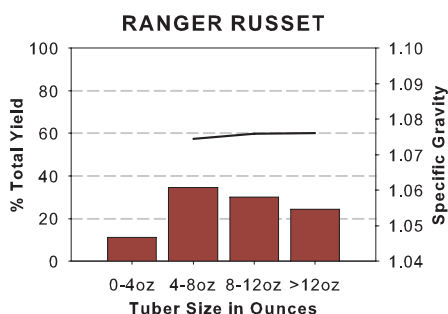
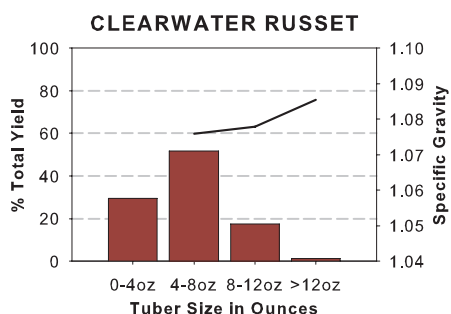
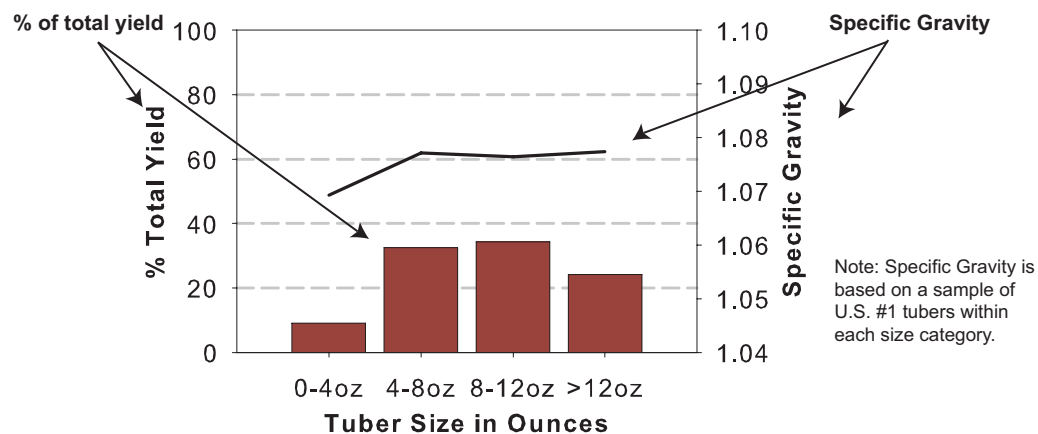
ENTRY	50 DAY	60 DAY	TUBER	STEMS PER	AVERAGE TUBER		SKIN	TUBER	BRUISE (%)	
	STAND	STAND	GREENING	PLANT	WEIGHT	NUMBER	SET	SHAPE	(8-12 oz tubers)	
	% Emerged	% Emerged	% Total Yield	Above Ground	Ounces	Tubers/Plant	1 = Poor 5 = Good	1 = Round 5 = Long	BLACKSPOT	SHATTER
Clearwater Russet	38	93	0	2.6	4.4	10.8	4.0	3.0	0	28
Ranger Russet	64	93	1	2.4	6.7	8.8	3.0	4.0	8	25
Russet Burbank	64	100	0	2.4	6.5	10.2	3.0	3.0	4	40
Russet Norkotah	60	91	0	2.3	6.1	10.0	4.0	3.0	0	0
Shepody	38	100	5	1.8	9.4	5.3	4.0	3.0	0	34
A09136-9LB	78	96	1	3.1	7.0	7.3	3.0	2.0	3	53
A12169-5	24	96	1	1.5	8.7	6.6	3.0	2.3	0	56
A13036-12	80	89	1	2.4	7.0	6.8	4.0	2.0	0	43
A13072-7	36	98	4	2.4	7.8	7.2	3.0	3.0	2	38
A13091-5	33	98	1	2.1	6.2	7.9	3.0	2.0	0	73
AFA6346-2	18	91	12	1.2	7.0	7.0	3.0	2.0	2	10
A10071-1	64	91	0	2.8	5.8	10.6	4.0	3.0	0	28
A11381-3	51	98	0	2.8	5.7	10.1	2.0	2.0	0	30
A12304-1sto	33	80	0	3.2	4.2	11.0	2.0	4.0	0	35
COA13241-3	20	82	4	2.2	5.7	8.3	2.0	4.0	0	10
COA14185-3	71	96	1	2.2	5.4	9.5	2.0	3.3	0	30
AOR13064-2	62	100	2	2.2	6.7	6.2	2.0	3.5	0	28

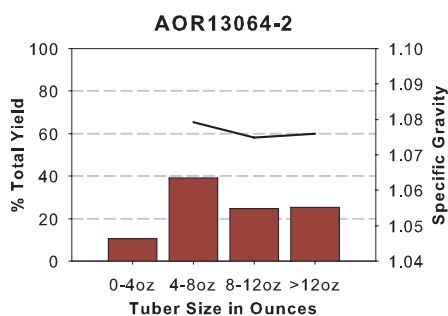
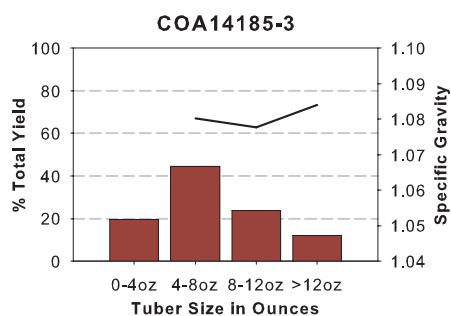
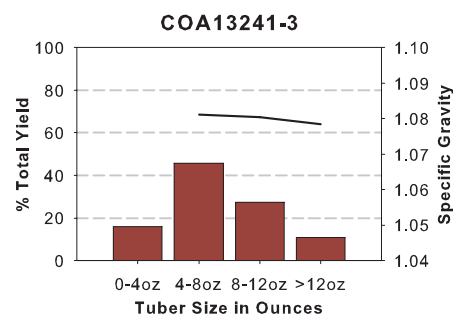
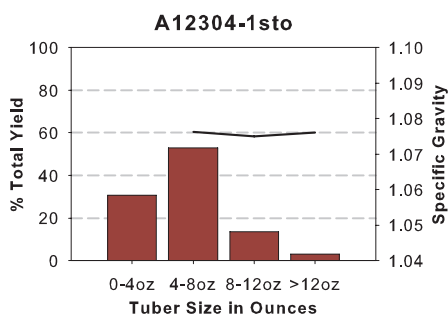
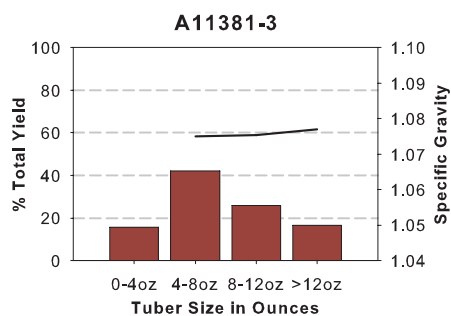
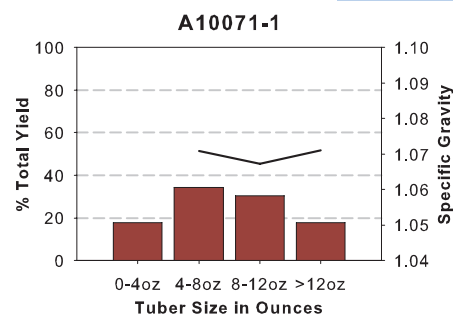
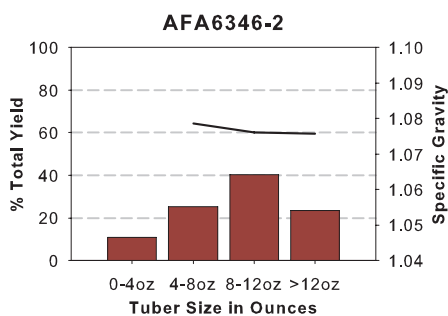
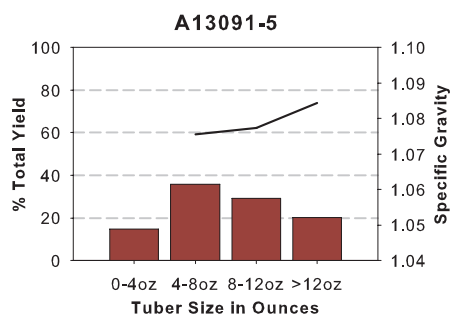
* Percent values may not total 100% due to rounding

2022 Early Harvest Tri-State Trial

Tuber Yield and Specific Gravity Distributions

12 inch In-Row Spacing





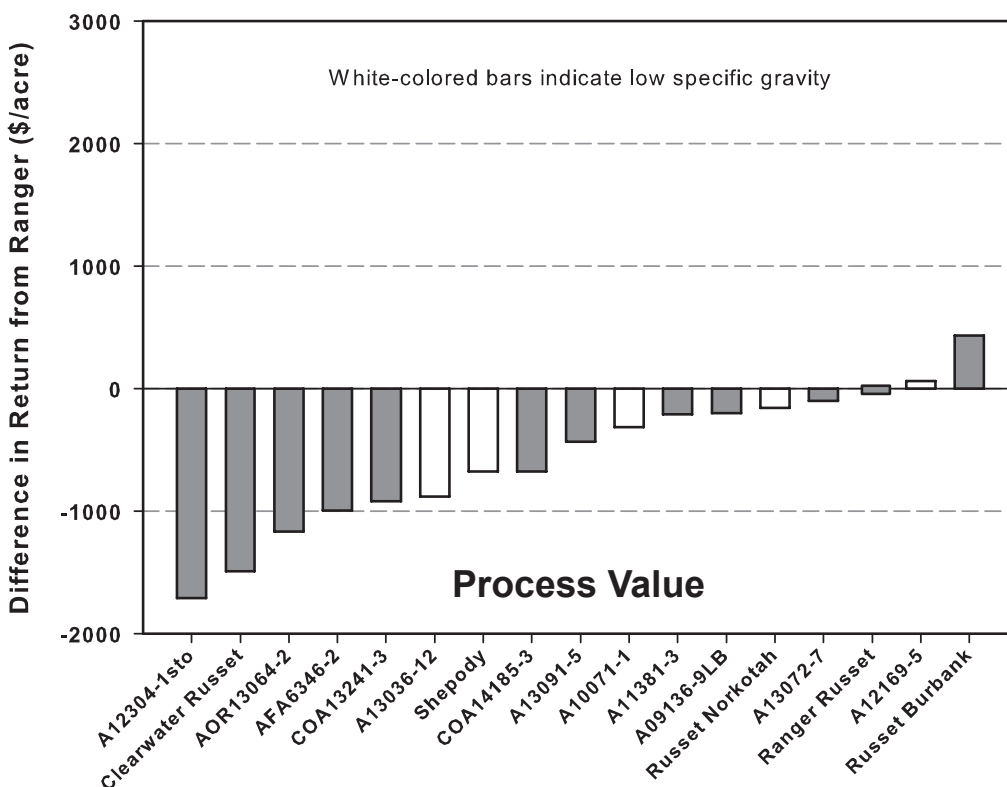
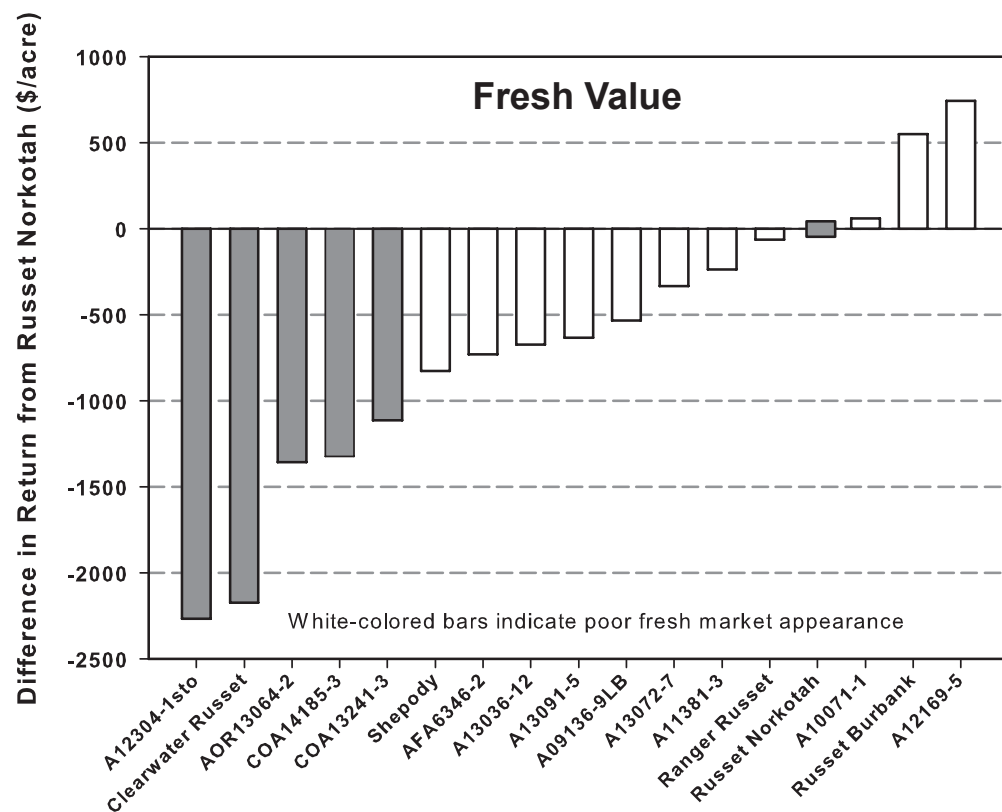


Figure 1 (top). Difference in gross return per acre (Fresh Market) from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry.

Figure 2 (bottom). Difference in gross return per acre (Process Market) from Ranger Russet calculated by subtracting the gross return of Ranger Russet from the gross return of the particular entry. Entries with the white-colored bars would be penalized due to a low specific gravity.

2022 Early Harvest Tri-State Trial

Tubers

Clearwater Russet



Ranger Russet



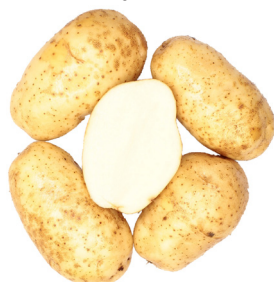
Russet Burbank



Russet Norkotah



Shepody



A09136-9LB



A12169-5



A13036-12



A13072-7



A13091-5



AFA6346-2



A10071-1



A11381-3



A12304-1sto



COA13241-3



COA14185-3



AOR13064-2



2022 Late Harvest Tri-State Trial

Location: WSU Research Center – Othello, WA

Planting Date: March 31

Vine Kill Date: September 9

Harvest Date: September 15

Days Grown: 162

The Tri-State trial is a part of the cooperative cultivar development program conducted at locations in Washington, Oregon, and Idaho. The Tri-State committee selects all official entries in this trial. All entries are grown for full season late harvest in each of the three states to determine how they perform when grown under different management and climatic conditions. The following is a summary of the Washington field and post-harvest results. See also: grading comments and merit scores near front of the book.

Fresh Market Standout(s): A12304-1sto

Process Market Standout(s): A12304-1sto

Yield and Economic Data

➤ Total Yield and U.S. #1 Yield

Highest: A12169-5 had the highest total yield (837 CWT/A) and A12304-1sto had the highest U.S. #1 yield (664 CWT/A). A12304-1sto had the second highest total yield (825 CWT/A) and A11381-3 had the second highest U.S. #1 yield (664 CWT/A).

Lowest: AOR13064-2 had the lowest total yield (528 CWT/A). AFA6346-2 had the lowest U.S. #1 yield (387 CWT/A).

➤ % U.S. #1's (greater than 4 oz)

Highest: A13036-12 (86 %), A11381-3, Russet Norkotah, and A09136-9LB (84%).

Lowest: AFA6346-2 (65%) and A12169-5 (66%).

➤ Carton Yield (100 to 50 Count (7 to 18 oz U.S. #1 Tubers))

Highest: A12304-1sto (21.9 Tons/A), A11381-3 (21.6 Tons/A).

Lowest: AFA6346-2 (12.0 Tons/A) and A13091-5 (13.1 Tons/A).

➤ Gross Return (\$/acre)

Fresh Market Highest: A11381-3 and A12304-1sto.

Fresh Market Lowest: AFA6346-2, AOR13064-2, and A13091-5.

Process Market Highest: A12169-5 and A11381-3.

Process Market Lowest: AFA6346-2, A11175-12TE, and AOR13064-2.

2022 Late Harvest Tri-State Trial

Postharvest Information

Samples were obtained from the Washington, Idaho, and Oregon field adaptation trials for analysis in Pullman. Fourteen numbered entries and three cultivars were tested from ID, WA, and OR. Postharvest performance ratings of the clones compared with Clearwater Russet, Russet Burbank, and Ranger Russet appear in the tables on pages 31 and 44 with details summarized below. An “*” in the summary below indicates similar performance and/or ranking in trials from previous years.

➤ Overall Postharvest Ratings

Highest scoring clones: AOR13064-2*, Clearwater Russet, A12169-5

Lowest scoring clones: A11326-1*, COA13241-3, Russet Burbank*

➤ Low Temperature Sweetening

Most resistant: AOR13064-2*, A13036-12, A12169-5

Most susceptible: Russet Burbank*, COA13241-3, A11381-3

➤ French Fry Taste Panel

Highest rated: Clearwater Russet*, AOR13064-2*, A13091-5

Lowest rated: A10071-1, A12304-1sto, Russet Burbank*

➤ Blackspot Bruise Susceptibility

Most resistant: A12169-5, A11175-12TE*

Most susceptible: Ranger Russet*, A12304-1sto

➤ Variability in Tuber Shape & Fry Yield (8- to 10-oz tubers)

Lowest L/W: A11175-12TE, A13036-12, A11381-3

Highest L/W: Russet Burbank*, Ranger Russet*, COA13241-3, COA14185-3

Lowest W/Th: COA13241-3, A11326-1

Highest W/Th: Clearwater Russet, A09136-9LB

Least variable: COA13241-3, Russet Burbank

Most variable: A11175-12TE, A11326-1

Details

- AOR13064-2*, Clearwater Russet, and A12169-5 were the highest rated entries, scoring 35.6, 33.2, and 32.5 points, respectively.
- Twelve of the seventeen evaluated clones ranked as resistant to cold sweetening with AOR13064-2*, A13036-12, and A12169-5 being the most resistant. Tuber samples from all states on average produced acceptably light-colored fries following storage for 60 days at 44 or 40°F (USDA 0 at 44°F, USDA 0 & 1 at 40°F, average of stem ends). Clearwater Russet* again identified as resistant to cold sweetening and five clones were numerically lighter than Clearwater Russet; A09136-9LB was lighter than Clearwater in 2022 and equivalent to Clearwater in 2021.
- For the WA trial, 2/17 entries stored at 48°F, 6/17 entries stored at 44°F, and 3/17 entries stored at 40°F produced non-uniform fry color (bud to stem end photovolt difference ≥9). For the OR trial, 3/17 entries stored at 48°F, 2/17 entries stored at 44°F, and 0/17 entries stored at 40°F produced non-uniform fry color. Only COA13241-3 was non-uniform at all temperature in the ID samples with the exception of Russet Burbank producing non-uniform samples at 48°F storage from ID. The top-rated entry for merit, AOR13064-2* maintained fry color regardless of production site (WA, ID, OR) and storage temperature (48, 44, 40°F) after 60 days in the 2020, 2021, & 2022 seasons. All experimental clones, except for A11326-1, AFA6346-2, and COA13241-3, maintained fry color uniformity at all temps from all states.

- Retention of process quality during storage of A12304-1sto, A10071-1, and A13072-7 at 44°F (60 days) was highly variable across production sites. By contrast, growing location had the least effect on the change in fry color of Clearwater Russet, A13036-12, and A09136-9LB following 60 days at 44°F.
- A11326-1*, COA13241-3, and Russet Burbank* received the lowest overall postharvest scores. A11326-1 again displayed color defects in 2022 with mottled fries from samples stored at 40°F and mottling was still observed in reconditioned and blanched samples from ID. In 2021 it developed excessively dark fry color in the OR samples at all temperatures (48, 44, 40°F) after 60 days of storage.
- Average (across states) gravities of A10071-1, and Russet Burbank* were 1.073 and 1.075, respectively; too low for frozen process contracts. The gravities of the other entries ranged from 1.078 to 1.088 when averaged across states. When averaged across the seventeen entries, gravities were 1.083 (WA), 1.085 (ID), and 1.080 (OR), an improvement over the 2021 season.
- Clearwater Russet*, AOR13064-2*, and A13091-5 were the favorites in the taste panels, scoring 3.6/5 on average across growing locations (5 is best). A10071-1, A12304-1sto, and Russet Burbank* received the lowest taste panel score of 2.8 on average.
- In addition to rating overall bruise susceptibility, blackspot bruise severity was rated from 1 to 5 (max. bruise) based on color intensity and percentage of the impacted area showing color (1 = no bruise, 2 = white knot bruise, 3 = less than 50% of impact area with color, 4 = >50% of impact area darkened or whole area light brown, 5 = full impact area dark). Ranger Russet* and A12304-1sto were the most susceptible, scoring 92.0% and 94.3% bruise (stem end), respectively, in the controlled impact study. These entries also had the highest bruise severity, averaging 4.0/5. A12169-5 and A11175-12TE* were the most resistant, averaging 7.0% and 10.0% bruise (stem end), respectively, and averaging a 1.2/5 severity rating.
- The 8- to 10-oz tubers of A11175-12TE, A13036-12, and A11381-3 had the lowest length to width ratios (avg. L/W=1.47 across states), which was lower than the average of 1.49 for the roundest entries in last year's trial. The range in L/W was 1.31 (A11381-3 from WA) to 2.46 (Russet Burbank from ID). Averaged across states, yield of 3-inch or longer French fries ranged from 78% to 94% by tuber fresh weight. A11326-1 and A11175-12TE had the greatest variation in L/W ratio; usable fry yields ranged from 73% to 95% across production sites. The average difference in W/Th was minimal (max. 0.1) among all entries and production sites. COA13241-3 and A11326-1 had the most consistent diameter (ca. 1.11) and Clearwater Russet and A09136-9LB were the least consistent (1.21).
- Reconditioning (60°F, 21 days) tubers of A11381-3, A11326-1*, and A10071-1 that had been stored at 40°F for 60 days resulted in the greatest improvement in stem end fry color compared with the other clones (ca. 28%). By contrast, fry color of A12169-5 and COA14185-3 changed little in response to reconditioning (ca. 6.3%). Ranger Russet* and A11381-3 appeared more susceptible to sugar end development based on attenuated reconditioning of the stem versus bud end of tubers following storage at 40°F. Fry color recovery via blanching potato strips prior to frying demonstrated COA13241-3 benefited the most (43.7% stem end). Blanching had the least effect on AOR13064-2 and A13036-12 stem ends (8.4% and 10.1%). When averaged for location and entry, stem end color recovery was 5.6% higher in blanched samples vs reconditioned samples for the Tri-State samples. Generally, reconditioning improved bud end color the most (17.3% vs 14.8%) while blanching improved stem end color the most (21.0% vs 15.4%).
- Following 60 days at 48°F, 82.0% of A09136-9LB* tubers were sprouting with an average sprout length of 1.1-inches. The next most sprouted entries on average were, A11326-1* (64.3%), Ranger Russet* (55.3%), and A10071-1 (53.3%) with sprout lengths of 0.7, 0.3, and 0.4-inches respectively. This compares to 35.7% of Clearwater Russet tubers with 0.3-inch sprouts and Russet Burbank* and COA13241-3 having no sprouting.

Overall Tri-State Postharvest Merit Scores

Clone	Postharvest Merit Scores			3 state Average
	WA	ID	OR	
17 AOR13064-2 *	4.7	4.7	4.7	4.7
1 Clearwater Russet	3.9	4.5	4.7	4.4
7 A12169-5	3.9	4.4	4.6	4.3
4 A09136-9LB	4.0	4.3	4.2	4.2
10 A13091-5	3.9	4.7	3.5	4.0
8 A13036-12	4.1	4.3	3.5	4.0
16 COA14185-3	3.7	4.2	3.7	3.9
5 A11175-12TE *	3.6	4.4	3.6	3.9
2 Ranger Russet	3.5	4.3	3.7	3.8
9 A13072-7	3.4	4.4	3.4	3.7
13 A11381-3	3.4	4.0	3.7	3.7
11 AFA6346-2	2.8	4.4	3.5	3.6
14 A12304-1sto	3.5	3.9	3.0	3.5
12 A10071-1	3.3	4.2	2.6	3.4
6 A11326-1 *	2.8	4.2	2.8	3.3
15 COA13241-3	2.9	2.9	3.1	3.0
3 Russet Burbank *	2.1	2.2	2.2	2.2

* similar results to 2021

2022 Late Harvest Tri-State Trial Summaries

ENTRY	TOTAL YIELD						CARTON YIELD		PROCESS YIELD	
				US # 1's*	US # 2's*	Culls*	100-50 count		US 1's and 2's	
	CWT/A	STATS**	Tons/A	> 4 oz % of Total Yield	> 4 oz % of Total Yield	& < 4 oz % of Total Yield	(US 1's 7-18 oz) % of Total Yield	Tons/A	> 6 oz % of Total Yield	Tons/A
Clearwater Russet	655	DEFG	32.8	81	3	16	49	16.1	63	20.9
Ranger Russet	742	BCDE	37.1	76	10	15	51	18.8	73	27.5
Russet Burbank	677	DEFG	33.8	74	12	14	47	16.0	68	23.2
Russet Norkotah	700	CDEF	35.0	84	4	12	51	17.9	72	25.4
A09136-9LB	667	DEFG	33.3	84	7	9	48	15.9	83	27.7
A11175-12TE	654	EFG	32.7	77	5	18	46	15.1	61	20.0
A11326-1	750	BCDE	37.5	83	6	11	57	21.3	79	29.8
A12169-5	837	A	41.9	66	26	8	40	16.7	84	35.2
A13036-12	770	BCDE	38.5	86	4	10	54	20.8	80	30.9
A13072-7	774	ABCD	38.7	77	13	11	39	15.2	81	31.5
A13091-5	563	G	28.1	82	3	16	46	13.1	60	16.8
AFA6346-2	595	FG	29.7	65	5	30	40	12.0	51	15.4
A10071-1	813	AB	40.6	74	11	15	46	18.9	68	27.8
A11381-3	793	ABC	39.6	84	3	14	54	21.6	69	27.3
A12304-1sto	825	A	41.2	81	1	18	53	21.9	66	27.3
COA13241-3	673	DEFG	33.7	78	8	14	53	17.8	77	26.3
COA14185-3	672	DEFG	33.6	74	7	19	45	15.1	63	21.3
AOR13064-2	528	G	26.4	78	6	16	52	13.7	68	18.1

ENTRY	US # 1 YIELD						> 4 oz SPECIFIC GRAVITY	INTERNAL DEFECTS (%)		
				> 4 oz	4-7 oz*	7-14 oz*		(8-12 oz tubers)		
	> 4 oz CWT/A	STATS**	Tons/A	% of Total Yield	% of Total Yield	% of Total Yield		% HH	% BC	% IBS
Clearwater Russet	531	CDE	26.6	39	53	8	1.087	0	0	8
Ranger Russet	564	BCDE	28.2	22	52	26	1.081	0	0	0
Russet Burbank	498	DEF	24.9	34	54	13	1.075	0	3	8
Russet Norkotah	587	ABCD	29.3	26	45	28	1.070	0	0	0
A09136-9LB	558	BCDE	27.9	14	42	44	1.086	0	0	0
A11175-12TE	501	DEF	25.0	40	53	8	1.074	0	0	0
A11326-1	624	ABC	31.2	16	49	35	1.090	0	0	0
A12169-5	548	BCDE	27.4	17	41	43	1.081	0	0	0
A13036-12	658	AB	32.9	16	49	35	1.081	0	0	0
A13072-7	596	ABCD	29.8	17	38	45	1.082	0	0	10
A13091-5	460	EFG	23.0	41	48	11	1.082	3	0	0
AFA6346-2	387	G	19.3	36	53	11	1.073	0	0	8
A10071-1	602	ABCD	30.1	33	55	12	1.071	0	0	0
A11381-3	664	A	33.2	29	51	19	1.087	0	0	0
A12304-1sto	664	A	33.2	30	54	15	1.085	0	0	0
COA13241-3	530	CDE	26.5	18	50	32	1.090	0	0	0
COA14185-3	502	DEF	25.1	33	46	20	1.085	0	0	3
AOR13064-2	414	FG	20.7	28	54	17	1.087	0	0	5

ENTRY	50 DAY STAND	60 DAY STAND	STEMS PER PLANT	TUBER GREENING	AVERAGE TUBER		SKIN SET	TUBER SHAPE	BRUISE (%)	
	% Emerged	% Emerged	Above Ground	% Total Yield	Weight	Number	1 = Poor 5 = Good	1 = Round 5 = Long	(8-12 oz tubers)	
					Ounces	Tubers/Plant			BLACKSPOT	SHATTER
Clearwater Russet	11	91	2.2	1	5.9	10.0	4.0	2.5	0	75
Ranger Russet	44	85	2.1	4	7.9	8.4	4.0	4.0	20	65
Russet Burbank	26	89	2.0	0	7.0	8.7	4.0	3.0	8	50
Russet Norkotah	29	91	2.3	1	7.3	8.7	4.0	3.8	0	48
A09136-9LB	73	94	3.3	2	9.0	6.7	4.0	2.0	0	80
A11175-12TE	36	91	2.7	3	5.9	10.0	4.0	2.0	5	58
A11326-1	56	95	2.4	3	8.7	7.8	3.0	3.0	3	49
A12169-5	30	88	1.9	1	9.7	7.8	2.8	3.0	0	73
A13036-12	77	95	2.7	1	8.9	7.8	3.8	2.3	0	85
A13072-7	39	91	2.3	4	9.2	7.5	4.0	2.8	3	68
A13091-5	30	97	1.9	1	6.1	8.3	3.3	2.5	0	100
AFA6346-2	5	86	1.3	10	5.0	10.7	4.0	3.0	5	53
A10071-1	64	91	2.9	1	6.4	11.5	4.0	3.0	0	90
A11381-3	44	92	3.0	0	6.5	11.0	4.0	2.0	11	76
A12304-1sto	16	84	3.1	3	6.4	11.6	3.8	3.0	5	83
COA13241-3	3	92	2.2	8	9.0	6.8	4.0	4.0	3	70
COA14185-3	44	95	2.4	3	6.3	9.7	3.5	3.5	0	58
AOR13064-2	44	94	2.3	3	6.9	6.9	3.8	3.0	0	72

* Percent values may not total 100% due to rounding

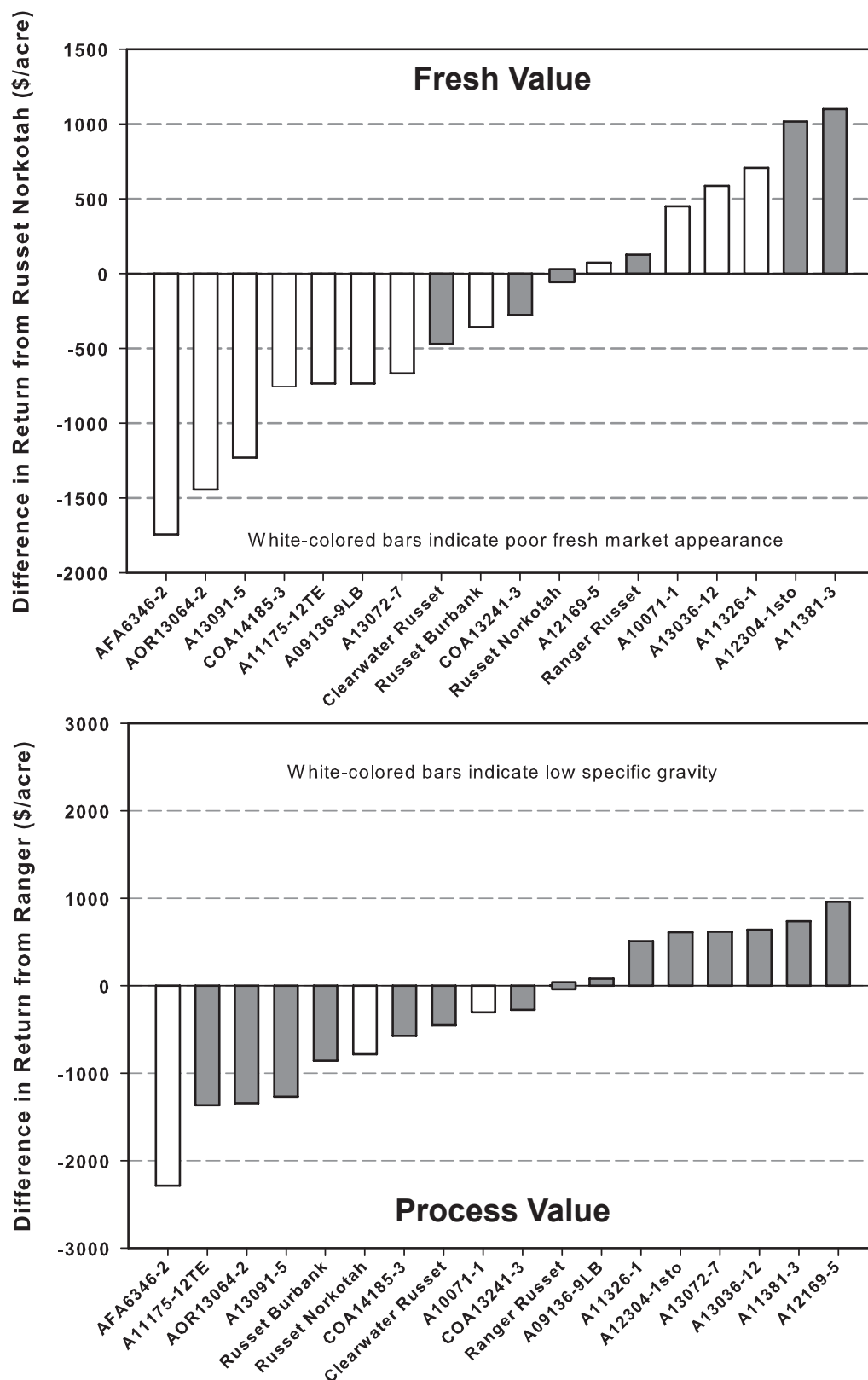
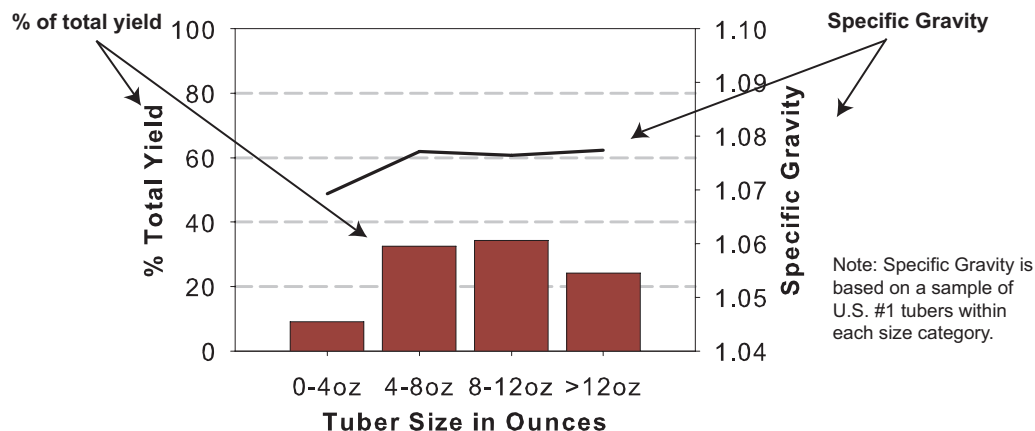


Figure 1 (top). Difference in gross return per acre (Fresh Market) from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry. Entries with the white-colored bars may not appeal to fresh market consumers due to undesirable shape or appearance. **Figure 2 (bottom).** Difference in gross return per acre (Process Market) from Ranger Russet calculated by subtracting the gross return of Ranger Russet from the gross return of the particular entry. Entries with the white-colored bars would be penalized (under the mock contract parameters) due to a specific gravity less than 1.075.

