

# 2023 Potato Cultivar Yield and Postharvest Quality Evaluations



WSU Potato Research Group



WASHINGTON STATE  
UNIVERSITY



# **2023 Potato Cultivar Yield and Postharvest Quality Evaluations**

## **Washington State University Potato Research Group**

PO Box 646414

Pullman, WA 99164-6414

<http://www.potatoes.wsu.edu/>

<http://www.pvmi.org>

### **Principal Investigators**

#### **Mark J. Pavek**

Field Trials and Information

[mjpavek@wsu.edu](mailto:mjpavek@wsu.edu)

Additional contact:

Zach Holden

[zholden@wsu.edu](mailto:zholden@wsu.edu)

#### **Jacob M. Blauer**

Postharvest Trials and Information

[jblauer@wsu.edu](mailto:jblauer@wsu.edu)

Additional contact:

Nora Fuller

[fullern@wsu.edu](mailto:fullern@wsu.edu)

### **Faculty and Staff**

Nora Fuller

Raul "Rudy" G. Garza Jr.

Zachary J. Holden

Vito Cantu

Scott Mattinson

Tymon James

### **Special Thanks**

John Steinbock; Mark Weber;

Mike Clouse; Martin Moore; Tim Waters,

Carrie Wohleb; Brian Clarke;

Washington State Potato Commission;

Growers and Industry;

Northwest Potato Consortium;

Jacob Meeuwsen; Alexa Hintze;

Morgan Southern; Connor Buckley;

Carlos Gonzalez; Sara Overfield;

Olufunke Ogundiya; Daphne Crum

On the cover: An overhead view of the  
2023 Field Day attendees.



# Table of Contents

Introduction .....	4
2023 Growing Season Temperatures .....	5
Guide to Clone Designations .....	6
Overall Cultivar and Clone Performance.....	7
Tri-State Specialty Yield Rankings (Washington) .....	9
Tri-State Tuber Comments (Washington) .....	10
Regional Tuber Comments (Washington) .....	11
Fresh Market Merit Scores (Washington).....	12
Process Market Merit Scores (Washington).....	14
Fresh Market Value - Methods.....	16
Process Value - Methods .....	17
Postharvest Procedures .....	18
Early Harvest Tri-State Trial (ETS)	
Trial Overview .....	22
Field Results .....	23
Economic Evaluations .....	26
Color Photographs .....	27
Late Harvest Tri-State Trial (LTS)	
Trial Overview .....	28
Field Results .....	32
Economic Evaluations .....	33
Color Photographs .....	36
Postharvest Results.....	42





## Early Harvest Regional Trial (ERT)

Trial Overview .....	56
Field Results .....	57
Color Photographs .....	60
Economic Evaluations .....	61

## Late Harvest Regional Trial (LRT)

Trial Overview .....	62
Field Results .....	66
Economic Evaluations .....	67
Color Photographs .....	70
Postharvest Results .....	76

## Tri-State Specialty Trial

Trial Overview .....	92
Field Results .....	96
Postharvest Results .....	100
Color Photographs .....	104

## Tri-State Chip Trial

Field Results .....	110
Postharvest Results .....	112
Color Photographs .....	114

## Index of Clones and

Cultivars .....	118
-----------------	-----





## INTRODUCTION

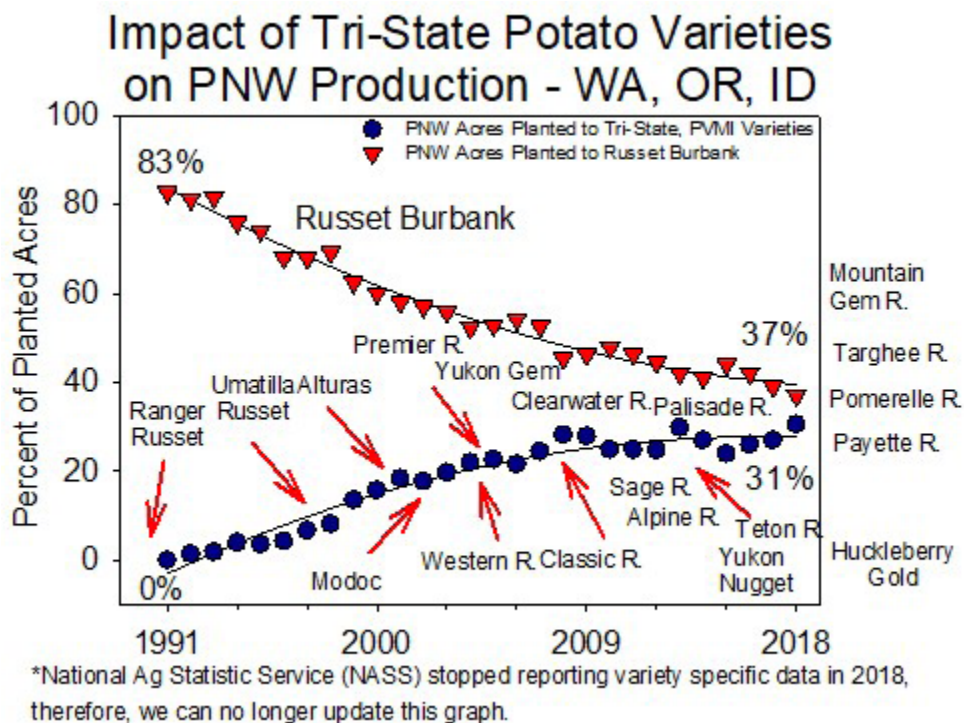
The 2023 Washington “Potato Cultivar Yield and Postharvest Quality Evaluations” is an annual report providing detailed information about promising new potato clones and cultivars grown in Washington conducted by the **Washington State University (WSU) Potato Research Group**. **Our mission:**

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.

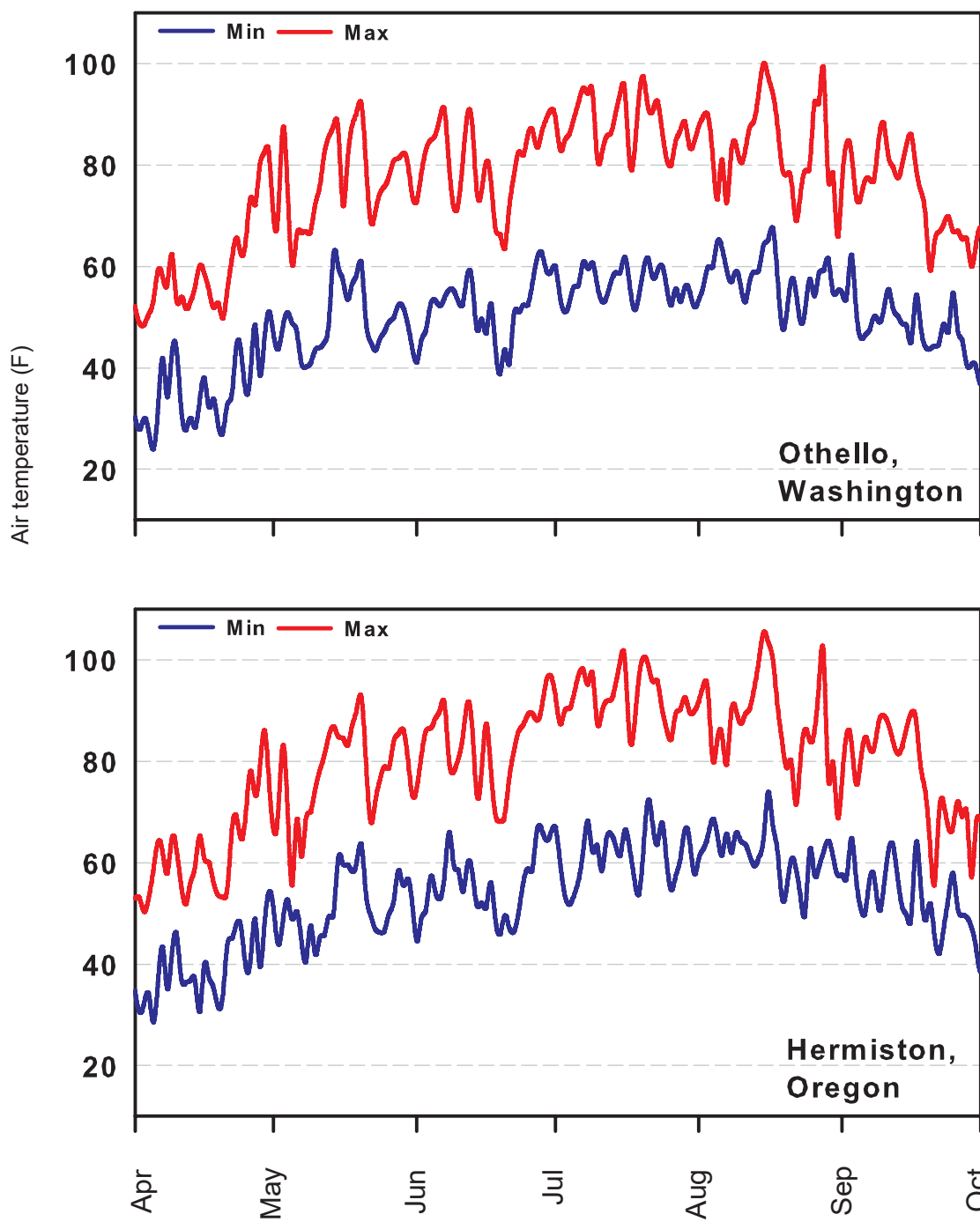
**Potato Variety Management Institute (PVMI)** is a nonprofit organization that licenses and promotes Tri-State varieties. PVMI collects royalties from the varieties which are then distributed among the Tri-State research programs to support the ongoing development efforts. Learn more at [www.pvmi.org](http://www.pvmi.org).

**Recent Accomplishments:** The **Northwest Potato Variety Development Program 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).





## 2023 Growing Season Temperatures





# Guide to Clone Designations

Example: ATX91137-1Ru

ATX91137-1Ru	Breeding Program ( <b>A</b> berdeen, ID)
ATX91137-1Ru	Selection Site ( <b>T</b> exas)
ATX <b>9</b> 1137-1Ru	Year of Cross ( <b>1991</b> )
ATX911 <b>37</b> -1Ru	Cross Number ( <b>137</b> )
ATX91137- <b>1</b> Ru	Tuber Selection ( <b>1</b> )
ATX91137-1 <b>Ru</b>	Russet ( <b>Ru</b> )

## Location Codes

Designation		Breeding Program	Selection Program	Other
A	=	Aberdeen, Idaho	Aberdeen, Idaho	
AO	=	Aberdeen, Idaho	Oregon	
AOA	=	Aberdeen, Idaho	Oregon	Aberdeen, Idaho
ATX	=	Aberdeen, Idaho	Texas	
BTX	=	Beltsville, Maryland	Texas	
CO	=	Colorado		
MWTX	=	Madison Wisconsin	Texas	
NDA	=	North Dakota	Aberdeen, Idaho	
NY	=	New York		
PA	=	Prosser, WA	Aberdeen, Idaho	
POR	=	Prosser, WA	Oregon	
TC	=	Texas	Colorado	
TXA	=	Texas	Aberdeen, Idaho	
TXNS	=	Texas		Norkotah Strain
OR	=	Hermiston, Oregon	Oregon	

## Miscellaneous Designations

A93157-6 <b>LS</b>	<b>LS</b>	=	Low <b>S</b> ugar
CO94165-3 <b>P/P</b>	<b>P/P</b>	=	Purple skin & Purple flesh
A96741-2 <b>R</b>	<b>R</b>	=	Red skin
CO94183-1 <b>R/R</b>	<b>R/R</b>	=	Red skin / Red flesh
VC0967-2 <b>R/Y</b>	<b>R/Y</b>	=	Red skin / Yellow flesh
ATX92230-1 <b>Ru</b>	<b>Ru</b>	=	Russet skin
VC1009-1 <b>W/Y</b>	<b>W/Y</b>	=	White skin & Yellow flesh
A97066-42 <b>LB</b>	<b>LB</b>	=	Late <b>B</b> light resistance
AC9923 <b>PW/Y</b>	<b>PW/Y</b>	=	Purple skin with <b>W</b> hite eyes/ Yellow flesh
AC9653 <b>P/Y</b>	<b>P/Y</b>	=	Purple skin/Yellow flesh
CO977-2 <b>P/PW</b>	<b>P/PW</b>	=	Purple skin/Purple & <b>W</b> hite flesh
A99029-3 <b>E</b>	<b>E</b>	=	Early maturing
A0008-1 <b>TE</b>	<b>TE</b>	=	<b>TE</b> tonia, ID Selection, Early maturing
A07008-4 <b>T</b>	<b>T</b>	=	<b>T</b> etonia, ID Selection, Late maturing
A06914-3 <b>CR</b>	<b>CR</b>	=	<b>C</b> orky <b>R</b> ingspot resistance
A06862-18 <b>VR</b>	<b>VR</b>	=	<b>V</b> irus <b>R</b> 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.



**Planting, stand counts, Field Day, in-season digs, final harvests and sorting are just the beginning to the post-harvest season.**





# 2023 Tri-State Specialty Potato Clones - Washington State University

2023 Tri-State Specialty Trial					
US#1	US #1 Yield		Fresh Market Appearance	(See also Tri-State Specialty Section near end of book)	Comments
	2023				
	Yield	0-6 oz 6-10oz			
	CWT/A	-----%-----			
<b>Red Skin/White Flesh*</b>					
Chieftain	738	38	40	3.0	Larger red, deep eyes.
Modoc	611	58	30	3.3	Nice oblong red, some pear shapes.
COOR15108-1	480	89	11	4.0	Nice deep red, skin set not so good. Shallow eyes.
POR17PG64-2	784	59	33	2.3	Deep red, some irregular shapes, bronzing, scab.
A08122-9RY	671	83	16	3.0	Light red, russetting, small, shape a bit irregular.
A11582-1R	610	81	19	3.8	Deep red, nice skin. A lot of small ones.
<b>Yellow Flesh</b>					
Yukon Gold	600	25	25	2.0	Larger, shape a bit irregular. Russetting.
Bintje	524	58	30	1.0	Garbage, looks like Shepody. Irregular shapes, scab.
A11576-1Ysto	816	82	17	3.3	Like a smaller Yukon Gold, pink eyes. Nice yellow.
POR18PG37-4	484	94	6	2.0	Smaller, yellow, with some skin finish issues.
A11573-5RYsto	615	91	9	3.8	Nice deep red, round, smaller. Deep eyes.
POR16PG34-1	474	93	7	1.7	Cracks, malformed. Discard.
<b>Purple/Purple Flesh</b>					
Purple Majesty	672	77	19	2.0	Irregular shapes, big size range, russetting.
POR18PG54-1	595	13	31	1.0	Very large, deep eyes, bronzing. Ugly.
POR16PG25-2	610	78	18	3.0	Oblong purple, typical for a purple, 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 - 2023 Tri-State Trials			
Fresh Market Appearance 1-5 (5 = Best)			
Clone	2023	2022	Tuber Appearance Comments*
<b>Early Harvest Tri-State</b>			
Ranger Russet	3.0	2.0	Long, dark russet, some curves.
Russet Burbank	2.3	1.0	Long, medium russet. Non uniform shapes.
A10020-3sto	3.7	-	Looks like Russet Norkotah with a larger size range.
A10071-1	2.7	2.0	Good length, a bit pointy, lenticils.
A12327-5VR	3.0	-	Short, round, heavy russet skin. Too round!
A13036-1	3.0	-	Uniform shape and size, typy, spotty skin.
A13072-7	3.0	2.0	Deep eyes, bumpy, larger, ok length. Bad greening.
A13091-5	4.0	2.0	Plump, deeper eyes. Typy, ok length, good skin.
AOR10071-8	2.7	-	Shape a bit irregular, range of sizes, typy, plump. Spotty skin.
AOR15166-2	3.0	-	Typy, a bit small. Good length, even in the small ones.
AOR15227-2	3.0	-	Typy, but flat. Nice uniform size and shape.
AOR15421-4	2.0	-	Plump, shape is irregular, some short, some long, flat.
COA15494-8	2.7	-	Some points, pears, river rocks.
Russet Norkotah	4.0	2.3	Uniform size and shape, many typy.
Shepody	1.0	1.0	Irregular shapes, light skin, pointy, ugly.
A10635-2chc	3.3	-	Small, typy, not early.
A11381-3	2.7	2.0	Medium russet, many round, short.
A12308-3adg	2.0	-	Light russet, feathery skin, spotty russetting, small.
A13072-5	2.0	-	Good length, typy, spotty skin, feathery skin. Lenticils.
A14026-16adg	3.0	-	Uniform shape, short, spotty skin.
<b>Late Harvest Tri-State</b>			
Clearwater Russet	3.8	3.0	Small to medium, a bit flat, typy, nice russetting.
Ranger Russet	2.0	2.8	Long, shape variable, medium russet.
Russet Burbank	2.0	2.0	Long, shape a bit lumpy, medium russet. Many #2's.
A10020-3sto	3.0	-	Motly typy, but variable, nice russet skin. Eye bulge.
A10071-1	2.3	2.0	Dark russet skin, pears, scabby, lenticils, typy.
A12304-1sto	3.5	3.5	Feathery skin, typy, nice length. Skin may be issue.
A12327-5VR	2.8	-	Round, dark russet, chipper in the Columbia Basin?
A13036-1	2.8	-	Mostly typy, lots of US #2's, medium russet.
A13072-7	2.5	2.0	Lumpy, variable shapes, some pears.
A13091-5	3.0	2.5	Nice shape, ok length. Eyes a bit deep, lenticils.
AOR10071-8	2.0	-	Round, scab, consider making this a chipper.
AOR15166-2	3.0	-	Nice russet skin, typy, a bit flat.
AOR15227-2	2.3	-	Plump, mostly typy. Ugly skin, lenticils.
AOR15421-4	3.0	-	Large, plump, a bit lumpy. Medium russet. Greening.
COA15494-8	2.0	-	Flat, oval river rocks, some pears and points.
Norkotah C-3	2.0	-	Large, deep eyes, very heavy russet. Some scab issues.
A10635-2chc	2.8	-	Small, flat, typy, some curves, nice russet skin.
A11381-3	2.0	2.8	Half of tubers are round, ugly, feathery skin. Discard.
A12308-3adg	2.5	-	Ugly skin, plump uniform shape and size.
A13072-5	2.0	-	Feathery light russet, spotty, ugly. Process only.
A14026-16adg	2.0	-	Small, light russet, some points. Discard.

\*Typy - Visually appealing, uniform tuber shape.



# At-Harvest Grading Comments & Fresh Market Appearance

Advanced Lines - 2023 Regional Trials				
Fresh Market Appearance 1-5 (5 = Best)				
Clone	2023	2022	2021	Tuber Appearance Comments*
<b>Early Harvest Regional</b>				
Ranger Russet	2.0	3.0	2.0	Long, mostly ttypy. Many irregular shapes.
Russet Burbank	2.0	2.0	1.0	Non uniform shapes, some ttypy, medium russet.
A09086-1LB	1.7	2.0	1.7	Small, not early. Ok length, non uniform shape.
A10594-4sto	1.3	3.0	3.3	Irregular shapes. Good length, feathery skin.
A12169-5	2.0	1.3	-	Lumpy, many short, spotty russet. Ugly skin.
A12305-2adg	3.0	3.0	3.0	Smaller, short, mostly ttypy.
A13036-12	2.3	1.3	-	Plump, lumpy, deep eyes. Lenticils.
AC12090-3RU	2.0	2.7	-	Long, some lumpy, red/pink russet skin. Good length.
AFA5661-8	2.0	3.0	3.0	Short, plump, ttypy, poor skin.
AOR11217-3	3.3	4.0	4.0	Some irregular shapes, long. Ttypy.
AOR13064-2	3.0	3.0	3.3	Larger, long, mostly ttypy.
CO13003-1RU	4.0	3.7	-	Too small, not early.
COTX08063-2Ru	2.0	-	-	Good length, shape mostly uniform. Feathery skin.
Russet Norkotah	3.3	3.0	4.0	Ttypy, long, deep eyes. Skin is a bit spotty.
Shepody	1.0	2.0	1.0	Long, skinny, with irregular shapes. Ugly.
COTX10080-2Ru	3.0	-	-	Smaller, ttypy, a lot of rot. Discard.
<b>Late Harvest Regional</b>				
Clearwater Russet	4.0	3.3	4.0	Ttypy, flat, nice skin, smaller, medium russet.
Ranger Russet	2.0	2.8	1.0	Good length, a bit flat, deep eyes, a bit mishapen.
Russet Burbank	1.8	2.3	1.0	Some ttypy, lots of irregular shapes.
A09086-1LB	2.0	2.3	2.5	Variable shapes and bad skin.
A10594-4sto	1.8	2.3	3.0	Larger, shape irregular, feathery skin, spotty skin.
A12169-5	1.3	1.5	-	Shape highly irregular, large, deep eyes, discard.
A12305-2adg	2.0	2.3	1.8	Good length, shape a bit irregular, bad skin set.
A13036-12	2.0	2.0	-	Deep eyes, lumpy and bumpy, variable shapes.
AC12090-3RU	2.5	3.5	-	Ttypy, ok russetting, lenticils, greening issue.
AFA5661-8	2.0	2.3	1.5	Purple/pink pigmented eyes, somewhat ttypy, bad skin.
AOR11217-3	2.5	3.3	3.0	Shape a bit irregular, longer, spotty skin, ok length.
AOR13064-2	2.0	2.3	2.3	Variable shapes, points and pears, scab.
CO13003-1RU	3.3	3.3	-	Flat, ttypy, smaller. Medium russet, skin cracks.
COTX08063-2Ru	2.0	-	-	Light russet, spotty skin, some pear shapes.
Norkotah C-3	3.0	-	-	Larger, ttypy, deep eyes, dark russet.
COTX10080-2Ru	2.5	-	-	Shape a bit irregular, some points and pears, bad scab.

\*Ttypy - Visually appealing, uniform tuber shape

AOR11217-3



EARLY

AOR13064-2



EARLY

Clearwater Russet



LATE

AOR11217-3



LATE



## **FRESH MARKET MERIT - NEWEST LINES**

### **2021-2023**

(5 = best) - Entries ranked by means

<b>EARLY HARVEST - Fresh Market Merit Scores</b>				
<b>Entry</b>	<b>Mean</b>	<b>2023</b>	<b>2022</b>	<b>2021</b>
1 AOR15227-2	3.8	3.8	-	-
2 A14026-16adg	3.5	3.5	-	-
3 Russet Norkotah	3.3	3.4	2.1	4.3
4 A12327-5VR	2.9	2.9	-	-
5 A13072-7	2.6	2.6	-	-
6 AOR15166-2	2.6	2.6	-	-
7 Ranger Russet	2.7	2.6	1.9	3.5
8 A10020-3sto	2.2	2.2	-	-
9 A10635-2chc	2.1	2.1	-	-
10 A13091-5	2.0	2.9	1.2	-
11 A13072-5	1.9	2.1	1.8	-
12 COA15494-8	1.8	1.8	-	-
13 A10071-1	1.8	1.4	2.1	-
14 AOR15421-4	1.8	1.8	-	-
15 AOR10071-8	1.6	1.6	-	-
16 A11381-3	1.6	1.4	1.8	-
17 A13036-1	1.4	1.4	-	-
18 Russet Burbank	1.3	0.9	2.0	1.0
19 A12308-3adg	0.6	0.6	-	-

<b>LATE HARVEST - Fresh Market Merit Scores</b>				
<b>Entry</b>	<b>Mean</b>	<b>2023</b>	<b>2022</b>	<b>2021</b>
1 A12304-1sto	3.4	3.1	3.7	-
2 AOR15166-2	3.3	3.3	-	-
3 A10020-3sto	2.8	2.9	2.1	3.5
4 Clearwater Russet	2.5	2.6	2.4	2.5
5 A12308-3adg	2.3	2.3	-	-
6 A10071-1	1.9	1.8	2.1	-
7 A11381-3	1.9	0.9	2.9	-
8 A12327-5VR	1.9	1.9	-	-
9 AOR15227-2	1.9	1.9	-	-
10 Ranger Russet	1.5	1.4	2.0	1.2
11 Norkotah C-3	1.4	1.4	-	-
12 A13036-1	1.4	0.6	2.2	-
13 AOR10071-8	1.1	1.1	-	-
14 AOR15421-4	1.0	1.0	-	-
15 COA15494-8	1.0	1.0	-	-
16 Russet Burbank	1.0	0.9	1.4	0.6
17 A10635-2chc	0.9	0.9	-	-
18 A13072-5	0.9	0.9	-	-
19 A13091-5	0.8	0.9	0.7	-
20 A13072-7	0.7	0.3	1.2	-
21 A14026-16adg	0.7	0.7	-	-

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

## **FRESH MARKET MERIT - ADVANCED LINES** **2019-2023**

(5 = best) - Entries ranked by means

<b>EARLY HARVEST - Fresh Market Merit Scores</b>						
Entry	Mean	2023	2022	2021	2020	2019
1 AOR11217-3	3.4	3.1	3.0	4.1	4.3	2.7
2 AOR13064-2	3.0	3.7	2.0	3.4	-	-
3 A12305-2adg	3.0	3.5	2.4	3.0	3.0	-
4 Russet Norkotah	2.9	2.6	3.2	3.4	1.8	3.4
5 AFA5661-8	2.5	2.2	3.2	3.8	0.9	-
6 A10594-4sto	2.3	1.6	2.7	3.7	1.3	-
7 CO13003-1RU	2.1	2.1	2.1	-	-	-
8 A12169-5	2.0	2.0	2.0	-	-	-
9 Ranger Russet	1.8	2.1	2.5	1.4	1.4	1.7
10 A13036-12	1.8	2.3	1.4	-	-	-
11 AC12090-3RU	1.5	1.6	1.4	-	-	-
12 A09086-1LB	1.4	1.8	1.1	1.3	-	-
13 COTX08063-2Ru	1.4	1.4	-	-	-	-
14 Russet Burbank	1.2	1.4	1.0	0.7	1.3	1.6

<b>LATE HARVEST - Fresh Market Merit Scores</b>						
Entry	Mean	2023	2022	2021	2020	2019
1 AOR11217-3	2.8	1.6	2.6	2.8	3.1	3.9
2 Norkotah C-3	2.7	3.5	2.5	3.1	1.8	2.6
3 Clearwater Russet	2.3	2.3	2.3	2.5	2.1	-
4 A12305-2adg	2.2	2.3	2.4	2.1	2.3	-
5 AOR13064-2	2.2	1.2	2.0	3.4	-	-
6 A10594-4sto	2.2	1.6	2.0	2.7	2.3	-
7 A09086-1LB	2.0	2.1	1.7	2.3	-	-
8 AFA5661-8	1.7	2.0	1.6	1.6	1.5	-
9 AC12090-3RU	1.6	1.1	2.2	-	-	-
10 CO13003-1RU	1.6	2.1	1.2	-	-	-
1 A12169-5	1.5	0.9	2.1	-	-	-
12 COTX10080-2Ru	1.4	1.6	0.9	1.6	-	-
13 Ranger Russet	1.3	1.3	2.2	0.6	1.1	1.4
14 A13036-12	1.2	1.1	1.4	-	-	-
15 Russet Burbank	1.1	0.8	1.6	0.6	1.3	1.3
16 COTX08063-2Ru	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.