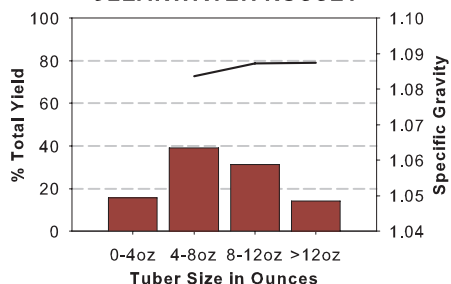
2022 Late Harvest Tri-State Trial

Tuber Yield and Specific Gravity Distributions

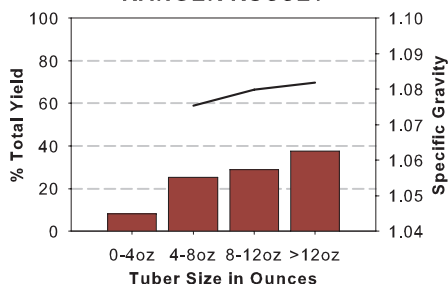
11 inch In-Row Spacing



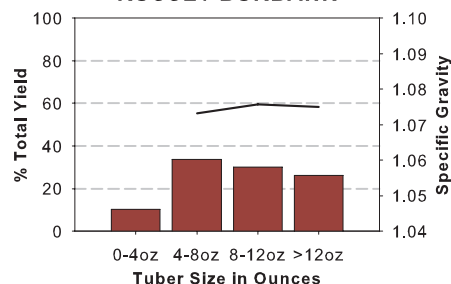
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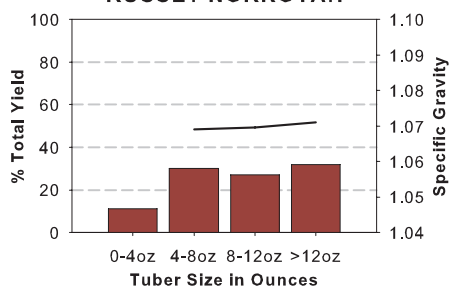
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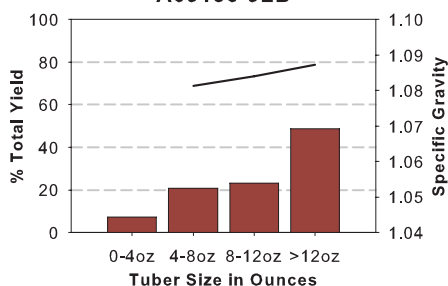
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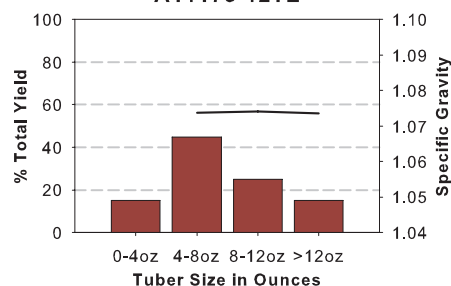
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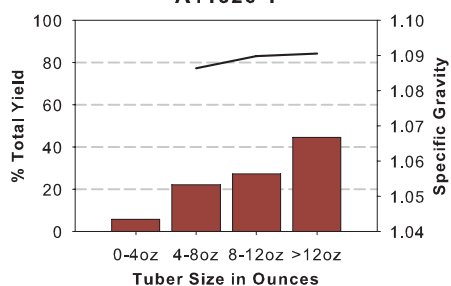
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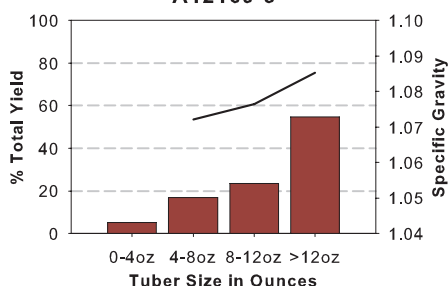
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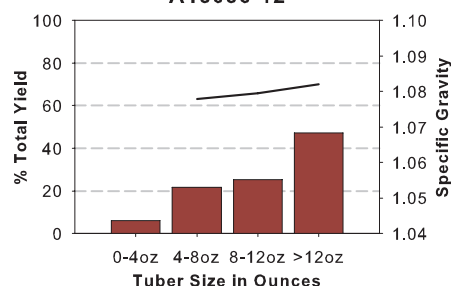
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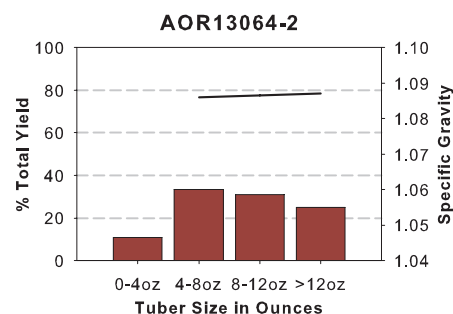
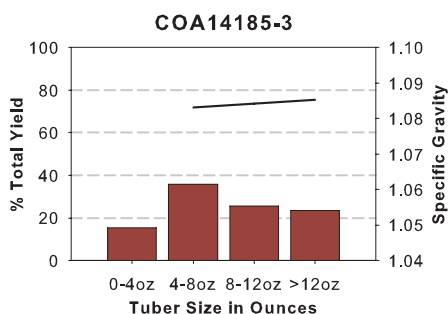
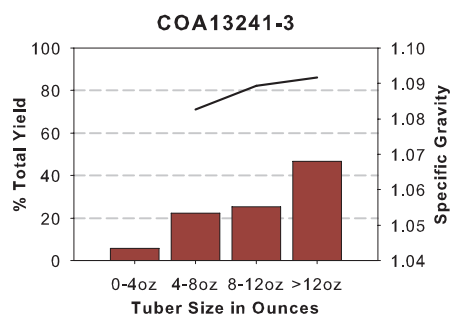
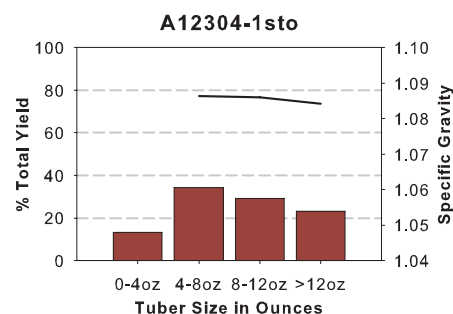
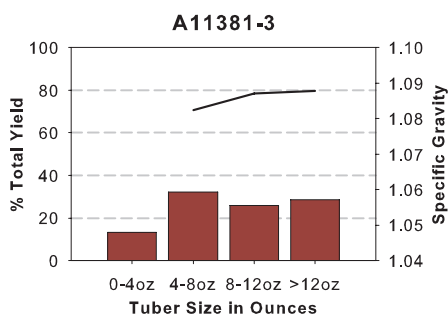
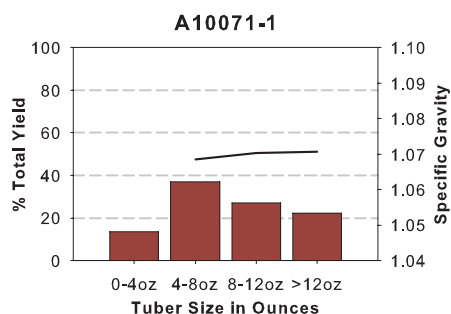
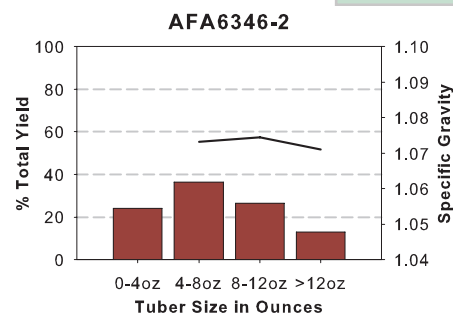
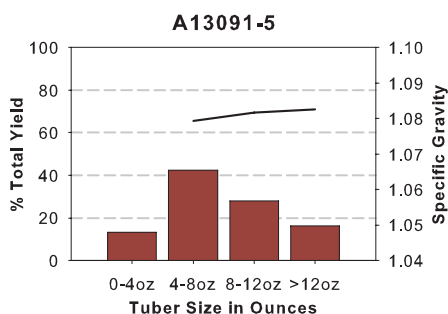
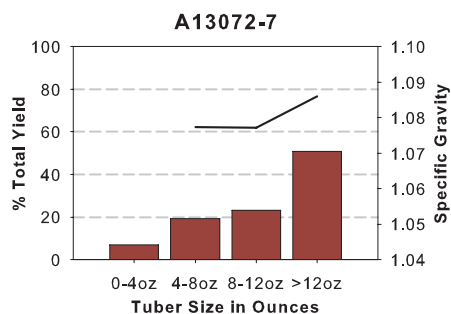


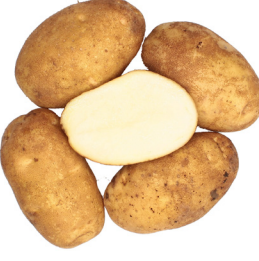
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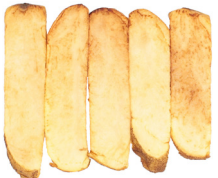
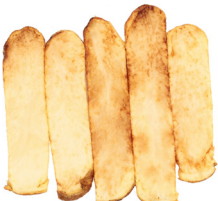
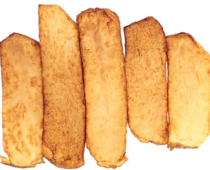
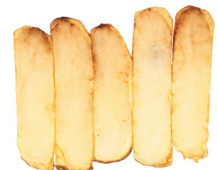
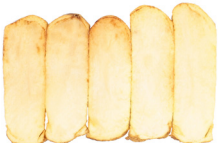


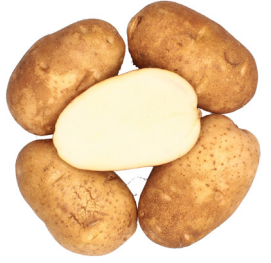
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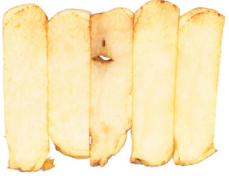
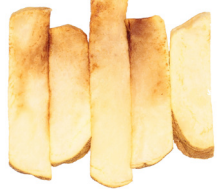
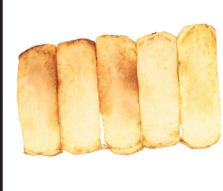
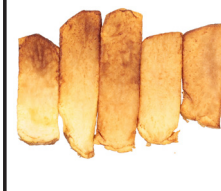
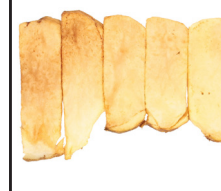
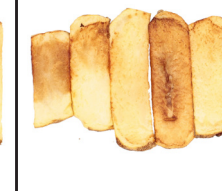
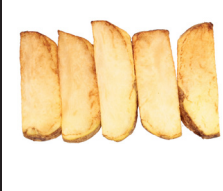
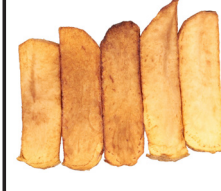
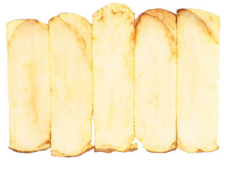
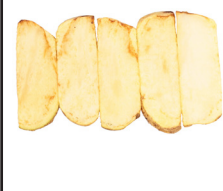
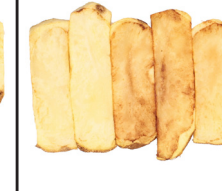
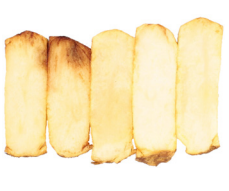
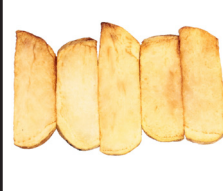
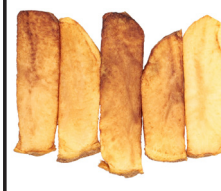
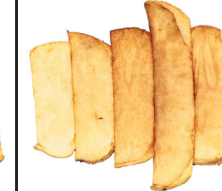
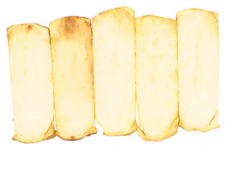
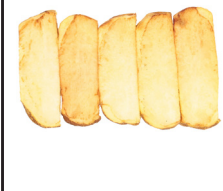
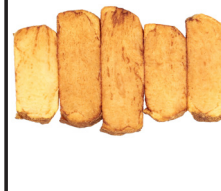
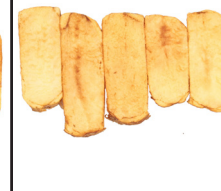


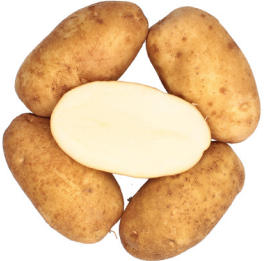
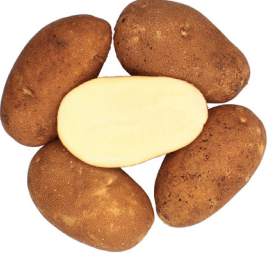


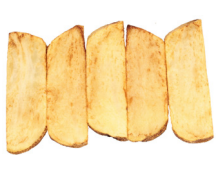
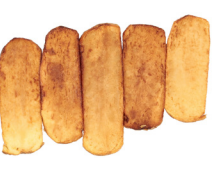
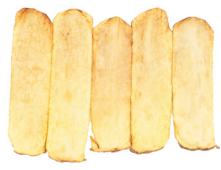
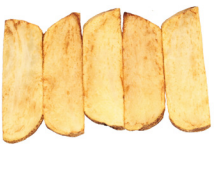
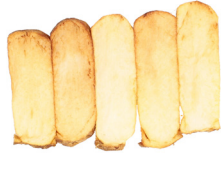
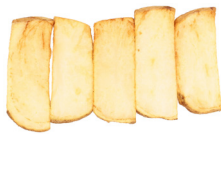
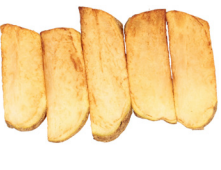
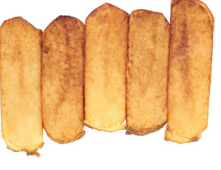
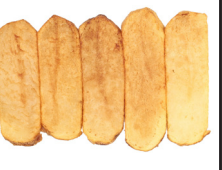
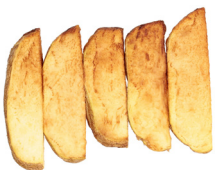
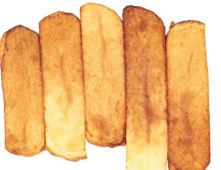
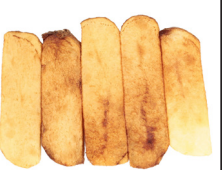
Tubers	WA Late Harvest Tri-State Trial Comments
Clearwater Russet	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, non-uniform; 40°F = light, non-uniform; Reconditioned = light, non-uniform.
Ranger Russet	
	Tubers: Oblong to long tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, non-uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform.
Russet Burbank	
	Tubers: Oblong tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, non-uniform; 48°F = light, uniform; 44°F = relatively dark, non-uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform.
A09136-9LB	
	Tubers: Round to oblong tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, uniform.
A11175-12TE	
	Tubers: Round to oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, uniform.

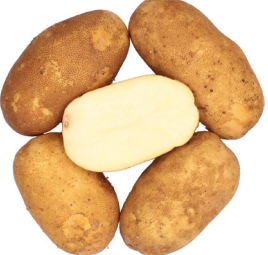
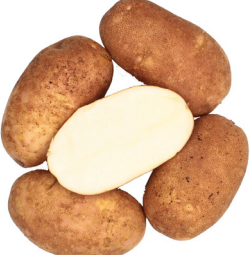
Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
Clearwater Russet					
					
Ranger Russet					
					
Russet Burbank					
					
A09136-9LB					
					
A11175-12TE					
					

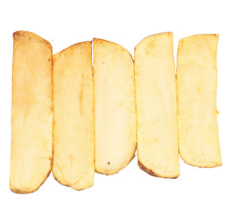
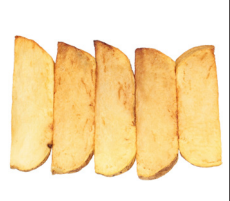
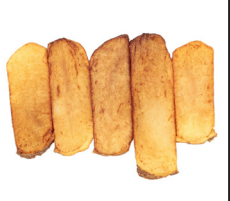
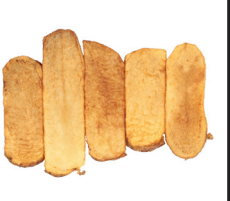
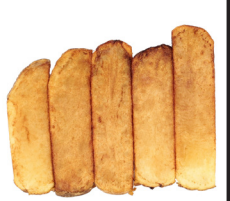
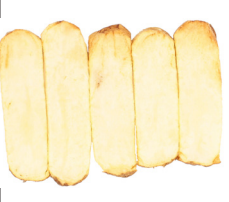
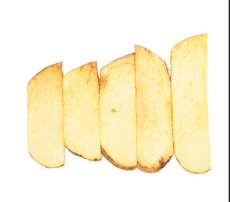
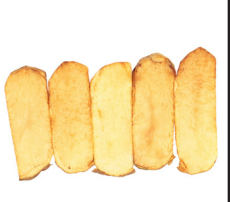
Tubers	WA Late Harvest Tri-State Trial Comments
A11326-1	
	Tubers: Oblong tubers. Fair skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, non-uniform; 44°F = light, non-uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform.
A12169-5	
	Tubers: Oblong tubers. Fair skin set; moderately deep eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform.
A13036-12	
	Tubers: Round to oblong tubers. Good skin set; moderately deep eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, uniform.
A13072-7	
	Tubers: Oblong tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform.
A13091-5	
	Tubers: Oblong tubers. Fair skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, non-uniform.

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
A11326-1					
					
A12169-5					
					
A13036-12					
					
A13072-7					
					
A13091-5					
					

Tubers	WA Late Harvest Tri-State Trial Comments
AFA6346-2	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, non-uniform; 48°F = light, uniform; 44°F = light, non-uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform.
A10071-1	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform.
A11381-3	
	Tubers: Round to oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform.
A12304-1sto	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform.
COA13241-3	
	Tubers: Oblong to long tubers. Good skin set; shallow eyes. Fry color: At harvest = light, non-uniform; 48°F = light, non-uniform; 44°F = light, non-uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform.

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
AFA6346-2					
					
A10071-1					
					
A11381-3					
					
A12304-1sto					
					
COA13241-3					
					

Tubers	WA Late Harvest Tri-State Trial Comments
COA14185-3	
	Tubers: Oblong to long tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform.
AOR13064-2	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, uniform.

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
COA14185-3					
					
AOR13064-2					
					

2022 Late Harvest Tri-State Trial

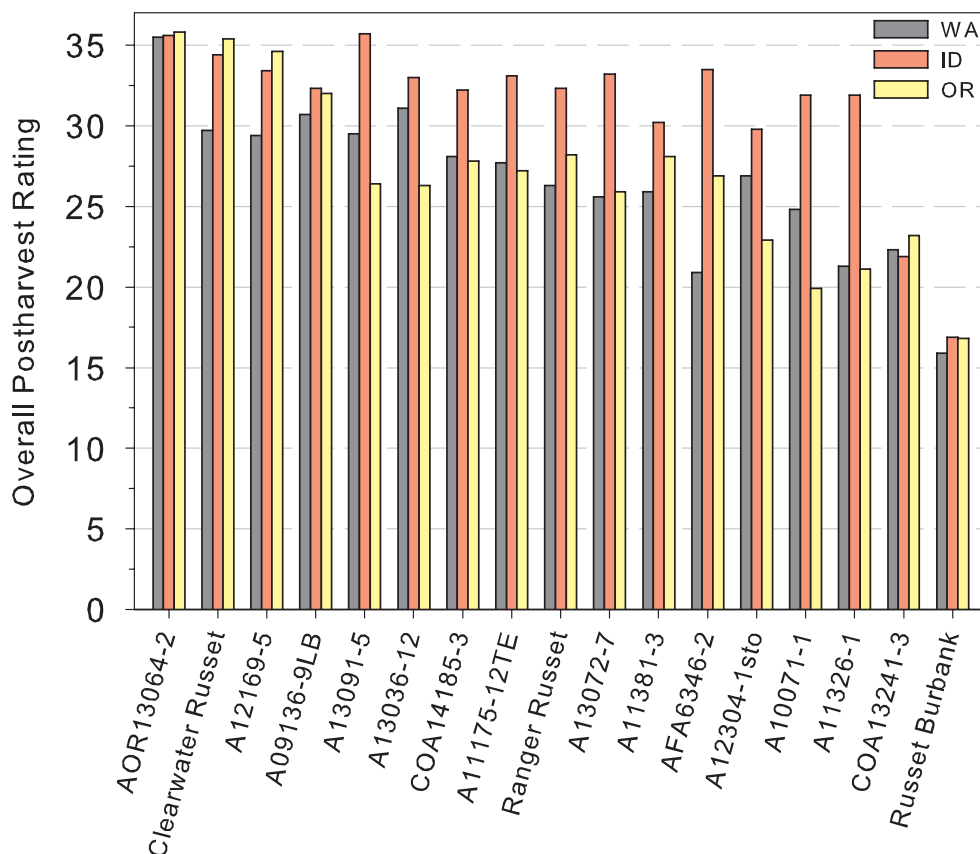
Accumulated Total Postharvest Rating of Clones

Clone	WA		ID		OR		3 State av. Rating Total
	Rating Total §	Discard §§	Rating Total §	Discard §§	Rating Total §	Discard §§	
17 AOR13064-2	35.5		35.6		35.8		35.6
1 Clearwater Russet	29.7		34.4		35.4		33.2
7 A12169-5	29.4		33.4		34.6		32.5
4 A09136-9LB	30.7		32.3		32.0		31.7
10 A13091-5	29.5		35.7		26.4	Sp. Gr.	30.5
8 A13036-12	31.1		33.0		26.3		30.2
16 COA14185-3	28.1		32.2		27.8		29.4
5 A11175-12TE	27.7		33.1		27.2		29.3
2 Ranger Russet	26.3		32.3		28.2		28.9
9 A13072-7	25.6		33.2		25.9		28.2
13 A11381-3	25.9		30.2		28.1		28.1
11 AFA6346-2	20.9	Sp. Gr.	33.5		26.9		27.1
14 A12304-1sto	26.9		29.8		22.9	Sp. Gr.	26.5
12 A10071-1	24.8	Sp. Gr.	31.9		19.9	Sp. Gr.	25.5
6 A11326-1	21.3		31.9		21.1		24.8
15 COA13241-3	22.3		21.9		23.2		22.5
3 Russet Burbank	15.9	Sp. Gr.	16.9	Sp. Gr.	16.8		16.5
	26.6		31.3		27.0		28.3

§ maximum rating possible = 38

§§ Values for the indicated evaluation are lower than the rejection level.

Late Harvest Tri-State Postharvest Ratings



2022 Late Harvest Tri-State Trial

Entries Retained from the 2021 Trials Currently in the Tri-State Trial

Harvested fall of 2021

Held at 48° F until December 16, 2021

Stored at 44° F until analysis

Four clones were retained from the 2021 Tri-State Trial into the 2022 Trial (A09136-9LB, A11175-12TE, A11326-1 & AOR13064-2). When averaged across states, AOR13064-2 produced the lightest fries (45.9 ref units) Only slightly better than Clearwater (45.6). A11175-12TE also produced very light fries with an average of 41.8. The uniformity of fry color was unacceptable for RB and A09136-9LB grown in WA and from A11326-1 grown in OR. All entries and the check cultivars Clearwater, Ranger Russet and Russet Burbank had sprout lengths that averaged between 3.5 and 9.5 inches. A11326-1 had the longest sprouts with WA at 9 inches, ID being 8 inches while OR was 11.5 inches. A11326-1 had some interior discoloration and waterlogged appearance when first cut. The center portion also fried dark from WA & OR.

		PHOTOVOLT READING				USDA	% REDUCING SUGAR			Sprouting	
Clone		stem	bud	avg	DIFF	COLOR	stem	bud	avg	percent	length (in.)
Washington											
1 Clearwater		40.6	45.8	43.2	8.2	0	0.7	0.6	0.6	100	1.0
2 Ranger Russet		24.2	31.7	27.9	7.9	2	2.1	1.2	1.6	100	5.5
3 Russet Burbank		22.7	36.6	29.7	13.8	2	2.3	0.9	1.6	100	5.0
4 A09136-9LB		27.4	37.3	32.4	10.3	1	1.7	0.9	1.3	100	8.5
5 A11175-12TE		39.7	45.0	42.4	5.4	0	0.7	0.6	0.7	100	6.5
6 A11326-1		32.1	40.2	36.2	8.3	0	1.2	0.7	1.0	100	9.0
7 AOR13064-2		39.8	38.2	39.0	5.9	0	0.7	0.8	0.8	100	6.5
Average		<i>LSD 0.05</i> 32.3	3.8 39.3	4.4 35.8	8.6	0.7	1.3	0.8	1.1	100	
Idaho											
1 Clearwater		48.0	47.1	47.6	3.7	0	0.5	0.5	0.5	100	1.5
2 Ranger Russet		33.6	33.5	33.6	4.3	0	1.1	1.1	1.1	100	6.0
3 Russet Burbank		32.5	34.8	33.7	8.5	0	1.2	1.0	1.1	100	6.0
4 A09136-9LB		39.7	38.4	39.0	4.6	0	0.7	0.8	0.8	100	6.5
5 A11175-12TE		40.9	46.4	43.6	5.4	0	0.7	0.5	0.6	100	4.5
6 A11326-1		45.5	45.0	45.2	5.1	0	0.6	0.6	0.6	100	8.0
7 AOR13064-2		50.7	48.4	49.6	3.2	0	0.5	0.5	0.5	100	6.0
Average		<i>LSD 0.05</i> 41.6	4.5 41.9	3.2 41.8	5.0	0.0	0.8	0.7	0.7	100	
Oregon											
1 Clearwater		44.9	47.3	46.1	4.2	0	0.6	0.5	0.6	100	8.0
2 Ranger Russet		28.7	32.6	30.6	5.9	1	1.5	1.2	1.3	100	5.5
3 Russet Burbank		28.3	34.5	31.4	6.7	1	1.6	1.0	1.3	100	9.5
4 A09136-9LB		26.7	30.3	28.5	5.4	1	1.7	1.4	1.6	100	6.5
5 A11175-12TE		38.8	40.0	39.4	2.2	0	0.8	0.7	0.8	100	7.0
6 A11326-1		10.8	16.8	13.8	9.6	4	5.0	3.2	4.1	100	11.5
7 AOR13064-2		49.7	48.3	49.0	3.0	0	0.5	0.5	0.5	100	5.0
Average		<i>LSD 0.05</i> 32.5	3.9 35.7	3.9 34.1	5.3	1.0	1.7	1.2	1.5	100	

Date test performed:

Washington April 29

Idaho May 2

Oregon May 4

2022 Late Harvest Tri-State Trial Prior to Storage

		PHOTOVOLT READING				USDA	SPECIFIC		
Clone		stem	bud	av	rtg §	DIFF	COLOR	GRAVITY	rtg
Washington									
1 Clearwater Russet	40.3	47.6	44.0	5+	7.3	0	1.091	4	
2 Ranger Russet	35.8	41.6	38.7	4+	6.4	0	1.083	5	
3 Russet Burbank	29.5	39.4	34.4	3-	10.8	1	1.075	0	
4 A09136-9LB	41.0	43.1	42.0	5+	2.8	0	1.088	5	
5 A11175-12TE	44.7	48.2	46.5	5+	4.1	0	1.078	2	
6 A11326-1	40.6	49.0	44.8	5+	8.4	0	1.095	2	
7 A12169-5	46.4	48.6	47.5	5+	3.2	0	1.080	3	
8 A13036-12	46.4	48.2	47.3	5+	3.0	0	1.081	4	
9 A13072-7	44.4	45.8	45.1	5+	3.9	0	1.076	1	
10 A13091-5	53.4	53.1	53.2	5+	2.5	0	1.080	3	
11 AFA6346-2	36.0	47.9	42.0	5-	12.0	0	1.073	0	
12 A10071-1	38.6	43.4	41.0	5+	6.0	0	1.075	0	
13 A11381-3	37.4	45.6	41.5	5+	8.7	0	1.089	4	
14 A12304-1sto	34.4	42.1	38.3	4+	7.7	0	1.089	4	
15 COA13241-3	35.9	49.0	42.4	5-	13.1	0	1.096	1	
16 COA14185-3	38.5	42.3	40.4	4+	4.1	0	1.083	5	
17 AOR13064-2	46.5	49.1	47.8	5+	3.4	0	1.086	5	
Average	40.6	LSD 0.05 46.1	2.8 43.3		3.4 6.3	0	0.007 1.083		
Idaho									
1 Clearwater Russet	42.2	44.7	43.5	5+	5.7	0	1.082	4	
2 Ranger Russet	43.7	45.1	44.4	5+	2.3	0	1.093	3	
3 Russet Burbank	29.1	36.0	32.6	3+	8.3	1	1.073	0	
4 A09136-9LB	46.5	47.2	46.8	5+	2.1	0	1.090	4	
5 A11175-12TE	46.7	49.3	48.0	5+	3.4	0	1.081	4	
6 A11326-1	39.7	43.9	41.8	5+	5.2	0	1.090	4	
7 A12169-5	47.7	49.4	48.6	5+	3.1	0	1.091	4	
8 A13036-12	48.2	45.9	47.0	5+	2.8	0	1.081	4	
9 A13072-7	40.1	39.3	39.7	4+	2.4	0	1.091	4	
10 A13091-5	51.5	53.4	52.4	5+	2.6	0	1.082	4	
11 AFA6346-2	46.1	44.8	45.5	5+	3.0	0	1.089	4	
12 A10071-1	43.7	42.8	43.2	5+	2.8	0	1.078	2	
13 A11381-3	36.5	45.1	40.8	5+	8.6	0	1.084	5	
14 A12304-1sto	32.9	38.6	35.7	4+	6.0	0	1.086	5	
15 COA13241-3	41.1	47.1	44.1	5-	10.0	0	1.078	2	
16 COA14185-3	43.3	43.2	43.3	5+	2.3	0	1.084	5	
17 AOR13064-2	48.4	46.6	47.5	5+	4.1	0	1.089	4	
Average	42.8	LSD 0.05 44.8	2.5 43.8		2.8 4.4	0	0.004 1.085		
Oregon									
1 Clearwater Russet	47.4	50.0	48.7	5+	3.9	0	1.085	5	
2 Ranger Russet	32.8	40.6	36.7	4+	7.9	0	1.083	5	
3 Russet Burbank	29.8	37.7	33.7	3+	8.2	1	1.076	1	
4 A09136-9LB	39.9	45.2	42.5	5+	5.3	0	1.085	5	
5 A11175-12TE	44.3	47.7	46.0	5+	3.5	0	1.076	1	
6 A11326-1	32.4	41.4	36.9	4-	11.7	0	1.088	5	
7 A12169-5	48.4	48.4	48.4	5+	3.0	0	1.083	5	
8 A13036-12	43.4	41.2	42.3	5+	3.3	0	1.077	1	
9 A13072-7	35.6	43.6	39.6	4+	8.0	0	1.081	4	
10 A13091-5	49.4	50.7	50.0	5+	2.5	0	1.073	0	
11 AFA6346-2	39.4	45.5	42.4	5+	6.1	0	1.076	1	
12 A10071-1	34.5	40.0	37.2	4+	6.6	0	1.066	0	
13 A11381-3	37.1	45.6	41.3	5+	8.6	0	1.083	5	
14 A12304-1sto	34.6	40.0	37.3	4+	5.5	0	1.075	0	
15 COA13241-3	34.2	42.3	38.2	4-	9.3	0	1.082	4	
16 COA14185-3	41.2	49.6	45.4	5+	8.4	0	1.079	2	
17 AOR13064-2	51.1	50.6	50.8	5+	2.4	0	1.088	5	
Average	45.0 39.7	LSD 0.05 44.7	2.9 42.2		3.8 6.1	0	0.005 1.080		

Date test performed:

Washington

Oct. 2

Sept. 29

Idaho

Oct. 7

Oct. 3

Oregon

Oct. 8

Oct. 6

§ rtg = rating (1-5, 5 is best); av = average Photovolt reading; Diff = Absolute difference between stem and bud Photovolt reading. Stem to bud differences of nine or greater (-) lose one point and differences of less than nine (+) gain one point in the accumulated total postharvest rating.

2022 Late Harvest Tri-State Trial

Stored at 48°F after Arrival

FRENCH FRY		BRUISE POTENTIAL			
Clone	TASTE PANEL	(percent)		[color 5=darkest]	
	rating	stem	bud	stem	bud
Washington					
1 Clearwater Russet	3.7	46	25	2.1	1.6
2 Ranger Russet	3.3	92	29	4.2	1.8
3 Russet Burbank	2.9	54	17	2.5	1.4
4 A09136-9LB	3.7	100	50	4.4	2.2
5 A11175-12TE	3.7	17	8	1.4	1.2
6 A11326-1	3.3	96	13	4.3	1.3
7 A12169-5	3.4	13	4	1.3	1.1
8 A13036-12	3.1	17	4	1.3	1.1
9 A13072-7	3.6	71	0	3.1	1.0
10 A13091-5	3.5	8	0	1.3	1.1
11 AFA6346-2	2.9	33	8	1.8	1.2
12 A10071-1	2.8	42	8	2.2	1.2
13 A11381-3	2.9	71	4	2.8	1.1
14 A12304-1sto	2.9	100	29	4.5	1.6
15 COA13241-3	3.3	50	17	2.3	1.4
16 COA14185-3	3.1	38	21	2.0	1.5
17 AOR13064-2	3.5	67	8	2.9	1.4
LSD 0.05	0.5	28	21		
Average	3.3	53.7	14.5	2.6	1.4
Idaho					
1 Clearwater Russet	3.4	0	13	1.0	1.3
2 Ranger Russet	3.3	92	17	3.8	1.4
3 Russet Burbank	1.9	25	13	1.5	1.1
4 A09136-9LB	3.3	58	4	2.6	1.1
5 A11175-12TE	3.1	0	0	1.0	1.0
6 A11326-1	2.9	58	0	2.5	1.0
7 A12169-5	3.4	8	13	1.2	1.3
8 A13036-12	3.0	13	0	1.3	1.0
9 A13072-7	3.2	8	0	1.2	1.0
10 A13091-5	3.7	17	4	1.4	1.1
11 AFA6346-2	3.5	58	0	2.6	1.0
12 A10071-1	2.9	4	0	1.1	1.0
13 A11381-3	3.2	46	0	2.1	1.0
14 A12304-1sto	2.8	100	42	4.3	2.2
15 COA13241-3	2.9	13	0	1.3	1.0
16 COA14185-3	3.2	4	0	1.1	1.0
17 AOR13064-2	3.6	58	0	2.7	1.0
LSD 0.05	0.4	22	15		
Average	3.1	33.1	6.1	1.9	1.1
Oregon					
1 Clearwater Russet	3.4	79	8	3.3	1.2
2 Ranger Russet	3.2	92	17	4.0	1.5
3 Russet Burbank	2.8	71	13	3.2	1.3
4 A09136-9LB	3.0	96	21	4.4	1.5
5 A11175-12TE	3.2	13	0	1.3	1.0
6 A11326-1	3.1	83	4	3.4	1.1
7 A12169-5	3.6	0	0	1.0	1.0
8 A13036-12	3.3	59	14	2.4	1.4
9 A13072-7	2.9	13	0	1.3	1.0
10 A13091-5	3.4	13	0	1.4	1.0
11 AFA6346-2	2.9	67	0	2.8	1.0
12 A10071-1	2.9	38	0	2.0	1.0
13 A11381-3	3.1	25	4	1.6	1.1
14 A12304-1sto	2.9	83	13	3.4	1.3
15 COA13241-3	3.2	58	0	2.6	1.0
16 COA14185-3	2.8	29	8	1.9	1.2
17 AOR13064-2	3.8	50	0	2.4	1.0
LSD 0.05	0.5	27	17		
Average	3.1	51.0	5.9	2.5	1.1

Date test performed:

Washington Oct. 24

Nov. 3

Idaho Oct. 25

Nov. 10

Oregon Oct. 26

Nov. 17

2022 Late Harvest Tri-State Trial

Stored at 48°F for 60 Days

	PHOTOVOLT READING				DIFF	USDA COLOR	% REDUCING SUGAR		SPROUTING	
	Clone	stem	bud	average			rtg §	stem	bud	(%)
Washington										
1 Clearwater Russet	47.5	50.7	49.1	5+	3.3	0	0.5	0.5	40	0.13
2 Ranger Russet	38.0	39.3	38.7	4+	4.2	0	0.8	0.8	93	0.25
3 Russet Burbank	31.8	40.6	36.2	4+	8.8	0	1.2	0.7	0	
4 A09136-9LB	40.0	42.4	41.2	5+	3.7	0	0.7	0.6	73	0.75
5 A11175-12TE	44.2	47.5	45.9	5+	3.8	0	0.6	0.5	13	0.13
6 A11326-1	36.3	48.2	42.3	5-	12.0	0	0.9	0.5	100	0.50
7 A12169-5	44.8	46.9	45.8	5+	3.6	0	0.6	0.5	13	0.25
8 A13036-12	46.7	48.0	47.3	5+	2.7	0	0.5	0.5	53	0.25
9 A13072-7	42.6	45.0	43.8	5+	3.9	0	0.6	0.6	40	0.13
10 A13091-5	50.3	51.9	51.1	5+	2.7	0	0.5	0.5	13	0.13
11 AFA6346-2	37.7	43.8	40.7	5+	6.2	0	0.8	0.6	0	
12 A10071-1	38.2	40.8	39.5	4+	4.0	0	0.8	0.7	60	0.50
13 A11381-3	45.2	47.3	46.2	5+	2.6	0	0.6	0.5	13	0.13
14 A12304-1sto	36.9	42.0	39.5	5+	5.3	0	0.9	0.7	7	0.13
15 COA13241-3	39.1	48.0	43.5	5-	9.0	0	0.8	0.5	0	
16 COA14185-3	42.6	45.1	43.8	5+	2.9	0	0.6	0.6	7	0.13
17 AOR13064-2	52.0	49.0	50.5	5+	3.5	0	0.5	0.5	20	0.13
Average	42.0	LSD 0.05 45.7	2.8 43.8		3.4 4.8				20 32	
Idaho										
1 Clearwater Russet	44.2	48.6	46.4	5+	4.9	0	0.6	0.5	20	0.13
2 Ranger Russet	40.9	43.6	42.2	5+	3.7	0	0.7	0.6	0	
3 Russet Burbank	27.3	37.7	32.5	3-	11.0	1	1.7	0.8	0	
4 A09136-9LB	45.8	46.9	46.3	5+	2.0	0	0.6	0.5	73	0.50
5 A11175-12TE	48.6	50.1	49.3	5+	2.8	0	0.5	0.5	0	
6 A11326-1	40.8	42.8	41.8	5+	4.6	0	0.7	0.6	0	
7 A12169-5	47.9	49.0	48.5	5+	3.1	0	0.5	0.5	0	
8 A13036-12	47.4	45.3	46.4	5+	3.5	0	0.5	0.6	13	0.13
9 A13072-7	40.8	44.5	42.7	5+	5.1	0	0.7	0.6	0	
10 A13091-5	54.7	52.0	53.4	5+	3.0	0	0.5	0.5	0	
11 AFA6346-2	45.8	44.7	45.3	5+	3.6	0	0.6	0.6	0	
12 A10071-1	45.0	46.8	45.9	5+	3.2	0	0.6	0.5	0	
13 A11381-3	37.7	45.7	41.7	5+	8.2	0	0.8	0.6	0	
14 A12304-1sto	35.4	38.9	37.2	4+	4.6	0	1.0	0.8	0	
15 COA13241-3	36.1	46.5	41.3	5-	10.4	0	0.9	0.5	0	
16 COA14185-3	41.0	44.0	42.5	5+	3.9	0	0.7	0.6	0	
17 AOR13064-2	50.7	48.7	49.7	5+	2.9	0	0.5	0.5	0	
Average	42.9	LSD 0.05 45.6	2.2 44.3		3.0 4.7				12 6	
Oregon										
1 Clearwater Russet	45.8	48.8	47.3	5+	3.0	0	0.6	0.5	47	0.50
2 Ranger Russet	33.9	36.4	35.2	3+	5.8	0	1.1	0.9	73	0.75
3 Russet Burbank	28.8	38.4	33.6	3-	9.7	1	1.5	0.8	0	
4 A09136-9LB	43.0	44.0	43.5	5+	2.4	0	0.6	0.6	100	2.00
5 A11175-12TE	44.5	47.5	46.0	5+	4.5	0	0.6	0.5	73	1.00
6 A11326-1	29.1	41.6	35.3	3-	13.7	1	1.5	0.7	93	1.50
7 A12169-5	47.1	45.8	46.5	5+	2.1	0	0.5	0.6	87	1.00
8 A13036-12	42.9	46.3	44.6	5+	4.0	0	0.6	0.5	100	1.50
9 A13072-7	37.5	42.7	40.1	4+	6.2	0	0.8	0.6	73	0.50
10 A13091-5	48.2	49.4	48.8	5+	2.9	0	0.5	0.5	33	0.25
11 AFA6346-2	39.7	45.1	42.4	5+	5.5	0	0.7	0.6	47	0.25
12 A10071-1	31.4	38.0	34.7	3+	7.0	0	1.3	0.8	100	0.75
13 A11381-3	38.3	43.3	40.8	5+	5.1	0	0.8	0.6	60	0.25
14 A12304-1sto	36.4	40.3	38.3	4+	4.2	0	0.9	0.7	0	
15 COA13241-3	32.9	41.7	37.3	4-	9.9	0	1.1	0.7	0	
16 COA14185-3	36.6	41.7	39.1	4+	5.1	0	0.9	0.7	0	
17 AOR13064-2	49.5	50.4	49.9	5+	2.2	0	0.5	0.5	73	0.25
Average	39.2	LSD 0.05 43.6	3.3 41.4		3.4 5.5				20 56	

Date test performed:

Washington

Dec. 1

Dec. 1

Dec. 19

Idaho

Dec. 7

Dec. 7

Dec. 19

Oregon

Dec. 13

Dec. 13

Dec. 19

§ rtg = rating (1-5, 5 is best); av = average Photovolt reading; Diff = Absolute difference between stem and bud Photovolt reading. Stem to bud differences of nine or greater (-) lose one point and differences of less than nine (+) gain one point in the accumulated total postharvest rating.