# PROCESS MARKET MERIT - NEWEST LINES

## 2021-2023

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

EARLY HARVEST - Process Market Merit Scores					
Field Performance		Field Performance Only*			
Entry	Mean	2023	2022	2021	
1 AOR15227-2	4.3	4.3	-	-	
2 AOR15166-2	3.9	3.9	-	-	
3 A14026-16adg	3.6	3.6	-	-	
4 A13072-5	3.6	3.6	-	-	
5 Ranger Russet	3.3	2.8	3.2	4.0	
6 A13072-7	3.1	3.2	3.0	-	
7 A12327-5VR	3.1	3.1	-	-	
8 A10071-1	2.9	2.4	3.3	-	
9 A13091-5	2.9	3.3	2.4	-	
10 A10020-3sto	2.7	2.7	-	-	
11 Russet Norkotah	2.7	2.7	-	-	
12 AOR15421-4	2.6	2.6	-	-	
13 A13036-1	2.5	2.5	-	-	
14 AOR10071-8	2.5	2.5	-	-	
15 A10635-2chc	2.2	2.2	-	-	
16 COA15494-8	2.0	2.0	-	-	
17 Russet Burbank	1.9	1.2	3.4	1.2	
18 Shepody	1.8	1.4	2.7	1.5	
19 A11381-3	1.6	1.6	-	-	
20 A12308-3adg	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.

LATE HARVEST - Process Market Merit Scores									
Field & Postharvest Processing Performance									
All Years									
Entry	Post		2023		2022		2021		
	Field Mean	Harvest Mean	Field	Post Harv	Field	Post Harv	Field	Post Harv	
1 AOR15227-2	4.7	3.7	4.7	3.7	-	-	-	-	
2 AOR15166-2	4.6	4.3	4.6	4.3	-	-	-	-	
3 A12304-1sto	4.5	3.1	3.6	2.4	4.9	3.5	4.9	3.5	
4 A10635-2chc	3.7	*	3.7	*	-	*	-	*	
5 A12308-3adg	3.7	*	3.7	*	-	*	-	*	
6 Clearwater Russet	3.6	3.3	4.1	3.4	3.4	3.9	3.4	2.5	
7 Ranger Russet	3.6	3.2	3.7	3.4	3.8	3.5	3.4	2.6	
8 A13072-7	3.5	3.3	1.8	3.2	4.4	3.4	4.4	3.4	
9 A13072-5	3.3	*	3.3	*	-	*	-	*	
10 A10071-1	3.2	3.0	3.0	2.4	3.3	3.3	3.3	3.3	
11 AOR15421-4	3.0	1.7	3.0	1.7	-	-	-	-	
12 A14026-16adg	2.8	*	2.8	*	-	*	-	*	
13 A10020-3sto	2.6	3.0	2.6	3.0	-	-	-	-	
14 A11381-3	2.4	3.4	0.8	*	3.2	3.4	3.2	3.4	
15 A13036-1	2.3	2.7	2.3	2.7	-	-	-	-	
16 A13091-5	2.0	3.9	1.2	3.9	2.4	3.9	2.4	3.9	
17 Russet Burbank	1.9	1.9	1.7	2.4	2.4	2.1	1.7	1.3	
18 AOR10071-8	1.2	3.9	1.2	3.9	-	-	-	-	
19 A12327-5VR	1.0	2.9	1.0	2.9	-	-	-	-	
20 COA15494-8	1.0	3.0	1.0	3.0	-	-	-	-	

The asterisk ("\*") indicates post-harvest data for 2023 not available for clone. The dash (" - ") indicates the clone was not yet entered into the trial. For more information on these cultivars, see the Early and Late Harvest Tri-State Trial sections in this book.

## PROCESS MARKET MERIT - ADVANCED LINES 2019-2023

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

EARLY HARVEST - Process Market Merit Scores						
Field Performance		Field Performance Only*				
Entry	Mean	2023	2022	2021	2020	2019
1 AOR11217-3	4.4	4.1	3.5	4.7	4.8	4.9
2 A12305-2adg	4.0	4.1	3.1	4.5	4.4	-
3 A09086-1LB	3.6	4.6	3.2	3.0	-	-
4 AOR13064-2	3.6	4.4	2.1	4.2	-	-
5 Ranger Russet	3.1	3.9	3.0	2.4	2.7	3.4
6 A12169-5	3.0	2.8	3.2	-	-	-
7 A10594-4sto	2.6	2.7	1.3	3.9	2.4	-
8 Shepody	2.4	0.8	3.0	1.4	3.2	3.9
9 AFA5661-8	2.3	2.0	2.8	2.8	1.5	-
10 Russet Burbank	2.2	1.8	1.8	1.2	2.7	3.3
11 COTX08063-2Ru	2.0	2.0	-	-	-	-
12 A13036-12	1.7	1.9	1.6	-	-	-
13 AC12090-3RU	1.4	1.3	1.6	-	-	-
14 CO13003-1RU	0.5	0.5	-	-	-	-

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 2019-2023

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

LATE HARVEST - Process Market Merit Scores												
Field & Postharvest Processing Performance												
All Years												
		Post	2023		2022		2021		2020		2019	
Entry	Field Mean	Harvest Mean	Field	Post Harv	Field	Post Harv	Field	Post Harv	Field	Post Harv	Field	Post Harv
1 A09086-1LB	4.1	2.5	3.4	2.7	4.3	2.8	4.7	2.1	-	-	-	-
2 AOR11217-3	4.0	3.5	4.0	3.6	3.3	4.0	3.6	2.8	4.5	3.4	4.5	3.9
3 A12305-2adg	3.8	2.2	4.0	1.8	3.8	3.1	3.3	1.4	4.2	2.4	-	-
4 AFA5661-8	3.8	2.9	2.4	3.3	4.9	3.2	3.8	2.3	4.1	2.7	-	-
5 Clearwater Russet	3.7	3.1	2.7	3.0	4.0	3.9	4.2	3.0	3.8	2.5	-	-
6 A13036-12	3.2	3.7	2.4	3.3	3.9	4.1	-	-	-	-	-	-
7 Ranger Russet	3.1	3.0	2.4	3.2	4.4	3.6	2.8	2.4	2.7	2.8	3.2	3.2
8 A10594-4sto	3.0	3.5	3.1	3.6	3.0	3.8	3.5	3.4	2.3	3.3	-	-
9 AOR13064-2	2.8	4.2	1.7	3.9	3.1	4.7	3.8	4.0	-	-	-	-
10 A12169-5	2.7	3.6	1.5	3.2	3.9	3.9	-	-	-	-	-	-
11 Russet Burbank	1.5	1.7	0.9	1.9	1.0	2.2	1.1	1.4	2.2	1.3	2.5	1.5
12 CO13003-1RU	1.5	1.5	1.2	0.9	1.9	2.1	-	-	-	-	-	-
13 AC12090-3RU	1.3	2.6	0.6	2.4	1.9	2.8	-	-	-	-	-	-
14 COTX08063-2Ru	1.1	2.9	1.1	2.9	-	-	-	-	-	-	-	-

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



# 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 <sup>a</sup>	Range of Tuber Sizes for Each Package Type and USDA Grade		Four Year WA State Columbia Basin Average Prices <sup>c</sup>	Pack-Shed Fee: Packaging and Handling	Adjusted Value
	U.S. No. 1 <sup>b</sup>	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

<sup>a</sup>Count = tuber number per 50 lb carton.

<sup>b</sup>18 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.

<sup>c</sup>Sales 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.



# 2023 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, 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  $\geq 3$ -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 ( $\geq 3$ 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
<b>Postharvest rating =</b>	<b>38</b>

\*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

**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.



# 2023 Early Harvest Tri-State Trial

Location: WSU Research Center – Othello, WA

Planting Date: April 6

Vine Kill Date: July 21

Harvest Date: August 9

Days Grown: 106

The Tri-State trial is conducted annually in Washington, Idaho, and Oregon. The Tri-State committee designates which clones are entered in the trial. Selected cultivars and clones in the early trial are grown and managed for an early harvest (July/Aug). The 2023 trial compared 4 local reference varieties to 16 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 book

**Fresh Market Standout(s): AOR15227-2**

**Process Market Standout(s): AOR15227-2**

## Yield and Economic Data

### ➤ Total Yield and U.S. #1 Yield

*Highest:* A12327-5VR had the highest total yield (765 CWT/A) and the highest U.S. #1 yield (689 CWT/A). A14026-16adg had the second highest total yield (741 CWT/A) and the second highest U.S. #1 yield (645 CWT/A).

*Lowest:* Shepody had the lowest total yield (538 CWT/A) and the lowest U.S. #1 yield (241 CWT/A). A13036-1 had the second lowest total yield (550 CWT/A)

### ➤ % U.S. #1's (greater than 4 oz)

*Highest:* A12327-5VR (90%) and AOR15227-2 (89%).

*Lowest:* Shepody (45%) and Russet Burbank (59%).

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

*Highest:* AOR15227-2 (24.4 Tons/A), A12327-5VR (24.1 Tons/A).

*Lowest:* A12308-3adg (5.8 Tons/A), Shepody (6.7 Tons/A).

### ➤ Gross Return (\$/acre)

*Fresh Market Highest:* A12327-5VR and AOR15227-2.

*Fresh Market Lowest:* Shepody, A12308-3adg, and A10635-2chc.

*Process Market Highest:* AOR15227-2, A12327-5VR, and A14026-16adg.

*Process Market Lowest:* Shepody, Russet Burbank, and A12308-3adg.

# 2023 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 and 2's	
				> 4 oz	> 4 oz	& < 4 oz	(US 1's 7-18 oz)		> 6 oz	
				% of Total Yield			% of Total Yield	Tons/A	% of Total Yield	Tons/A
Ranger Russet	597	DEF	29.8	73	14	13	52	15.5	72	21.9
Russet Burbank	625	DEF	31.2	59	14	27	34	10.8	56	17.8
A10020-3sto	623	DEF	31.1	78	5	17	38	11.9	55	17.3
A10071-1	606	DEF	30.3	86	2	12	55	16.8	70	21.1
A12327-5VR	765	A	38.2	90	0	10	63	24.1	74	28.3
A13036-1	550	EF	27.5	78	7	16	45	12.3	64	17.7
A13072-7	734	AB	36.7	74	18	8	54	19.7	86	31.5
A13091-5	584	DEF	29.2	87	4	9	58	16.8	73	21.4
AOR10071-8	606	DEF	30.3	86	0	13	50	15.1	68	20.4
AOR15166-2	559	EF	28.0	87	2	11	54	15.1	68	19.1
AOR15227-2	675	ABCD	33.7	89	3	8	72	24.4	83	28.1
AOR15421-4	632	CDEF	31.6	82	10	8	52	16.5	89	28.0
COA15494-8	728	ABC	36.4	79	4	18	47	17.2	62	22.4
Russet Norkotah	619	DEF	30.9	78	6	16	52	16.2	69	21.3
Shepody	538	F	26.9	45	19	35	25	6.7	48	13.0
A10635-2chc	683	ABCD	34.2	67	0	32	28	9.5	39	13.7
A11381-3	592	DEF	29.6	78	0	21	45	13.3	59	17.4
A12308-3adg	682	ABCD	34.1	65	2	33	17	5.8	34	11.8
A13072-5	647	BCDE	32.4	83	4	13	58	18.7	71	23.0
A14026-16adg	741	AB	37.0	87	5	8	63	23.3	77	28.5

ENTRY	US # 1 YIELD						> 4 oz SPECIFIC GRAVITY	INTERNAL DEFECTS (%)		
	> 4 oz		> 4 oz	4-7 oz*	7-14 oz*	> 14 oz*		(8-12 oz tubers)		
	CWT/A	STATS**	Tons/A	%				% HH	% BC	% IBS
Ranger Russet	440	EFG	22.0	28	61	11	1.073	0	0	0
Russet Burbank	371	G	18.6	39	52	9	1.070	7	10	0
A10020-3sto	487	DEF	24.3	51	45	4	1.072	0	0	0
A10071-1	518	CDEF	25.9	34	60	6	1.066	0	0	0
A12327-5VR	689	A	34.5	30	61	9	1.069	0	0	0
A13036-1	430	FG	21.5	44	53	4	1.077	0	0	0
A13072-7	544	BCDE	27.2	9	40	51	1.068	0	0	0
A13091-5	507	CDEF	25.3	34	57	9	1.078	0	0	0
AOR10071-8	523	CDEF	26.2	35	51	14	1.073	0	0	0
AOR15166-2	489	DEF	24.4	40	57	3	1.080	0	0	0
AOR15227-2	598	ABC	29.9	17	65	18	1.079	0	0	0
AOR15421-4	519	CDEF	25.9	7	41	52	1.060	0	0	0
COA15494-8	572	BCD	28.6	39	56	5	1.067	0	0	0
Russet Norkotah	482	DEF	24.1	28	56	16	1.068	0	0	0
Shepody	241	H	12.1	43	52	5	1.066	0	0	0
A10635-2chc	464	EFG	23.2	60	39	1	1.075	0	0	0
A11381-3	465	EFG	23.2	42	54	4	1.071	0	0	0
A12308-3adg	445	EFG	22.3	73	25	2	1.075	0	0	0
A13072-5	534	CDEF	26.7	27	63	10	1.079	0	0	0
A14026-16adg	645	AB	32.3	28	66	6	1.072	0	0	0