Sprouting was rated after approximately 3 months in storage.

2022 Late Harvest Tri-State Trial

Stored at 44°F for 60 Days

	Clone	PHOTOVOLT READING				DIFF	USDA COLOR	% REDUCING SUGAR	
		stem	bud	average	rtg §			stem	bud
Washington									
1	Clearwater Russet	38.3	48.8	43.5	5-	10.5	0	0.8	0.5
2	Ranger Russet	27.1	36.3	31.7	3-	9.3	1	1.7	0.9
3	Russet Burbank	23.5	34.9	29.2	2-	11.4	2	2.2	1.0
4	A09136-9LB	37.3	40.0	38.6	4+	2.9	0	0.9	0.7
5	A11175-12TE	40.0	43.3	41.6	5+	3.9	0	0.7	0.6
6	A11326-1	31.6	43.9	37.7	4-	12.7	0	1.2	0.6
7	A12169-5	38.3	43.3	40.8	5+	5.3	0	0.8	0.6
8	A13036-12	44.4	45.0	44.7	5+	1.7	0	0.6	0.6
9	A13072-7	38.1	39.6	38.8	4+	4.2	0	0.8	0.8
10	A13091-5	44.8	48.7	46.7	5+	4.8	0	0.6	0.5
11	AFA6346-2	27.2	36.2	31.7	3-	9.1	1	1.7	0.9
12	A10071-1	35.7	37.6	36.7	4+	2.7	0	1.0	0.8
13	A11381-3	32.1	39.7	35.9	4+	7.7	0	1.2	0.7
14	A12304-1sto	29.0	35.3	32.1	3+	6.3	1	1.5	1.0
15	COA13241-3	29.3	42.2	35.8	4-	12.8	1	1.5	0.6
16	COA14185-3	32.4	37.7	35.1	3+	5.9	0	1.2	0.8
17	AOR13064-2	45.8	46.7	46.2	5+	2.5	0	0.6	0.5
Average		35.0	LSD 0.05 41.1	3.1 38.1		3.2 6.7	0	1.1	0.7
Idaho									
1	Clearwater Russet	41.1	46.5	43.8	5+	5.3	0	0.7	0.5
2	Ranger Russet	38.4	44.0	41.2	5+	5.7	0	0.8	0.6
3	Russet Burbank	25.9	34.1	30.0	2+	8.6	1	1.8	1.1
4	A09136-9LB	45.2	44.5	44.8	5+	1.7	0	0.6	0.6
5	A11175-12TE	42.1	44.9	43.5	5+	3.4	0	0.6	0.6
6	A11326-1	37.2	40.4	38.8	4+	4.7	0	0.9	0.7
7	A12169-5	46.8	46.8	46.8	5+	2.9	0	0.5	0.5
8	A13036-12	46.4	44.3	45.4	5+	2.8	0	0.5	0.6
9	A13072-7	40.9	41.6	41.2	5+	3.6	0	0.7	0.7
10	A13091-5	49.8	50.2	50.0	5+	2.2	0	0.5	0.5
11	AFA6346-2	42.8	42.8	42.8	5+	2.7	0	0.6	0.6
12	A10071-1	40.1	40.9	40.5	5+	2.8	0	0.7	0.7
13	A11381-3	35.5	43.0	39.2	4+	7.5	0	1.0	0.6
14	A12304-1sto	37.0	38.1	37.6	4+	2.1	0	0.9	0.8
15	COA13241-3	28.6	39.9	34.2	3-	11.3	1	1.5	0.7
16	COA14185-3	33.4	37.9	35.7	4+	4.8	0	1.1	0.8
17	AOR13064-2	46.9	46.3	46.6	5+	3.1	0	0.5	0.5
Average		39.9	LSD 0.05 42.7	2.3 41.3		2.6 4.4	0	0.8	0.7
Oregon									
1	Clearwater Russet	43.3	48.4	45.9	5+	6.0	0	0.6	
2	Ranger Russet	30.3	36.9	33.6	3+	7.2	1	1.4	
3	Russet Burbank	24.3	35.3	29.8	2-	11.1	2	2.0	
4	A09136-9LB	35.5	40.7	38.1	4+	5.2	0	1.0	
5	A11175-12TE	43.2	44.8	44.0	5+	3.3	0	0.6	
6	A11326-1	29.2	41.8	35.5	4-	13.6	1	1.5	
7	A12169-5	47.3	46.7	47.0	5+	2.2	0	0.5	
8	A13036-12	38.9	39.7	39.3	4+	3.0	0	0.8	
9	A13072-7	37.6	38.3	37.9	4+	5.0	0	0.8	
10	A13091-5	46.2	46.6	46.4	5+	1.3	0	0.5	
11	AFA6346-2	34.2	39.4	36.8	4+	5.3	0	1.0	
12	A10071-1	25.0	30.9	27.9	2+	7.3	1	2.0	
13	A11381-3	32.2	37.1	34.7	3+	5.2	0	1.2	
14	A12304-1sto	30.7	35.9	33.3	3+	5.3	0	1.3	
15	COA13241-3	28.0	36.0	32.0	3+	8.0	1	1.6	
16	COA14185-3	35.3	38.7	37.0	4+	4.5	0	1.0	
17	AOR13064-2	45.6	47.2	46.4	5+	2.7	0	0.6	
Average		35.7		3.4 38.0		3.5 5.7	0	1.1	

Date test performed:

Washington

Dec. 2

Dec. 2

Idaho

Dec. 8

Dec. 8

Oregon

Dec. 14

Dec. 14

§ rtg = rating (1-5, 5 is best); av = average Photovolt reading; Diff = Absolute difference between stem and bud Photovolt reading. Stem to bud differences of nine or greater (-) lose one point and differences of less than nine (+) gain one point in the accumulated total postharvest rating.

2022 Late Harvest Tri-State Trial

Stored at 40°F for 60 Days and Reconditioned

		PHOTOVOLT(60 Days at 40°F)						PHOTOVOLT AFTER RECONDITIONING (21 days at 60°F)					USDA
Clone	SPROUTING (%)	stem	bud	average	rtg	\$	DIFF	USDA COLOR	stem	bud	average	DIFF	COLOR
Washington													
1 Clearwater Russet	0	26.7	39.9	33.3	3	13.1	1		36.4	46.7	41.5	11.1	0
2 Ranger Russet	0	22.5	30.8	26.7	2	8.3	2		27.4	36.1	31.7	8.7	1
3 Russet Burbank	0	18.8	24.7	21.7	1	6.0	3		22.5	30.0	26.2	7.5	2
4 A09136-9LB	7	31.3	35.7	33.5	3	4.4	0		41.8	42.5	42.1	2.3	0
5 A11175-12TE	0	30.5	34.4	32.5	3	5.3	0		33.5	41.8	37.7	8.3	0
6 A11326-1	0	23.5	33.5	28.5	2	10.1	2		33.0	47.0	40.0	14.2	0
7 A12169-5	0	26.2	32.1	29.2	2	6.9	1		31.7	41.1	36.4	9.3	0
8 A13036-12	0	36.3	36.4	36.4	4	3.1	0		42.3	45.6	43.9	3.7	0
9 A13072-7	0	24.4	32.0	28.2	2	7.9	2		37.2	39.5	38.4	3.1	0
10 A13091-5	0	32.3	36.5	34.4	3	5.1	0		36.9	47.5	42.2	10.6	0
11 AFA6346-2	0	23.6	30.3	26.9	2	6.8	2		24.3	32.9	28.6	8.8	2
12 A10071-1	0	25.7	31.0	28.4	2	5.6	1		29.7	37.6	33.7	9.8	1
13 A11381-3	0	18.6	24.8	21.7	1	6.2	3		28.1	38.1	33.1	10.0	1
14 A12304-1sto	0	20.4	28.8	24.6	2	8.4	2		26.6	34.2	30.4	7.7	1
15 COA13241-3	0	20.6	33.7	27.1	2	13.1	2		25.2	37.7	31.4	12.6	1
16 COA14185-3	0	20.7	26.2	23.5	1	5.5	2		25.0	33.6	29.3	8.6	1
17 AOR13064-2	0	40.3	43.5	41.9	5	4.9	0		47.3	48.1	47.7	2.4	0
LSD 0.05	4.5			3.5		3.8					3.9	4.5	
Average	0	26.0	32.6	29.3		7.1	1		32.3	40.0	36.1	8.2	1
Idaho													
1 Clearwater Russet	0	36.3	42.7	39.5	4	6.4	0		39.0	46.6	42.8	8.7	0
2 Ranger Russet	0	30.0	37.8	33.9	3	7.8	1		33.6	47.0	40.3	13.5	0
3 Russet Burbank	0	21.4	27.3	24.4	1	6.4	2		23.3	34.4	28.9	11.6	2
4 A09136-9LB	0	39.4	40.5	39.9	4	3.4	0		40.0	45.3	42.6	5.4	0
5 A11175-12TE	0	32.0	37.5	34.8	3	6.1	0		37.9	45.1	41.5	7.9	0
6 A11326-1	0	31.1	36.8	33.9	3	6.7	0		36.4	41.6	39.0	6.7	0
7 A12169-5	0	39.9	38.6	39.3	4	3.0	0		39.1	46.6	42.8	8.9	0
8 A13036-12	0	41.0	40.8	40.9	5	2.3	0		40.4	42.0	41.2	3.8	0
9 A13072-7	0	36.2	40.6	38.4	4	4.9	0		35.2	41.4	38.3	6.4	0
10 A13091-5	0	38.0	43.8	40.9	5	6.5	0		43.9	49.0	46.4	5.3	0
11 AFA6346-2	0	29.4	33.4	31.4	3	4.7	1		36.8	39.3	38.0	3.0	0
12 A10071-1	0	36.9	36.0	36.4	4	3.7	0		38.9	42.5	40.7	3.8	0
13 A11381-3	0	26.3	34.4	30.3	2	8.1	1		32.6	46.4	39.5	14.2	0
14 A12304-1sto	0	26.9	32.0	29.4	2	5.1	1		31.4	39.5	35.4	8.1	0
15 COA13241-3	0	23.0	36.1	29.5	2	13.1	2		26.2	35.0	30.6	9.1	1
16 COA14185-3	0	25.9	30.8	28.3	2	6.3	1		27.4	34.5	30.9	7.6	1
17 AOR13064-2	0	40.5	44.7	42.6	5	4.8	0		43.6	45.4	44.5	4.7	0
LSD 0.05	ns			2.7		3.1					3.1	3.9	
Average	0	32.6	37.3	34.9		5.8	1		35.6	42.4	39.0	7.6	0
Oregon													
1 Clearwater Russet	0	34.8	42.0	38.4	4	7.3	0		37.1	46.0	41.6	8.8	0
2 Ranger Russet	0	22.3	27.9	25.1	2	6.2	2		26.8	35.5	31.1	9.7	1
3 Russet Burbank	0	17.3	24.8	21.0	1	7.7	3		20.8	29.5	25.2	8.8	2
4 A09136-9LB	40	34.8	38.3	36.6	4	5.2	0		33.1	39.6	36.4	7.4	0
5 A11175-12TE	0	29.6	32.4	31.0	3	3.9	1		36.5	40.2	38.4	4.2	0
6 A11326-1	0	23.7	31.3	27.5	2	8.1	2		29.8	39.5	34.7	9.7	1
7 A12169-5	0	40.7	40.9	40.8	5	3.2	0		43.4	47.4	45.4	4.5	0
8 A13036-12	0	30.1	34.3	32.2	3	5.6	1		39.3	44.0	41.6	4.7	0
9 A13072-7	0	26.6	30.0	28.3	2	3.8	1		30.1	30.2	30.2	4.1	1
10 A13091-5	0	32.5	36.4	34.4	3	5.4	0		36.5	39.4	38.0	3.7	0
11 AFA6346-2	0	23.3	28.6	26.0	2	5.3	2		29.8	35.5	32.6	5.9	1
12 A10071-1	0	19.8	26.2	23.0	1	6.4	2		35.0	37.7	36.3	6.1	0
13 A11381-3	0	22.8	27.4	25.1	2	4.5	2		28.3	37.9	33.1	9.6	1
14 A12304-1sto	0	25.6	32.2	28.9	2	7.1	1		23.8	31.1	27.5	8.2	2
15 COA13241-3	0	20.9	24.3	22.6	1	4.8	2		21.0	28.5	24.7	8.3	2
16 COA14185-3	0	23.4	27.4	25.4	2	5.5	2		21.3	28.2	24.7	7.3	2
17 AOR13064-2	0	43.7	47.5	45.6	5	4.7	0		47.5	49.1	48.3	2.8	0
LSD 0.05	9			3.4		3.3					3.5	3.7	
Average	2	27.8	32.5	30.1		5.6	1		31.8	37.6	34.7	6.7	1

Date test performed:

Washington

Dec. 19

Dec. 3

Dec. 15

Idaho

Dec. 19

Dec. 9

Dec. 16

Oregon

Dec. 19

Dec. 5

Dec. 16

DIFF = Absolute difference between bud and stem Photovolt reading.

Sprouting was rated after approximately 3 months in storage.

2022 Late Harvest Tri-State Trial

Stored at 40°F for 60 Days and Water Blanched

PHOTOVOLT(60 Days at 40°F)							PHOTOVOLT AFTER WATER BLANCHING					
Clone	stem	bud	average	rtg	§	DIFF	USDA COLOR	stem	bud	10 min @ 160°F average	DIFF	USDA COLOR
Washington												
1 Clearwater Russet	26.7	39.9	33.3	3	13.1	1		34.2	43.4	38.8	9.2	0
2 Ranger Russet	22.5	30.8	26.7	2	8.3	2		27.2	36.3	31.8	9.0	1
3 Russet Burbank	18.8	24.7	21.7	1	6.0	3		24.7	33.1	28.9	8.3	1
4 A09136-9LB	31.3	35.7	33.5	3	4.4	0		40.1	41.6	40.9	2.4	0
5 A11175-12TE	30.5	34.4	32.5	3	5.3	0		38.0	38.6	38.3	2.6	0
6 A11326-1	23.5	33.5	28.5	2	10.1	2		32.8	40.4	36.6	8.1	0
7 A12169-5	26.2	32.1	29.2	2	6.9	1		31.8	37.3	34.5	5.7	0
8 A13036-12	36.3	36.4	36.4	4	3.1	0		39.8	39.9	39.8	3.4	0
9 A13072-7	24.4	32.0	28.2	2	7.9	2		28.2	36.7	32.4	8.5	1
10 A13091-5	32.3	36.5	34.4	3	5.1	0		36.9	41.4	39.1	4.8	0
11 AFA6346-2	23.6	30.3	26.9	2	6.8	2		26.1	34.0	30.0	7.8	1
12 A10071-1	25.7	31.0	28.4	2	5.6	1		26.4	34.0	30.2	7.7	1
13 A11381-3	18.6	24.8	21.7	1	6.2	3		22.0	30.5	26.3	8.5	2
14 A12304-1sto	20.4	28.8	24.6	2	8.4	2		24.8	31.0	27.9	6.2	1
15 COA13241-3	20.6	33.7	27.1	2	13.1	2		25.6	37.3	31.4	12.5	1
16 COA14185-3	20.7	26.2	23.5	1	5.5	2		24.3	29.8	27.0	5.7	2
17 AOR13064-2	40.3	43.5	41.9	5	4.9	0		41.8	44.3	43.0	3.2	0
LSD 0.05			3.5		3.8					2.9	3.6	
Average	26.0	32.6	29.3		7.1	1.4		30.9	37.0	33.9	6.7	0.6
Idaho												
1 Clearwater Russet	36.3	42.7	39.5	4	6.4	0		45.3	46.7	46.0	2.7	0
2 Ranger Russet	30.0	37.8	33.9	3	7.8	1		35.4	41.9	38.7	6.5	0
3 Russet Burbank	21.4	27.3	24.4	1	6.4	2		28.7	30.5	29.6	4.7	1
4 A09136-9LB	39.4	40.5	39.9	4	3.4	0		44.7	43.7	44.2	3.0	0
5 A11175-12TE	32.0	37.5	34.8	3	6.1	0		36.6	42.7	39.6	7.1	0
6 A11326-1	31.1	36.8	33.9	3	6.7	0		37.0	40.1	38.5	6.5	0
7 A12169-5	39.9	38.6	39.3	4	3.0	0		43.7	42.9	43.3	2.7	0
8 A13036-12	41.0	40.8	40.9	5	2.3	0		42.7	44.0	43.4	2.9	0
9 A13072-7	36.2	40.6	38.4	4	4.9	0		40.0	41.0	40.5	4.0	0
10 A13091-5	38.0	43.8	40.9	5	6.5	0		46.5	47.5	47.0	2.5	0
11 AFA6346-2	29.4	33.4	31.4	3	4.7	1		33.5	36.6	35.0	4.3	0
12 A10071-1	36.9	36.0	36.4	4	3.7	0		39.2	38.9	39.0	2.6	0
13 A11381-3	26.3	34.4	30.3	2	8.1	1		30.1	40.6	35.3	10.5	1
14 A12304-1sto	26.9	32.0	29.4	2	5.1	1		32.3	34.0	33.2	2.8	0
15 COA13241-3	23.0	36.1	29.5	2	13.1	2		32.5	42.9	37.7	10.4	0
16 COA14185-3	25.9	30.8	28.3	2	6.3	1		29.7	33.4	31.5	4.3	1
17 AOR13064-2	40.5	44.7	42.6	5	4.8	0		44.7	44.9	44.8	2.7	0
LSD 0.05			2.7		3.1					2.4	2.5	
Average	32.6	37.3	34.9		5.8	0.5		37.8	40.7	39.3	4.7	0.2
Oregon												
1 Clearwater Russet	34.8	42.0	38.4	4	7.3	0		39.7	46.2	43.0	6.5	0
2 Ranger Russet	22.3	27.9	25.1	2	6.2	2		31.3	36.2	33.7	5.2	0
3 Russet Burbank	17.3	24.8	21.0	1	7.7	3		23.3	30.4	26.9	7.1	2
4 A09136-9LB	34.8	38.3	36.6	4	5.2	0		42.2	43.8	43.0	3.3	0
5 A11175-12TE	29.6	32.4	31.0	3	3.9	1		36.6	39.7	38.1	3.8	0
6 A11326-1	23.7	31.3	27.5	2	8.1	2		33.8	41.5	37.7	7.9	0
7 A12169-5	40.7	40.9	40.8	5	3.2	0		45.9	46.0	46.0	1.8	0
8 A13036-12	30.1	34.3	32.2	3	5.6	1		35.7	41.2	38.4	5.9	0
9 A13072-7	26.6	30.0	28.3	2	3.8	1		34.7	37.5	36.1	3.8	0
10 A13091-5	32.5	36.4	34.4	3	5.4	0		39.4	41.7	40.5	3.6	0
11 AFA6346-2	23.3	28.6	26.0	2	5.3	2		32.6	37.5	35.0	4.9	0
12 A10071-1	19.8	26.2	23.0	1	6.4	2		28.5	32.7	30.6	6.7	1
13 A11381-3	22.8	27.4	25.1	2	4.5	2		33.8	38.9	36.3	5.6	0
14 A12304-1sto	25.6	32.2	28.9	2	7.1	1		33.3	37.0	35.2	3.7	0
15 COA13241-3	20.9	24.3	22.6	1	4.8	2		34.7	38.5	36.6	4.8	0
16 COA14185-3	23.4	27.4	25.4	2	5.5	2		36.1	38.3	37.2	3.8	0
17 AOR13064-2	43.7	47.5	45.6	5	4.7	0		48.5	48.7	48.6	1.8	0
LSD 0.05			3.4		3.3					3.0	3.1	
Average	27.8	32.5	30.1		5.6	1.2		35.9	39.7	37.8	4.7	0.2

Date test performed:

Washington

Dec. 3

Dec. 3

Idaho

Dec. 9

Dec. 9

Oregon

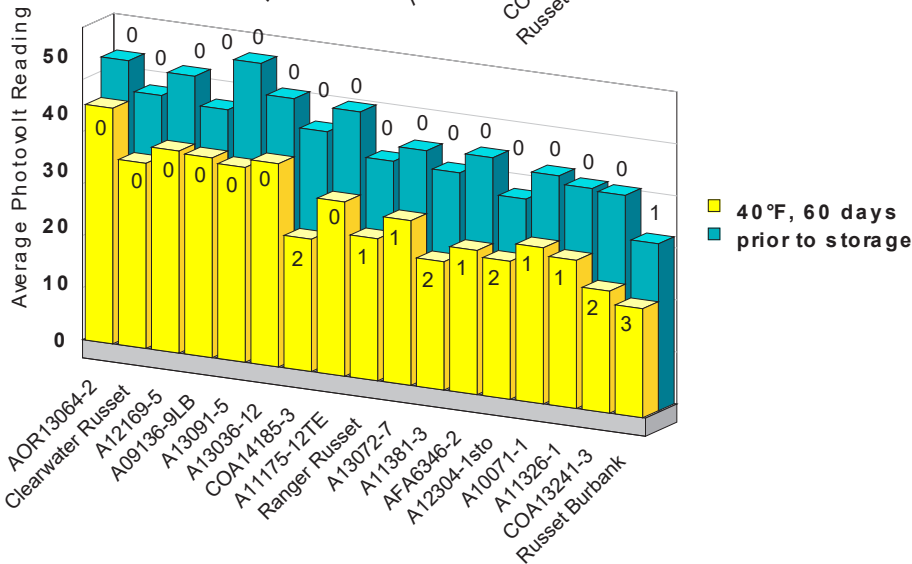
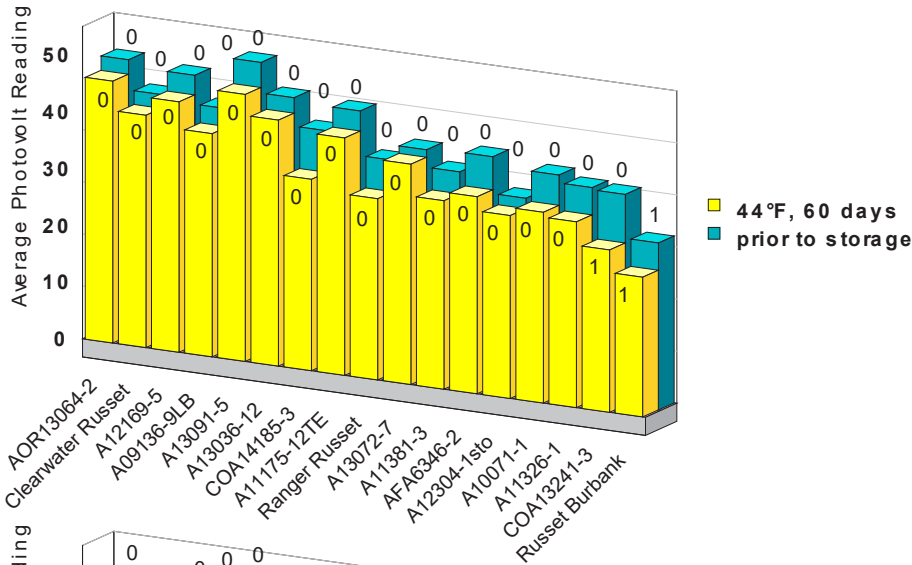
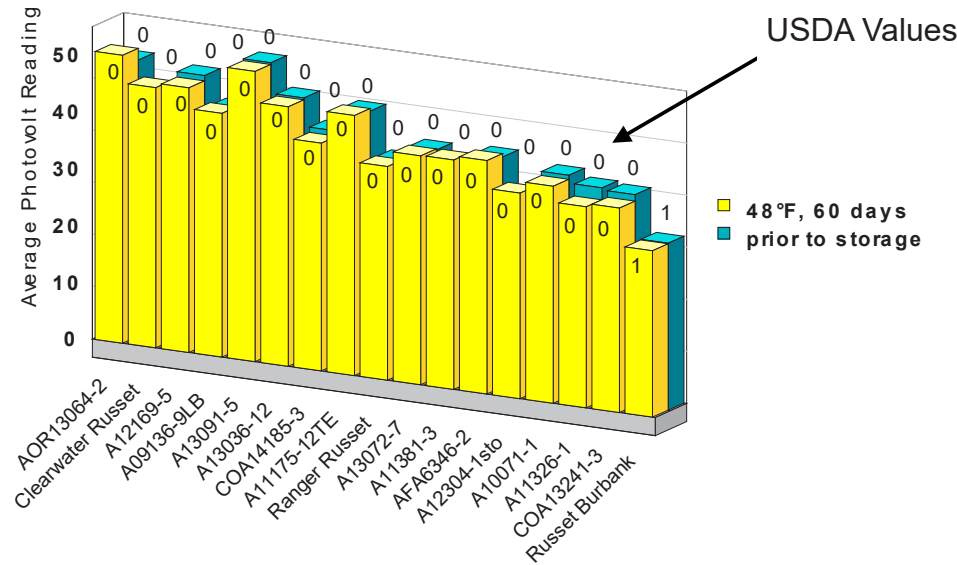
Dec. 15

Dec. 15

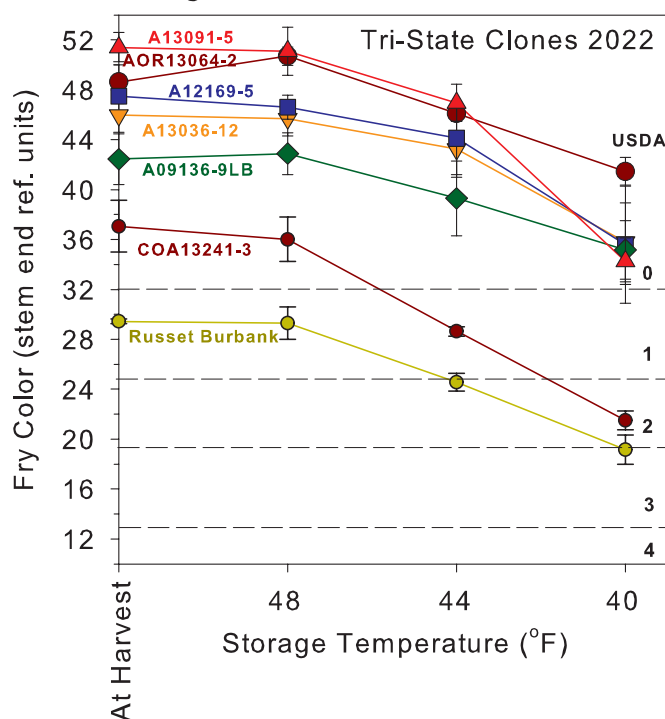
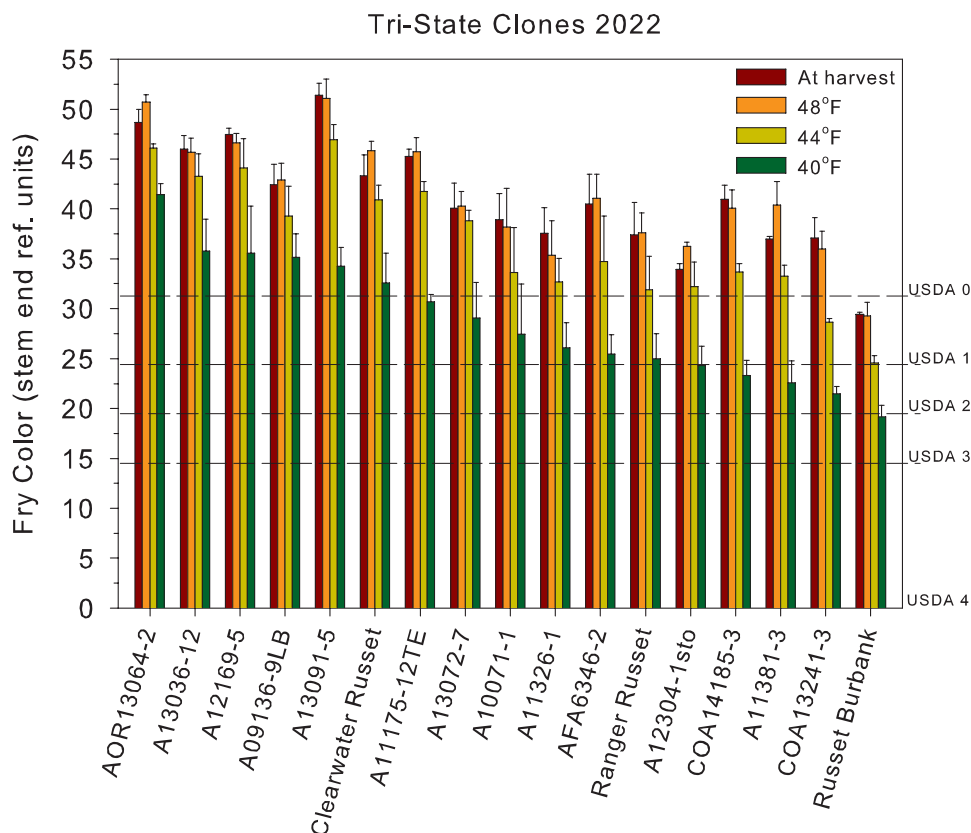
Diff = Absolute difference between stem and bud Photovolt reading.

2022 Late Harvest Tri-State Trial

Tri-State Trial - 3 state Average of Stem End



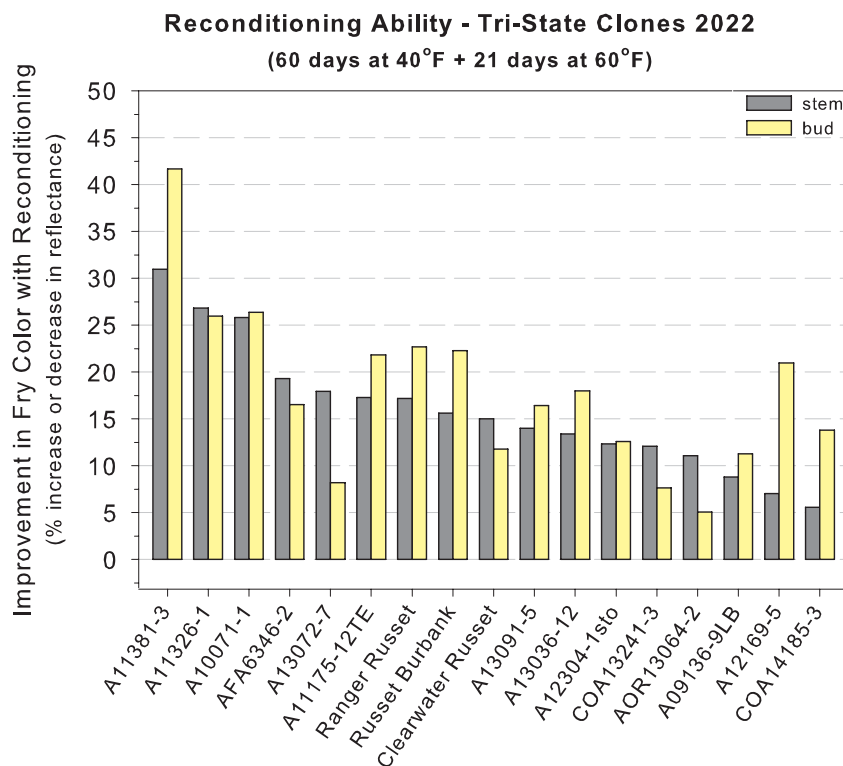
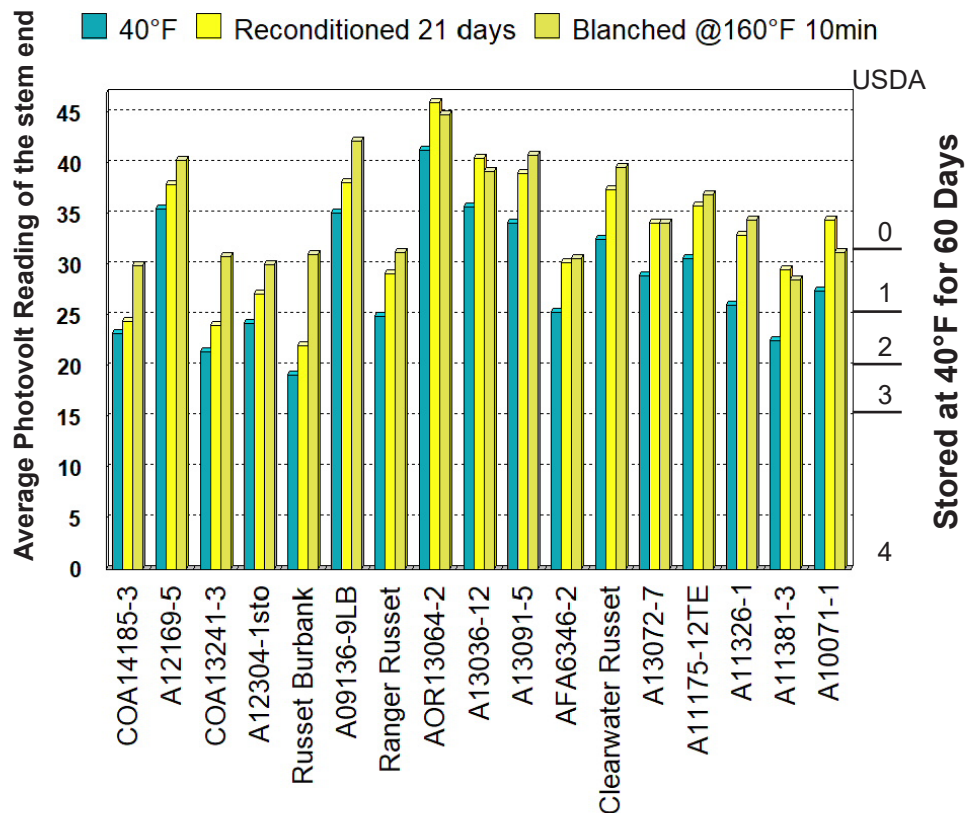
2022 Late Harvest Tri-State Trial



Top: At-harvest and after-storage French fry colors (stem end) of clones in the Tri-State Trial. Tubers were stored for 60 days at 48, 44, and 40°F. The clones are ranked from best to worst on fry color of the 40°F-stored tubers. High reflectance values indicate light colored fries.

Bottom: Line graph depicting the effects of storage temperature on change in French fry processing quality (stem end fry color) of the most cold sweetening resistant (A13091-5, AOR13064-2*, A12169-5, A13036-12 and A09136-9LB*) and susceptible (COA13241-3 and RB*) clones in the Tri-State Trial. *Indicates similar performance of the clones last year.

2022 Late Harvest Tri-State Trial



Reconditioning abilities of clones in the 2022 Tri-State Trial (3-state averages). Clones were stored at 40°F for 60 days after harvest and then reconditioned at 60°F for 21 days. **Top:** Stem end fry color before and after reconditioning and blanching. Numbers on side indicate the USDA color rating of the stem end. **Bottom:** Percent improvement of stem and bud end fry color with reconditioning.