ENTRY	40 DAY	50 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
Ranger Russet	96	100	1	1.9	6.5	9.0	4.0	4.0	0	5
Russet Burbank	69	98	3	1.8	6.4	9.6	3.0	3.0	0	13
A10020-3sto	29	98	0	2.2	5.8	10.6	4.0	4.0	0	27
A10071-1	84	91	0	2.2	6.5	9.2	5.0	3.3	0	47
A12327-5VR	91	98	0	2.8	6.6	11.3	4.7	2.0	0	57
A13036-1	62	93	1	2.0	6.0	8.9	3.0	3.0	3	70
A13072-7	76	87	3	2.0	10.2	7.0	3.3	3.0	0	70
A13091-5	84	98	1	1.6	6.8	8.4	3.3	3.0	0	50
AOR10071-8	76	91	1	2.1	6.3	9.4	4.0	2.7	0	13
AOR15166-2	78	96	1	1.6	6.3	8.7	4.0	3.0	0	3
AOR15227-2	73	93	2	1.4	8.1	8.2	3.0	3.0	0	7
AOR15421-4	53	80	1	1.7	10.6	5.9	2.7	3.0	0	7
COA15494-8	71	91	1	2.0	5.8	12.2	4.7	2.3	0	27
Russet Norkotah	96	96	1	2.1	6.3	9.6	4.0	3.3	0	17
Shepody	47	82	7	2.2	5.7	9.3	3.7	4.0	0	0
A10635-2chc	62	98	1	2.1	4.4	15.2	4.0	3.0	0	13
A11381-3	69	91	0	2.5	5.4	10.7	3.0	2.0	0	23
A12308-3adg	96	96	0	2.5	4.3	15.5	3.0	3.7	10	13
A13072-5	71	87	1	2.1	6.6	9.6	3.3	3.0	3	10
A14026-16adg	53	91	1	2.1	7.1	10.3	2.7	2.7	0	23

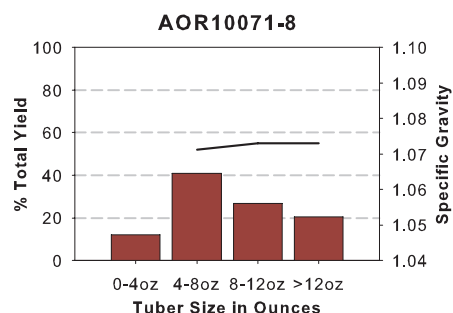
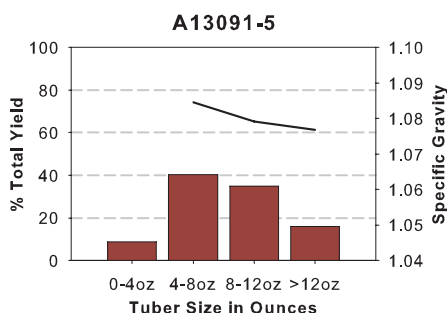
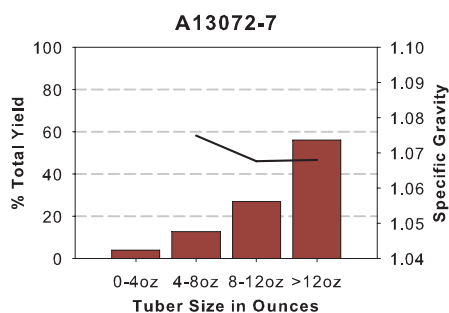
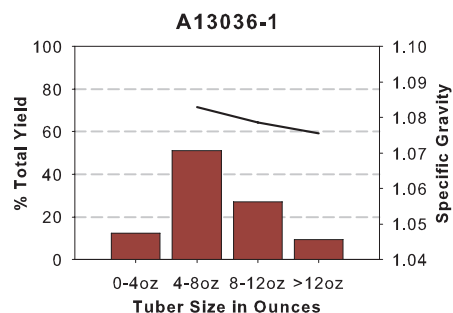
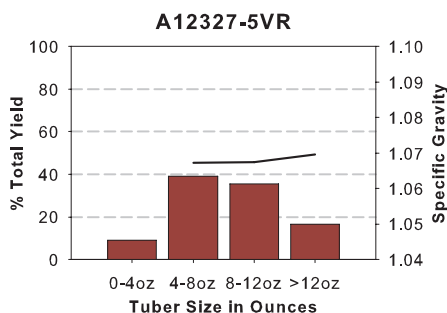
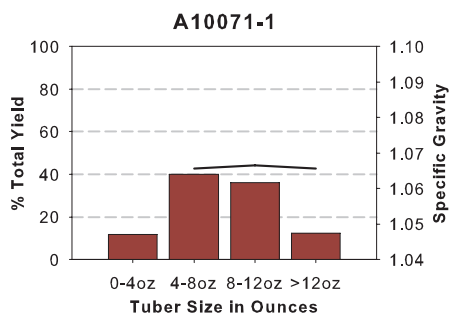
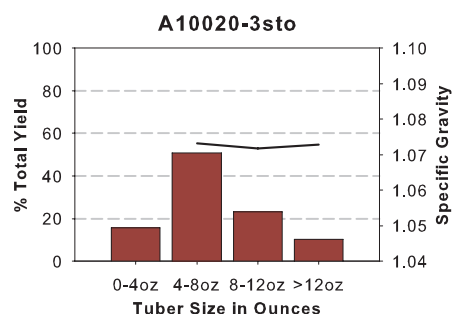
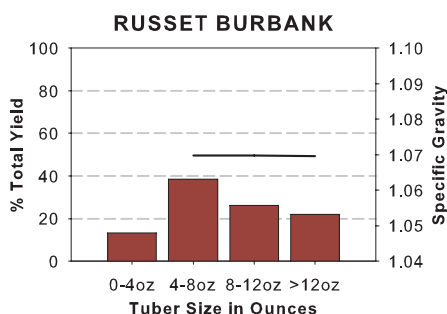
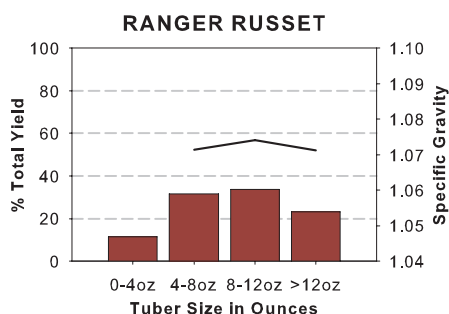
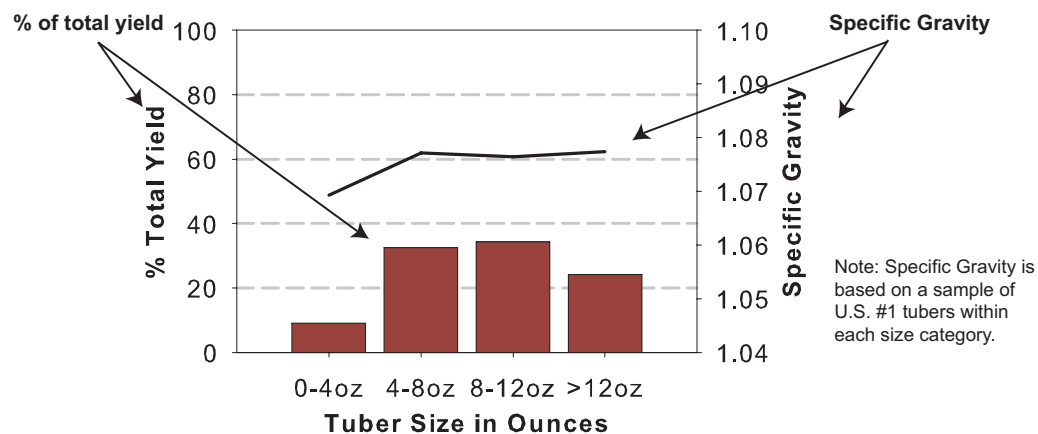
\* Percent values may not total 100% due to rounding

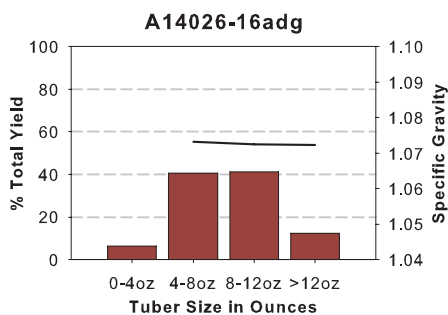
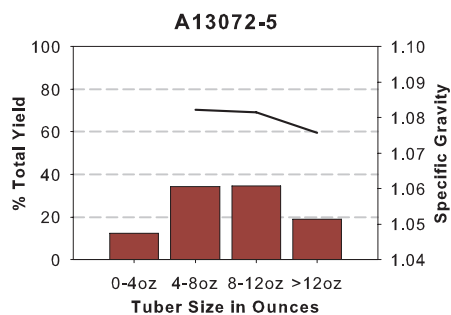
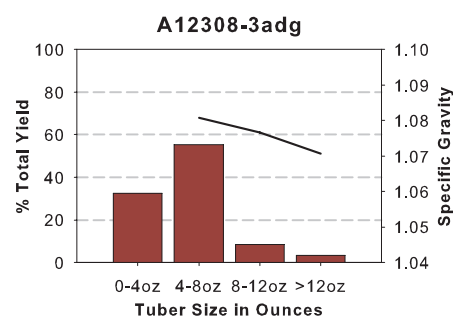
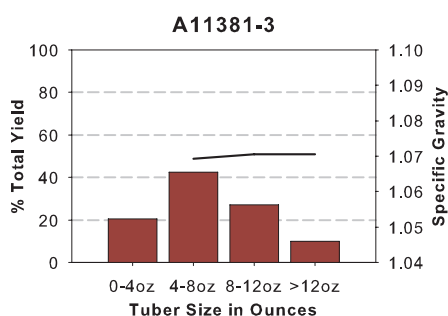
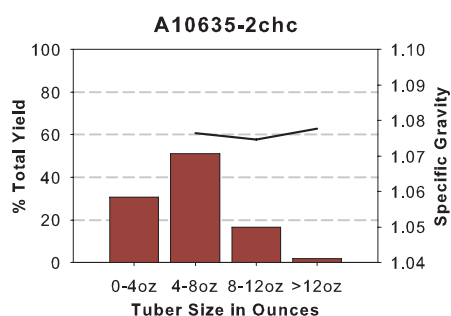
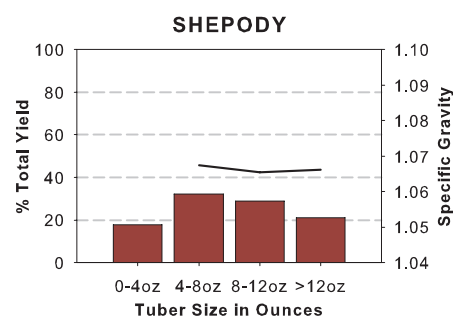
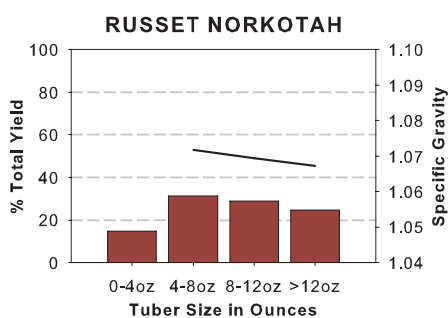
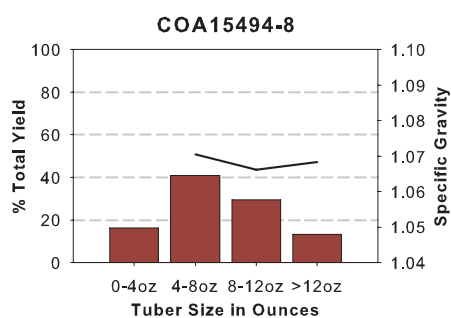
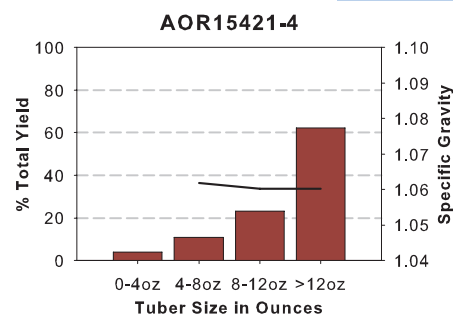
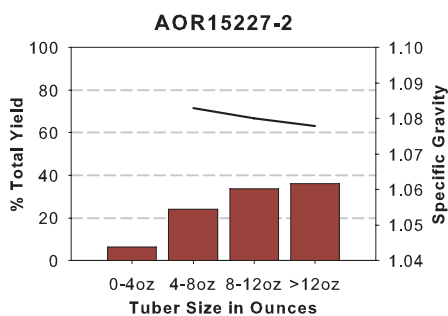
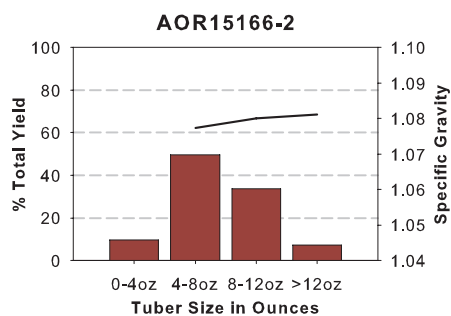


# 2023 Early Harvest Tri-State Trial

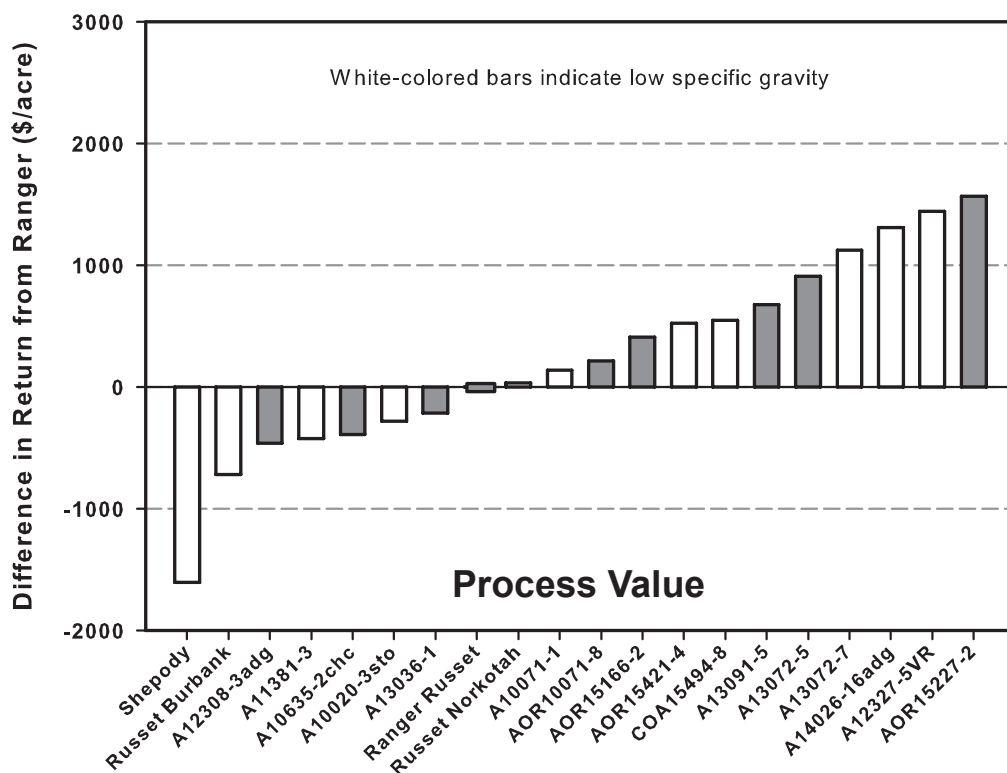
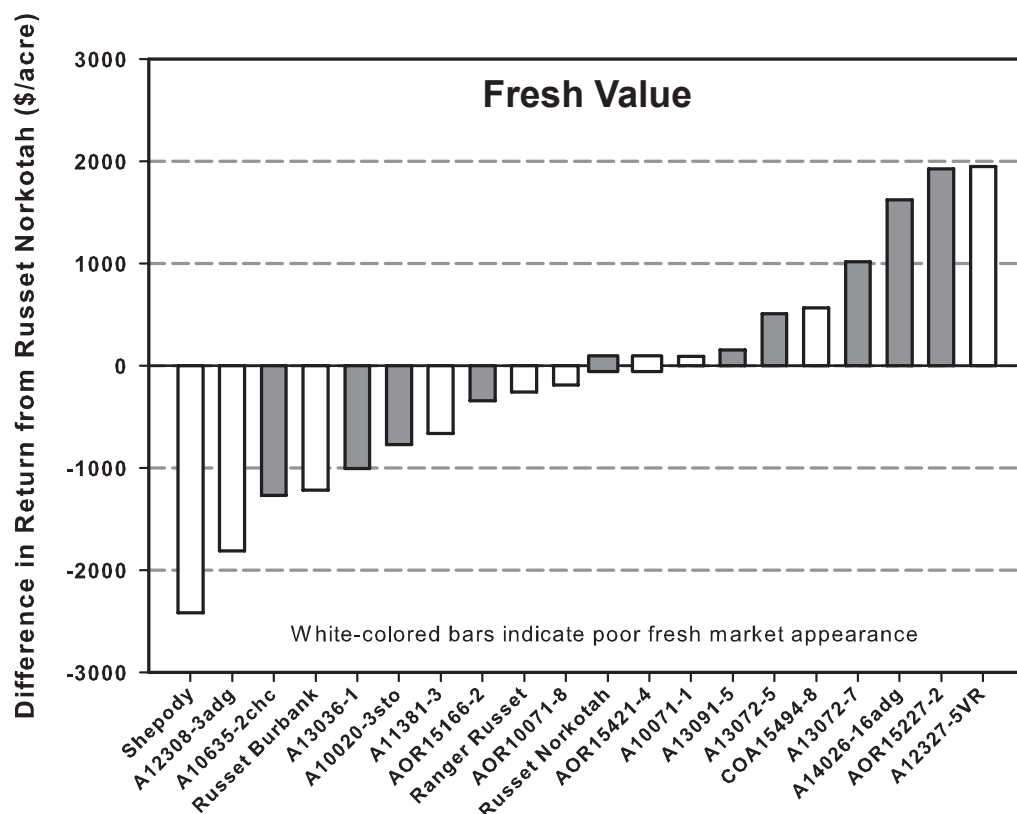
## Tuber Yield and Specific Gravity Distributions

### 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.

# 2023 Early Harvest Tri-State Trial

## Tubers

Ranger Russet



Russet Burbank



A10020-3sto



A10071-1



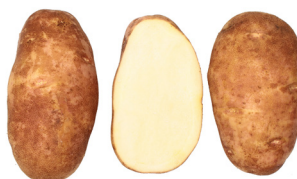
A14026-16adg



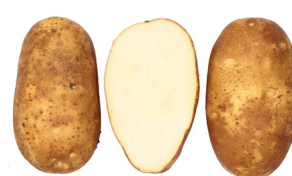
A12327-5VR



A13036-1



A13072-7



A13091-5



AOR10071-8



AOR15166-2



AOR15227-2



AOR15421-4



COA15494-8



Russet Norkotah



A10635-2chc



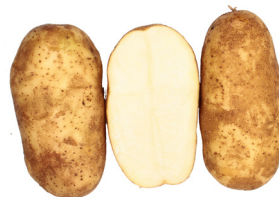
A11381-3



A12308-3adg



A13072-5





# 2023 Late Harvest Tri-State Trial

Location: WSU Research Center – Othello, WA

Planting Date: April 4

Vine Kill Date: September 1

Harvest Date: September 11

Days Grown: 152

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): AOR15227-2, AOR15166-2, and A12304-1sto**

## Yield and Economic Data

### ➤ Total Yield and U.S. #1 Yield

*Highest:* A12304-1sto had the highest total yield (1075 CWT/A) and the highest U.S. #1 yield (931 CWT/A). AOR15421-4 had the second highest total yield (1048 CWT/A) and A12327-5VR had the second highest U.S. #1 yield (918 CWT/A).

*Lowest:* A13091-5 had the lowest total yield (662 CWT/A) and the lowest U.S. #1 yield (562 CWT/A).

### ➤ % U.S. #1's (greater than 4 oz)

*Highest:* AOR15166-2 and AOR10071-8 (93 %), AOR15227-2 (92%).  
*Lowest:* Russet Burbank (74%) and A14026-16adg (76%).

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

*Highest:* AOR15166-2 (35.3 Tons/A), A12308-3adg (34.7 Tons/A).  
*Lowest:* A14026-16adg (17.0 Tons/A) and AOR15421-4 (18.0 Tons/A).

### ➤ Gross Return (\$/acre)

*Fresh Market Highest:* AOR15166-2 and A12308-3adg.  
*Fresh Market Lowest:* AOR15421-4, A14026-16adg, and A13072-7.  
*Process Market Highest:* AOR15166-2 and A12304-1sto.  
*Process Market Lowest:* A13091-5, COA15494-8, and A14026-16adg.

# 2023 Late Harvest Tri-State Trial

## Postharvest Information

Samples were obtained from the Washington, Idaho, and Oregon field adaptation trials for analysis in Pullman, WA. Twelve 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:* AOR15166-2, A13091-5, AOR10071-8

*Lowest scoring clones:* A12304-1st, Russet Burbank\*, AOR15421-4

### ➤ Low Temperature Sweetening

*Most resistant:* AOR15166-2, A13091-5, AOR15227-2

*Most susceptible:* A12304-1st, A13036-1, Russet Burbank\*

### ➤ French Fry Taste Panel

*Highest rated:* AOR15166-2, AOR15227-2, A13091-5\*

*Lowest rated:* A12327-5VR, AOR15421-4, Russet Burbank\*

### ➤ Blackspot Bruise Susceptibility

*Most resistant:* COA15494-8, AOR15421-4, AOR10071-8

*Most susceptible:* Ranger Russet\*, A12304-1st\*, A13036-1

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

*Lowest L/W:* AOR10071-8, COA15494-8, A12327-5VR

*Highest L/W:* Russet Burbank\*, Ranger Russet\*, A12304-1st, A10071-1

*Lowest W/Th:* A12327-5VR, AOR15421-4, A13072-7

*Highest W/Th:* COA15494-8, Russet Burbank, AOR10071-8

*Least variable:* A13091-5, A10071-1, Ranger Russet

*Most variable:* AOR15227-2, A12327-5VR, AOR10071-8

### Details

- AOR15166-2, A13091-5, and AOR10071-8 were the highest rated entries, scoring 32.2, 32.1, and 28.9 points, respectively.
- Seven of the fifteen evaluated clones ranked as resistant to cold sweetening with AOR15166-2, A13091-5, and AOR15227-2 being the most resistant. Tuber samples from all states produced acceptably light-colored fries (stem end >USDA 2) following storage for 45 days at 44°F except for AOR15421-4 from ID (three 3-state average was acceptable). At 40°F, stem end fry color was significantly darker, but when averaged across the three states, only Russet Burbank and A13036-1 produced fries darker than USDA 2. Clearwater Russet\* again identified as resistant to cold sweetening and four clones were numerically lighter than Clearwater Russet; all were new entries in this year's evaluations.
- For the WA trial, 0/15 entries stored at 48°F, 1/15 entries stored at 44°F, and 3/15 entries stored at 40°F produced non-uniform fry color (bud to stem end photovolt difference ≥9). For the OR trial, 0/15 entries stored at 48°F, 0/15 entries stored at 44°F, and 2/15 entries stored at 40°F produced non-uniform fry color. For the ID trial, 4/15 entries stored at 48°F, 1/15 entries stored at 44°F, and 2/15 entries stored at 40°F produced non-uniform fry color. The top-rated entries for

merit (AOR15166-2, A13091-5, & AOR10071-8) maintained fry color regardless of production site (WA, ID, OR) and storage temperature (48, 44, 40°F) after 60 days. Entries which did not maintain color uniformity differed between states and storage temperatures.

- Retention of process quality during storage of COA15494-8, A12327-5VR, Clearwater Russet, Russet Burbank, and Ranger Russet at 44°F (45 days) was highly variable across production sites. By contrast, growing location had the least effect on the change in fry color of A13072-7, A10020-3sto, and AOR15421-4 following 45 days at 44°F.
- A12304-1sto, AOR15421-4, and Russet Burbank\* received the lowest overall postharvest scores. Low specific gravity and/or poor fry color after 60-days storage at 40°F were reoccurring problems for these clones in WA and ID.
- Average (across states) gravities of A10071-1\*, A12327-5VR, COA15494-8, and Russet Burbank\* were 1.069, 1.073, 1.075 and 1.075, respectively; too low for frozen process contracts. Alternatively, AOR15227-2 had very high gravities (1.099). The gravities of the other entries ranged from 1.078 to 1.090 when averaged across states. When averaged across the fifteen entries, gravities were 1.076 (WA), 1.080 (ID), and 1.085 (OR), lower for WA and ID compared to the 2022 season (1.083 and 1.085, respectively).
- AOR15166-2, A13091-58, and AOR15227-2 were the favorites in the taste panels, scoring 3.8/5 on average across growing locations (5 is best). A10071-1\*, Russet Burbank\*, and AOR15421-4 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\*, A12304-1sto\*, and A13036-1 were the most susceptible, scoring 87.5%, 77.8%, and 61.1% bruise (stem end), respectively, in the controlled impact study. These entries also had the highest bruise severity, averaging 3.0/5. AOR10071-8, COA15494-8, and AOR15421-4 were the most resistant, averaging 8.3%, 4.2%, and 4.2% bruise (stem end), respectively, and averaging a 1.1/5 severity rating.
- The 8- to 10-oz tubers of AOR10071-8, COA15494-8, A12327-5VR had the lowest length to width ratios (avg. L/W=1.50 across states), higher than the average of 1.47 for the roundest entries in last year's trial. The range in L/W was 1.30 (AOR10071-8 from WA) to 2.32 (Russet Burbank from ID). Averaged across states, yield of 3-inch or longer French fries ranged from 80% to 94% by tuber fresh weight. AOR15227-2, A12327-5VR, and AOR10071-8 had the greatest variation in L/W ratio; usable fry yields ranged from 73% to 93% across production sites. The average difference in W/Th was minimal (max. 0.15) among all entries and production sites. A12327-5VR, AOR15421-4, and A13072-7 had the most consistent width to thickness ratio (ca. 1.15) and COA15494-8, Russet Burbank, and AOR10071-8 were the least consistent (1.25).
- Reconditioning (60°F, 21 days) tubers of COA15494-8, A13036-1, and A13072-7 that had been stored at 40°F for 60 days resulted in the greatest percent improvement in stem end fry color compared with the other clones (ca. 29%). By contrast, fry color of A10020-3sto, AOR10071-8, and AOR15166-2 changed the least in response to reconditioning (ca. 12.1%). Clearwater Russet, AOR15227-2, and Ranger Russet\* appeared more susceptible to sugar end development based on the difference between the stem and bud end of tubers following reconditioning. Percent fry color recovery via blanching potato strips prior to frying demonstrated Russet Burbank, Clearwater Russet, and A12304-1sto benefited the most (51%, 43%, & 41% stem end, respectively). Blanching improved stem end color by at least 23% in all clones, but had the least effect on AOR15166-2, A13091-5, and A12327-5VR (25%, 25%, and 23%, respectively). When averaged for location and entry, stem end color recovery was 11.5% higher in blanched samples vs reconditioned samples for the Tri-State samples. Generally, reconditioning improved bud end color the most (21.3% vs 17.4%) while blanching improved stem end color the most (31.8% vs 20.4%).