2022 Late Harvest Tri-State Trial

Length to Width Ratios of 8-10 oz Tubers

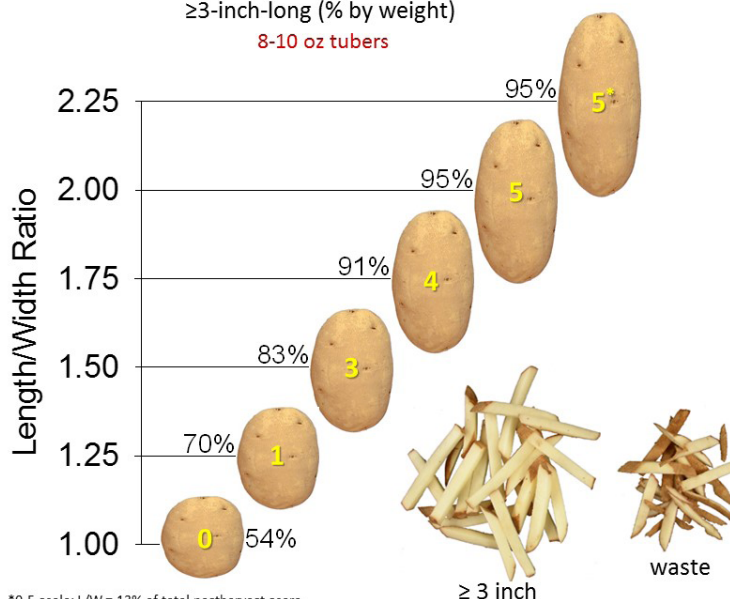
Clone	Length to width ratio						3 State Avg.
	WA	rtg \$	ID	rtg \$	OR	rtg \$	
1 Clearwater Russet	1.57	3	1.91	5	1.87	5	1.78
2 Ranger Russet	1.70	4	2.45	5	2.07	5	2.07
3 Russet Burbank	1.74	4	2.46	5	1.97	5	2.06
4 A09136-9LB	1.47	2	1.60	3	1.54	3	1.54
5 A11175-12TE	1.33	1	1.81	5	1.35	2	1.50
6 A11326-1	1.33	1	1.96	5	1.58	3	1.62
7 A12169-5	1.64	3	1.71	4	1.53	3	1.63
8 A13036-12	1.37	2	1.64	3	1.46	2	1.49
9 A13072-7	1.41	2	2.09	5	1.49	2	1.66
10 A13091-5	1.48	2	1.88	5	1.46	2	1.61
11 AFA6346-2	1.77	4	2.04	5	1.70	4	1.84
12 A10071-1	1.75	4	2.08	5	1.71	4	1.85
13 A11381-3	1.31	1	1.59	3	1.36	2	1.42
14 A12304-1sto	1.64	3	1.86	5	1.76	4	1.76
15 COA13241-3	1.97	5	2.14	5	2.05	5	2.05
16 COA14185-3	1.69	4	2.28	5	1.91	5	1.96
17 AOR13064-2	1.70	4	2.10	5	1.79	4	1.86
Average	1.58		1.98		1.68		1.75

Clone	Width to thickness ratio				3 State Avg.
	WA	ID	OR		
1 Clearwater Russet	1.21	1.19	1.19		1.20
2 Ranger Russet	1.19	1.17	1.19		1.18
3 Russet Burbank	1.24	1.16	1.20		1.20
4 A09136-9LB	1.24	1.15	1.24		1.21
5 A11175-12TE	1.17	1.12	1.20		1.16
6 A11326-1	1.14	1.09	1.13		1.12
7 A12169-5	1.19	1.17	1.20		1.19
8 A13036-12	1.21	1.14	1.21		1.18
9 A13072-7	1.21	1.12	1.12		1.15
10 A13091-5	1.16	1.12	1.16		1.15
11 AFA6346-2	1.14	1.11	1.17		1.14
12 A10071-1	1.18	1.16	1.18		1.17
13 A11381-3	1.20	1.10	1.16		1.15
14 A12304-1sto	1.17	1.14	1.19		1.17
15 COA13241-3	1.09	1.11	1.09		1.10
16 COA14185-3	1.17	1.14	1.21		1.17
17 AOR13064-2	1.16	1.15	1.16		1.16
Average	1.18	1.14	1.18		1.16

French Fry Yield vs Tuber L/W Ratio

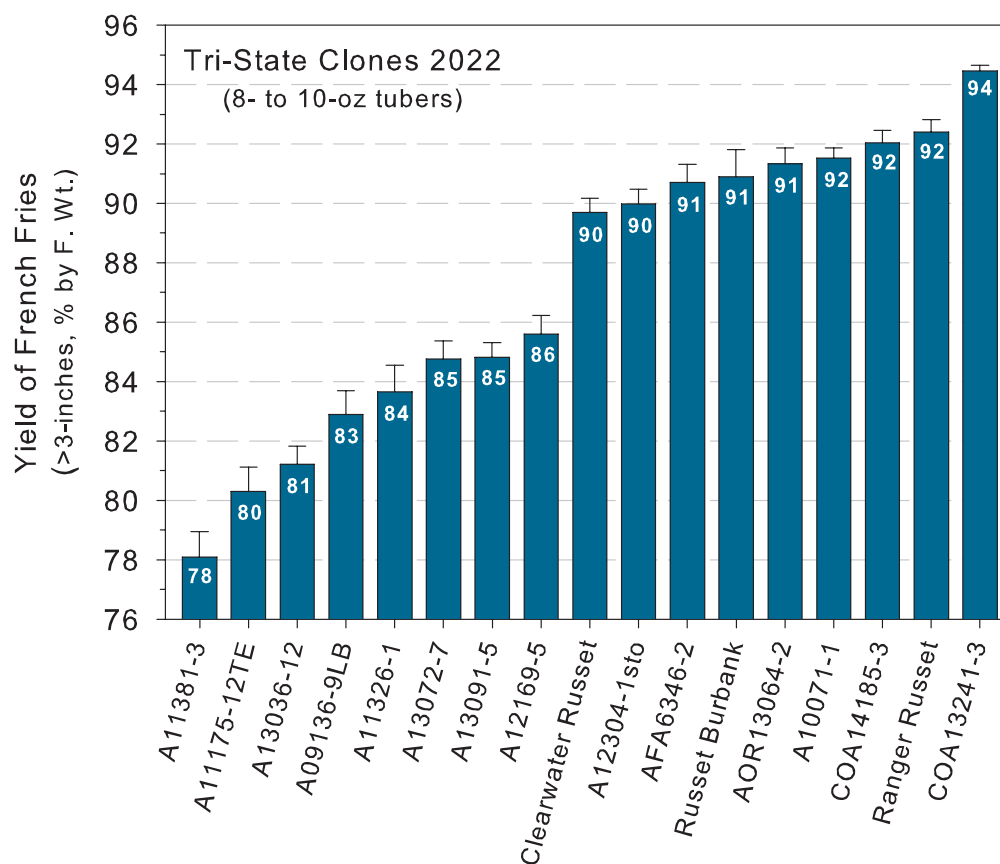
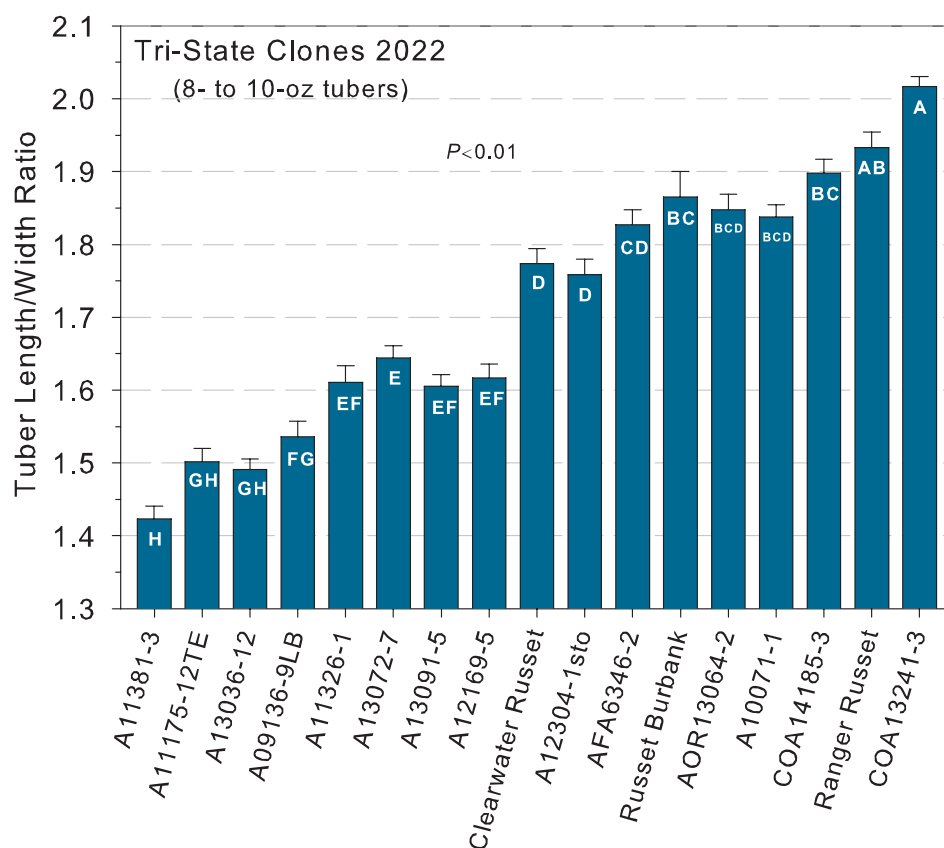
≥3-inch-long (% by weight)

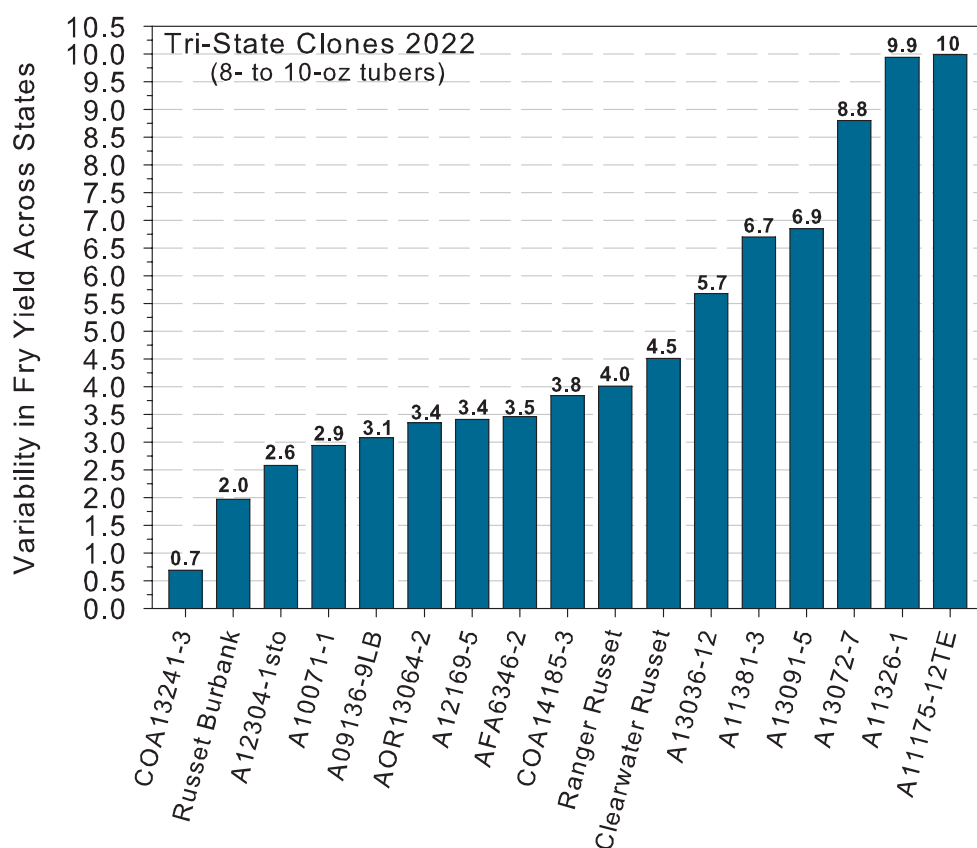
8-10 oz tubers



*0-5 scale; L/W = 13% of total postharvest score

2022 Late Harvest Tri-State Trial





Relative ranking of clones in the Late Season Tri-State Trial for variability in yield of French fries prepared from 8- to 10-oz tubers. Variability is expressed as the standard deviation (calculated across ID, WA and OR production sites) for the yield of fries ≥ 3 inches in length (% by fresh weight) from 8- to 10-oz tubers. High values reflect more variation in tuber shape and thus fry yield from state to state. For example, A11175-12TE had a length to width ratio of 1.50, resulting in 80% of the tuber producing usable French fries ≥ 3 inches in length (page 56). However, tuber shape of this entry also varied the most across production sites (see above), resulting in fry yields ranging from 74 to 92% ($80 \pm 5.77\%$).

Pages 55-56: Tuber length to width ratios and the associated percentage yield of fries. Bars with same letter are not significantly different ($P \leq 0.01$).

2022 Early Harvest Regional Trial

Location: WSU Research Center – Othello, WA

Planting Date: March 30

Vine Kill Date: August 5

Harvest Date: August 16

Days Grown: 128

Regional trials are conducted throughout the western region of the United States, including Washington. Entries in the Regional Trial are chosen by a coordinating committee and are grown for both early (Early Regional) and full (Late Regional) season harvest. The 2022 early harvest trial compared 5 local reference varieties to 11 new clones on the WSU Othello Research Station. The following is a summary of the Washington field and post-harvest results. See also: grading comments and merit scores near front of book

Fresh Market Standout(s): AOR11217-3

Process Market Standout(s): AOR11217-3

Yield and Economic Data

➤ Total Yield and U.S. #1 Yield

Highest: AOR10204-3 had the highest total yield (717 CWT/A) and the highest U.S. #1 yield was A12305-2adg (580 CWT/A). A12305-2adg had the second highest total yield (573 CWT/A) and the second highest U.S. #1 yield was A10594-4sto (555 CWT/A).

Lowest: CO11009-3RU had the lowest total yield (461 CWT/A). Clearwater Russet had the second lowest total yield (476 CWT/A) and the lowest U.S. #1 yield was CO10085-1RU (323 CWT/A).

➤ % U.S. #1's (greater than 4 oz)

Highest: A10594-4sto (91%) and AFA5661-8 (90%).

Lowest: Clearwater Russet (65%) and Russet Burbank (67%).

➤ Carton Yield (100 to 50 Count (7 to 18 oz U.S. #1 Tubers))

Highest: A10594-4sto (19.1 Tons/A) and A12305-2adg (18.9 Tons/A).

Lowest: Clearwater Russet (6.3 Tons/A) and CO10085-1RU (6.8 Tons/A).

➤ Gross Return (\$/acre)

Fresh Market Highest: A12305-2adg and A10594-4sto.

Fresh Market Lowest: Clearwater Russet, CO10085-1RU, and CO11009-3RU.

Process Market Highest: A10594-4sto, AOR08540-1, and AOR10204-3.

Process Market Lowest: CO10085-1RU, Clearwater Russet, and AC12090-3RU.

2022 Early Harvest Regional Trial

Summaries

ENTRY	TOTAL YIELD						CARTON YIELD		PROCESS YIELD	
			US # 1's*	US # 2's*	Culls*		100-50 count		US 1's and 2's	
	CWT/A	Tons/A	> 4 oz	> 4 oz	& < 4 oz	% of Total Yield	(US 1's 7-18 oz)	Tons/A	> 6 oz	Tons/A
Clearwater Russet	476	F	23.8	69	1	30	27	6.3	40	9.8
Ranger Russet	573	BCDEF	28.6	82	5	13	46	13.1	64	18.4
Russet Burbank	614	ABCD	30.7	67	3	30	36	11.1	49	15.9
Russet Norkotah	626	ABC	31.3	83	3	14	51	15.8	67	21.0
Shepody	635	ABC	31.8	74	14	12	42	13.4	83	26.4
A09086-1LB	605	ABCDE	30.2	77	0	23	35	10.5	50	15.1
A10594-4sto	609	ABCDE	30.5	91	0	8	63	19.1	78	23.7
A12305-2adg	691	AB	34.5	84	1	15	55	18.9	65	22.7
AFA5661-8	488	EF	24.4	90	0	10	69	16.8	81	19.8
AOR11217-3	557	CDEF	27.9	76	5	19	41	11.5	55	15.5
AOR08540-1	653	ABC	32.6	83	2	15	47	15.4	64	21.0
AC12090-3RU	489	DEF	24.5	74	6	20	38	9.4	57	14.2
AOR10204-3	717	A	35.9	75	8	16	45	16.3	68	24.4
CO13003-1RU	630	ABC	31.5	74	1	25	26	8.2	43	13.7
CO10085-1RU	491	DEF	24.6	65	2	33	28	6.8	39	9.7
CO11009-3RU	461	F	23.1	76	2	22	42	9.7	59	13.5

ENTRY	US # 1 YIELD						> 4 oz SPECIFIC GRAVITY	INTERNAL DEFECTS (%)		
			> 4 oz	4-7 oz*	7-14 oz*	> 14 oz*		(8-12 oz tubers)		
	CWT/A	STATS**	Tons/A	%	%	%		% HH	% BC	% IBS
Clearwater Russet	331	E	16.5	63	37	0	1.083	0	0	0
Ranger Russet	468	ABCD	23.4	41	53	5	1.077	0	0	0
Russet Burbank	407	CDE	20.3	44	46	10	1.077	10	23	0
Russet Norkotah	521	ABC	26.0	38	56	7	1.074	0	0	0
Shepody	468	ABCD	23.4	10	43	47	1.071	0	0	0
A09086-1LB	467	ABCD	23.4	54	41	5	1.082	0	0	0
A10594-4sto	555	AB	27.8	25	59	16	1.079	13	27	0
A12305-2adg	580	A	29.0	34	60	6	1.073	0	0	0
AFA5661-8	441	BCDE	22.1	23	70	7	1.077	0	0	0
AOR11217-3	429	BCDE	21.4	47	51	2	1.084	0	0	0
AOR08540-1	543	AB	27.1	42	50	8	1.079	0	0	0
AC12090-3RU	361	DE	18.1	44	42	14	1.074	0	0	0
AOR10204-3	541	AB	27.0	31	48	21	1.068	0	0	0
CO13003-1RU	467	ABCD	23.4	65	34	1	1.077	0	0	0
CO10085-1RU	323	E	16.1	58	41	1	1.082	0	0	0
CO11009-3RU	352	DE	17.6	40	50	10	1.081	0	0	0

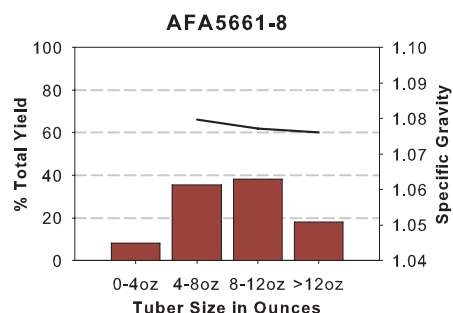
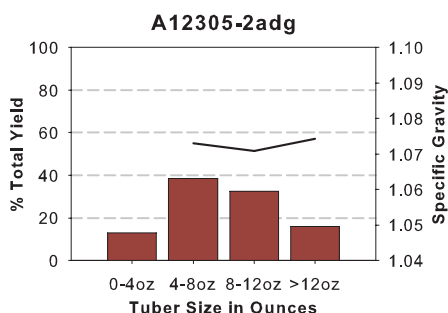
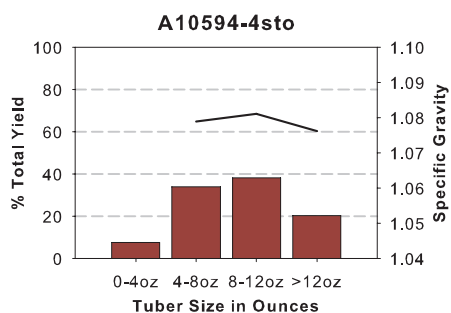
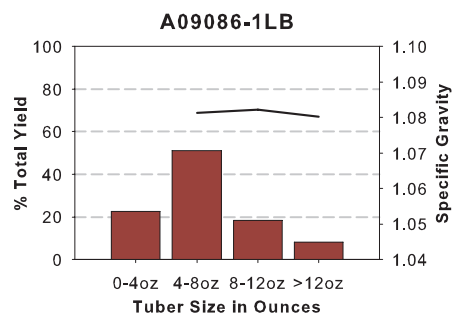
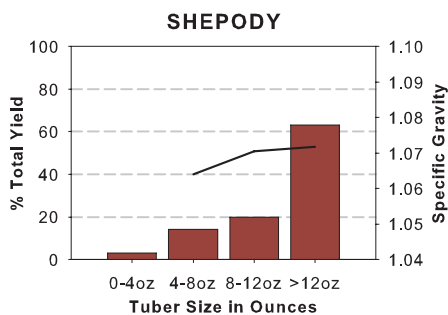
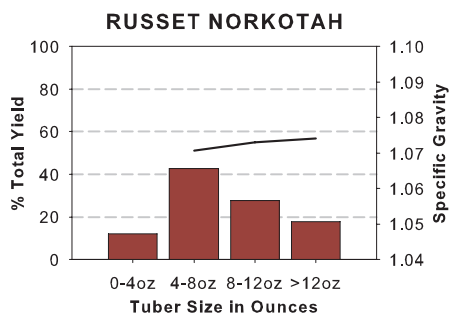
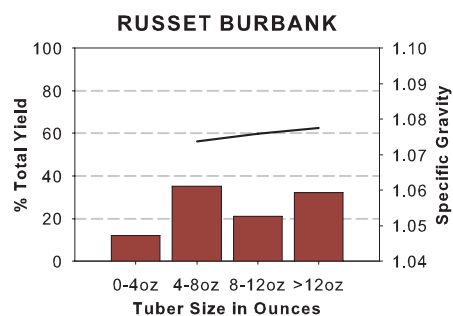
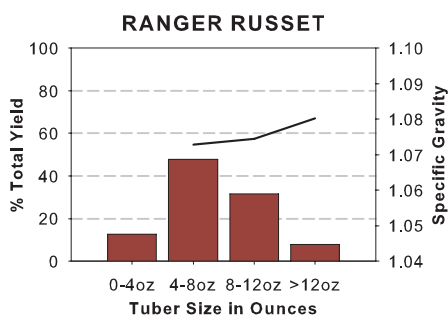
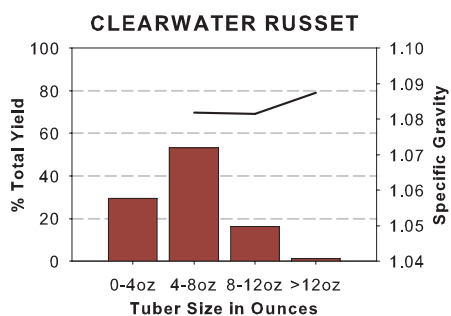
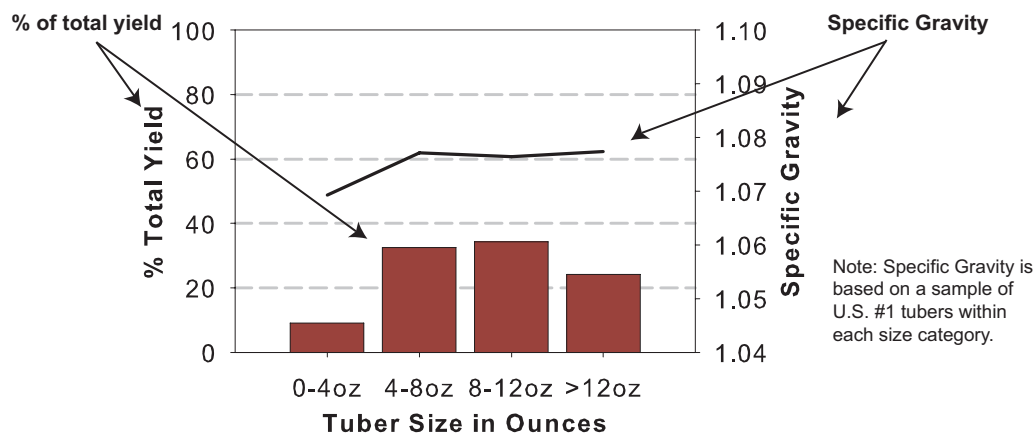
ENTRY	50 DAY	60 DAY	TUBER	STEMS PER	AVERAGE TUBER		SKIN	TUBER	BRUISE (%)	
	STAND	STAND	GREENING	PLANT	WEIGHT	NUMBER	SET	SHAPE	(8-12 oz tubers)	
	% Emerged	% Emerged	% Total Yield	Above Ground	Ounces	Tubers/Plant	1 = Poor 5 = Good	1 = Round 5 = Long	BLACKSPOT	SHATTER
Clearwater Russet	98	100	1	2.3	4.6	10.2	3.3	4.0	0	20
Ranger Russet	97	97	0	2.5	6.0	9.4	3.0	4.0	7	0
Russet Burbank	87	98	0	2.1	6.8	8.9	3.0	3.0	0	7
Russet Norkotah	100	100	2	2.6	6.3	9.8	3.7	4.0	0	0
Shepody	87	96	7	1.7	11.2	5.6	3.7	4.0	3	0
A09086-1LB	100	100	1	2.9	4.9	12.1	2.0	3.0	0	30
A10594-4sto	87	98	0	1.6	7.4	8.1	2.3	2.0	7	7
A12305-2adg	80	89	1	1.9	6.1	11.2	2.0	3.0	0	23
AFA5661-8	91	91	1	1.7	7.1	6.8	2.7	3.0	0	3
AOR11217-3	98	98	1	2.2	5.5	9.9	2.7	3.0	0	21
AOR08540-1	97	98	2	2.8	6.0	10.7	3.0	3.0	0	0
AC12090-3RU	83	96	4	3.2	5.6	8.5	3.0	3.0	0	0
AOR10204-3	100	100	4	3.1	6.7	10.5	2.0	3.3	0	17
CO13003-1RU	91	84	1	3.9	4.7	13.1	3.0	3.0	0	12
CO10085-1RU	93	98	0	3.6	4.2	11.4	2.0	3.0	0	3
CO11009-3RU	75	82	7	3.7	5.8	7.8	2.3	3.3	0	7

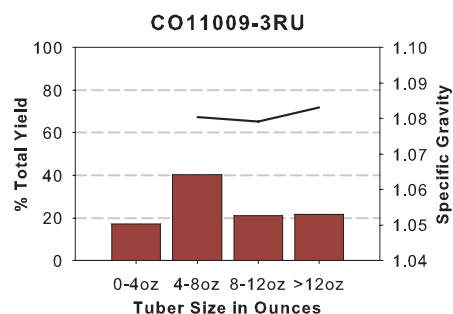
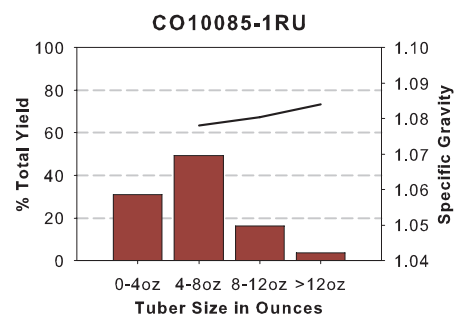
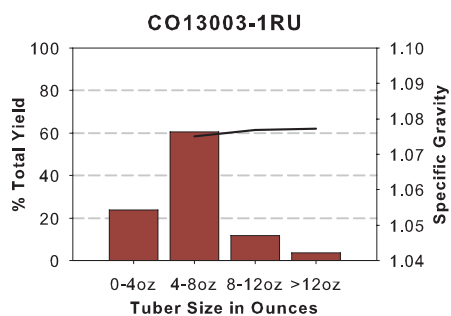
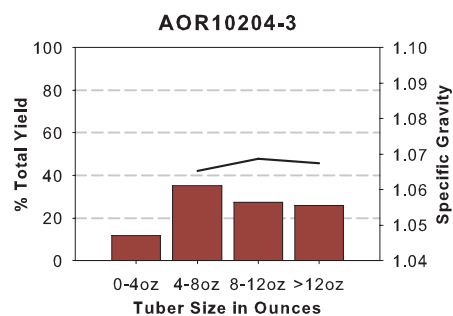
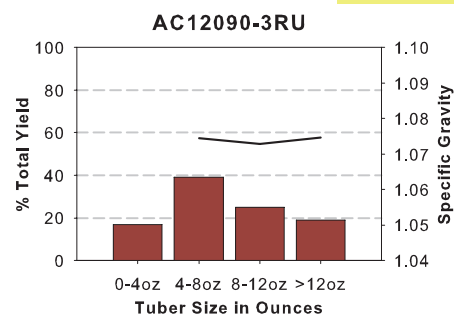
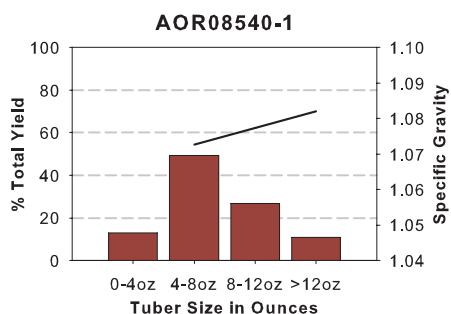
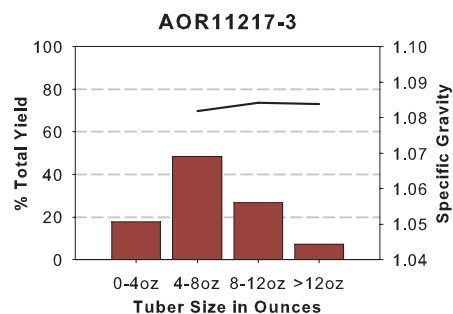
* Percent values may not total 100% due to rounding

2022 Early Harvest Regional Trial

Tuber Yield and Specific Gravity Distributions

12 inch In-Row Spacing





2022 Early Harvest Regional Trial

Tubers

Clearwater Russet



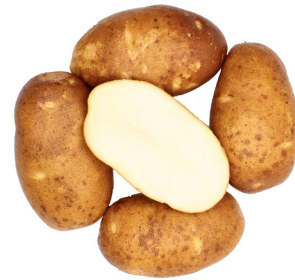
Ranger Russet



Russet Burbank



Russet Norkotah



Shepody



A09086-1LB



A10594-4sto



A12305-2adg



AFA5661-8



AOR11217-3



AOR08540-1



AC12090-3RU



AOR10204-3



CO13003-1RU



CO10085-1RU



CO11009-3RU



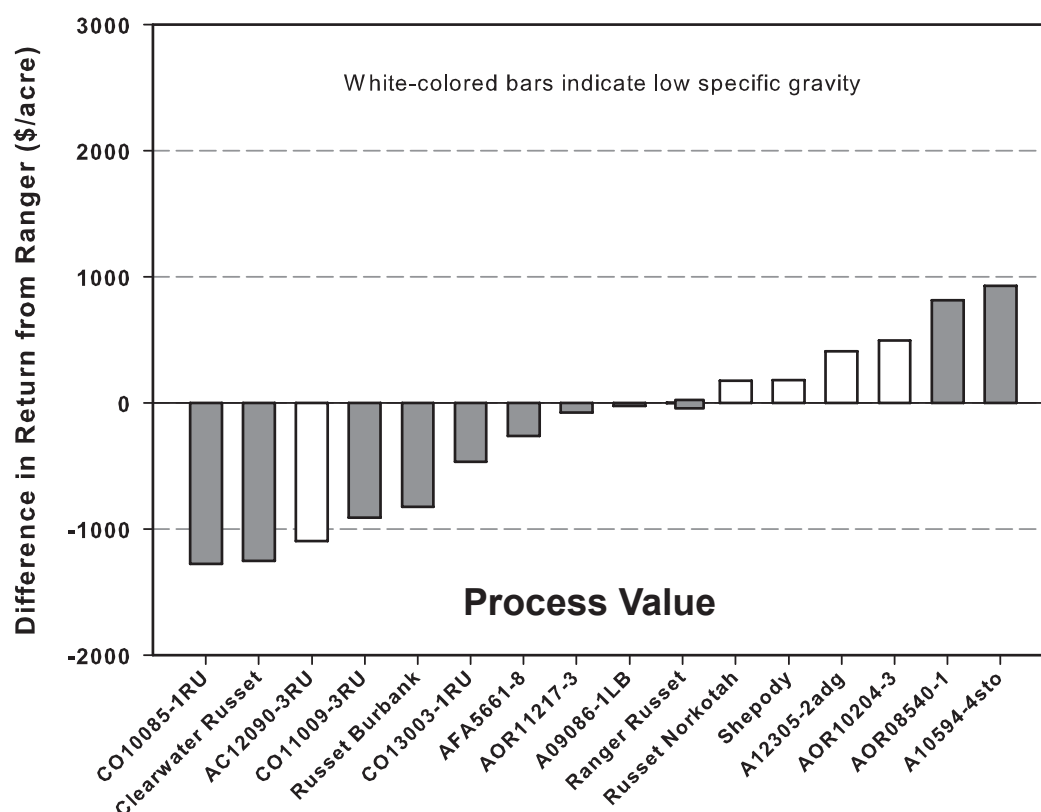
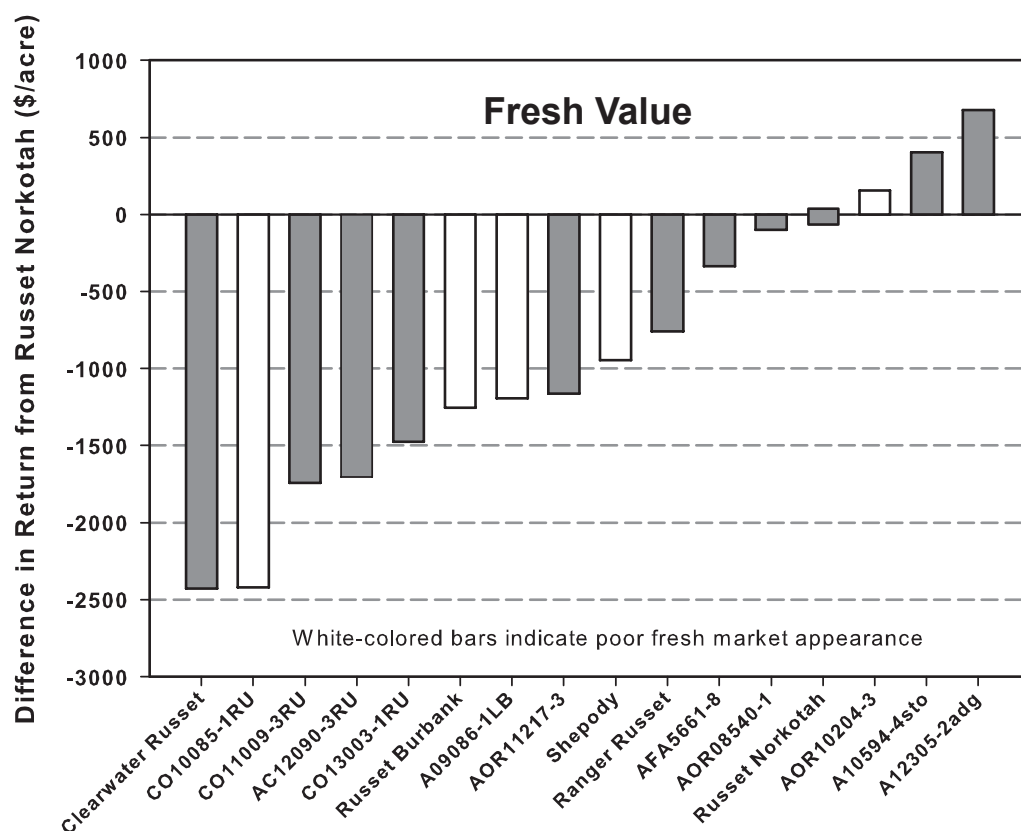


Figure 1 (top). Difference in gross return per acre (Fresh Market) from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry. Entries with the white-colored bars may not appeal to fresh market consumers due to the undesirable shape or appearance. **Figure 2 (bottom).** Difference in gross return per acre (Process Market) from Ranger Russet calculated by subtracting the gross return of Ranger Russet from the gross return of the particular entry.

2022 Late Harvest Regional Trial

Location: WSU Research Center – Othello, WA

Planting Date: March 31

Vine Kill Date: September 9

Harvest Date: September 19

Days Grown: 162

Regional trials are conducted throughout the western region of the United States, including Washington. Entries in the Regional Trial are chosen by a coordinating committee and are grown for both early (Early Regional) and full (Late Regional) season harvest. This year's trial included 4 local reference varieties and 11 new clones. The following is a summary of the Washington field and post-harvest results. See also: grading comments and merit scores near front of the book.

Fresh Market Standout(s): AOR11217-3

Process Market Standout(s): AOR11217-3

Yield and Economic Data

➤ Total Yield and U.S. #1 Yield

Highest: AOR10204-3 had the highest total yield (734 CWT/A) and the third highest U.S. #1 yield (562 CWT/A). A09086-1LB had the second highest total yield (720 CWT/A) and the highest U.S. #1 yield (580 CWT/A).

Lowest: Russet Norkotah had the lowest total yield (561 CWT/A). CO13003-1RU had the lowest U.S. #1 yield (427 CWT/A).

➤ % U.S. #1's (greater than 4 oz)

Highest: CO11009-3RU (85%) and A10594-4sto (83%).

Lowest: CO13003-1RU (72%) and CO10085-1RU (74%).

➤ Carton Yield (100 to 50 Count (7 to 18 oz U.S. #1 Tubers))

Highest: A10594-4sto (20.4 Tons/A) and Ranger Russet (19.5 Tons/A).

Lowest: CO13003-1RU (9.3 Tons/A) and CO10085-1RU (13.7 Tons/A).

➤ Gross Return (\$/acre)

Fresh Market Highest: A10594-4sto and Ranger Russet.

Fresh Market Lowest: CO13003-1RU, Russet Norkotah, and CO10085-1RU.

Process Market Highest: A09086-1LB and Ranger Russet.

Process Market Lowest: Russet Norkotah, CO13003-1RU, and Russet Burbank.

2022 Late Harvest Regional Trial

Postharvest Information

The 2022 trial evaluated 10 clones along with Clearwater Russet, Russet Burbank, and Ranger Russet as check cultivars from each growing location (WA, ID, & OR). When averaged across states, all entries received higher overall postharvest scores than Russet Burbank. An “*” in the summary below indicates similar performance and/or ranking in trials from previous years.

➤ Overall Postharvest Ratings

Highest scoring clones: CO11009-3RU*, Clearwater Russet*, AOR11217-3

Lowest scoring clones: CO13003-1RU, Russet Burbank*

➤ Low Temperature Sweetening

Most resistant: CO11009-3RU*, Clearwater Russet*, AFA5661-8, AOR11217-3, A10594-4sto

Most susceptible: Russet Burbank*, A09086-1LB, AOR08540-1*, CO13003-1RU

➤ Tuber asparagine content (WA Regional Trial samples)

Highest concentration: Russet Burbank*, AC12090-3RU

Lowest concentration: Ranger Russet, Clearwater Russet

➤ French Fry Taste Panel

Highest rated: CO11009-3RU*, Clearwater Russet*, AFA5661-8

Lowest rated: Russet Burbank*, AC12090-3RU, CO13003-1RU

➤ Blackspot Bruise Susceptibility

Most resistant: CO10085-1RU*, AOR08540-1*

Most susceptible: Ranger Russet*, A09086-1LB

➤ Variability in Tuber Shape & Fry Yield (8- to 10-oz tubers)

Lowest L/W: AFA5661-8, CO13003-1RU, A09086-1LB

Highest L/W: Russet Burbank*, Ranger Russet*, AC12090-3RU

Lowest W/Th: CO11009-3RU, A12305-2adg

Highest W/Th: CO13003-1RU, CO10085-1RU*, Clearwater Russet

Least variable: Russet Burbank*, AC12090-3RU, CO1303-1RU, AOR08540-1*

Most variable: CO10085-1RU*, A10594-4sto, AOR11217-3, Clearwater Russet

Details

- CO11009-3RU*, Clearwater Russet*, and AOR11217-3 were the highest rated entries, scoring 34.8, 33.6, and 32.4 points of 38 possible points, respectively. Overall scores (range and average across clones) were on par with last year.
- CO13003-1RU and Russet Burbank* scored the lowest on the overall postharvest performance with 16.1 and 15.6 of 38 possible points.
- CO11009-3RU*, Clearwater Russet*, AFA5661-8, AOR11217-3, and A10594-4sto were all rated resistant to cold sweetening with CO11009-3RU having the best fry color. CO11009-3RU produced USDA 0 fries (stem end) when stored for 60 days at 40°F averaged across locations and Clearwater Russet*, AFA5661-8, AOR11217-3, and A10594-4sto produced USDA 1 fries under the same conditions. Russet Burbank*, A09086-1LB, AOR08540-1*, and CO13003-1RU were susceptible to LTS, producing USDA 3-4 fries after 60 days at 40°F.
- Compared as a percentage of Russet Burbank, AC12090-3RU had the highest concentration of asparagine (asn; 100.2%) (acrylamide precursor) followed by A12305-2adg (80.4%) and A10594-4sto (79.9%). Ranger Russet (59.5%) and Clearwater Russet (54.8%) produced the lowest concentration of asn. However, Ranger Russet is cold sweetening susceptible and therefore would likely not have a low acrylamide

forming phenotype when stored cold. By contrast, Clearwater Russet was resistant to cold sweetening, which when coupled with its low asn concentration would limit acrylamide formation during processing. CO11009-3RU had the lowest 2022 reducing sugars and low asn concentrations in 2020 and 2021 crop years, but had the fifth lowest asn concentration in 2022. Low asparagine and reducing sugars are indicators of low acrylamide forming potential.