- Following 60 days at 48°F, 89% of A10020-3sto tubers were sprouting with an average sprout length of 0.5-inches. The next most sprouted entries on average were, Ranger Russet\* (73%), A10071-1\* (62%), and Clearwater Russet (49%) with sprout lengths of 0.4, 0.7, and 0.1-inches respectively. This compares to 7% of A13091-5 tubers with 0.1-inch sprouts and Russet Burbank\* having no sprouting.

### Overall Tri-State Postharvest Merit Scores

		2023 LRT Postharvest Merit Scores			3 state
	Clone	WA	ID	OR	Average
12	AOR15166-2	4.3	4.1	4.3	4.2
10	A13091-5	3.9	4.2	4.6	4.2
11	AOR10071-8	3.9	3.6	3.9	3.8
13	AOR15227-2	3.7	3.8	3.8	3.7
2	Ranger Russet	3.4	3.7	4.0	3.7
4	A10020-3sto	3.0	3.9	4.3	3.7
1	Clearwater Russet	3.4	2.8	4.6	3.6
15	COA15494-8	3.0	3.6	3.6	3.4
8	A13036-1	2.7	3.5	3.9	3.4
7	A12327-5VR	2.9	3.2	3.3	3.2
9	A13072-7	3.2	2.2	3.8	3.1
5	A10071-1	2.4	3.5	3.3	3.1
6	A12304-1sto	2.4	2.2	4.0	2.9
3	Russet Burbank	2.4	1.8	3.1	2.4
14	AOR15421-4	1.7	1.1	3.8	2.2

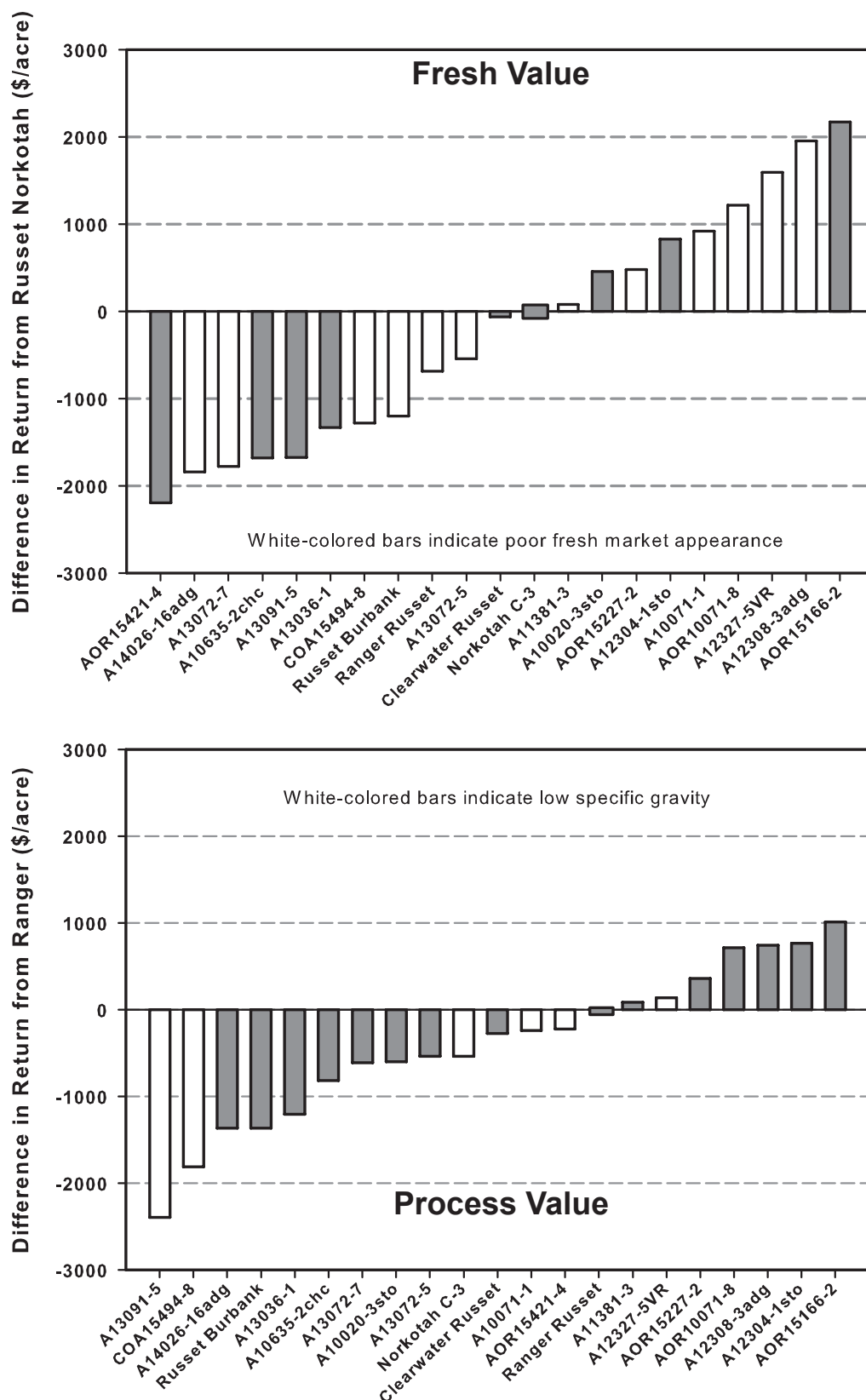
# 2023 Late Harvest Tri-State Trial Summaries

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	> 4 oz	& < 4 oz	(US 1's 7-18 oz)		> 6 oz	
				----- % of Total Yield -----			% of Total Yield	Tons/A	% of Total Yield	Tons/A
Clearwater Russet	835	DEF	41.8	87	2	11	62	26.0	75	31.4
Ranger Russet	929	BCD	46.4	77	14	9	50	23.2	83	38.7
Russet Burbank	832	DEF	41.6	74	14	12	50	20.9	77	32.0
A10020-3sto	905	CDE	45.3	88	4	9	62	28.0	77	34.8
A10071-1	1008	ABC	50.4	82	10	8	58	29.3	84	42.5
A12304-1sto	1075	A	53.7	86	3	10	54	28.8	81	43.6
A12327-5VR	1043	AB	52.2	88	4	8	61	31.9	85	44.2
A13036-1	743	FG	37.1	80	10	10	57	21.1	78	29.1
A13072-7	887	DE	44.3	83	12	5	43	19.2	91	40.4
A13091-5	662	G	33.1	84	2	13	61	20.2	71	23.8
AOR10071-8	916	CD	45.8	93	1	6	68	31.1	84	38.3
AOR15166-2	942	BCD	47.1	93	4	4	75	35.3	90	42.7
AOR15227-2	877	DE	43.9	92	1	7	65	28.7	88	38.6
AOR15421-4	1048	AB	52.4	82	7	11	34	18.0	86	45.2
COA15494-8	790	EF	39.5	82	4	14	53	21.0	71	28.1
Norkotah C-3	945	BCD	47.3	86	6	8	54	25.4	85	40.1
A10635-2chc	879	DE	44.0	77	4	19	41	18.1	59	25.9
A11381-3	913	CD	45.6	87	1	12	58	26.6	77	35.1
A12308-3adg	1017	ABC	50.9	89	4	7	68	34.7	86	43.7
A13072-5	833	DEF	41.6	82	5	13	58	24.2	79	32.8
A14026-16adg	869	DE	43.5	76	3	20	39	17.0	53	23.1

ENTRY	US # 1 YIELD						> 4 oz SPECIFIC GRAVITY	INTERNAL DEFECTS (%)		
				> 4 oz	4-7 oz*	7-14 oz*		(8-12 oz tubers)		
	CWT/A	STATS**	Tons/A	> 4 oz	> 4 oz	> 14 oz*		% HH	% BC	% IBS
				----- % -----						
Clearwater Russet	732	DEFG	36.6	24	54	22	1.084	0	0	0
Ranger Russet	715	EFGH	35.8	15	49	36	1.078	0	0	0
Russet Burbank	611	HI	30.5	20	50	30	1.075	3	3	8
A10020-3sto	794	CDEF	39.7	27	61	11	1.075	0	0	3
A10071-1	827	ABCD	41.4	15	51	33	1.065	0	0	0
A12304-1sto	931	A	46.5	14	43	43	1.076	0	0	3
A12327-5VR	918	AB	45.9	16	51	33	1.069	0	0	3
A13036-1	589	I	29.5	21	56	23	1.080	0	0	0
A13072-7	734	DEFG	36.7	7	33	60	1.074	0	0	18
A13091-5	562	I	28.1	25	64	12	1.073	0	0	3
AOR10071-8	847	ABCD	42.3	19	58	23	1.087	8	0	3
AOR15166-2	875	ABC	43.8	10	58	32	1.090	0	0	0
AOR15227-2	807	BCDE	40.3	9	49	42	1.088	0	0	0
AOR15421-4	850	ABCD	42.5	5	24	71	1.062	3	3	3
COA15494-8	648	GHI	32.4	28	54	18	1.071	0	0	0
Norkotah C-3	812	BCDE	40.6	13	42	44	1.067	3	0	5
A10635-2chc	680	FGHI	34.0	43	50	7	1.084	0	0	0
A11381-3	797	CDEF	39.8	21	50	29	1.081	0	0	10
A12308-3adg	905	ABC	45.2	13	58	28	1.077	0	0	0
A13072-5	680	FGHI	34.0	15	53	32	1.088	0	0	3
A14026-16adg	663	GHI	33.1	49	49	2	1.084	0	0	10

ENTRY	40 DAY	50 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	72	88	2.6	1	7.4	10.1	4.0	3.0	0	67
Ranger Russet	92	95	2.0	2	8.9	9.3	4.0	4.0	0	16
Russet Burbank	83	86	2.2	2	8.3	9.0	4.0	4.0	3	75
A10020-3sto	81	98	2.5	1	7.3	11.2	4.0	3.0	0	59
A10071-1	95	100	2.4	3	9.1	10.0	4.0	3.5	0	80
A12304-1sto	80	97	2.3	5	9.2	10.6	3.0	4.0	0	83
A12327-5VR	91	97	2.3	1	8.7	10.9	4.0	2.0	0	93
A13036-1	91	95	2.3	2	8.1	8.2	4.0	3.0	4	85
A13072-7	89	97	1.9	2	12.1	6.6	4.0	2.3	0	88
A13091-5	86	98	2.1	1	6.8	8.7	4.0	3.0	0	82
AOR10071-8	91	95	2.4	1	8.2	10.1	4.0	1.5	0	68
AOR15166-2	80	89	2.0	1	9.8	8.7	4.0	3.0	0	79
AOR15227-2	86	92	1.7	2	9.8	8.0	4.0	3.0	0	65
AOR15421-4	72	84	2.5	8	13.1	7.2	3.0	3.0	0	30
COA15494-8	84	95	2.4	1	6.5	10.9	5.0	2.0	0	48
Norkotah C-3	72	89	2.4	2	9.8	8.7	4.0	3.0	0	50
A10635-2chc	78	91	2.3	2	5.7	13.9	4.0	3.8	0	45
A11381-3	86	91	2.9	1	7.5	10.9	4.0	1.8	0	69
A12308-3adg	84	94	2.3	1	8.6	10.5	3.3	3.0	3	73
A13072-5	89	97	1.7	6	8.4	8.9	4.0	3.0	3	83
A14026-16adg	92	98	3.1	1	5.4	14.5	4.0	3.0	0	71

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



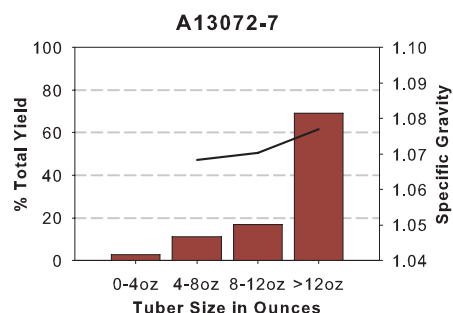
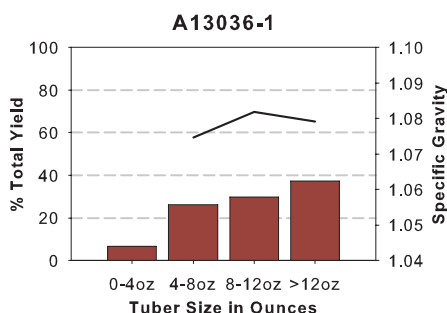
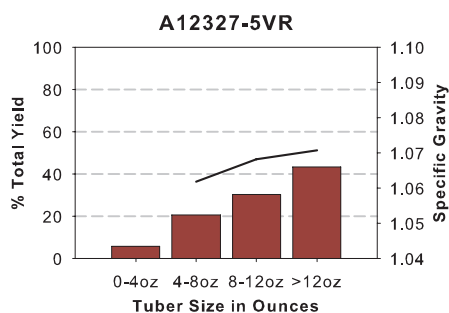
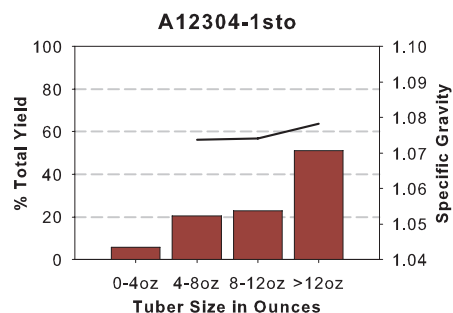
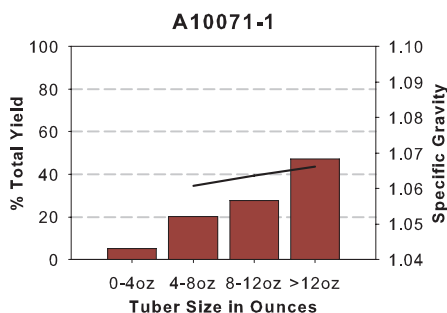
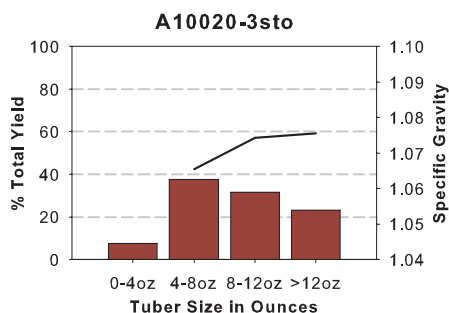
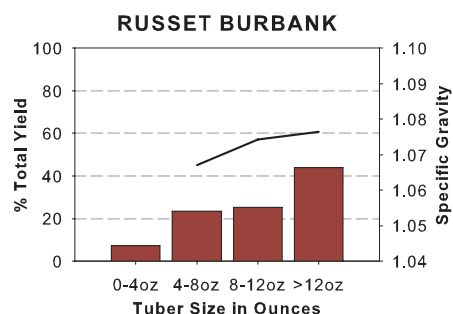
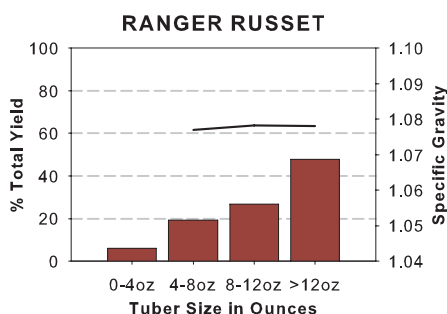
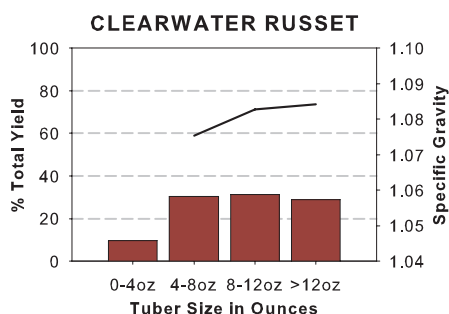
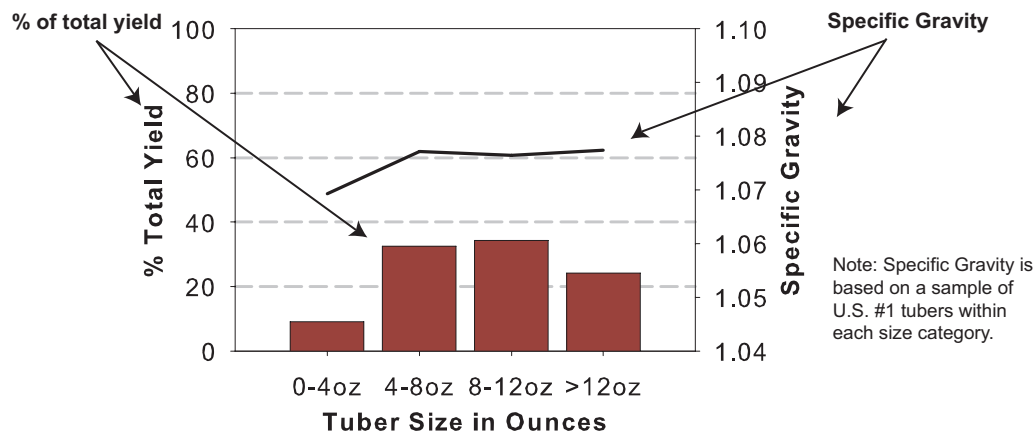
**Figure 1 (top).** Difference in gross return per acre (Fresh Market) from Russet Norkotah calculated by subtracting the gross return of Norkotah C-3 from the gross return of the particular entry. Entries with the white-colored bars may not appeal to fresh market consumers due to undesirable shape or 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.

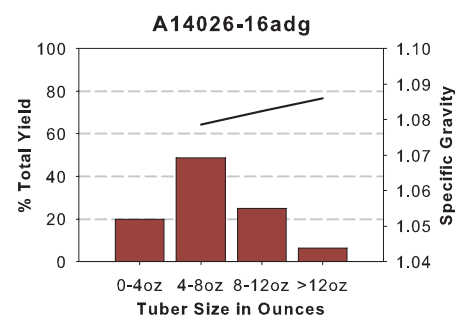
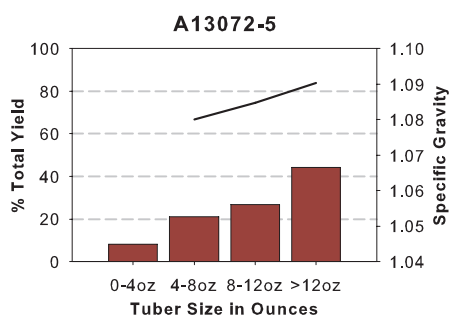
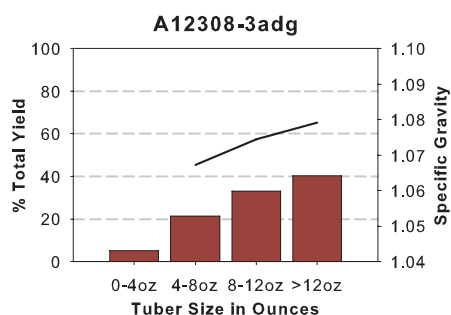
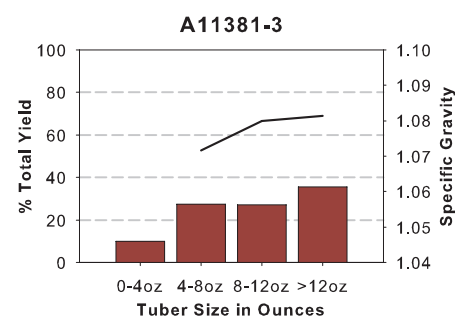
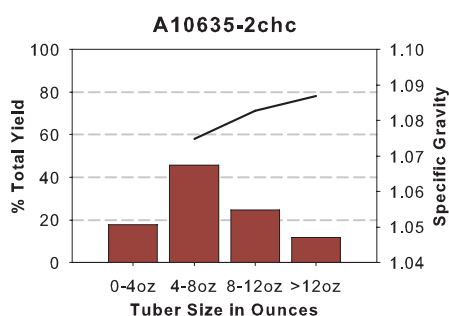
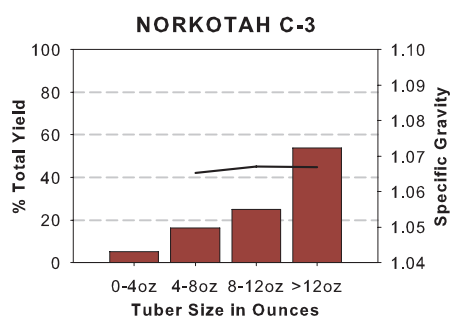
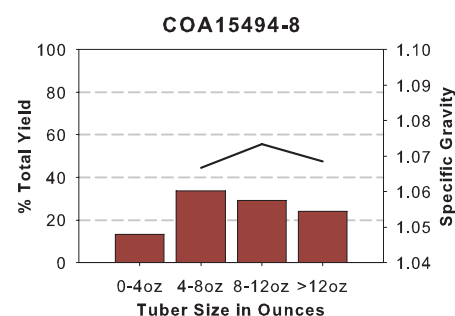
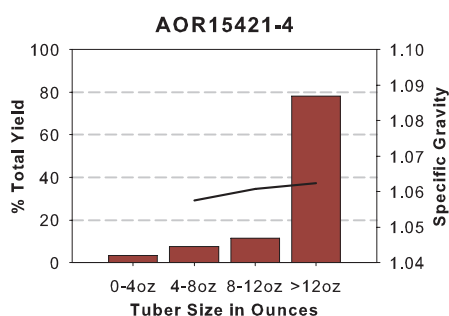
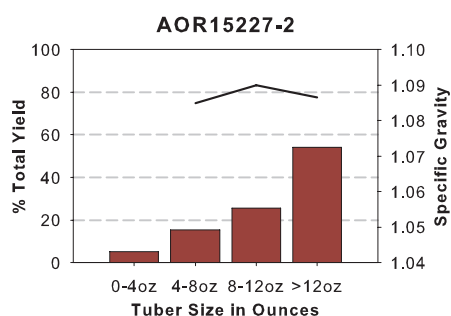
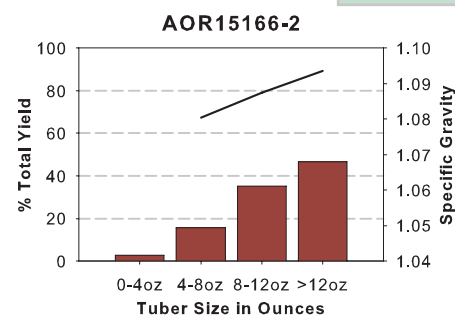
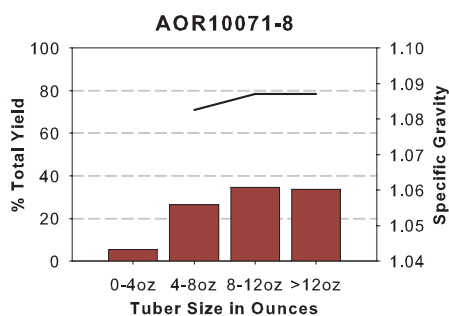
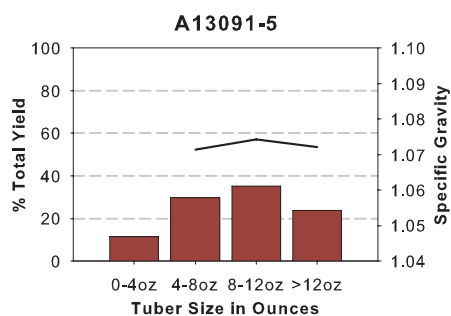


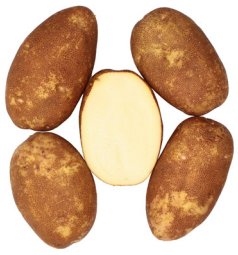
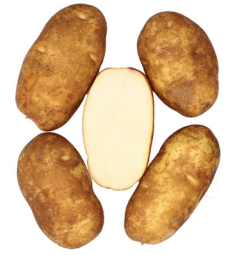
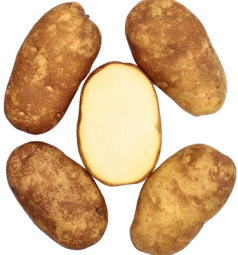
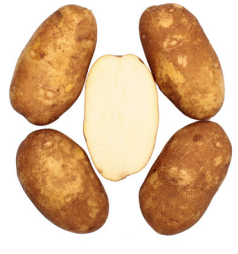

# 2023 Late Harvest Tri-State Trial

## Tuber Yield and Specific Gravity Distributions









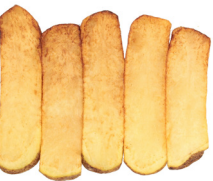







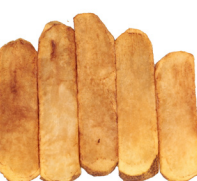


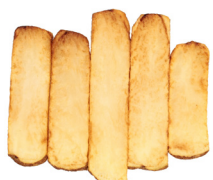



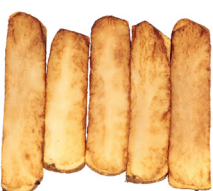
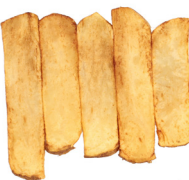
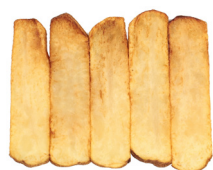

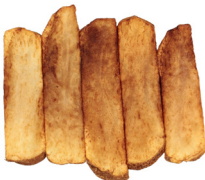


### 11 inch In-Row Spacing



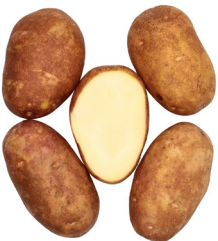
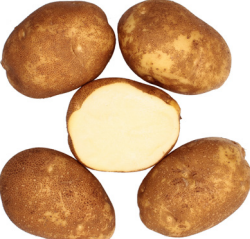