- Average (across states) gravities of Russet Burbank* were the lowest, 1.075, the low end for frozen process contracts. The gravities of the other entries ranged from 1.078 to 1.093 when averaged across states. When averaged across the six entries, gravities were 1.087 (WA), 1.085 (ID), and 1.086 (OR). Gravities from ID were the lowest and ranged from 1.080 to 1.096. Over all locations, AFA5661-8 and A09086-1LB had the highest gravities (1.093 & 1.091; span= 1.090-1.093 & 1.091-1.094). Specific gravity span was estimated by 3 reps of 4 tubers weighed in the air and in water.
- CO11009-3RU*, Clearwater Russet*, and AFA5661-8 were the favorites in the taste panels, scoring 3.7/5 on average across growing locations (5 is best). Russet Burbank*, AC12090-3RU, and CO13003-1RU received the lowest taste panel score of 2.7 on average.
- On average, tubers grown in WA produced the lightest fry colors at harvest and ID produced the lightest fries post-storage regardless of storage temperature. The Regional experimental entries from all locations averaged 86% and 60% of their at-harvest process quality (stem end fry color) when stored at 44°F and 40°F for 60 days, respectively. Storage at 48°F saw minimal to no reduction in storage color during the 2022 season.
- Non-uniformity of color was observed in all states and storage treatments to some degree. Of the 10 experimental entries, 3 entries at harvest (WA, ID, & OR each); 6 (WA), 3 (ID), & 2 (ID) at 48°F; 7 (WA) and 4 (ID & OR each) at 44°F; and 3 at 40°F (WA, ID, & OR each) were non-uniform in fry color (bud to stem end photovolt difference >9). The top-rated entries, CO11009-3RU*, Clearwater Russet*, and AOR11217-3 maintained fry color regardless of production site (WA, ID, OR) and storage temperature (48, 44, 40°F) after 60 days except for Clearwater at 40°F from WA. CO11009-3RU also maintained uniform color in 2020 and 2021 with only non-uniformity at 40°F in the WA sample in 2021.
- Retention of process quality during storage of A12305-2adg, A09086-1LB, and AFA5661-8 at 44°F (60 days) was highly variable across production sites. By contrast, growing location had the least effect on the change in fry color of CO13003-1RU, AOR08540-1*, and Russet Burbank* following 60 days at 44°F.
- A09086-1LB and CO10085-1RU showed the greatest percent photovolt improvement in stem end fry color (46.7% & 55.8%) when reconditioned at 60°F following storage for 60 days at 40°F. Reconditioning tubers of A12305-2adg, AC12090-3RU, and AFA5661-8 had the least effect on percent change in stem end fry color (0.9%, 9.9%, & 10.6%). A12305-2adg and CO13003-1RU appeared more susceptible to sugar end development based on attenuated reconditioning of the stem versus bud end of tubers following storage at 40°F.
- Fry color recovery was also assessed by blanching potato strips prior to frying after storage at 40°F for 60 days. A09086-1LB, CO13003-1RU, and Russet Burbank benefited the most and improved percent stem fry color 50.9%, 46.9%, and 46.4% compared to stem end fry color at 40°F storage. Blanching had the least effect on CO11009-3RU, A10594-4sto, and AOR11217.3 (11.7%, 26.2%, and 27.6%). When averaged for location and entry, average fry color (bud+stem) percent recovery from 40°F storage was equivalent in blanched samples to reconditioned samples for the 2022 crop (ca. 25%), though reconditioning resulted in non-uniform fry color and blanching preserved fry color uniformity.
- In 2021 & 2022, blanching improved stem end fry color more than reconditioning, but reconditioning improved bud end fry color more than blanching.
- CO10085-1RU* and AOR08540-1* were the most resistant to blackspot bruise and averaged 25-46% bruise (stem end) in the controlled impact study (3-state average). These entries also scored lowest in bruise severity, averaging 1.9/5 (1 = no bruise; 5 = 100% of impact area is dark). Ranger Russet*, A09086-1LB were highly susceptible to bruise, averaging 88.2% bruise. Bruise severity was also greatest in these two entries and in A10594-4sto (average 3.8/5).

- ID grown tubers (8-10 oz) had the highest L/W ratios (2.07) compared to those grown in OR (1.79) and WA (1.63). AFA5661-8, CO13003-1RU, and A09086-1LB had the lowest L/W ratios (avg. 1.65), reflecting a rounder tuber shape phenotype. Russet Burbank*, Ranger Russet*, AC12090-3RU had the highest L/W ratios (2.10-1.93). CO10085-1RU*, A10594-4sto, and AOR11217-3 showed the greatest variation in L/W ratio 8- to 10-oz tubers across production sites. By contrast, the L/W ratios of CO13003-1RU, AC12090-3RU, and Russet Burbank* were the least affected by the growing region. Additionally in 2022, the width to thickness (W/Th) ratio was measured. The average difference in W/Th was minimal (max. 0.12; consistent with 2021) among all entries and production sites. CO11009-3RU and A12305-2adg had the most consistent diameter (1.09 & 1.11) and CO13003-1RU, CO10085-1RU*, and Clearwater Russet were the least consistent (1.21, 1.20 & 1.20).
- Following 60 days at 48°F, 87% of A09086-1LB tubers were sprouting the most with an average sprout length of 0.4 inches indicating a relatively short dormancy (Ranger = 58% with 0.4-inch sprouts). By contrast, no tubers had sprouted in Russet Burbank*, AC12090-3RU, and CO13003-1RU. Sprout lengths were the longest in OR samples (0.6-inch average) and less than or equal to ca. 0.2-inches in samples from ID and WA.
- After 7-months of storage (3 months at 48°F = 4 months at 44°F), sprout lengths ranged from 1.3 to 10.0-inches depending on the clone and state. CO11009-3RU and Russet Burbank produced the longest sprouts (avg. 7.7 & 7.3-inches), indicating a shorter dormancy than the other clones. By contrast, AOR08540-1 averaged 3.1-inch sprouts and AOR11217-3 average 3.9-inch sprouts which indicates a longer dormancy than Russet Burbank and Clearwater Russet (7.3 and 4.4-inch sprouts).
- All samples from all states arrived in Pullman with good quality except for CO10085-1RU from OR which had significant rot issues.

Overall Regional Postharvest Merit Scores

Clone	Postharvest Merit Scores			3 state Average
	WA	ID	OR	
13 CO11009-3RU	4.6	4.8	4.3	4.6
1 Clearwater Russet	3.9	4.7	4.7	4.4
8 AOR11217-3	4.0	4.5	4.2	4.3
5 A10594-4sto	3.8	4.4	4.1	4.1
2 Ranger Russet	3.6	4.3	3.7	3.9
6 A12305-2adg	3.1	3.6	4.1	3.6
7 AFA5661-8	3.2	3.5	3.6	3.5
12 CO10085-1RU	2.9	3.3	3.6	3.2
4 A09086-1LB	2.8	3.8	2.7	3.1
10 AC12090-3RU	2.8	3.1	2.5	2.8
9 AOR08540-1	2.6	2.8	3.0	2.8
11 CO13003-1RU	2.1	2.3	1.9	2.1
3 Russet Burbank	2.2	1.8	2.2	2.1

2022 Late Harvest Regional Trial

Summaries

ENTRY	TOTAL YIELD						CARTON YIELD		PROCESS YIELD	
	CWT/A	STATS**	Tons/A	US # 1's*	US # 2's*	Culls*	100-50 count		US 1's and 2's	
				> 4 oz	> 4 oz	& < 4 oz	(US 1's 7-18 oz)		> 6 oz	
				-----	-----	-----	% of Total Yield	Tons/A	% of Total Yield	Tons/A
Clearwater Russet	638	BCDE	31.9	82	2	17	40	13.9	60	19.5
Ranger Russet	698	ABC	34.9	80	5	15	49	19.5	73	25.5
Russet Burbank	622	CDE	31.1	77	7	17	49	16.1	67	21.0
Russet Norkotah	561	E	28.0	80	3	17	40	14.8	66	18.9
A09086-1LB	720	AB	36.0	81	5	14	43	16.6	67	24.1
A10594-4sto	670	ABCD	33.5	83	4	13	48	20.4	78	26.6
A12305-2adg	658	ABCD	32.9	77	9	14	46	19.2	77	25.4
AFA5661-8	665	ABCD	33.3	76	11	13	39	15.4	81	26.8
AOR11217-3	632	BCDE	31.6	82	3	15	42	14.5	62	20.1
AOR08540-1	712	ABC	35.6	76	5	19	43	17.4	66	23.9
AC12090-3RU	598	DE	29.9	77	3	20	45	14.9	65	20.0
AOR10204-3	734	A	36.7	78	6	16	41	18.3	71	26.1
CO13003-1RU	590	DE	29.5	72	5	24	28	9.3	47	14.2
CO10085-1RU	635	BCDE	31.7	74	2	24	37	13.7	55	18.4
CO11009-3RU	668	ABCD	33.4	85	2	13	44	17.0	72	24.8

ENTRY	US # 1 YIELD						> 4 oz SPECIFIC GRAVITY	INTERNAL DEFECTS (%)		
	> 4 oz	STATS**	Tons/A	> 4 oz	4-7 oz*	7-14 oz*		(8-12 oz tubers)		
				-----	-----	-----		% HH	% BC	% IBS
Clearwater Russet	523	ABCD	26.2	46	51	3	1.086	0	0	0
Ranger Russet	558	ABC	27.9	25	56	20	1.082	0	0	0
Russet Burbank	476	CDEF	23.8	28	53	19	1.073	3	5	5
Russet Norkotah	449	EF	22.5	30	54	15	1.071	0	0	0
A09086-1LB	580	A	29.0	35	52	13	1.089	0	0	0
A10594-4sto	562	ABC	28.1	17	52	31	1.080	15	8	0
A12305-2adg	508	BCDE	25.4	20	63	17	1.080	0	0	0
AFA5661-8	500	BCDE	25.0	12	44	43	1.088	0	0	0
AOR11217-3	520	ABCD	26.0	40	43	16	1.089	0	0	0
AOR08540-1	544	ABCD	27.2	30	57	13	1.084	0	0	0
AC12090-3RU	457	DEF	22.9	29	53	19	1.077	0	3	0
AOR10204-3	562	ABC	28.1	26	51	23	1.074	0	0	3
CO13003-1RU	427	F	21.4	57	40	3	1.079	0	0	0
CO10085-1RU	483	CDEF	24.2	43	49	8	1.091	0	0	0
CO11009-3RU	571	AB	28.5	25	46	30	1.090	0	0	0

ENTRY	50 DAY	60 DAY	STEMS PER	TUBER	AVERAGE TUBER		SKIN	TUBER	BRUISE (%)	
	STAND	STAND	PLANT	GREENING	WEIGHT	NUMBER	SET	SHAPE	(8-12 oz tubers)	
	% Emerged	% Emerged	Above Ground	% Total Yield	Ounces	Tubers/Plant	1 = Poor 5 = Good	1 = Round 5 = Long	BLACKSPOT	SHATTER
Clearwater Russet	17	94	2.1	1	5.7	10.1	3.5	2.8	0	60
Ranger Russet	50	92	2.4	1	7.0	9.0	4.0	4.0	25	40
Russet Burbank	41	91	2.0	2	6.9	8.1	4.0	3.0	8	68
Russet Norkotah	58	95	2.1	1	6.6	7.6	4.0	3.0	5	48
A09086-1LB	31	97	2.6	4	6.6	9.9	4.0	2.5	0	83
A10594-4sto	36	89	1.4	8	8.8	6.7	4.0	3.0	30	40
A12305-2adg	0	92	1.5	3	7.6	7.9	3.5	3.3	8	58
AFA5661-8	23	92	1.5	3	9.3	6.4	3.5	3.0	13	50
AOR11217-3	42	94	2.2	1	6.3	9.0	3.3	3.0	0	33
AOR08540-1	55	92	2.6	6	6.4	9.9	3.5	3.0	3	68
AC12090-3RU	6	97	2.7	7	6.8	7.9	4.0	3.3	8	70
AOR10204-3	6	94	2.5	4	7.7	8.5	3.5	4.0	0	60
CO13003-1RU	0	98	2.9	2	5.1	10.3	4.0	3.0	3	63
CO10085-1RU	33	97	2.9	1	5.3	10.7	4.0	2.0	0	55
CO11009-3RU	42	92	2.4	3	7.5	8.1	2.8	3.0	0	58

* Percent values may not total 100% due to rounding

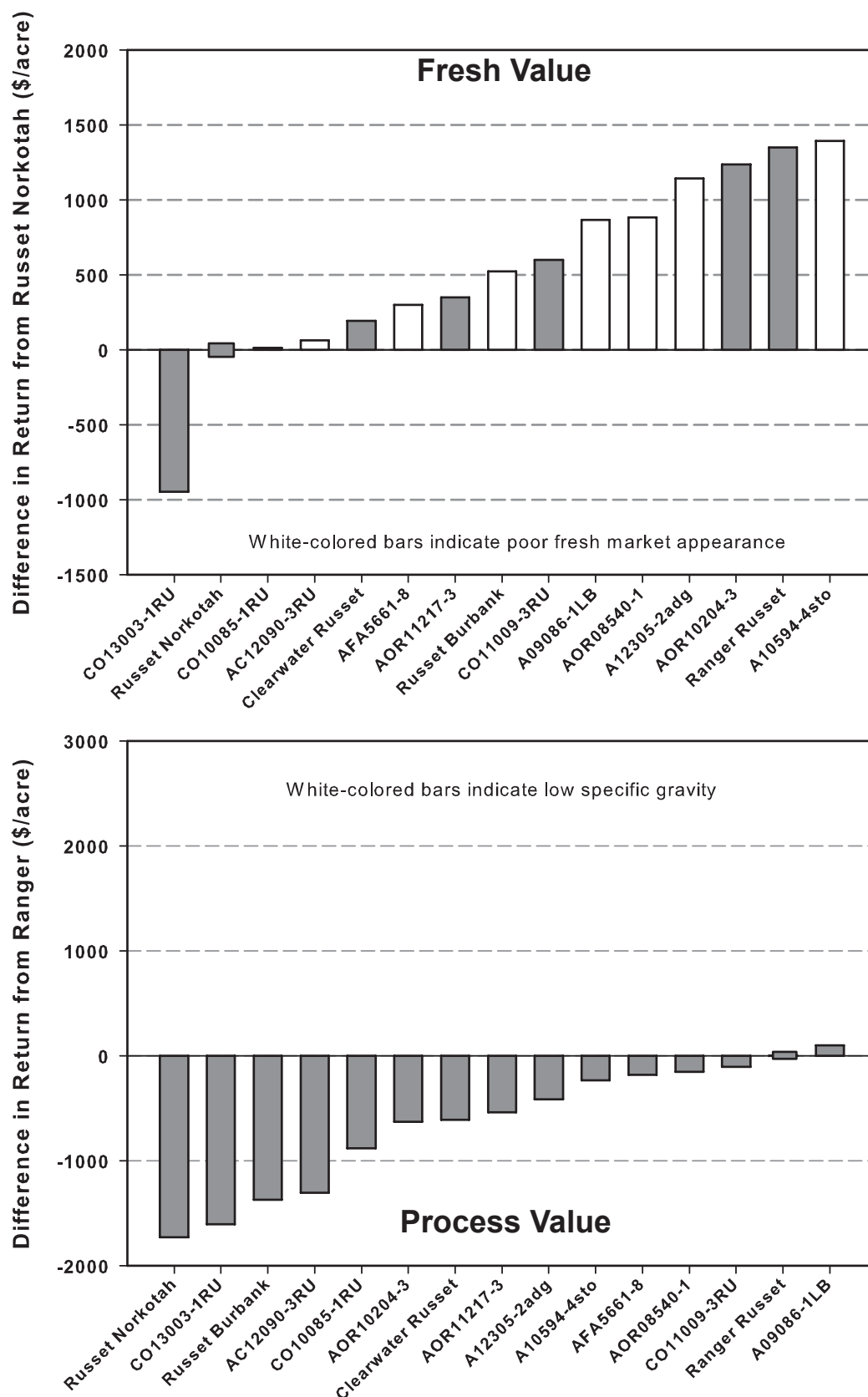
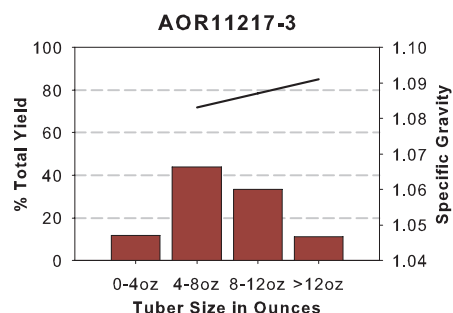
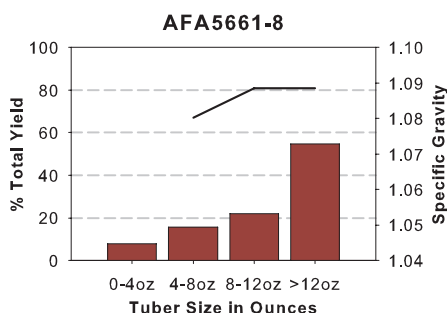
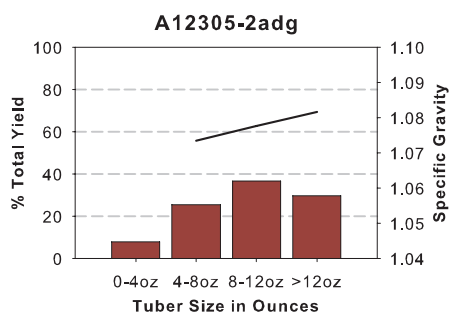
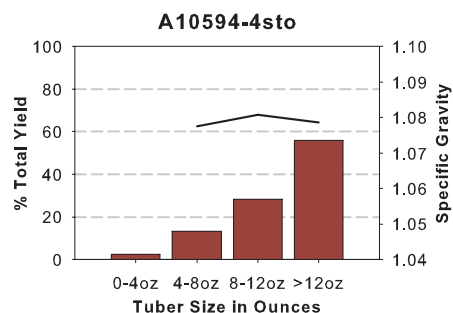
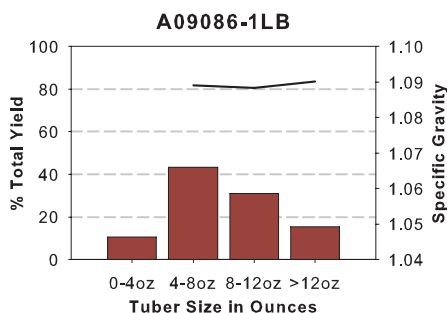
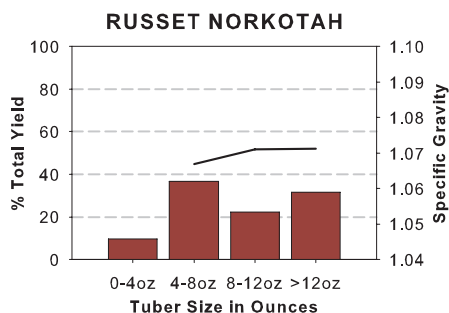
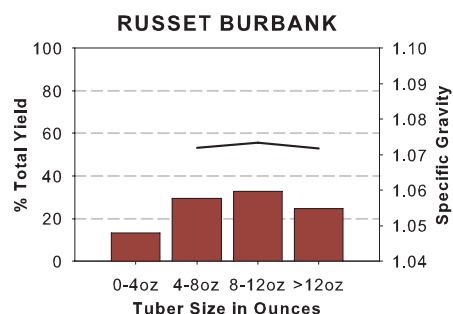
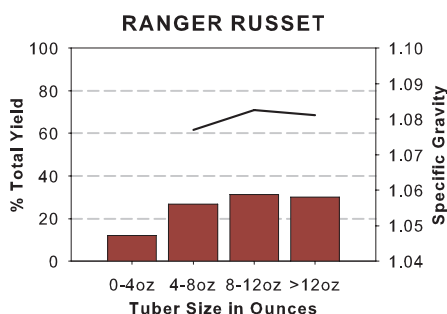
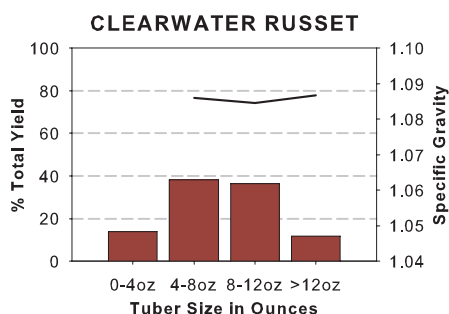
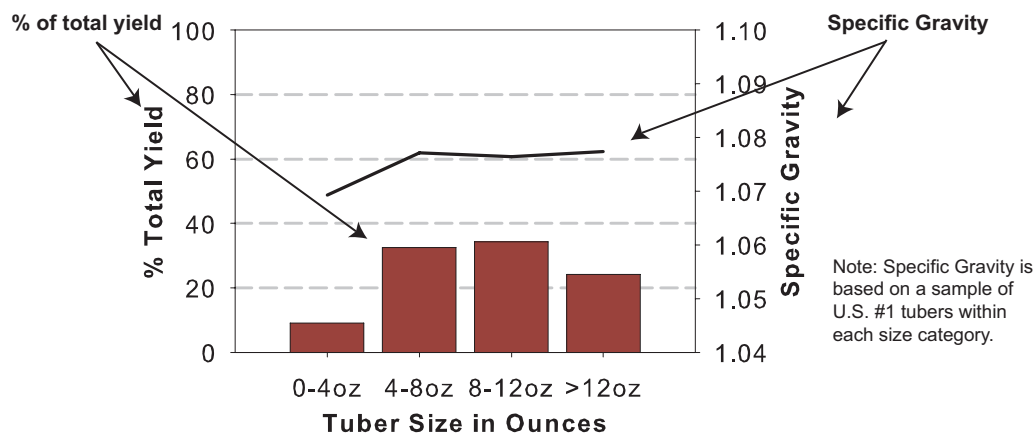


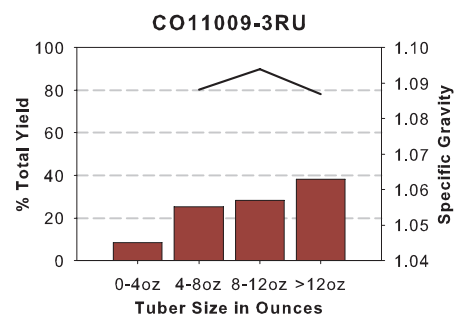
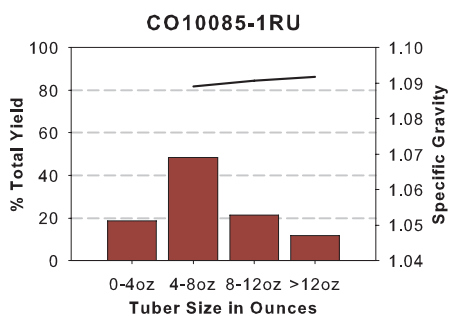
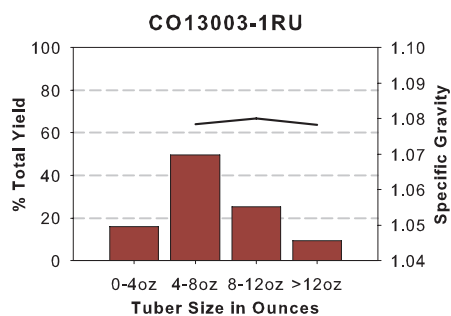
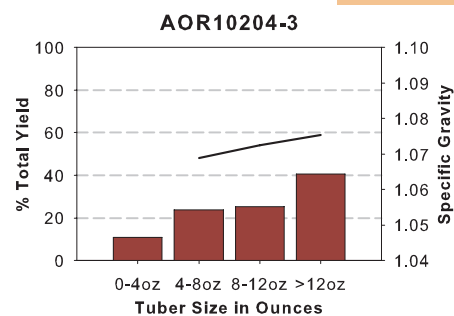
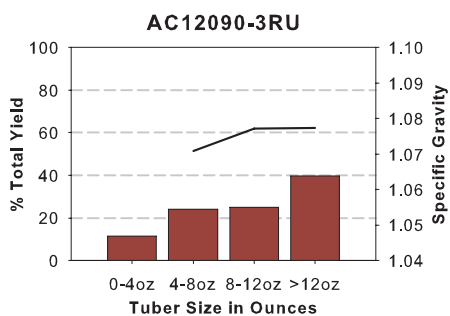
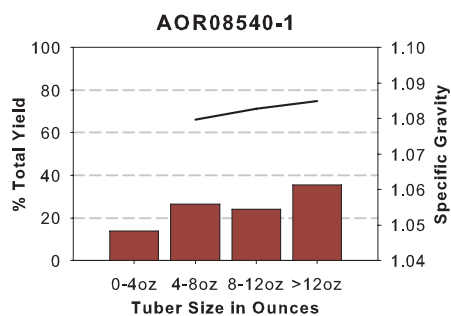
Figure 1 (top). Difference in gross return per acre (Fresh Market) from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry. Entries with the white-colored bars may not appeal to fresh market consumers due to the undesirable shape or appearance. **Figure 2 (bottom).** Difference in gross return per acre (Process Market) from Ranger Russet calculated by subtracting the gross return of Ranger Russet from the gross return of the particular entry.

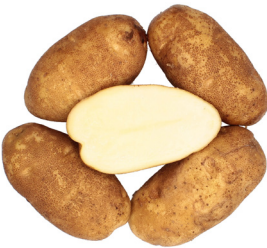
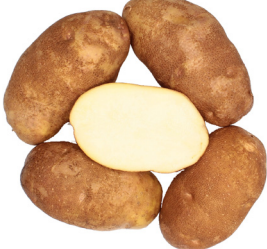
2022 Late Harvest Regional Trial

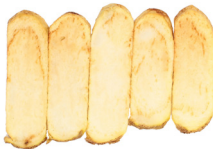
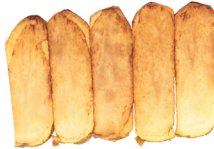
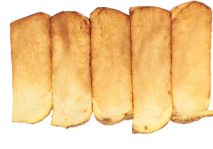
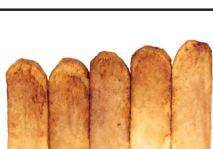
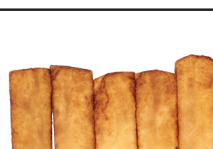
Tuber Yield and Specific Gravity Distributions

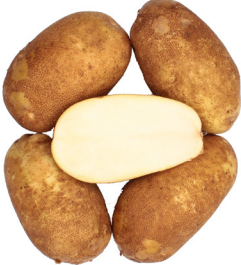
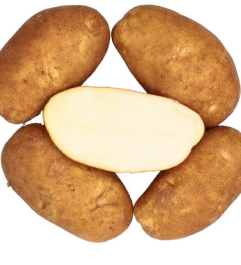
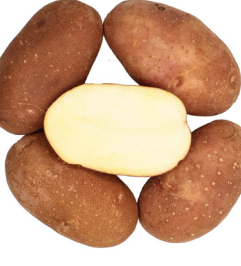
11 inch In-Row Spacing

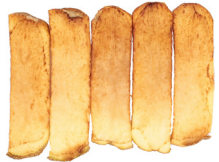
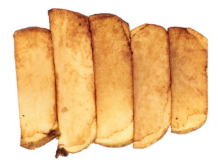




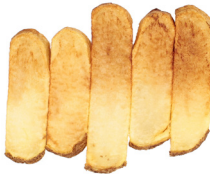
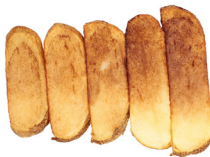
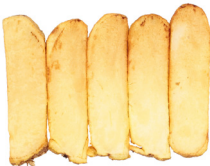
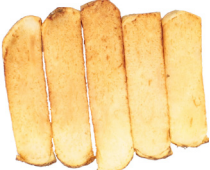
Tubers	WA Late Harvest Regional Trial Comments
Clearwater Russet	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform.
Ranger Russet	
	Tubers: Oblong to long tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, non-uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform.
Russet Burbank	
	Tubers: Oblong tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, non-uniform; 48°F = light, non-uniform; 44°F = relatively dark, non-uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform.
A09086-1LB	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, non-uniform; 44°F = relatively dark, uniform; 40°F = Unacceptably dark, uniform; Reconditioned = relatively dark, uniform.
A10594-4sto	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform.

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
Clearwater Russet					
					
Ranger Russet					
					
Russet Burbank					
					
A09086-1LB					
					
A10594-4sto					
					

Tubers	WA Late Harvest Regional Trial Comments
A12305-2adg	
	Tubers: Oblong tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, non-uniform; 48°F = light, non-uniform; 44°F = light, non-uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, non-uniform.
AFA5661-8	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, non-uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform.
AOR11217-3	
	Tubers: Oblong tubers. Fair skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform.
AOR08540-1	
	Tubers: Oblong tubers. Good skin set; moderate eye depth. Fry color: At harvest = light, non-uniform; 48°F = light, non-uniform; 44°F = relatively dark non-uniform; 40°F = Unacceptably dark, uniform; Reconditioned = relatively dark, uniform.
AC12090-3RU	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = relatively dark uniform; 40°F = Unacceptably dark, uniform; Reconditioned = relatively dark, uniform.

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
A12305-2adg					
					
AFA5661-8					
					
AOR11217-3					
					
AOR08540-1					
					
AC12090-3RU					
					

Tubers	WA Late Harvest Regional Trial Comments
CO13003-1RU	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, non-uniform; 48°F = light, non-uniform; 44°F = relatively dark non-uniform; 40°F = Unacceptably dark, non-uniform; Reconditioned = relatively dark, uniform.
CO10085-1RU	
	Tubers: Round to oblong tubers. Good skin set; shallow eyes. Fry color: At harvest = light, uniform; 48°F = light, non-uniform; 44°F = light, non-uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform.
CO11009-3RU	
	Tubers: Oblong tubers. Fair skin set; moderate eye depth. Fry color: At harvest = light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, uniform.

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
CO13003-1RU					
					
CO10085-1RU					
					
CO11009-3RU					
					

2022 Late Harvest Regional Trial

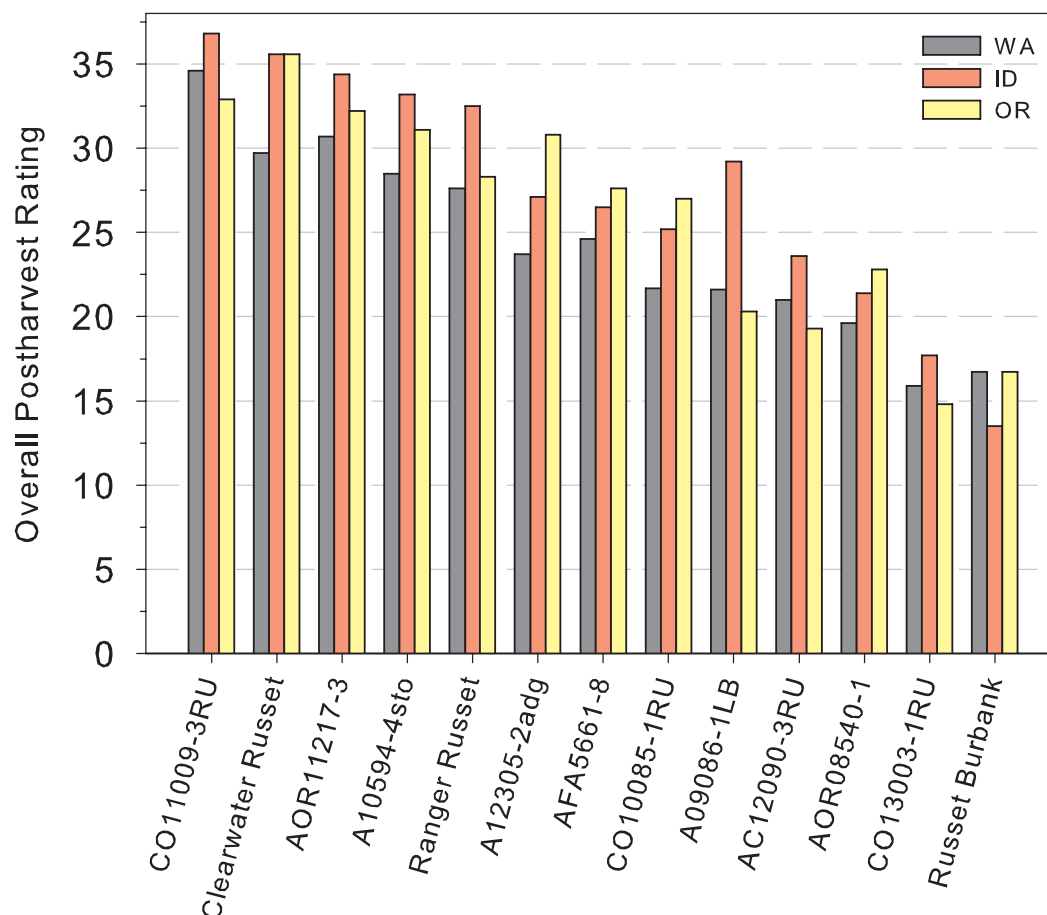
Accumulated Total Postharvest Ratings of Clones

Clone	WA		ID		OR		3 State av. Rating Total
	Rating Total §	Discard §§	Rating Total §	Discard §§	Rating Total §	Discard §§	
13 CO11009-3RU	34.6		36.8		32.9		34.8
1 Clearwater Russet	29.7		35.6		35.6		33.6
8 AOR11217-3	30.7		34.4		32.2		32.4
5 A10594-4sto	28.5		33.2		31.1		30.9
2 Ranger Russet	27.6		32.5		28.3		29.5
6 A12305-2adg	23.7		27.1		30.8		27.2
7 AFA5661-8	24.6		26.5		27.6		26.2
12 CO10085-1RU	21.7		25.2		27		24.6
4 A09086-1LB	21.6	40°F	29.2		20.3		23.7
10 AC12090-3RU	21.0	40°F	23.6	40°F	19.3	40°F	21.3
9 AOR08540-1	19.6	40°F	21.4	40°F	22.8		21.3
11 CO13003-1RU	15.9	40°F	17.7		14.8		16.1
3 Russet Burbank	16.7		13.5	Sp Gr	16.7		15.6
	24.3		27.4		26.1		

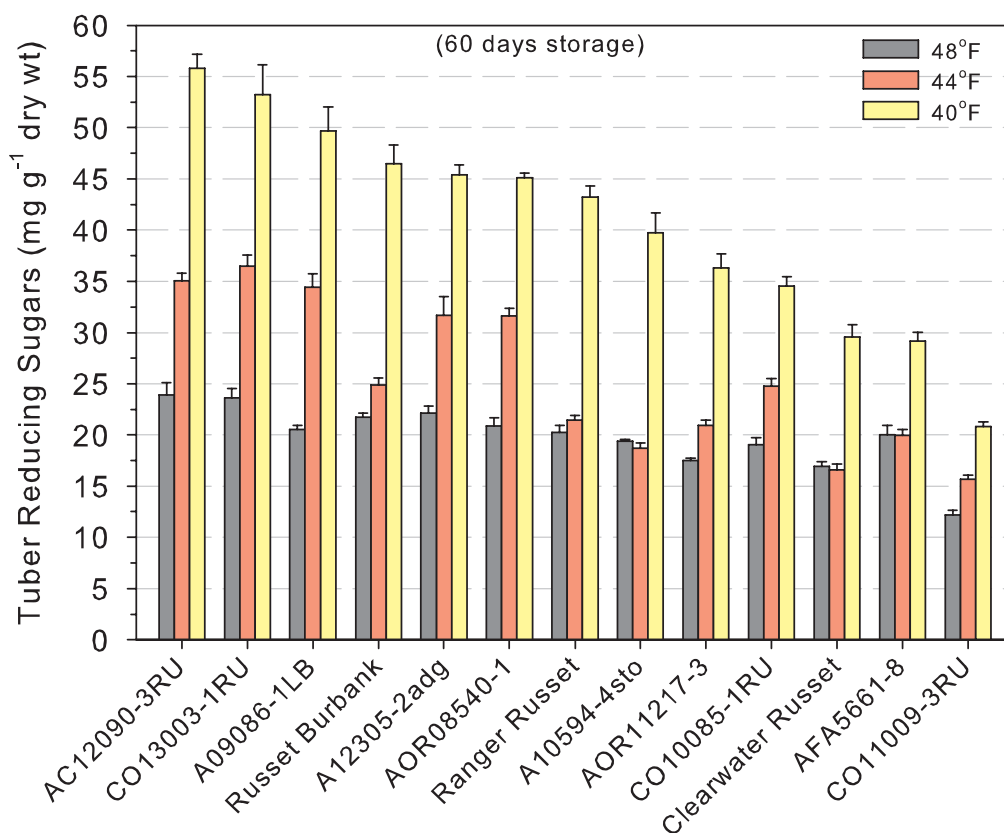
§ maximum rating possible = 38

§§ Values for the indicated evaluation are lower than the rejection level.

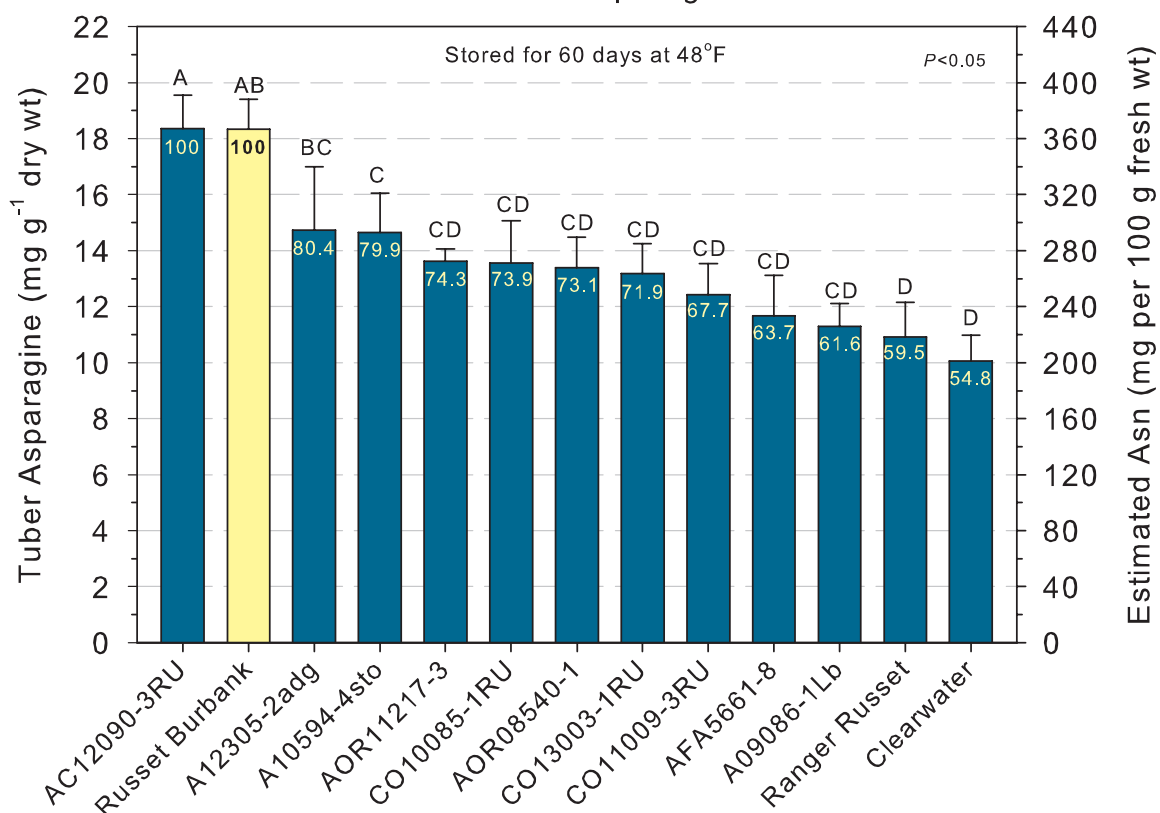
2022 Late Harvest Regional Trial Postharvest Ratings



2022 WA LRT Reducing Sugars



2022 WA LRT Tuber Asparagine Content



2022 Late Harvest Regional Trial

Prior to Storage

PHOTOVOLT READING						USDA	SPECIFIC		
Clone	stem	bud	av	rtg §	DIFF	COLOR	GRAVITY	rtg	Range
Washington									
1 Clearwater Russet	41.0	48.2	44.6	5+	7.3	0	1.092	3	1.087-1.096
2 Ranger Russet	40.8	43.7	42.2	5+	3.9	0	1.088	5	1.085-1.093
3 Russet Burbank	32.3	42.5	37.4	4-	10.2	0	1.079	2	1.074-1.084
4 A09086-1LB	32.5	40.5	36.5	4+	8.7	0	1.091	4	1.090-1.094
5 A10594-4sto	41.1	43.5	42.3	5+	4.7	0	1.082	4	1.079-1.087
6 A12305-2adg	37.6	51.7	44.7	5-	14.1	0	1.085	5	1.083-1.087
7 AFA5661-8	39.9	48.0	43.9	5+	8.7	0	1.092	3	1.088-1.094
8 AOR11217-3	46.6	50.6	48.6	5+	3.9	0	1.087	5	1.084-1.089
9 AOR08540-1	37.8	46.8	42.3	5-	9.2	0	1.087	5	1.084-1.094
10 AC12090-3RU	37.4	42.9	40.1	4+	7.2	0	1.079	2	1.077-1.082
11 CO13003-1RU	23.7	45.8	34.8	3-	22.1	2	1.083	5	1.080-1.087
12 CO10085-1RU	41.7	48.6	45.2	5+	6.9	0	1.092	3	1.089-1.095
13 CO11009-3RU	46.9	47.8	47.3	5+	2.6	0	1.087	5	1.086-1.089
Average		LSD 0.05	2.6		3.8		0.004		
	38.4	46.2	42.3		8.4	0	1.086		
Idaho									
1 Clearwater Russet	41.2	45.3	43.3	5+	5.3	0	1.086	5	1.083-1.091
2 Ranger Russet	43.3	45.1	44.2	5+	3.3	0	1.088	5	1.083-1.094
3 Russet Burbank	26.3	38.6	32.5	3-	12.3	1	1.071	0	1.066-1.075
4 A09086-1LB	37.8	44.4	41.1	5+	6.6	0	1.089	4	1.088-1.091
5 A10594-4sto	45.5	43.9	44.7	5+	2.7	0	1.081	4	1.078-1.083
6 A12305-2adg	37.0	43.3	40.1	4+	7.0	0	1.093	3	1.092-1.095
7 AFA5661-8	37.1	43.5	40.3	4+	6.5	0	1.096	1	1.095-1.097
8 AOR11217-3	49.9	50.5	50.2	5+	1.4	0	1.083	5	1.082-1.086
9 AOR08540-1	25.1	32.3	28.7	2+	8.1	1	1.082	4	1.080-1.085
10 AC12090-3RU	34.9	40.5	37.7	4+	5.9	0	1.080	3	1.080-1.081
11 CO13003-1RU	30.2	41.2	35.7	4-	11.0	1	1.080	3	1.076-1.083
12 CO10085-1RU	27.4	41.5	34.5	3-	14.1	1	1.084	5	1.078-1.090
13 CO11009-3RU	48.6	44.0	46.3	5+	4.6	0	1.085	5	1.084-1.087
Average		LSD 0.05	2.7		3.3		0.004		
	37.3	42.6	39.9		6.8	0	1.084		
Oregon									
1 Clearwater Russet	47.4	50.0	48.7	5+	3.9	0	1.085	5	1.084-1.087
2 Ranger Russet	32.8	40.6	36.7	4+	7.9	0	1.083	5	1.080-1.087
3 Russet Burbank	29.8	37.7	33.7	3+	8.2	1	1.076	1	1.072-1.078
4 A09086-1LB	33.4	44.6	39.0	4-	11.3	0	1.093	3	1.091-1.094
5 A10594-4sto	44.0	44.5	44.3	5+	3.9	0	1.083	5	1.082-1.085
6 A12305-2adg	40.3	44.7	42.5	5+	5.9	0	1.092	3	1.087-1.095
7 AFA5661-8	33.7	43.8	38.7	4-	11.1	0	1.091	4	1.090-1.092
8 AOR11217-3	41.9	48.8	45.4	5+	7.2	0	1.090	4	1.085-1.097
9 AOR08540-1	31.4	38.2	34.8	3+	8.8	0	1.083	5	1.082-1.085
10 AC12090-3RU	26.7	34.3	30.5	3+	8.1	1	1.076	1	1.074-1.080
11 CO13003-1RU	24.4	43.2	33.8	4-	18.8	2	1.078	2	1.075-1.079
12 CO10085-1RU	33.6	42.1	37.8	4+	8.5	0	1.083	5	1.081-1.087
13 CO11009-3RU	44.8	43.3	44.0	5+	2.6	0	1.094	2	1.092-1.096
Average		LSD 0.05	2.7		3.8		0.004		
	35.7	42.7	39.2		8.2	0	1.085		

Date test performed:

Washington

Sept. 30

Sept. 29

Idaho

Oct. 4

Oct. 3

Oregon

Oct. 9

Oct. 6

§ rtg = rating (1-5, 5 is best); av = average Photovolt reading; Diff = Absolute difference between stem and bud Photovolt reading. Stem to bud differences of nine or greater (-) lose one point and differences of less than nine (+) gain one point in the accumulated total postharvest rating.

Specific Gravity done by weight in air weight in water method. Range done by brine solutions.

2022 Late Harvest Regional Trial

Stored at 48°F after Arrival

FRENCH FRY		BRUISE POTENTIAL			
TASTE PANEL		(percent)		[color 5=darkest]	
Clone	rating	stem	bud	stem	bud
Washington					
1 Clearwater Russet	3.7	88	46	3.3	2.2
2 Ranger Russet	3.6	100	46	4.6	2.2
3 Russet Burbank	2.7	92	33	3.4	1.9
4 A09086-1LB	3.6	100	8	4.2	1.2
5 A10594-4sto	3.5	100	13	5.8	1.3
6 A12305-2adg	3.7	71	25	2.8	1.5
7 AFA5661-8	3.6	96	4	3.8	1.1
8 AOR11217-3	3.7	79	17	3.2	1.4
9 AOR08540-1	3.6	50	4	2.3	1.1
10 AC12090-3RU	3.0	50	17	2.2	1.4
11 CO13003-1RU	2.9	83	29	3.1	1.8
12 CO10085-1RU	3.7	33	13	1.7	1.3
13 CO11009-3RU	3.6	71	25	2.7	1.5
LSD 0.05	0.5	24	22		
Average	3.5	77.9	21.5	3.3	1.5
Idaho					
1 Clearwater Russet	3.6	38	38	1.8	1.9
2 Ranger Russet	3.5	83	13	3.4	1.3
3 Russet Burbank	2.5	33	4	1.7	1.1
4 A09086-1LB	3.2	58	38	2.4	1.8
5 A10594-4sto	3.2	38	0	1.9	1.0
6 A12305-2adg	3.1	50	13	2.3	1.3
7 AFA5661-8	3.5	46	8	2.2	1.2
8 AOR11217-3	3.4	46	25	2.1	1.6
9 AOR08540-1	2.4	29	21	1.7	1.5
10 AC12090-3RU	2.6	46	25	2.1	1.5
11 CO13003-1RU	2.7	71	63	3.0	2.5
12 CO10085-1RU	3.2	4	4	1.1	1.1
13 CO11009-3RU	3.8	21	8	1.5	1.2
LSD 0.05	0.5	30	24		
Average	3.1	43.3	19.9	2.1	1.5
Oregon					
1 Clearwater Russet	3.6	79	8	3.3	1.2
2 Ranger Russet	3.3	92	17	4.0	1.5
3 Russet Burbank	2.7	71	13	3.2	1.3
4 A09086-1LB	3.3	96	8	4.0	1.2
5 A10594-4sto	3.1	92	13	3.9	1.3
6 A12305-2adg	3.8	71	4	2.9	1.1
7 AFA5661-8	3.6	100	38	4.1	1.8
8 AOR11217-3	3.2	67	25	3.0	1.6
9 AOR08540-1	2.8	58	13	2.7	1.3
10 AC12090-3RU	2.3	63	4	2.6	1.1
11 CO13003-1RU	2.8	50	0	2.1	1.0
12 CO10085-1RU	3.0	38	4	2.0	1.1
13 CO11009-3RU	3.9	88	21	3.3	1.5
LSD 0.05	0.5	26	22		
Average	3.2	74.0	12.8	3.2	1.3

Date test performed:

Washington

Oct. 18

Nov. 1

Idaho

Oct. 19

Nov. 8

Oregon

Oct. 20

Nov. 15

2022 Late Harvest Regional Trial

Stored at 48°F for 60 Days

PHOTOVOLT READING					DIFF	USDA	% REDUCING SUGAR		SPROUTING	
Clone	stem	bud	average	rtg §		COLOR	stem	bud	(%)	length (in)
Washington										
1 Clearwater Russet	43.8	51.6	47.7	5+	7.8	0	0.6	0.5	80	0.13
2 Ranger Russet	37.0	39.4	38.2	4+	4.3	0	0.9	0.8	80	0.25
3 Russet Burbank	27.3	36.4	31.8	3-	9.1	1	1.7	0.9	0	
4 A09086-1LB	32.1	43.2	37.6	4-	11.0	0	1.2	0.6	67	0.13
5 A10594-4sto	40.6	42.1	41.3	5+	2.9	0	0.7	0.6	87	0.50
6 A12305-2adg	35.0	47.8	41.4	5-	12.8	0	1.0	0.5	0	
7 AFA5661-8	39.5	42.8	41.1	5+	4.5	0	0.8	0.6	93	0.13
8 AOR11217-3	44.8	48.3	46.6	5+	4.4	0	0.6	0.5	67	0.13
9 AOR08540-1	29.6	40.2	34.9	3-	10.6	1	1.4	0.7	0	
10 AC12090-3RU	31.8	32.8	32.3	3+	3.0	0	1.2	1.1	0	
11 CO13003-1RU	24.8	41.0	32.9	3-	16.2	1	2.0	0.7	0	
12 CO10085-1RU	35.8	45.5	40.6	5-	9.8	0	0.9	0.6	100	0.50
13 CO11009-3RU	47.1	47.8	47.4	5+	1.8	0	0.5	0.5	13	0.13
Average		LSD 0.05	2.6		3.4				18	
	36.1	43.0	39.5		7.6	0	1.0	0.7	45	
Idaho										
1 Clearwater Russet	46.3	47.6	47.0	5+	2.6	0	0.5	0.5	0	
2 Ranger Russet	41.5	45.5	43.5	5+	5.0	0	0.7	0.6	21	0.13
3 Russet Burbank	26.7	40.2	33.5	3-	13.5	1	1.7	0.7	0	
4 A09086-1LB	42.2	45.0	43.6	5+	2.9	0	0.6	0.6	100	0.13
5 A10594-4sto	46.4	46.2	46.3	5+	1.9	0	0.5	0.5	0	
6 A12305-2adg	42.5	49.0	45.8	5+	6.9	0	0.6	0.5	0	
7 AFA5661-8	44.2	48.6	46.4	5+	5.0	0	0.6	0.5	0	
8 AOR11217-3	50.1	50.0	50.1	5+	4.2	0	0.5	0.5	0	
9 AOR08540-1	29.2	31.7	30.5	3+	4.7	1	1.5	1.2	0	
10 AC12090-3RU	37.9	41.2	39.6	4+	3.7	0	0.8	0.7	0	
11 CO13003-1RU	33.1	44.7	38.9	4-	11.6	0	1.1	0.6	0	
12 CO10085-1RU	41.7	51.1	46.4	5-	10.9	0	0.7	0.5	40	0.13
13 CO11009-3RU	53.1	49.5	51.3	5+	3.9	0	0.6	0.5	0	
Average		LSD 0.05	2.4		3.5				13	
	41.2	45.4	43.3		5.9	0	0.8	0.6	12	
Oregon										
1 Clearwater Russet	45.8	48.8	47.3	5+	3.0	0	0.6	48.8	47	0.50
2 Ranger Russet	33.9	36.4	35.2	3+	5.8	0	1.1	36.4	73	0.75
3 Russet Burbank	28.8	38.4	33.6	3-	9.7	1	1.5	38.4	0	
4 A09086-1LB	33.6	41.5	37.6	4+	8.1	0	1.1	41.5	93	1.00
5 A10594-4sto	41.8	41.7	41.7	5+	4.4	0	0.7	41.7	93	0.75
6 A12305-2adg	43.7	48.8	46.3	5+	5.1	0	0.6	48.8	13	0.50
7 AFA5661-8	36.7	45.1	40.9	5+	8.7	0	0.9	45.1	87	0.50
8 AOR11217-3	42.2	49.6	45.9	5+	7.4	0	0.6	49.6	33	0.50
9 AOR08540-1	29.9	36.6	33.2	3+	6.8	1	1.4	36.6	67	0.13
10 AC12090-3RU	29.2	34.1	31.6	3+	6.3	1	1.5	34.1	0	
11 CO13003-1RU	21.4	40.5	31.0	3-	19.1	2	2.5	40.5	0	
12 CO10085-1RU	36.6	42.8	39.7	4+	8.6	0	0.9	42.8	100	1.50
13 CO11009-3RU	48.2	46.5	47.3	5+	3.6	0	0.5	46.5	40	0.13
Average		LSD 0.05	2.8		3.4				21	
	36.3	42.4	39.3		7.4	0	1.1	42.4	50	

Date test performed:

Washington

Nov. 28

Nov. 28

Dec. 19

Idaho

Dec. 4

Dec. 4

Dec. 19

Oregon

Dec. 10

Dec. 10

Dec. 19

§ rtg = rating (1-5, 5 is best); av = average Photovolt reading; Diff = Absolute difference between stem and bud Photovolt reading. Stem to bud differences of nine or greater (-) lose one point and differences of less than nine (+) gain one point in the accumulated total post-harvest rating.

2022 Late Harvest Regional Trial

Stored at 44°F for 60 Days

PHOTOVOLT READING					DIFF	USDA COLOR	% REDUCING SUGAR	
Clone	stem	bud	average	rtg §			stem	bud
Washington								
1 Clearwater Russet	39.9	48.6	44.3	5+	8.8	0	0.7	0.5
2 Ranger Russet	30.8	41.2	36.0	4-	10.4	0	1.3	0.7
3 Russet Burbank	24.1	34.4	29.3	2-	10.3	2	2.1	1.0
4 A09086-1LB	20.6	28.4	24.5	2+	8.4	2	2.6	1.6
5 A10594-4sto	37.8	41.8	39.8	4+	4.4	0	0.8	0.7
6 A12305-2adg	25.7	38.0	31.9	3-	12.4	1	1.9	0.8
7 AFA5661-8	28.4	41.0	34.7	3-	12.6	1	1.5	0.7
8 AOR11217-3	35.0	43.1	39.0	4+	8.1	0	1.0	0.6
9 AOR08540-1	23.1	32.9	28.0	2-	9.8	2	2.2	1.1
10 AC12090-3RU	25.8	28.2	27.0	2+	3.6	1	1.8	1.6
11 CO13003-1RU	19.3	38.1	28.7	2-	18.8	3	2.8	0.8
12 CO10085-1RU	29.1	39.1	34.1	3-	10.0	1	1.5	0.8
13 CO11009-3RU	42.7	48.0	45.3	5+	5.8	0	0.6	0.5
Average	29.4	LSD 0.05 38.7	2.7 34.0		3.6 9.5	1	1.6	0.9
Idaho								
1 Clearwater Russet	39.9	44.9	42.4	5+	5.6	0	0.7	0.6
2 Ranger Russet	34.5	41.7	38.1	4+	7.4	0	1.0	0.7
3 Russet Burbank	24.9	33.9	29.4	2-	9.4	1	2.0	1.1
4 A09086-1LB	33.1	37.6	35.3	3+	4.7	0	1.1	0.8
5 A10594-4sto	42.8	45.3	44.0	5+	3.3	0	0.6	0.6
6 A12305-2adg	33.1	42.8	38.0	4-	9.7	0	1.1	0.6
7 AFA5661-8	38.0	41.7	39.9	4+	4.4	0	0.8	0.7
8 AOR11217-3	43.5	46.9	45.2	5+	3.8	0	0.6	0.5
9 AOR08540-1	21.3	27.8	24.6	2+	6.5	2	2.5	1.6
10 AC12090-3RU	29.5	31.1	30.3	2+	2.9	1	1.4	1.3
11 CO13003-1RU	20.8	38.7	29.8	2-	17.9	2	2.6	0.8
12 CO10085-1RU	34.6	44.7	39.6	4-	10.1	0	1.0	0.6
13 CO11009-3RU	50.6	47.3	49.0	5+	3.3	0	0.5	0.5
Average	34.4	LSD 0.05 40.3	2.4 37.4		3.6 6.8	0	1.2	0.8
Oregon								
1 Clearwater Russet	43.3	48.4	45.9	5+	6.0	0	0.6	0.5
2 Ranger Russet	30.3	36.9	33.6	3+	7.2	1	1.4	0.9
3 Russet Burbank	24.3	35.3	29.8	2-	11.1	2	2.0	1.0
4 A09086-1LB	22.3	35.9	29.1	2-	13.6	2	2.3	0.9
5 A10594-4sto	37.6	42.3	39.9	4+	5.1	0	0.8	0.6
6 A12305-2adg	40.0	46.4	43.2	5+	6.6	0	0.7	0.5
7 AFA5661-8	36.5	41.0	38.8	4+	4.5	0	0.9	0.7
8 AOR11217-3	41.6	46.5	44.1	5+	6.9	0	0.7	0.5
9 AOR08540-1	23.9	34.3	29.1	2-	10.4	2	2.1	1.0
10 AC12090-3RU	24.3	27.7	26.0	2+	3.6	2	2.0	1.6
11 CO13003-1RU	17.7	28.9	23.3	1-	11.2	3	3.1	1.5
12 CO10085-1RU	31.4	39.4	35.4	3+	8.3	0	1.3	0.8
13 CO11009-3RU	45.7	46.3	46.0	5+	2.9	0	0.6	0.5
Average	32.2	LSD 0.05 39.2	3.1 35.7		3.4 7.5	1	1.4	0.9

Date test performed:

Washington

Nov. 29

Nov. 29

Idaho

Dec. 5

Dec. 5

Oregon

Dec. 11

Dec. 11

§ rtg = rating (1-5, 5 is best); av = average Photovolt reading; Diff = Absolute difference between stem and bud Photovolt reading. Stem to bud differences of nine or greater (-) lose one point and differences of less than nine (+) gain one point in the accumulated total postharvest rating.

2022 Late Harvest Regional Trial

Stored at 40°F for 60 Days and Reconditioned

Clone	PHOTOVOLT(60 Days at 40°F)							PHOTOVOLT AFTER RECONDITIONING (21 days at 60°F)				
	SPROUTING (%)	stem	bud	average	rtg \$	DIFF	USDA COLOR	stem	bud	average	DIFF	USDA COLOR
Washington												
1 Clearwater Russet	0	23.1	37.2	30.2	2	14.2	2	33.1	46.1	39.6	13.0	0
2 Ranger Russet	0	19.5	28.1	23.8	1	8.5	2	27.2	33.3	30.3	8.7	1
3 Russet Burbank	0	16.3	23.3	19.8	1	7.0	3	23.4	31.9	27.6	8.5	2
4 A09086-1LB	0	14.1	21.0	17.6	0	7.3	4	24.4	32.6	28.5	8.2	2
5 A10594-4sto	0	21.2	26.7	24.0	1	6.4	2	31.9	38.0	34.9	6.1	0
6 A12305-2adg	0	16.4	25.1	20.7	1	8.7	3	20.7	34.1	27.4	13.4	2
7 AFA5661-8	0	24.5	34.7	29.6	2	10.3	1	30.5	41.3	35.9	10.8	0
8 AOR11217-3	0	24.4	31.1	27.7	2	6.8	2	31.9	37.9	34.9	6.0	0
9 AOR08540-1	0	16.0	20.6	18.3	0	4.6	3	20.6	26.5	23.6	6.3	2
10 AC12090-3RU	0	16.6	18.1	17.3	0	3.0	3	18.8	21.4	20.1	2.6	3
11 CO13003-1RU	0	13.0	22.4	17.7	0	9.4	4	18.6	27.5	23.0	8.9	3
12 CO10085-1RU	0	18.1	24.3	21.2	1	6.1	3	34.0	45.0	39.5	11.0	0
13 CO11009-3RU	0	33.9	41.3	37.6	4	7.5	0	41.3	45.8	43.6	4.8	0
<i>LSD 0.05</i>	<i>ns</i>			2.5		3.3				3.7	3.2	
Average	0	19.8	27.2	23.5		7.7	2	27.4	35.5	31.4	8.3	1
Idaho												
1 Clearwater Russet	0	33.1	40.1	36.6	4	7.6	0	38.1	45.8	42.0	8.1	0
2 Ranger Russet	0	25.0	32.6	28.8	2	9.7	1	35.1	44.2	39.6	10.6	0
3 Russet Burbank	0	16.3	23.5	19.9	1	7.2	3	22.2	33.3	27.7	12.3	2
4 A09086-1LB	0	19.3	23.6	21.5	1	4.4	3	28.8	36.0	32.4	7.5	1
5 A10594-4sto	0	29.3	35.6	32.5	3	6.3	1	35.6	45.4	40.5	9.8	0
6 A12305-2adg	0	24.7	29.3	27.0	2	6.4	1	23.8	37.9	30.9	14.0	2
7 AFA5661-8	0	27.0	32.4	29.7	2	5.7	1	30.7	37.2	33.9	6.5	0
8 AOR11217-3	0	28.0	35.1	31.6	3	7.4	1	34.9	44.1	39.5	9.2	0
9 AOR08540-1	0	15.7	19.0	17.3	0	4.0	3	20.5	22.3	21.4	5.1	2
10 AC12090-3RU	0	17.0	18.9	17.9	0	2.7	3	21.5	26.4	23.9	5.0	2
11 CO13003-1RU	0	13.1	29.7	21.4	1	16.5	4	17.7	33.6	25.6	15.9	3
12 CO10085-1RU	0	24.6	37.1	30.8	3	12.5	1	36.9	48.2	42.5	11.2	0
13 CO11009-3RU	0	43.2	44.0	43.6	5	2.2	0	47.8	48.9	48.3	2.2	0
<i>LSD 0.05</i>	<i>ns</i>			3.1		3.4				2.9	3.4	
Average	0	24.3	30.8	27.6		7.1	2	30.3	38.7	34.5	9.0	1
Oregon												
1 Clearwater Russet	0	34.8	42.0	38.4	4	7.3	0	37.1	46.0	41.6	8.8	0
2 Ranger Russet	0	22.3	27.9	25.1	2	6.2	2	26.8	35.5	31.1	9.7	1
3 Russet Burbank	0	17.3	24.8	21.0	1	7.7	3	20.8	29.5	25.2	8.8	2
4 A09086-1LB	0	16.0	26.2	21.1	1	10.2	3	19.4	30.0	24.7	10.5	3
5 A10594-4sto	0	26.3	33.8	30.1	2	7.6	1	29.0	41.0	35.0	11.9	1
6 A12305-2adg	0	25.1	34.1	29.6	2	9.0	1	22.1	33.4	27.8	11.3	2
7 AFA5661-8	0	30.4	37.6	34.0	3	8.0	1	29.4	41.0	35.2	11.6	1
8 AOR11217-3	0	26.0	33.9	29.9	2	7.9	1	33.8	43.8	38.8	10.0	0
9 AOR08540-1	0	17.3	24.4	20.8	1	7.3	3	22.2	32.0	27.1	10.1	2
10 AC12090-3RU	0	17.7	20.1	18.9	0	3.2	3	16.1	20.0	18.0	4.4	3
11 CO13003-1RU	0	12.3	27.4	19.9	1	15.0	4	13.6	26.8	20.2	13.2	4
12 CO10085-1RU	0	21.8	28.3	25.1	2	6.5	2	29.7	39.0	34.3	9.2	1
13 CO11009-3RU	0	33.3	38.3	35.8	4	5.7	0	41.8	44.1	43.0	6.3	0
<i>LSD 0.05</i>	<i>ns</i>			3.1		3.7				3.7	4.3	
Average	0	23.1	30.7	26.9		7.8	2	26.3	35.5	30.9	9.7	2

Date test performed:

Washington Dec. 19
Idaho Dec. 19
Oregon Dec. 19

Nov. 30
 Dec. 6
 Dec. 12

Dec. 15
 Dec. 15
 Dec. 16

DIFF = Absolute difference between bud and stem Photovolt reading.
 Sprouting was rated after approximately 3 months after storage.

2022 Late Harvest Regional Trial

Stored at 40°F for 60 Days and Water Blanched

PHOTOVOLT(60 Days at 40°F)							PHOTOVOLT AFTER WATER BLANCHING					
Clone	stem	bud	average	rtg	\$	DIFF	USDA COLOR	stem	10 min @ 160°F bud	average	DIFF	USDA COLOR
Washington												
1 Clearwater Russet	23.1	37.2	30.2	2	14.2	2		37.3	44.1	40.7	7.1	0
2 Ranger Russet	19.5	28.1	23.8	1	8.5	2		30.6	36.6	33.6	6.3	0
3 Russet Burbank	16.3	23.3	19.8	1	7.0	3		24.6	30.4	27.5	5.8	1
4 A09086-1LB	14.1	21.0	17.6	0	7.3	4		25.5	32.2	28.8	6.7	1
5 A10594-4sto	21.2	26.7	24.0	1	6.4	2		30.3	33.4	31.8	3.4	1
6 A12305-2adg	16.4	25.1	20.7	1	8.7	3		24.2	33.2	28.7	9.0	2
7 AFA5661-8	24.5	34.7	29.6	2	10.3	1		35.4	40.6	38.0	7.1	0
8 AOR11217-3	24.4	31.1	27.7	2	6.8	2		33.0	38.0	35.5	5.5	0
9 AOR08540-1	16.0	20.6	18.3	0	4.6	3		25.2	28.7	27.0	3.6	1
10 AC12090-3RU	16.6	18.1	17.3	0	3.0	3		25.5	26.5	26.0	3.0	1
11 CO13003-1RU	13.0	22.4	17.7	0	9.4	4		20.6	28.0	24.3	8.3	2
12 CO10085-1RU	18.1	24.3	21.2	1	6.1	3		27.5	34.6	31.0	7.2	1
13 CO11009-3RU	33.9	41.3	37.6	4	7.5	0		38.7	44.8	41.7	6.9	0
LSD 0.05			2.5		3.3					2.5	2.8	
Average	19.8	27.2	23.5		7.7	2.5		29.1	34.7	31.9	6.1	1
Idaho												
1 Clearwater Russet	33.1	40.1	36.6	4	7.6	0		42.8	43.8	43.3	5.3	0
2 Ranger Russet	25.0	32.6	28.8	2	9.7	1		32.5	41.6	37.0	9.1	0
3 Russet Burbank	16.3	23.5	19.9	1	7.2	3		24.9	29.6	27.3	5.0	1
4 A09086-1LB	19.3	23.6	21.5	1	4.4	3		27.3	30.4	28.8	3.3	1
5 A10594-4sto	29.3	35.6	32.5	3	6.3	1		33.7	38.4	36.1	5.1	0
6 A12305-2adg	24.7	29.3	27.0	2	6.4	1		31.6	33.3	32.4	4.6	0
7 AFA5661-8	27.0	32.4	29.7	2	5.7	1		34.3	36.5	35.4	3.7	0
8 AOR11217-3	28.0	35.1	31.6	3	7.4	1		37.1	39.5	38.3	3.2	0
9 AOR08540-1	15.7	19.0	17.3	0	4.0	3		21.3	22.0	21.7	4.2	2
10 AC12090-3RU	17.0	18.9	17.9	0	2.7	3		25.5	28.0	26.7	2.8	1
11 CO13003-1RU	13.1	29.7	21.4	1	16.5	4		19.1	32.4	25.8	13.3	3
12 CO10085-1RU	24.6	37.1	30.8	3	12.5	1		34.7	41.3	38.0	7.8	0
13 CO11009-3RU	43.2	44.0	43.6	5	2.2	0		45.8	43.9	44.9	3.1	0
LSD 0.05			3.1		3.4					3.3	2.9	
Average	24.3	30.8	27.6		7.1	2		31.6	35.4	33.5	5.4	1
Oregon												
1 Clearwater Russet	34.8	42.0	38.4	4	7.3	0		39.7	46.2	43.0	6.5	0
2 Ranger Russet	22.3	27.9	25.1	2	6.2	2		31.3	36.2	33.7	5.2	0
3 Russet Burbank	17.3	24.8	21.0	1	7.7	3		23.3	30.4	26.9	7.1	2
4 A09086-1LB	16.0	26.2	21.1	1	10.2	3		22.0	32.3	27.1	10.3	2
5 A10594-4sto	26.3	33.8	30.1	2	7.6	1		32.9	39.9	36.4	7.0	0
6 A12305-2adg	25.1	34.1	29.6	2	9.0	1		35.3	40.7	38.0	5.4	0
7 AFA5661-8	30.4	37.6	34.0	3	8.0	1		37.3	43.5	40.4	7.3	0
8 AOR11217-3	26.0	33.9	29.9	2	7.9	1		29.8	37.9	33.9	8.3	1
9 AOR08540-1	17.3	24.4	20.8	1	7.3	3		22.5	28.3	25.4	6.1	2
10 AC12090-3RU	17.7	20.1	18.9	0	3.2	3		23.7	26.5	25.1	3.2	2
11 CO13003-1RU	12.3	27.4	19.9	1	15.0	4		16.8	27.7	22.2	10.9	3
12 CO10085-1RU	21.8	28.3	25.1	2	6.5	2		30.5	35.5	33.0	5.0	0
13 CO11009-3RU	33.3	38.3	35.8	4	5.7	0		38.8	44.3	41.6	5.5	0
LSD 0.05			3.1		3.7					3.0	3.3	
Average	23.1	30.7	26.9		7.8	2		29.5	36.1	32.8		1

Date test performed:

Washington

Nov. 30

Nov. 30

Idaho

Dec. 6

Dec. 6

Oregon

Dec. 12

Dec. 12

Diff = Absolute difference between stem and bud Photovolt reading.

Entries Retained from the 2021 Trials Currently in the Regional Trial

Harvested fall of 2021

Held at 48°F until December 16

Stored at 44°F until analysis

There were five clones, A09086-1LB, A10594-4sto, A12305-2adg, AFA5661-8 & AOR11217-3 advanced from the 2021 Tri-State Trial into the 2022 Regional Trial. Two clones were retained in the Regional Trial. When averaged across states, CO11009-3RU* produced the lightest fries (47.4 ref units) for the second year. AOR11217-3 produced the second highest fries (45.7 ref units) this clone was the highest scoring in the longterm Tri-State trial for the past two seasons. The uniformity of fry color was unacceptable for RB and AOR08540-1 from WA, A09086-1LB & A12305-2adg when grown in both WA and OR. Average sprout length ranged from 3.1 to 7.7 inches. CO11009-3RU produced the longest sprouts of 7.5 (WA), 5.5 (ID) and 10 (OR) respectively.

		PHOTOVOLT READING				USDA	% REDUCING SUGAR			Sprouting	
Clone		stem	bud	avg	DIFF	COLOR	stem	bud	avg	percent	length (in.)
Washington											
1 Clearwater		42.7	42.9	42.8	4.6	0	0.6	0.6	0.6	100	1.3
2 Ranger Russet		28.4	34.6	31.5	7.4	1	1.5	1.0	1.3	100	3.5
3 Russet Burbank		23.6	35.1	29.3	11.5	2	2.1	1.0	1.6	100	6.5
4 A09086-1LB §		19.2	36.7	28.0	17.5	3	2.8	0.9	1.8	100	3.5
5 A10594-4sto §		34.7	41.4	38.0	6.7	0	1.0	0.7	0.8	100	6.5
6 A12305-2adg §		21.4	45.1	33.3	23.7	2	2.5	0.6	1.5	100	5.0
7 AFA5661-8 §		39.9	43.7	41.8	6.4	0	0.7	0.6	0.7	100	7.0
8 AOR11217-3 §		38.1	43.3	40.7	6.3	0	0.8	0.6	0.7	100	3.8
9 AOR08540-1		24.3	35.9	30.1	11.6	2	2.0	0.9	1.5	100	2.3
10 CO11009-3RU		49.3	47.2	48.3	2.6	0	0.5	0.5	0.5	100	7.5
Average		LSD 0.05		3.1	4.5						
		32.2	40.6	36.4	9.8	1	1.5	0.7	1.1	100	
Idaho											
1 Clearwater		48.0	46.0	47.0	4.1	0	0.5	0.5	0.5	100	4.0
2 Ranger Russet		41.4	40.9	41.2	6.4	0	0.7	0.7	0.7	100	5.0
3 Russet Burbank		32.5	34.8	33.7	8.5	0	1.2	1.0	1.1	100	6.0
4 A09086-1LB §		35.3	41.2	38.2	5.9	0	1.0	0.7	0.8	100	4.5
5 A10594-4sto §		35.3	39.0	37.2	4.8	0	1.0	0.8	0.9	100	5.5
6 A12305-2adg §		44.1	46.0	45.0	5.1	0	0.6	0.5	0.6	100	6.0
7 AFA5661-8 §		47.9	49.2	48.6	2.9	0	0.5	0.5	0.5	100	3.5
8 AOR11217-3 §		52.8	50.8	51.8	3.1	0	0.5	0.5	0.5	100	2.0
9 AOR08540-1		20.0	26.7	23.4	6.7	2	2.7	1.7	2.2	100	3.5
10 CO11009-3RU		49.0	47.4	48.2	3.4	0	0.5	0.5	0.5	100	5.5
Average		LSD 0.05		3.0	3.3						
		40.6	42.2	41.4	5.1	0	0.9	0.8	0.8	100	
Oregon											
1 Clearwater		44.9	47.3	46.1	4.2	0	0.6	0.5	0.6	100	8.0
2 Ranger Russet		28.7	32.6	30.6	5.9	1	1.5	1.2	1.3	100	5.5
3 Russet Burbank		28.3	34.5	31.4	6.7	1	1.6	1.0	1.3	100	9.5
4 A09086-1LB §		13.9	27.2	20.5	13.3	4	3.9	1.7	2.8	100	4.5
5 A10594-4sto §		37.0	40.4	38.7	4.2	0	0.9	0.7	0.8	100	6.5
6 A12305-2adg §		31.7	44.9	38.3	13.2	0	1.2	0.6	0.9	100	6.0
7 AFA5661-8 §		42.9	44.9	43.9	3.1	0	0.6	0.6	0.6	100	9.0
8 AOR11217-3 §		44.4	44.8	44.6	2.7	0	0.6	0.6	0.6	100	6.0
9 AOR08540-1		32.9	33.4	33.2	3.4	0	1.1	1.1	1.1	100	3.5
10 CO11009-3RU		45.9	45.4	45.6	3.0	0	0.5	0.6	0.6	100	10.0
Average		LSD 0.05		3.5	3.9						
		35.1	39.5	37.3	6.0	1	1.3	0.8	1.1	100	

Date test performed:

Washington April 29**Idaho** May 2**Oregon** May 4

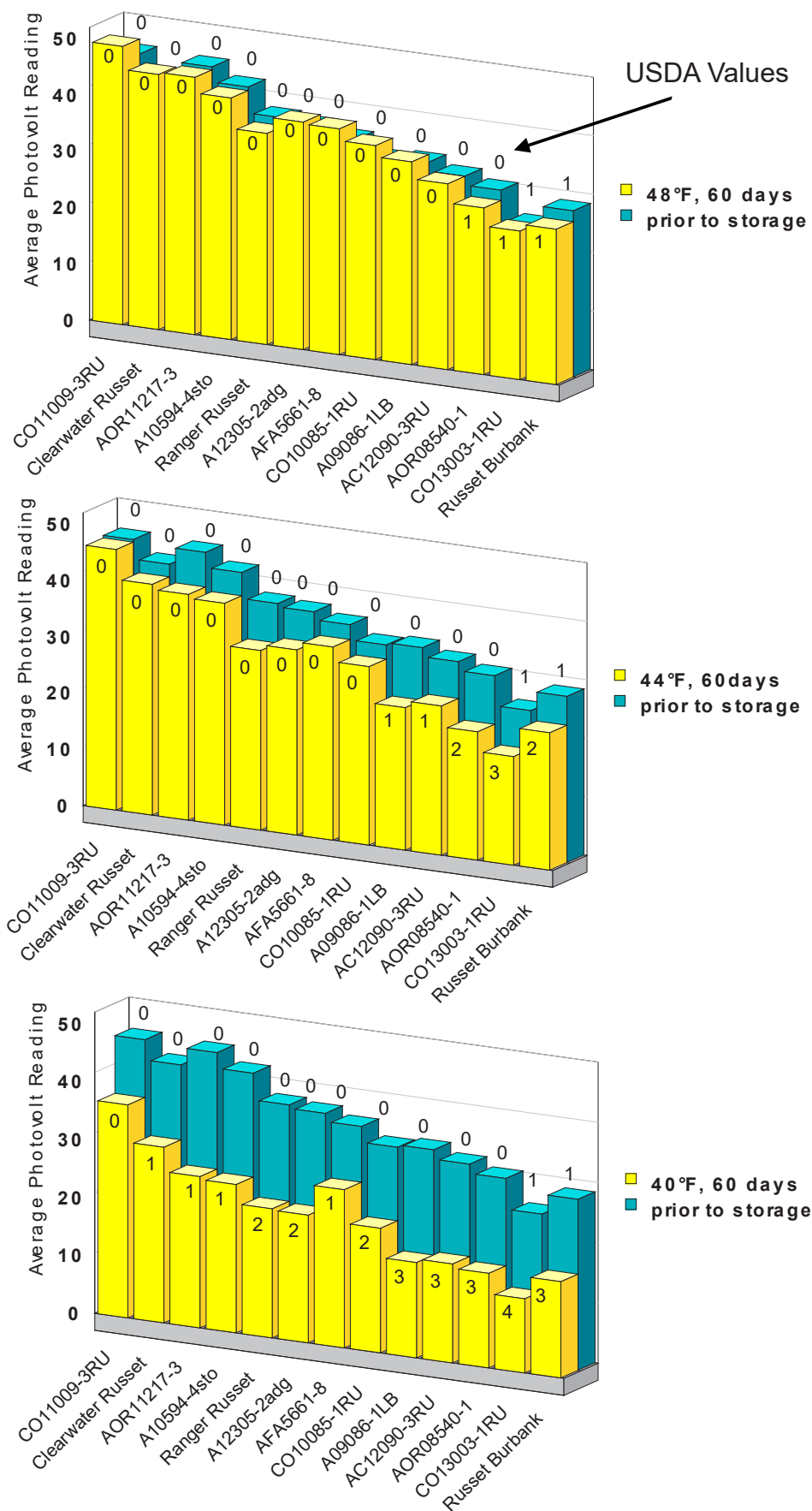
§ Advanced from 2021 Tri-State Trial.

Johnson Hall demo, relocation, and postharvest evaluations in a construction zone. Work completing the temporary Pilot Plant finished Dec 23rd, 2022.

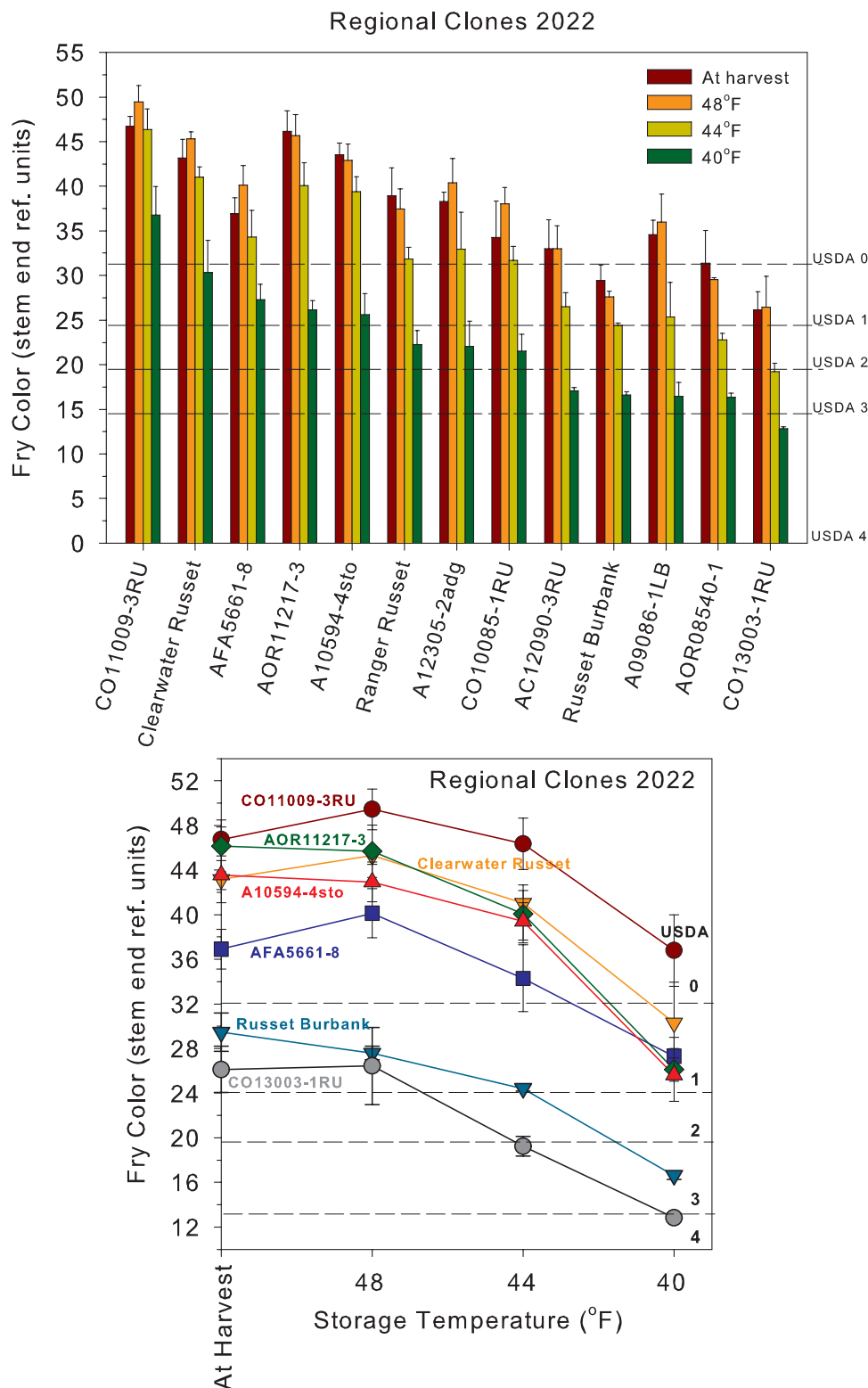


Regional Trial - 3 State Average of Stem End

2022 Late Harvest Regional Trial



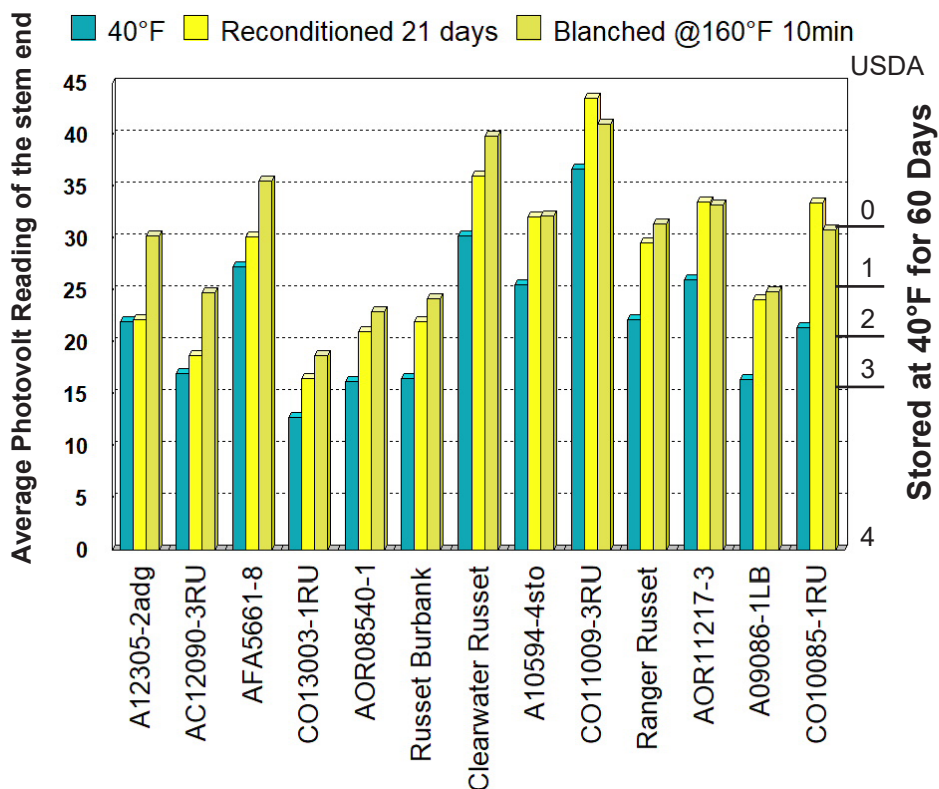
2022 Late Harvest Regional Trial



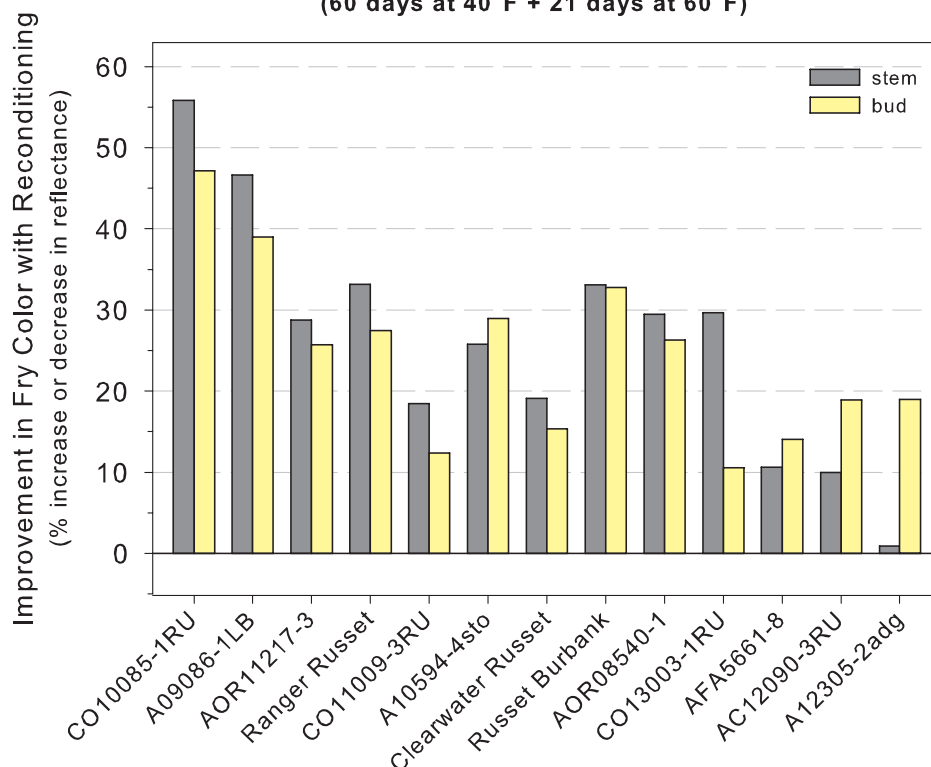
Top: At-harvest and after-storage French fry colors (stem end) of clones in the Regional Trial. Tubers were stored for 60 days at 48, 44 and 40°F. The clones are ranked from best to worst based on fry color of the 40°F-stored tubers. High reflectance values indicate light colored fries.

Bottom: Line graph depicting the effects of storage temperature on change in French fry processing quality (stem end fry color) of the most cold sweetening resistant (CO11009-3RU*, Clearwater Russet*, AOR11217-3, A10594-4sto, AFA5661-8) and susceptible (Russet Burbank* and CO13003-1RU) clones in the Regional Trial. *Indicates similar performance of the clones last year.

2022 Late Harvest Regional Trial



Regional Clones 2022 (60 days at 40°F + 21 days at 60°F)



Reconditioning abilities of clones in the 2022 Regional Trial (3-state averages). Clones were stored at 40°F for 60 days after harvest and then reconditioned at 60°F for 21 days. Top: Stem end fry color before and after reconditioning & blanching. Numbers on side indicate the USDA color rating of the stem end.

Bottom: Percent improvement of stem and bud end fry color with reconditioning.

2022 Late Harvest Regional Trial

Length to Width Ratios of 8-10 oz Tubers

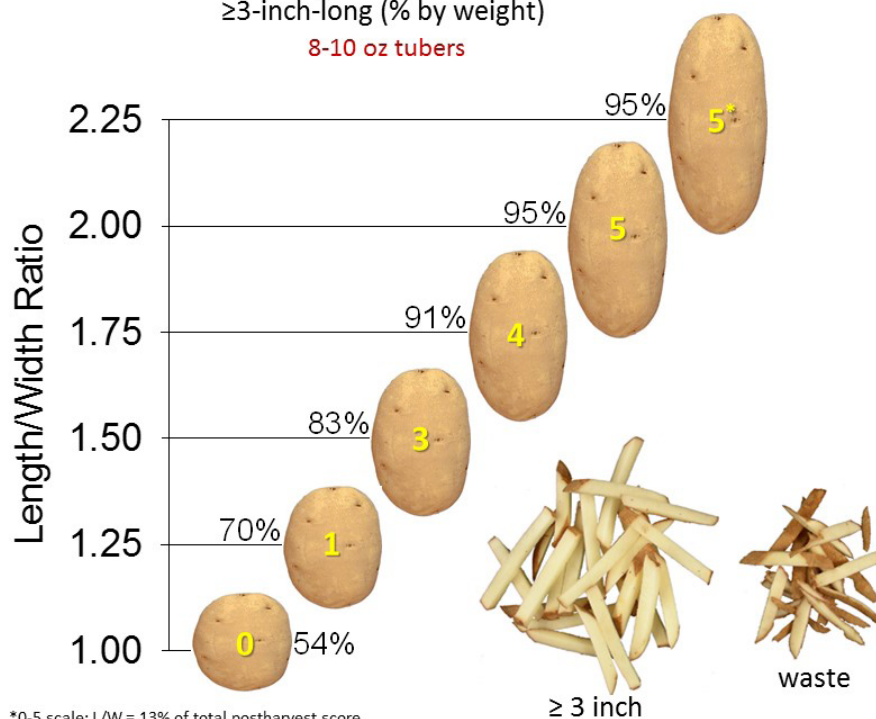
Clone	Length to width ratio						3 State Avg.
	WA	rtg \$	ID	rtg \$	OR	rtg \$	
1 Clearwater Russet	1.56	3	1.91	5	1.87	5	1.78
2 Ranger Russet	1.67	4	2.56	5	2.07	5	2.10
3 Russet Burbank	1.82	5	2.24	5	1.97	5	2.01
4 A09086-1LB	1.60	3	1.82	5	1.65	4	1.69
5 A10594-4sto	1.54	3	2.21	5	1.71	4	1.82
6 A12305-2adg	1.70	4	1.92	5	1.68	4	1.77
7 AFA5661-8	1.46	2	1.74	4	1.60	3	1.60
8 AOR11217-3	1.58	3	2.07	5	1.91	5	1.86
9 AOR08540-1	1.73	4	2.00	5	1.89	5	1.88
10 AC12090-3RU	1.79	4	2.05	5	1.93	5	1.93
11 CO13003-1RU	1.61	3	1.76	4	1.65	4	1.67
12 CO10085-1RU	1.42	2	2.22	5	1.57	3	1.74
13 CO11009-3RU	1.71	4	2.09	5	1.81	5	1.87
Average	1.63		2.07		1.79		1.82

Clone	Width to thickness ratio			3 State Avg.
	WA	ID	OR	
1 Clearwater Russet	1.21	1.19	1.19	1.20
2 Ranger Russet	1.14	1.16	1.19	1.16
3 Russet Burbank	1.19	1.14	1.20	1.18
4 A09086-1LB	1.19	1.18	1.17	1.18
5 A10594-4sto	1.14	1.12	1.15	1.13
6 A12305-2adg	1.11	1.08	1.14	1.11
7 AFA5661-8	1.15	1.10	1.12	1.12
8 AOR11217-3	1.16	1.10	1.16	1.14
9 AOR08540-1	1.13	1.09	1.15	1.12
10 AC12090-3RU	1.12	1.08	1.16	1.12
11 CO13003-1RU	1.19	1.21	1.23	1.21
12 CO10085-1RU	1.20	1.16	1.24	1.20
13 CO11009-3RU	1.08	1.07	1.11	1.09
Average	1.15	1.13	1.17	1.15

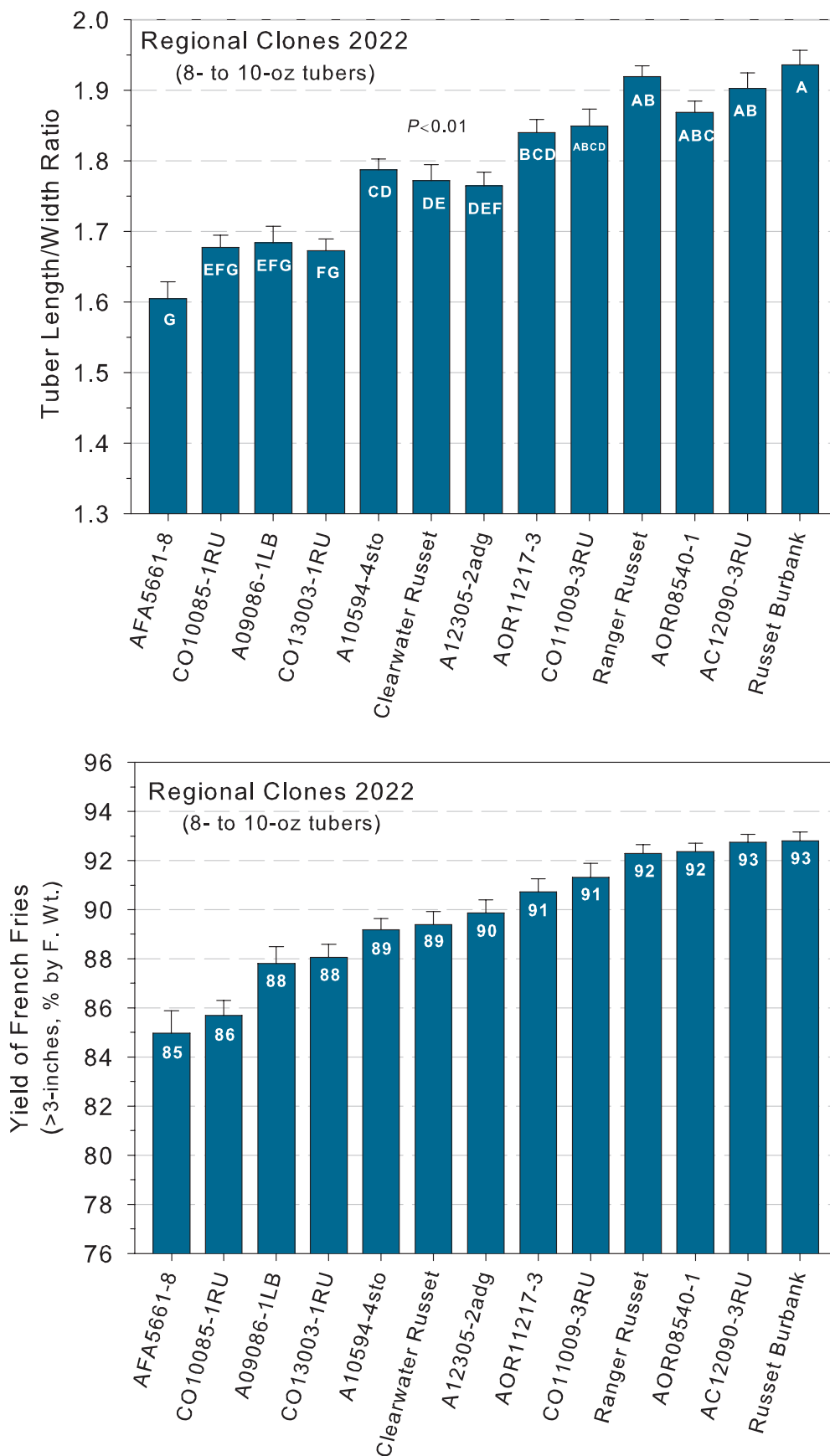
French Fry Yield vs Tuber L/W Ratio

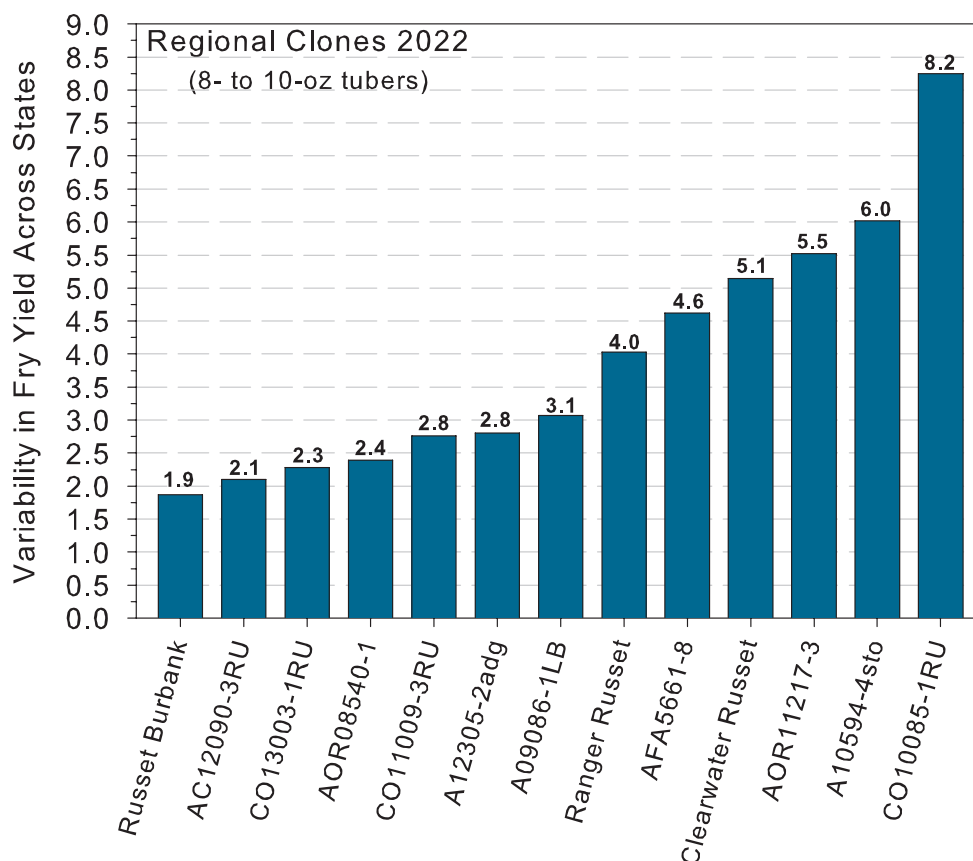
≥3-inch-long (% by weight)

8-10 oz tubers



2022 Late Harvest Regional Trial





Relative ranking of clones in the Late Season Regional Trial for variability in yield of French fries prepared from 8- to 10-oz tubers. Variability is expressed as the standard deviation (calculated across ID, WA and OR production sites) for the yield of fries ≥ 3 inches in length (% by fresh weight) from 8- to 10-oz tubers. High values reflect more variation in tuber shape and thus fry yield from state to state. For example, CO10085-1RU had a length to width ratio of 1.74, resulting in 86% of the tuber producing usable French fries ≥ 3 inches in length (page 92). However, tuber shape of this entry also varied the most across production sites (see above), resulting in fry yields ranging from 78 to 95% ($86 \pm 4.76\%$).

Pages 91-92: Tuber length to width ratios and the associated percentage yield of fries. Bars with same letter are not significantly different ($P \leq 0.01$).

2022 Tri-State Specialty Trial

Location: WSU Research Center – Othello, WA

Planting Date: March 30

Vine Kill Date: August 5

Harvest Date: August 16

Days Grown: 128

In-Row Spacing: 8 inches

The Tri-State Specialty trial is a part of the overall Tri-State Trial effort. This trial consists of clones with unique color and attributes which are primarily evaluated for fresh market suitability. This year's trial compared 6 local reference varieties to 12 new clones. The following is a summary of the Washington field and postharvest results.

Visual Standouts (nice color, skin, size distribution, & shape):

(See also: grading comments and US #1 yield ranking near front of book)

Red-Purple/Yellow flesh: A11582-1R, A11596-6R.

Yellow flesh: A11576-1YSTO

Suggested Discards: A08122-12Rsto, NDA8512C-1R, A11661-22Y, and POR16PG34-1.

Standcounts

➤ 60 Day

Full emergence: All entries were greater than 80% emerged at 60 days after planting, except for A11573-5RYsto (76%) and Austrian Crescent (78%).

Plant and Tuber Growth & Development

➤ 60 Day Stems per plant

Most: A08122-12Rsto, POR16PG25-2 and A11573-5RYsto (3.7).

Fewest: NDA8512C-1R (1.6) and Yukon Gold (1.7).

➤ Average Tuber Number Per Plant

Most: A08122-9RY (14.8) and A08122-12Rsto (14.0).

Fewest: OR11157-1 (3.4) and Yukon Gold (4.6).

➤ Average Tuber Size (oz)

Largest: Yukon Gold (7.6) and Chieftain (5.7).

Smallest: A11596-6R (1.8) and A08120-4Y (2.1).

Standcounts

➤ Total Yield and U.S. #1 Yield

Highest: Chieftain had the highest total (876 CWT/A) and the highest U.S. #1 yield (862 CWT/A). Bintje had the second highest total yield (697 CWT/A) and second highest U.S. #1 yield (611 CWT/A).

Lowest: OR11157-1 had the lowest total (134 CWT/A) and U.S. #1 yield (132 CWT/A).

2022 Tri-State Red/Specialty Trial

Postharvest Information

The 2022 red & specialty trial consisted of six cultivars and twelve numbered clones (8 red, 7 yellow, and 3 purple) for a total of 18 entries. An “*” in the summary below indicates similar performance and/or ranking in trials from previous years.

➤ Overall Postharvest Ratings

Highest scoring Overall: OR11157-1* (Fingerling)

Highest scoring Red: A08122-9RY

Highest scoring Yellow: Austrian Crescent (Fingerling, Yellow) and Yukon Gold*

Highest scoring Purple: OR11157-1* (Fingerling)

➤ Boiling

Highest scoring Overall: OR11157-1

Highest scoring Red: Modoc

Highest scoring Yellow: Austrian Crescent (Fingerling)

Highest scoring Purple: OR11157-1*

➤ Baking

Highest scoring Overall: Bintje

Highest scoring Red: A08122-9RY

Highest scoring Yellow: Bintje*

Highest scoring Purple: Purple Majesty

➤ Microwaving

Highest scoring Overall: Purple Majesty

Highest scoring Red: A11582-1R

Highest scoring Yellow: A08120-4Y

Highest scoring Purple: Purple Majesty

Details:

- Similar to previous years, culinary scores were high with all entries receiving 70-78% of the total points possible in the 2022 culinary evaluations.
- The top scoring clone was OR11157-1* (purple) with 58.4 points and NDA8512C-1R (Red) was the lowest with 52.3 points. There was a 6.1 point difference between the top and bottom scoring clones.
- The top red entries were A08122-9RY, Chieftain*, & Modoc* (average 56.4 points each). Austrian Crescent & Yukon Gold* were the top yellow entries with 56.2 and 55.5 points respectively. OR11157-1* was the top purple entry (and overall) with 58.4 points.
- OR11157-1* showed no sloughing when boiled in both the 2021 and 2022 evaluations. All other entries showed “slight” to “moderate” sloughing when boiled except for Purple Majesty which rated “sever” for sloughing. All entries showed “slight” to “moderate” after cooking darkening and A11596-6R and Chieftain had a “pasty” texture while all other entries had a “creamy” to “fluffy” texture. The tuber center for all entries rated between “mushy” and “fully cooked”. Flavor was “bland” for all entries.
- In baked evaluations, all entries had “moderate” to “slight” after cooking darkening with A08122-12rsto* having the least darkening. Modoc and A11582-1R had a “pasty” texture and all other entries had a “creamy” to “fluffy” texture with Austrian Crescent having the “fluffiest” texture. The

baked samples of all entries had acceptable flavor (“good” to “bland”). A08122-12Rsto had the lowest flavor rating. Skin ratings for all entries were “steamy” to “fully cooked”. Tuber centers for all entries were rated as “mushy” to “fully cooked”.

- Microwaving produced “slight” in all entries. Texture of microwaved samples was favorably rated as “fluffy” or “creamy” for all entries with A11576-1Ysto having the “fluffiest” texture. The flavor rating for Bintje was “unacceptable” and all other entries were “bland” to “good”. Skins of all entries were rated “steamy” to “fully cooked”. Tuber centers of all entries rated “mushy” to “fully cooked”.
- A11661-2Y produced the lightest chips with a SFA color rating of 2.3 and Yukon Gold & Purple Majesty produced the darkest with a rating of 3.8 (1-5 scale). All other entries rated 2.5 to 3.7 with an average color of 3.2 overall.
- Cooking time for boiled samples was again assessed this year. Cores of tuber tissue (1.3 cm diameter x 1.3 cm long) from the stem and bud ends of all entries were immersed in boiling water and the time to penetration by a 90-g probe was recorded. Stem cores averaged 6.3 minutes to cook compared with 4.9 minutes for bud end cores. Cooking times (stem end) ranged from 4.7 min (Purple Majesty* & NDA8512C-1R) to 9.5 min (Modoc*). For the experimental entries, NDA8512C-1R (red) had the fastest stem end cooking time (4.7 min) and A08122-9RY* (red) & A11596-6R had the longest cooking time (8.5 min). Overall average cooking time regardless of tuber portion was 5.5 minutes.

Overall Culinary Evaluation Scores

	Clone	Boiled (25 max)	Baked (25 max)	Microwaved (25 max)	Total (75 max)
18	OR11157-1	20.1	18.5	19.8	58.4
5	A08122-9RY	18.4	19.1	19.8	57.2
1	Chieftain	18.0	18.8	19.6	56.4
17	Austrian Crescent	19.4	19.2	17.6	56.2
9	Yukon Gold	18.1	19.4	18.0	55.5
2	Modoc	18.5	18.3	18.8	55.5
12	A11661-2Y	18.1	18.3	18.9	55.2
3	A11582-1R	17.9	17.2	20.0	55.1
6	A08122-12Rsto	17.4	17.8	19.5	54.7
8	A11573-5RYsto	17.5	18.1	19.0	54.6
15	Purple Majesty	15.0	18.8	20.3	54.0
10	Bintje	18.0	19.7	16.3	53.9
11	A11576-1Ysto	16.5	18.1	19.3	53.8
13	A08120-4Y	16.6	16.8	19.8	53.1
14	POR16PG34-1	16.5	17.8	18.8	53.1
16	POR16PG25-2	16.4	18.6	18.0	53.0
4	A11596-6R	16.7	17.3	18.8	52.8
7	NDA8512C-1R	17.6	17.4	17.3	52.3

Chipped: Aug. 23

Boiled: Aug. 25

Microwaved: Aug. 30

Baked: Sept. 1

Cooking Time: Sept. 6

2022 Tri-State Specialty Trial

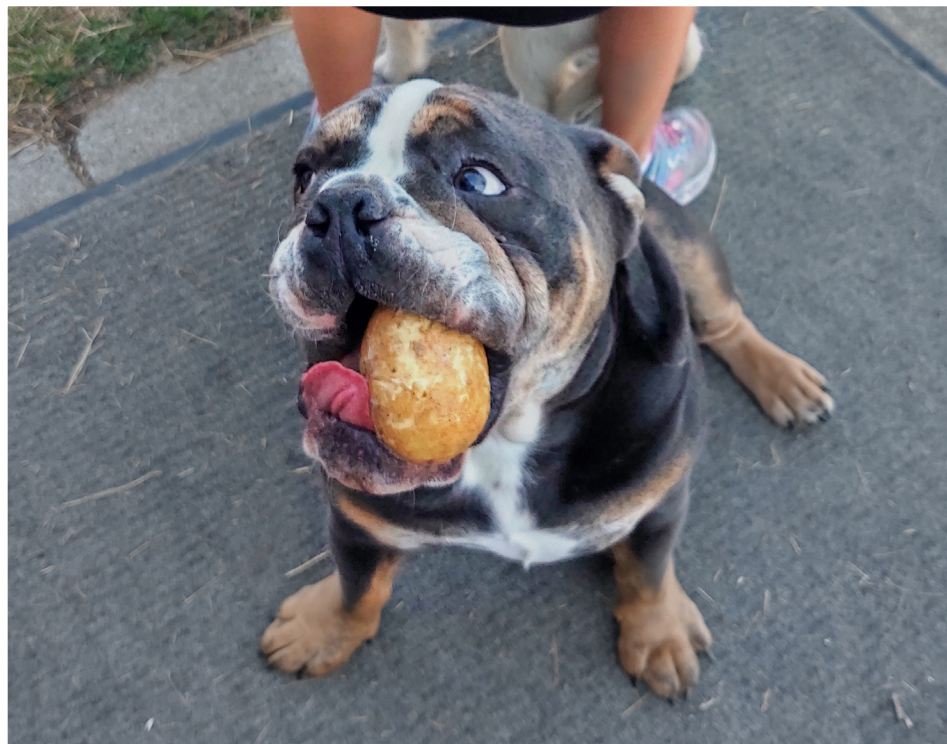
Summaries

ENTRY	TOTAL YIELD		US # 1's* > 0 oz	US # 2's* > 0 oz	Culls* > 0 oz	EXTERNAL DEFECTS		
						1 = Severe	5 =None	
		CWT/A	Tons/A	----- % of Total Yield -----			Knobs	Growth Cracks
Red Skin/White Flesh								
Chieftain	876	43.8	98	1	1	5	4	4
Modoc	609	30.5	97	2	1	5	4	4
A11582-1R	509	25.5	98	0	1	5	5	4
A11596-6R	268	13.4	99	0	0	5	5	5
A08122-9RY	588	29.4	97	2	1	5	5	4
A08122-12Rsto	650	32.5	93	0	7	5	2	4
NDA8512C-1R	585	29.2	82	4	14	5	1	5
Red-Purple/Yellow Flesh								
A11573-5RYsto	393	19.7	96	4	0	5	4	4
Yellow Flesh								
Yukon Gold	542	27.1	95	3	2	5	4	5
Bintje	697	34.8	88	8	4	1	4	4
A11576-1Ysto	534	26.7	99	1	0	5	5	4
A11661-2Y	613	30.7	94	6	0	5	4	4
A08120-4Y	374	18.7	98	1	1	5	4	4
POR16PG34-1	565	28.2	86	0	14	5	1	4
Purple/Purple Flesh								
Purple Majesty	577	28.8	99	1	0	5	5	5
POR16PG25-2	581	29.1	98	0	2	5	5	5
Fingerling								
Austrian Crescent	275	13.7	76	16	8	3	5	4
OR11157-1	134	6.7	99	1	0	5	5	5

ENTRY	US # 1 YIELD							Specific Gravity
	CWT/A	Tons/A	0-2 oz*	2-4 oz*	4-6 oz*	6-10 oz*	> 10 oz*	
			-----%					
Red Skin/White Flesh								
Chieftain	862	43.1	2	14	23	36	25	1.064
Modoc	591	29.5	9	31	30	23	6	1.063
A11582-1R	501	25.0	16	40	28	14	3	1.059
A11596-6R	266	13.3	50	44	6	0	0	1.056
A08122-9RY	572	28.6	23	47	21	8	0	1.071
A08122-12Rsto	605	30.3	18	41	22	16	3	1.068
NDA8512C-1R	479	24.0	5	24	30	36	6	1.067
Red-Purple/Yellow Flesh								
A11573-5RYsto	377	18.9	33	49	14	4	0	1.075
Yellow Flesh								
Yukon Gold	514	25.7	2	8	11	27	51	1.081
Bintje	611	30.6	6	23	25	38	7	1.075
A11576-1Ysto	529	26.5	20	48	23	8	0	1.075
A11661-2Y	574	28.7	12	47	32	9	0	1.076
A08120-4Y	367	18.4	35	52	11	2	0	1.065
POR16PG34-1	485	24.3	16	40	27	16	1	1.077
Purple/Purple Flesh								
Purple Majesty	571	28.6	10	41	29	17	2	1.072
POR16PG25-2	575	28.7	12	38	27	19	4	1.073
Fingerling								
Austrian Crescent	202	10.1	30	45	17	8	0	1.082
OR11157-1	132	6.6	20	58	15	0	7	1.072

* Percent values may not total 100% due to rounding

ENTRY	SKIN	TUBER	60 DAY STAND	STEMS PER PLANT	AVERAGE TUBER		SIZE	SHAPE
	SET	SHAPE			WEIGHT	NUMBER	UNIFORMITY	UNIFORMITY
	1 = Poor 5 = Good	1 = Round 5 = Long			Ounces	Tubers/Plant	1 = Poor 5 = Good	1 = Poor 5 = Good
Red Skin/White Flesh								
Chieftain	3.0	1.0	84	2.4	5.7	9.9	3.0	2.7
Modoc	4.0	1.0	83	3.1	3.7	10.7	2.7	3.3
A11582-1R	4.0	1.0	84	3.0	3.0	11.0	3.0	4.0
A11596-6R	3.3	1.0	80	3.0	1.8	9.6	4.0	4.0
A08122-9RY	4.3	1.0	93	3.2	2.6	14.8	3.0	3.0
A08122-12Rsto	3.7	1.0	86	3.7	3.0	14.0	3.0	4.0
NDA8512C-1R	3.0	1.0	88	1.6	4.6	8.2	3.0	3.0
Red-Purple/Yellow Flesh								
A11573-5RYsto	4.0	1.0	76	3.7	2.2	11.2	4.0	4.0
Yellow Flesh								
Yukon Gold	4.0	1.0	84	1.7	7.6	4.6	2.0	3.0
Bintje	2.0	3.0	94	2.5	4.6	10.0	2.0	1.0
A11576-1Ysto	5.0	1.0	84	3.2	2.7	12.7	3.0	3.7
A11661-2Y	4.0	3.0	84	2.6	3.2	12.7	3.0	1.3
A08120-4Y	4.0	1.0	89	3.4	2.1	11.4	4.0	3.0
POR16PG34-1	4.0	1.0	88	2.6	3.2	11.4	3.0	3.0
Purple/Purple Flesh								
Purple Majesty	3.0	1.0	88	3.0	3.4	11.2	3.0	1.3
POR16PG25-2	3.7	3.0	86	3.7	3.4	11.2	2.3	3.0
Fingerling								
Austrian Crescent	4.0	5.0	78	3.5	2.6	6.9	3.0	1.0
OR11157-1	3.3	5.0	83	2.9	2.6	3.4	4.0	3.7



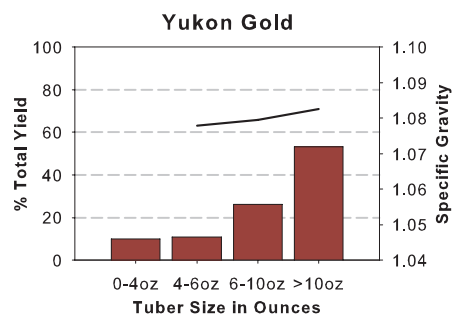
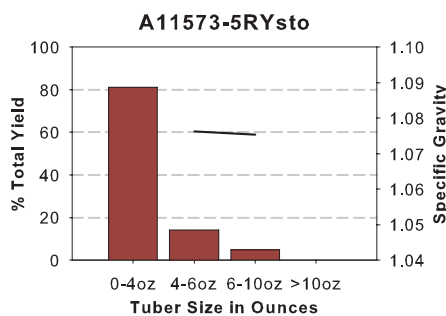
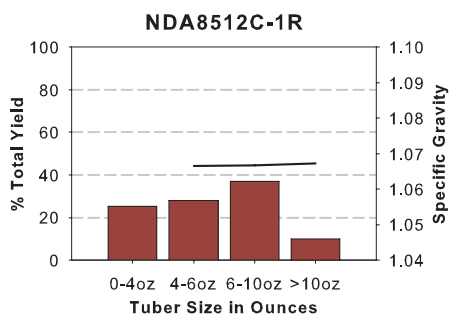
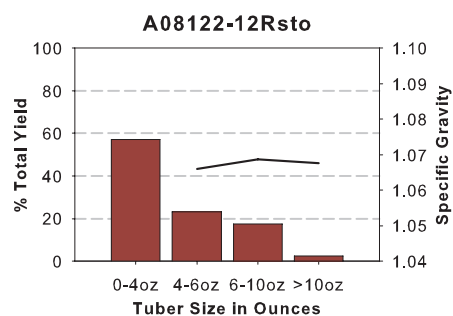
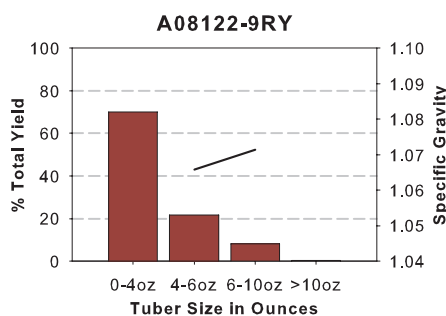
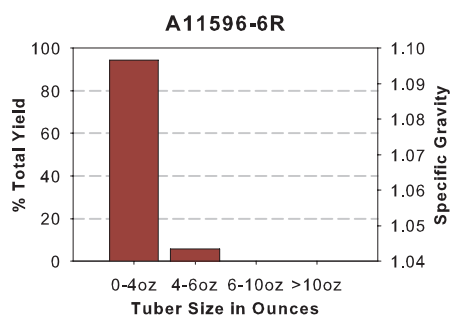
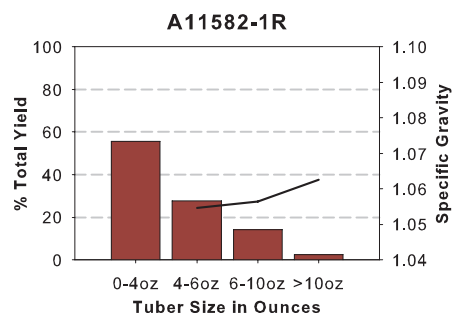
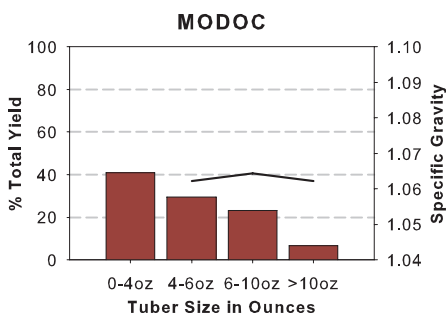
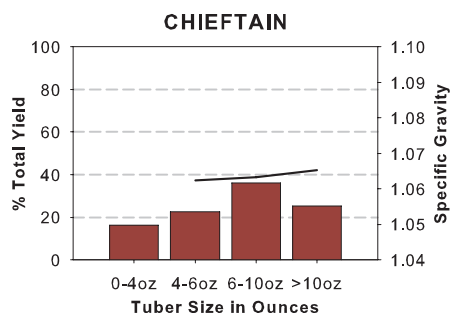
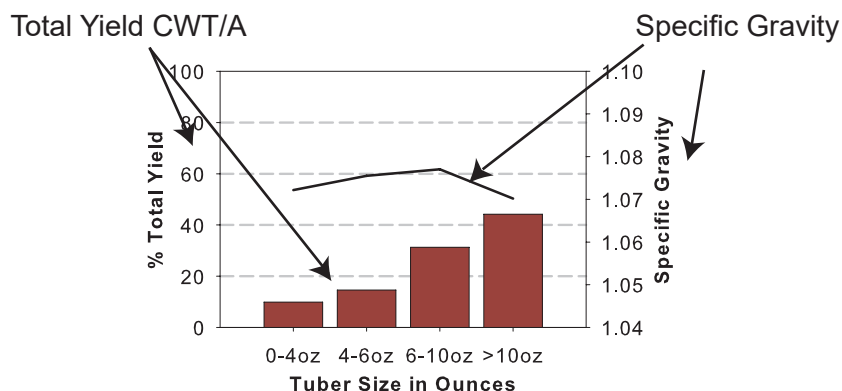
Brutus, our new group mascot!

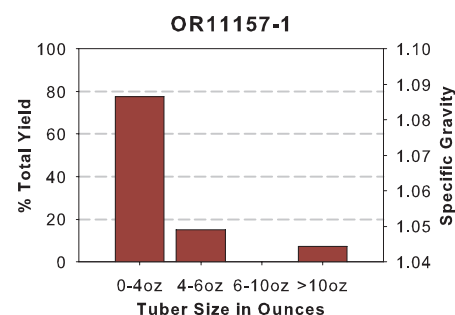
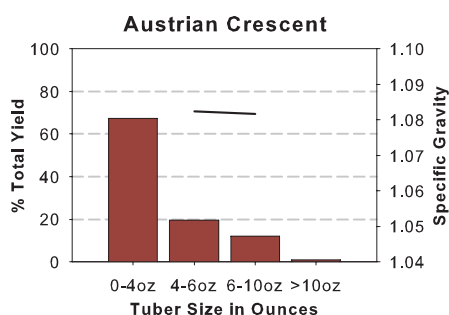
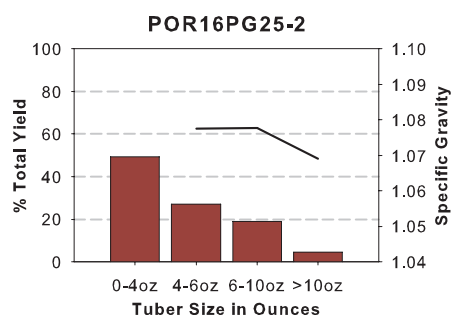
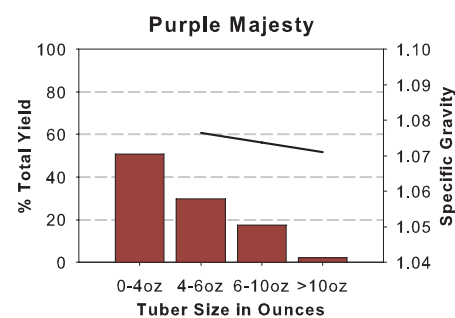
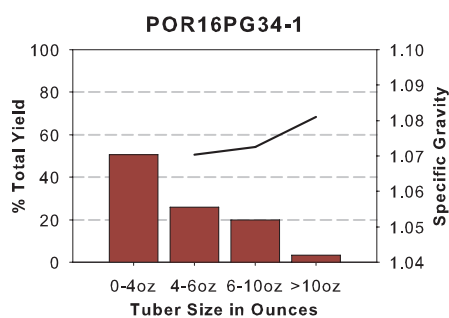
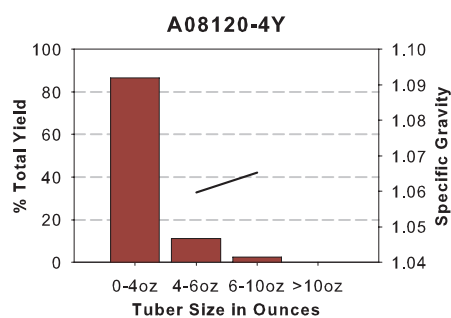
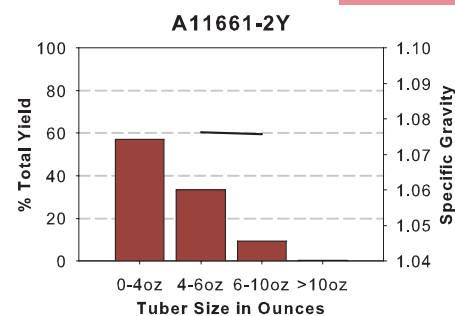
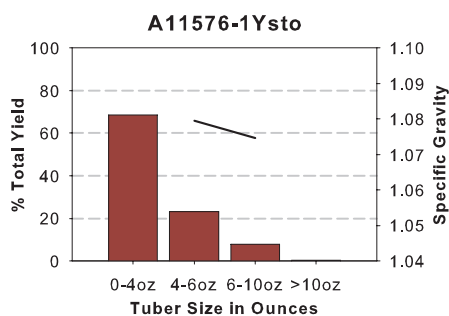
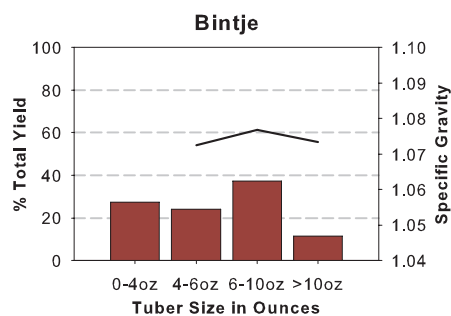
2022 Tri-State Specialty Trial

Tuber Yield and Specific Gravity Distributions

Note: Specific Gravity is based on a sample of U.S. #1 tubers within each size category

8 inch In-Row Spacing





2022 Washington Tri-State Specialty Trial

Red Clone Culinary Evaluation

Boiled

Clone	After Cooking			Tuber Center	Sloughing	Total Rating
	Flavor	Darkening	Texture			
1 Chieftain	3.4	4.2	2.4	4.5	3.5	18.0
2 Modoc	3.4	4.0	2.9	4.4	3.8	18.5
3 A11582-1R	2.6	3.6	2.8	4.3	4.6	17.9
4 A11596-6R	2.9	3.3	1.9	4.3	4.3	16.7
5 A08122-9RY	3.4	3.5	3.3	4.4	3.8	18.4
6 A08122-12Rsto	2.6	4.0	2.6	4.5	3.7	17.4
7 NDA8512C-1R	2.5	3.9	2.6	4.7	3.9	17.6
8 A11573-5RYsto	3.1	3.0	3.5	4.7	3.2	17.5
LSD 0.05	ns	0.5	1.0	ns	0.7	ns
Average	3.0	3.7	2.8	4.5	3.9	17.8

Oven Baked

Clone	After cooking			Tuber Center	Skin Rating	Total Rating
	Flavor	Darkening	Texture			
1 Chieftain	3.8	4.3	2.5	4.1	4.2	18.8
2 Modoc	3.3	4.4	2.3	4.1	4.2	18.3
3 A11582-1R	2.8	4.5	2.2	3.8	4.0	17.2
4 A11596-6R	2.9	3.8	2.6	3.8	4.2	17.3
5 A08122-9RY	3.7	4.0	3.0	4.4	4.0	19.1
6 A08122-12Rsto	2.4	4.6	2.6	4.1	4.1	17.8
7 NDA8512C-1R	3.3	3.8	2.6	3.8	4.0	17.4
8 A11573-5RYsto	3.0	3.8	3.5	3.8	4.0	18.1
LSD 0.05	0.9	0.6	0.9	ns	ns	ns
Average	3.1	4.1	2.7	4.0	4.1	18.0

Microwaved

Clone	After cooking			Tuber Center	Skin Rating	Total Rating
	Flavor	Darkening	Texture			
1 Chieftain	3.6	4.1	3.6	3.8	4.5	19.6
2 Modoc	3.1	4.0	3.3	4.1	4.3	18.8
3 A11582-1R	3.5	4.0	3.8	4.3	4.5	20.0
4 A11596-6R	2.8	4.1	3.3	4.3	4.4	18.8
5 A08122-9RY	3.5	4.0	3.5	4.3	4.5	19.8
6 A08122-12Rsto	3.1	4.1	3.5	4.1	4.6	19.5
7 NDA8512C-1R	3.0	3.8	2.9	3.6	4.0	17.3
8 A11573-5RYsto	2.9	3.8	3.9	4.0	4.5	19.0
LSD 0.05	ns	ns	1.0	ns	0.5	1.3
Average	3.2	4.0	3.5	4.0	4.4	19.1

*Differences between clones equal to or greater than the LSD 0.05 are significant.

2022 Washington Tri-State Specialty Trial

Specialty Clone Culinary Evaluation

Boiled

Clone	Flavor	After Cooking		Tuber Center	Sloughing	Total Rating
		Darkening	Texture			
9 Yukon Gold	3.3	3.7	3.0	4.3	3.8	18.1
10 Bintje	3.5	3.8	3.4	4.2	3.1	18.0
11 A11576-1Ysto	3.2	3.4	3.1	4.1	2.7	16.5
12 A11661-2Y	3.0	3.5	3.5	4.2	3.9	18.1
13 A08120-4Y	2.6	3.2	2.7	4.5	3.6	16.6
14 POR16PG34-1	2.5	2.9	3.1	4.4	3.6	16.5
15 Purple Majesty	2.7	3.2	3.4	3.9	1.8	15.0
16 POR16PG25-2	2.5	2.9	3.6	4.3	3.1	16.4
17 Austrian Crescent	3.0	3.7	3.9	4.5	4.3	19.4
18 OR11157-1	3.3	3.8	3.5	4.5	5.0	20.1
LSD 0.05	0.9	0.7	1.0	0.6	0.6	2.7
Average	3.0	3.4	3.3	4.3	3.5	17.5

Oven Baked

Clone	Flavor	After cooking		Tuber Center	Skin Rating	Total Rating
		Darkening	Texture			
9 Yukon Gold	3.8	4.1	3.8	3.6	4.3	19.4
10 Bintje	3.8	4.0	3.2	4.6	4.1	19.7
11 A11576-1Ysto	3.1	4.2	3.6	3.4	3.8	18.1
12 A11661-2Y	3.3	4.2	3.3	3.8	3.8	18.3
13 A08120-4Y	2.6	3.4	2.8	3.8	4.2	16.8
14 POR16PG34-1	3.2	3.8	2.9	3.5	4.5	17.8
15 Purple Majesty	3.2	4.3	3.8	3.7	3.8	18.8
16 POR16PG25-2	2.8	4.4	3.1	4.3	4.0	18.6
17 Austrian Crescent	3.0	3.8	4.0	3.9	4.4	19.2
18 OR11157-1	3.3	4.2	3.5	4.0	3.5	18.5
LSD 0.05	0.8	0.8	0.9	0.8	0.6	2.2
Average	3.2	4.0	3.4	3.9	4.0	18.5

Microwaved

Clone	Flavor	After cooking		Tuber Center	Skin Rating	Total Rating
		Darkening	Texture			
9 Yukon Gold	3.4	3.8	3.4	3.4	4.1	18.0
10 Bintje	2.4	4.4	2.6	2.8	4.1	16.3
11 A11576-1Ysto	3.0	3.8	4.1	4.1	4.3	19.3
12 A11661-2Y	2.9	3.9	3.3	4.3	4.6	18.9
13 A08120-4Y	3.4	3.8	3.9	4.4	4.4	19.8
14 POR16PG34-1	2.8	3.5	4.1	3.9	4.5	18.8
15 Purple Majesty	3.4	4.4	3.6	4.6	4.3	20.3
16 POR16PG25-2	3.0	3.9	3.0	3.9	4.3	18.0
17 Austrian Crescent	2.9	3.9	3.4	3.9	3.6	17.6
18 OR11157-1	3.4	4.4	3.8	4.5	3.8	19.8
LSD 0.05	1.0	0.8	1.1	0.9	0.7	2.4
Average	3.0	4.0	3.5	4.0	4.2	18.7

*Differences between clones equal to or greater than the LSD 0.05 are significant.

Chipping and Boiling Evaluations

Clone	(Chips)	(BOILED Cooking Time)		
	Av of 6 raters SFA	Time to Breakdown (min)		
		Stem	Bud	Average
1 Chieftain	2.8	7.0	5.0	6.0
2 Modoc	3.5	9.5	5.5	7.5
3 A11582-1R	3.3	5.7	5.3	5.5
4 A11596-6R	3.8	8.5	6.6	7.5
5 A08122-9RY	2.8	8.5	5.9	7.2
6 A08122-12Rsto	3.0	6.3	4.7	5.5
7 NDA8512C-1R	2.5	4.7	4.0	4.4
8 A11573-5RYsto	3.3	5.2	4.7	5.0
9 Yukon Gold	3.8	6.7	4.3	5.5
10 Bintje	3.2	4.8	4.3	4.6
11 A11576-1Ysto	3.2	7.3	4.3	5.8
12 A11661-2Y	2.3	5.6	4.7	5.2
13 A08120-4Y	2.7	4.9	4.2	4.5
14 POR16PG34-1	3.3	6.4	4.8	5.6
15 Purple Majesty	3.8	4.7	3.9	4.3
16 POR16PG25-2	3.7	5.0	4.0	4.5
17 Austrian Crescent	2.8	7.2	5.6	6.4
18 OR11157-1	3.7	5.3	4.4	4.9
LSD 0.05 *		1.8	0.5	
Average		6.3	4.9	5.5

*Differences between clones equal to or greater than the LSD 0.05 are significant.
SFA 1 (lightest) to 5 (darkest).



Jacob Blauer gives a talk during Field Day.



Seed Size Demo



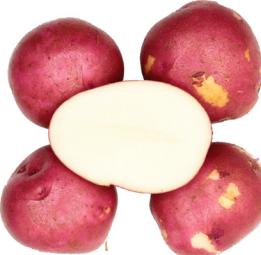
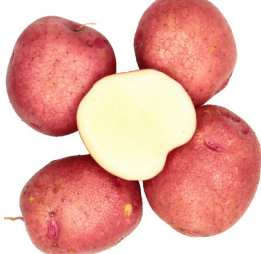
PVY canine detecting demonstration

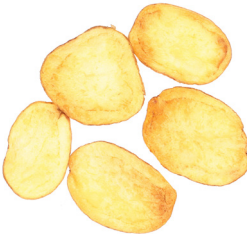
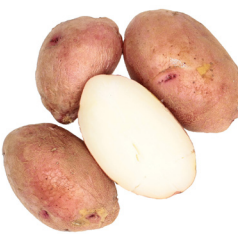
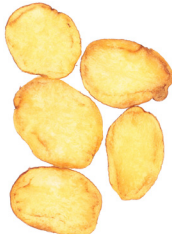
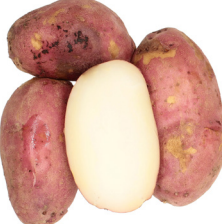
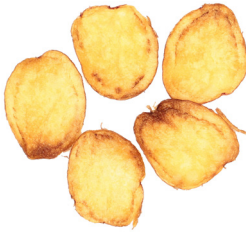
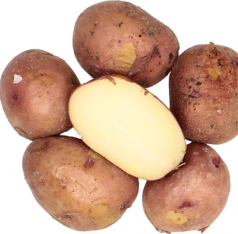
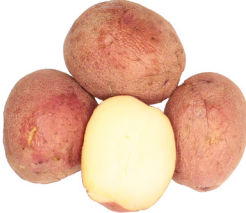


PVY infected tuber detected!

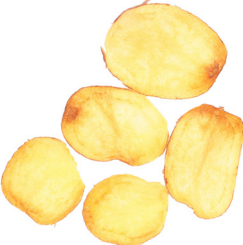
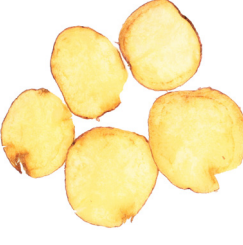
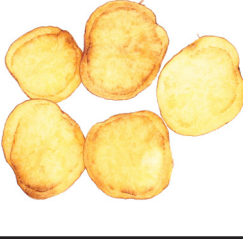
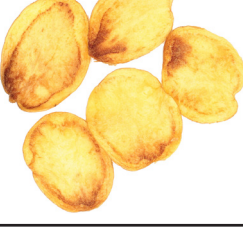
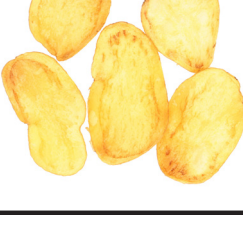


Graduate students Jacob Meeuwsen (left) and Alexa Hintze taking data on in-season harvests of a Nitrogen trial.

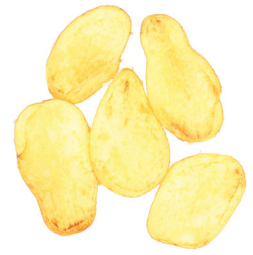
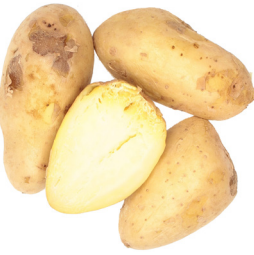
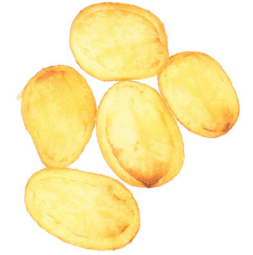
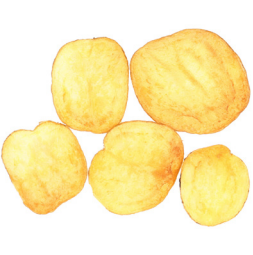
Tubers	WA Tri-State Specialty Trial Comments
Chieftain	
	Tubers: Round tubers. Fair skin set; moderate eye depth. Baked: slight after cooking darkening, creamy texture, good flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, pasty texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, fluffy texture, good flavor, mushy tuber center, fully cooked skin.
Modoc	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: slight after cooking darkening, pasty texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.
A11582-1R	
	Tubers: Round tubers. Good skin set; shallow eyes. Baked: none after cooking darkening, pasty texture, bland flavor, mushy tuber center, steamy skin. Boiled: none sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, fluffy texture, good flavor, mushy tuber center, fully cooked skin.
A11596-6R	
	Tubers: Round tubers. Fair skin set; moderate eye depth. Baked: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, moderate after cooking darkening, pasty texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.
A08122-9RY	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: slight after cooking darkening, creamy texture, good flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, fluffy texture, good flavor, mushy tuber center, fully cooked skin.

Chips	Baked	Boiled	Microwaved
Chieftain			
			
Modoc			
			
A11582-1R			
			
A11596-6R			
			
A08122-9RY			
			

Tubers	WA Tri-State Specialty Trial Comments
A08122-12Rsto	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: none after cooking darkening, creamy texture, unacceptable flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, creamy texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, fully cooked skin.
NDA8512C-1R	
	Tubers: Round tubers. Fair skin set; moderate eye depth. Baked: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, creamy texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.
A11573-5RYsto	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, moderate after cooking darkening, fluffy texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, fully cooked skin.
Yukon Gold	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: slight after cooking darkening, fluffy texture, good flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.
Bintje	
	Tubers: Oblong tubers. Poor skin set; moderate eye depth. Baked: slight after cooking darkening, creamy texture, good flavor, fully cooked tuber center, steamy skin. Boiled: moderate sloughing, slight after cooking darkening, creamy texture, good flavor, mushy tuber center. Microwaved: slight after cooking darkening, creamy texture, unacceptable flavor, mushy tuber center, steamy skin.

Chips	Baked	Boiled	Microwaved
A08122-12Rsto			
			
NDA8512C-1R			
			
A11573-5RYsto			
			
Yukon Gold			
			
Bintje			
			

Tubers	WA Tri-State Specialty Trial Comments
A11576-1Ysto	
	Tubers: Round tubers. Good skin set; shallow eyes. Baked: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin. Boiled: moderate sloughing, moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin.
A11661-2Y	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Baked: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, fully cooked skin.
A08120-4Y	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, moderate after cooking darkening, creamy texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin.
POR16PG34-1	
	Tubers: Round tubers. Good skin set; moderate eye depth. Baked: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, fully cooked skin. Boiled: slight sloughing, moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, fully cooked skin.
Purple Majesty	
	Tubers: Round tubers. Fair skin set; moderate eye depth. Baked: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin. Boiled: severe sloughing, moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, fully cooked tuber center, steamy skin.

Chips	Baked	Boiled	Microwaved
A11576-1Ysto			
			
A11661-2Y			
			
A08120-4Y			
			
POR16PG34-1			
			
Purple Majesty			
			

Tubers	WA Tri-State Specialty Trial Comments
POR16PG25-2	
	Tubers: Oblong tubers. Good skin set; shallow eyes. Baked: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin. Boiled: moderate sloughing, moderate after cooking darkening, fluffy texture, bland flavor, mushy tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.
Austrian Crescent	
	Tubers: Long tubers Good skin set; shallow eyes. Baked: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin. Boiled: slight sloughing, slight after cooking darkening, fluffy texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.
OR11157-1	
	Tubers: Long tubers Fair skin set; shallow eyes. Baked: slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin. Boiled: none sloughing, slight after cooking darkening, fluffy texture, bland flavor, fully cooked tuber center. Microwaved: slight after cooking darkening, fluffy texture, bland flavor, fully cooked tuber center, steamy skin.

Chips	Baked	Boiled	Microwaved
POR16PG25-2			
			
Austrian Crescent			
			
OR11157-1			
			

2022 Tri-State Chip Trial

Summaries

ENTRY	TOTAL YIELD		US # 1's*	US # 2's*	Culls*	EXTERNAL DEFECTS		
						1 = Severe	5 =None	
			> 0 oz	> 0 oz	> 0 oz		Growth	
	CWT/A	Tons/A	----- % of Total Yield -----			Knobs	Cracks	Green
Atlantic	351	17.6	96	2	2	5	5	4
Lamoka	430	21.5	98	0	2	5	5	4
Snowden	375	18.8	97	1	2	5	5	5
AOR12197-4	393	19.7	95	3	2	5	5	4
COOR13270-2	372	18.6	97	0	3	5	4	4
NYOR14Q9-5	385	19.3	97	0	3	5	5	4
NYOR14Q9-9	320	16.0	98	0	2	5	5	4
A13125-3C	427	21.3	97	1	2	5	4	4

* Percent values may not total 100% due to rounding.

** Numbers followed by the same letter are not significantly different at the 5% level using Fisher's LSD Test.

ENTRY	US # 1 YIELD						Specific Gravity	
	CWT/A	Tons/A	0-2 oz*	2-4 oz*	4-6 oz*	6-10 oz*		> 10 oz*
			-----%-----					
Atlantic	338	16.9	8	34	25	24	8	1.078
Lamoka	419	21.0	5	21	24	37	14	1.074
Snowden	362	18.1	7	31	27	25	9	1.081
AOR12197-4	372	18.6	6	25	29	31	9	1.077
COOR13270-2	363	18.1	8	31	29	26	6	1.078
NYOR14Q9-5	374	18.7	5	21	22	34	18	1.080
NYOR14Q9-9	313	15.6	6	31	35	26	2	1.074
A13125-3C	415	20.8	5	17	24	39	16	1.080

* Percent values may not total 100% due to rounding.

** Numbers followed by the same letter are not significantly different at the 5% level using Fisher's LSD Test.

ENTRY	SKIN SET	L x W RATIO	60 DAY STAND	STEMS PER PLANT	AVERAGE TUBER		SIZE UNIFORMITY	SHAPE UNIFORMITY
	1 = Poor 5 = Good	1 = Round 5 = Long	% Emerged	Above Ground	WEIGHT Ounces	NUMBER Tubers/Plant	1 = Poor 5 = Good	1 = Poor 5 = Good
Atlantic	3.3	1.0	85	2.5	3.9	8.5	3.0	2.7
Lamoka	3.3	1.1	85	2.4	5.0	8.4	3.0	4.0
Snowden	3.0	1.0	83	2.8	4.3	8.5	3.0	3.5
AOR12197-4	3.3	1.0	82	2.5	4.4	8.3	3.0	3.0
COOR13270-2	2.7	1.0	74	2.9	4.0	8.6	3.0	3.7
NYOR14Q9-5	2.7	1.0	86	2.2	5.0	7.4	3.0	3.0
NYOR14Q9-9	3.7	1.0	74	2.5	4.1	7.3	3.0	3.0
A13125-3C	4.0	1.1	82	2.0	5.3	7.7	3.0	3.0

* Percent values may not total 100% due to rounding

Planting Date: April 19th
Harvest Date: August 16

Vine Kill Date: August 5th
Days grown: 108

2022 Tri-State Chip Trial

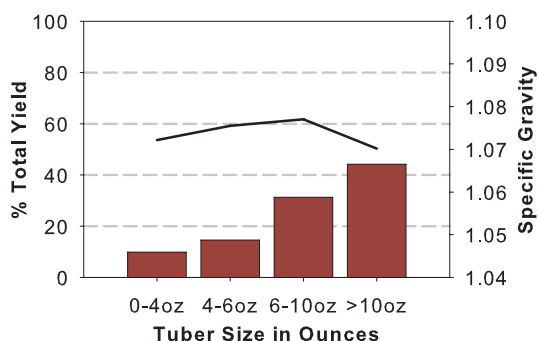
Tuber Yield and Specific Gravity Distributions

Note: Specific Gravity is based on a sample of U.S. #1 tubers within the 6-10 oz category

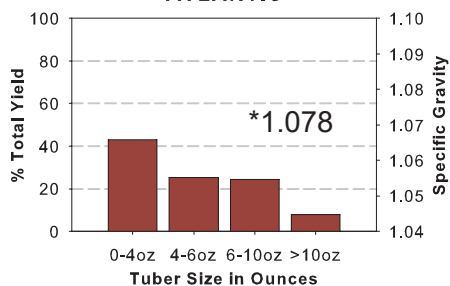
8 inch In-Row Spacing

Total Yield CWT/A

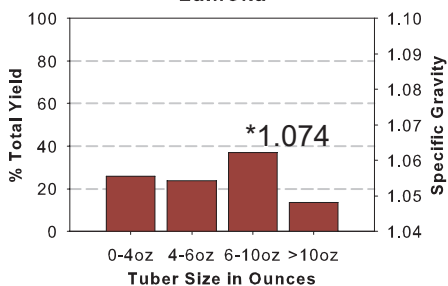
Specific Gravity



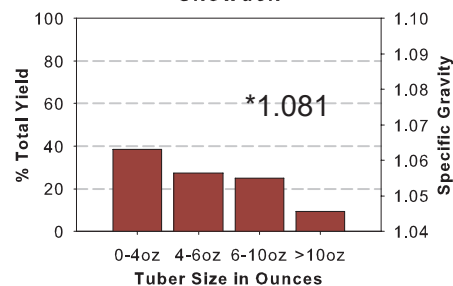
ATLANTIC



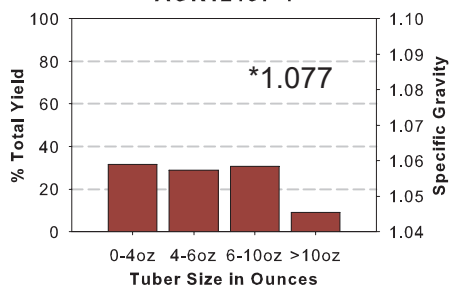
Lamoka



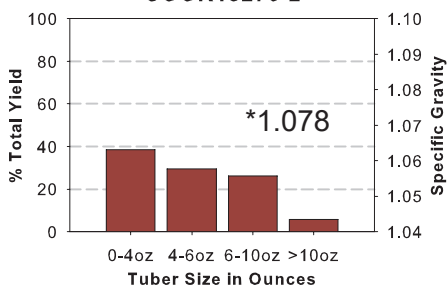
Snowden



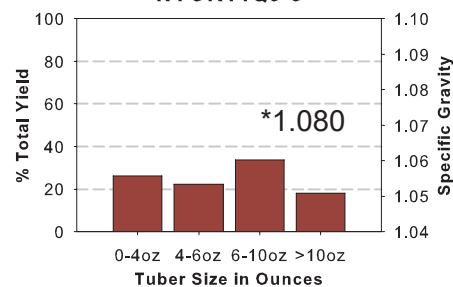
AOR12197-4



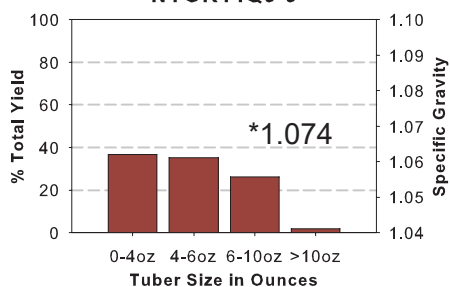
COOR13270-2



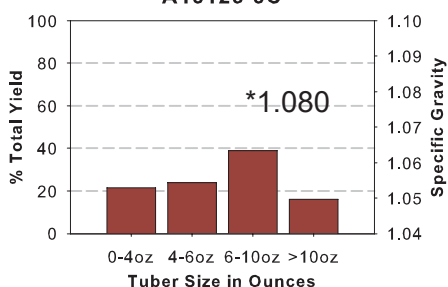
NYOR14Q9-5



NYOR14Q9-9



A13125-3C



2022 WA Chip Trial

Postharvest Information

Five experimental chipping clones were evaluated in 2022 along with Atlantic, Lamoka, and Snowden as check cultivars. Samples were from WSU's Othello, WA Research station. An asterisk in the summary below indicates similar performance and/or ranking in trials from previous years.

➤ Overall Fry Color

Lightest Fry Color: NYOR14Q9-5*

Darkest Fry Color: COOR13270-2*

➤ Harvest Fry Color

Lightest Fry Color: A13125-3C

Darkest Fry Color: NYOR14Q9-9, Atlantic

➤ 44°F Fry Color

Lightest Fry Color: NYOR14Q9-5*

Darkest Fry Color: COOR13270-2

➤ 48°F Fry Color

Lightest Fry Color: NYOR14Q9-5*

Darkest Fry Color: COOR13270-2*

Details:

- When averaged over the three fry point intervals, NYOR14Q9-5* produced the lightest chips (2.0) as referenced with the SFA color chart (1-5 (darkest)). A13125-3C had the second lightest overall color of the experimental clones (2.2), slightly lighter than Snowden (2.3).
- When fried directly out of the field A13125-3C averaged the lightest fries with a score of 1.2
- NYOR14Q9-5 had an average score of 1.5 at harvest, 1.4 after 60 days at 48° and 3.0 out of 44°F
- COOR13270-2 was the darkest scoring clone out of both 44°F and 48°F storages with average scores of 4.0 and 5.0.
- COOR13270-2 also scored a relatively dark 2.7 out of the field, though NYOR14Q9-9 was equally as dark (2.8).
- COOR13270-2 scored the darkest chip color in both the 2021 and the 2022 seasons.

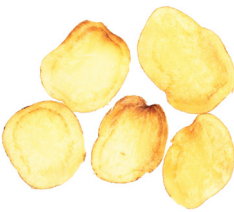
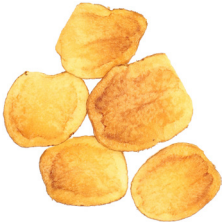
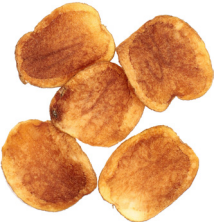
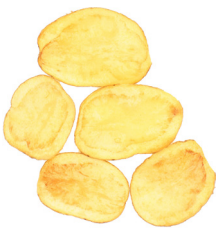
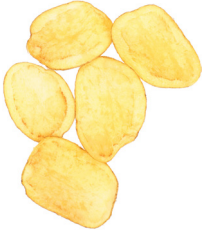
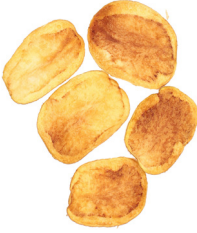
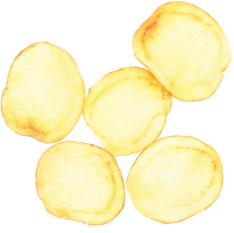
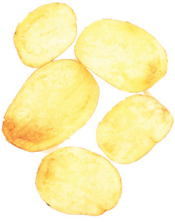
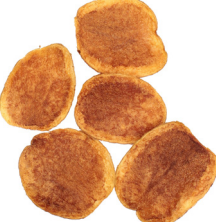
2022 Tri-State Chip Trial

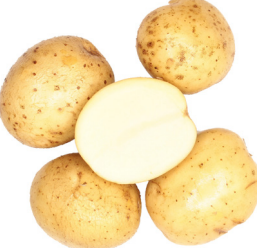
Postharvest Assessments for Storability and Color

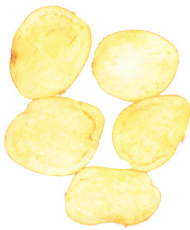
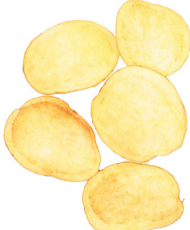
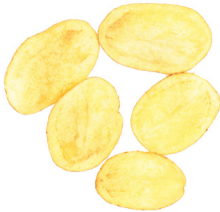
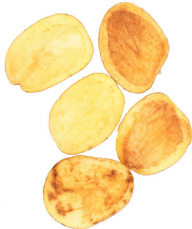
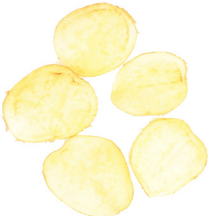
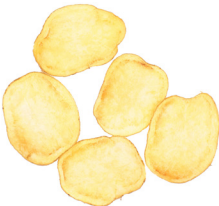
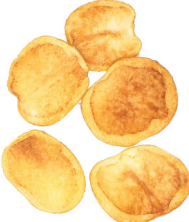
		<u>SFA Ratings</u>		
Clone		Prior to Storage	48°F Storage	44°F Storage
1	Atlantic	2.8	3.0	4.8
2	Lamoka	1.3	2.4	3.8
3	Snowden	1.5	1.8	3.6
4	COOR13270-2	2.7	4.0	5.0
5	NYOR14Q9-5	1.5	1.4	3.0
6	NYOR14Q9-9	2.8	3.4	4.0
7	A13125-3C	1.2	2.0	3.4
8	AOR12197-4	1.8	-	-
Average		2.0	2.6	3.7
Date test performed:				
Prior to storage		Aug. 23		
48°F		Oct. 30		
44°F		Oct. 30		

*Chips were stored for 68 days at 44°F and 48°F

Tubers	WA Tri-State Chip Trial Comments
Atlantic	
	Tubers = Round tubers. Fair skin set; moderately deep eyes. Initial Chips: Acceptable 48°F = Acceptable 44°F = Unacceptable
Lamoka	
	Tubers = Round tubers. Fair skin set; shallow eyes. Initial Chips: Light 48°F = Light 44°F = Unacceptable
Snowden	
	Tubers = Oblong tubers. Fair skin set; deep eyes. Initial Chips: Light 48°F = Light 44°F = Light
AOR12197-4	
	Tubers = Round tubers. Fair skin set; shallow eyes. Initial Chips: Light
COOR13270-2	
	Tubers = Round tubers. Fair skin set; shallow eyes. Initial Chips: Acceptable 48°F = Unacceptable 44°F = Unacceptable

Initial Chips	48° F Storage	44° F Storage
Atlantic		
		
Lamoka		
		
Snowden		
		
AOR12197-4		
	NA	NA
COOR13270-2		
		

Tubers	WA Tri-State Chip Trial Comments
NYOR14Q9-5	
	Tubers = Round tubers. Fair skin set; moderate eye depth. Initial Chips: Light 48°F = Light 44°F = Acceptable
NYOR14Q9-9	
	Tubers = Round tubers. Good skin set; shallow eyes. Initial Chips: Acceptable 48°F = Acceptable 44°F = Unacceptable
A13125-3C	
	Tubers = Round tubers. Good skin set; moderate eye depth. Initial Chips: Light 48°F = Light 44°F = Acceptable

Initial Chips	48° F Storage	44° F Storage
NYOR14Q9-5		
		
NYOR14Q9-9		
		
A13125-3C		
		

Index of Clones and Cultivars

Early Harvest Tri-State Trial22-27

A09136-9LB
A10071-1
A11381-3
A12169-5
A12304-1sto
A13036-12

A13072-7
A13091-5
AFA6346-2
AOR13064-2
Clearwater Russet
COA13241-3

COA14185-3
Ranger Russet
Russet Burbank
Russet Norkotah
Shepody

Late Harvest Tri-State Trial28-57

A09136-9LB
A10071-1
A11175-12TE
A11326-1
A11381-3
A12169-5
A12304-1sto

A13036-12
A13072-7
A13091-5
AFA6346-2
AOR13064-2
Clearwater Russet
COA13241-3

COA14185-3
Ranger Russet
Russet Burbank
Russet Norkotah

Early Harvest Regional Trial58-63

A09086-1LB
A10594-4sto
A12305-2adg
AC12090-3RU
AFA5661-8
AOR08540-1

AOR10204-3
AOR11217-3
Clearwater Russet
CO10085-1RU
CO11009-3RU
CO13003-1RU

Ranger Russet
Russet Burbank
Russet Norkotah
Shepody

Late Harvest Regional Trial64-93

A09086-1LB
A10594-4sto
A12305-2adg
AC12090-3RU
AFA5661-8

AOR08540-1
AOR10204-3
AOR11217-3
Clearwater Russet
CO10085-1RU

CO11009-3RU
CO13003-1RU
Ranger Russet
Russet Burbank
Russet Norkotah

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A08120-4Y
A08122-12Rsto
A08122-9RY
A11573-5RYsto
A11576-1Ysto
A11582-1R

A11596-6R
A11661-2Y
Austrian Crescent
Bintje
Chieftain
Modoc

NDA8512C-1R
OR11157-1
POR16PG25-2
POR16PG34-1
Purple Majesty
Yukon Gold

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A13125-3C
AOR12197-4
Atlantic
COOR13270-2

Lamoka
NYOR14Q9-5
NYOR14Q9-9
Snowden