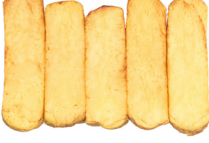











Tubers	WA Late Harvest Tri-State Trial Comments
Clearwater Russet	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; shallow eyes. <b>Fry color:</b> At harvest= light, non-uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform; Blanched = light, non-uniform.</p>
Ranger Russet	
	<p><b>Tubers:</b> Oblong to long tubers. Good skin set; moderate eye depth. <b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, non-uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform; Blanched = relatively dark, uniform.</p>
Russet Burbank	
	<p><b>Tubers:</b> Oblong to long tubers. Good skin set; moderate eye depth. <b>Fry color:</b> At harvest= light, uniform; 48°F = relatively dark, uniform; 44°F = relatively dark, uniform; 40°F = unnacceptably dark, uniform; Reconditioned = relatively dark, uniform; Blanched = relatively dark, uniform.</p>
A10020-3sto	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; moderate eye depth. <b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, non-uniform; Blanched = relatively dark, uniform.</p>
A10071-1	
	<p><b>Tubers:</b> Oblong to long tubers. Good skin set; shallow eyes. <b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = relatively dark, uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform; Blanched = relatively dark, uniform.</p>

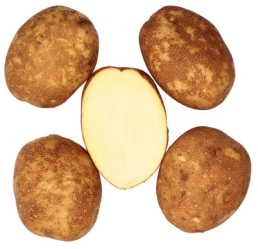
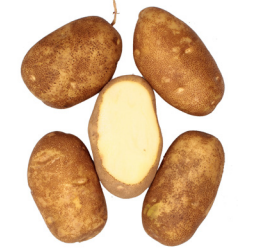
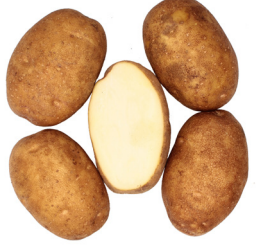
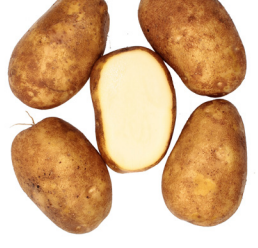



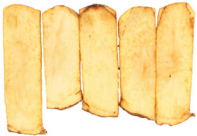
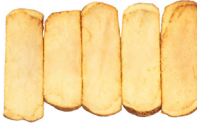






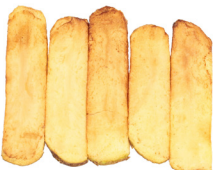
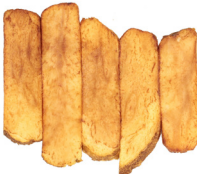


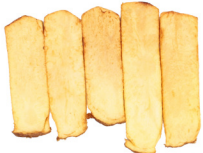


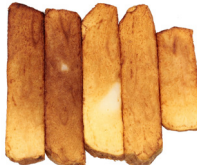






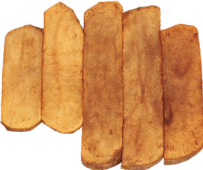
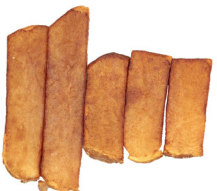





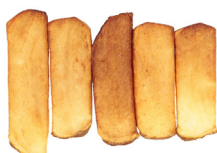
Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
Clearwater Russet					
					
Ranger Russet					
					
Russet Burbank					
					
A10020-3sto					
					
A10071-1					
					

Tubers	WA Late Harvest Tri-State Trial Comments
A12304-1sto	
	<p><b>Tubers:</b> Oblong to long tubers. Fair skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, non-uniform; 48°F = light, uniform; 44°F = relatively dark, uniform; 40°F = unnacceptably dark, uniform; Reconditioned = relatively dark, non-uniform; Blanched = relatively dark, uniform.</p>
A12327-5VR	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform; Blanched = relatively dark, uniform.</p>
A13036-1	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = relatively dark, uniform; 40°F = unnacceptably dark, uniform; Reconditioned = relatively dark, uniform; Blanched = relatively dark, uniform.</p>
A13072-7	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform; Blanched = relatively dark, uniform.</p>
A13091-5	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, non-uniform; Blanched = light, uniform.</p>

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
A12304-1sto					
					
A12327-5VR					
					
A13036-1					
					
A13072-7					
					
A13091-5					
					



Tubers	WA Late Harvest Tri-State Trial Comments
AOR10071-8	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform; Blanched = relatively dark, uniform.</p>
AOR15166-2	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = light, uniform; Reconditioned = light, uniform; Blanched = light, uniform.</p>
AOR15227-2	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform; Blanched = relatively dark, uniform.</p>
AOR15421-4	
	<p><b>Tubers:</b> Oblong tubers. Fair skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = relatively dark, uniform; 44°F = relatively dark,uniform; 40°F = unnacceptably dark, uniform; Reconditioned = unnacceptably dark, uniform; Blanched = unacceptably dark, uniform.</p>
COA15494-8	
	<p><b>Tubers:</b> Round to oblong tubers. Very good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = relatively dark, non-uniform; Reconditioned = relatively dark, non-uniform; Blanched = relatively dark, uniform.</p>

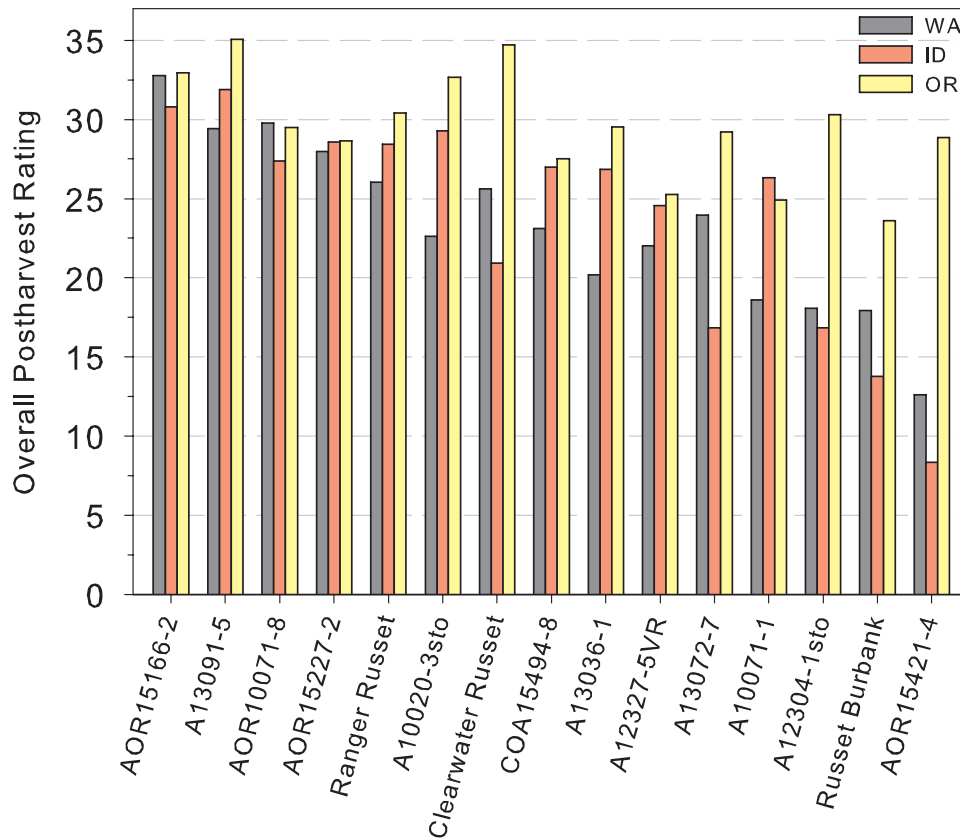
Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
AOR10071-8					
					
AOR15166-2					
					
AOR15227-2					
					
AOR15421-4					
					
COA15494-8					
					

# 2023 Late Harvest Tri-State Trial

## Accumulated Total Postharvest Rating of Clones

Clone	WA		ID		OR		3 State av.
	Rating Total \$	Discard \$\$	Rating Total \$	Discard \$\$	Rating Total \$	Discard \$\$	Rating Total
12 AOR15166-2	32.8		30.8		33.0		32.2
10 A13091-5	29.4		31.9		35.1		32.1
11 AOR10071-8	29.8		27.4		29.5		28.9
13 AOR15227-2	28.0		28.6		28.7		28.4
2 Ranger Russet	26.0		28.4		30.4		28.3
4 A10020-3sto	22.6	Sp. Gr.	29.3		32.7		28.2
1 Clearwater Russet	25.6		20.9	Sp. Gr.	34.7		27.1
15 COA15494-8	23.1	Sp. Gr.	27.0		27.5		25.9
8 A13036-1	20.2	Sp. Gr., 40°F	26.9	40°F	29.5		25.5
7 A12327-5VR	22.0	Sp. Gr.	24.6	Sp.Gr.	25.3	Sp. Gr.	23.9
9 A13072-7	24.0	Sp. Gr.	16.9	40°F	29.2		23.3
5 A10071-1	18.6	Sp. Gr.	26.3	Sp. Gr.	24.9	Sp. Gr.	23.3
6 A12304-1sto	18.1	40°F	16.8	Sp. Gr.	30.3		21.7
3 Russet Burbank	17.9	40°F	13.8	Sp. Gr., 40°F	23.6		18.4
14 AOR15421-4	12.6	Sp. Gr., 40°F	8.4	Sp Gr, 48°F, 40°F	28.8		16.6
	23.4		23.9		29.5		25.6

## Late Harvest Tri-State Postharvest Ratings





# 2023 Late Harvest Tri-State Trial

## Entries Retained from the 2022 Trials Currently in the Tri-State Trial

Harvested fall of 2022

Held at 48° F until December 19, 2022

Stored at 44° F until analysis

Four clones were retained from the 2022 Tri-State Trial into the 2023 Trial (A13072-7, A13091-5, A10071-1 & A12304-1sto). When averaged across states, Clearwater produced the lightest fries (45.6 ref units) A13091-5 was slightly behind with (45.0). The uniformity of fry color was unacceptable for RB grown in ID and OR, RR grown in OR and A13091-5 grown in WA. All entries and the check cultivars Clearwater, Ranger Russet and Russet Burbank had sprout lengths that averaged between 1 and 6 inches. A10071-1 had the longest sprouts with WA at 7 inches, ID & OR being 5.5 inches. A10071-1 produced mottled fries when grown in WA and OR.

PHOTOVOLT READING		USDA		% REDUCING SUGAR			Sprouting			
Clone	stem	bud	avg	DIFF	COLOR	stem	bud	avg	percent	length (in.)
Washington										
1 Clearwater	47.2	47.6	47.4	5.2	0	0.5	0.5	0.5	100	0.8
2 Ranger Russet	28.7	29.8	29.3	5.4	1	1.5	1.4	1.5	100	2.5
3 Russet Burbank	30.5	38.3	34.4	7.8	0	1.3	0.8	1.1	100	2.3
4 A13072-7	39.4	40.5	40.0	3.8	0	0.8	0.7	0.7	100	3.5
5 A13091-5	44.3	45.7	45.0	3.1	0	0.6	0.6	0.6	100	3.0
6 A10071-1	22.3	35.4	28.8	13.4	2	2.3	1.0	1.7	100	7.0
7 A12304-1sto	33.8	39.8	36.8	6.0	0	1.1	0.7	0.9	100	1.8
Average	LSD 0.05		3.0	3.7						
	35.2	39.6	37.4	6.4	0.4	1.2	0.8	1.0	100	
Idaho										
1 Clearwater	44.0	43.9	44.0	3.1	0	0.6	0.6	0.6	100	0.8
2 Ranger Russet	35.3	42.0	38.6	7.2	0	1.0	0.7	0.8	100	2.0
3 Russet Burbank	28.2	41.5	34.8	14.0	1	1.6	0.7	1.1	100	0.3
4 A13072-7	43.0	45.8	44.4	4.2	0	0.6	0.6	0.6	100	1.8
5 A13091-5	47.1	46.1	46.6	1.7	0	0.5	0.5	0.5	100	2.5
6 A10071-1	40.0	41.5	40.7	2.6	0	0.7	0.7	0.7	100	5.5
7 A12304-1sto	41.4	41.3	41.3	3.4	0	0.7	0.7	0.7	100	2.3
Average	LSD 0.05		2.5	2.8						
	39.9	43.1	41.5	5.2	0.1	0.8	0.6	0.7	100	
Oregon										
1 Clearwater	44.2	46.7	45.4	3.8	0	0.6	0.5	0.6	100	1.5
2 Ranger Russet	24.1	32.4	28.2	10.0	2	2.1	1.2	1.6	100	2.0
3 Russet Burbank	22.6	35.3	29.0	13.1	2	2.3	1.0	1.6	100	3.0
4 A13072-7	34.6	35.9	35.2	5.2	0	1.0	0.9	1.0	100	3.5
5 A13091-5	41.4	45.1	43.2	4.4	0	0.7	0.6	0.6	100	1.5
6 A10071-1	25.8	30.1	27.9	8.9	1	1.9	1.4	1.6	100	5.5
7 A12304-1sto	32.5	37.7	35.1	6.1	0	1.2	0.8	1.0	100	2.8
Average	LSD 0.05		4.5	4.6						
	32.2	37.6	34.9	7.4	0.7	1.4	0.9	1.1	100	

Date test performed:

**Washington** April 29

**Idaho** April 29

**Oregon** April 29

# 2023 Late Harvest Tri-State Trial Prior to Storage

\* \*\* \*\*\*

PHOTOVOLT READING						USDA	SPECIFIC	
Clone	stem	bud	ave.	rtg §	DIFF	COLOR	GRAVITY	rtg
Washington								
1 Clearwater Russet	30.4	42.2	36.3	4-	11.8	1	1.080	3
2 Ranger Russet	38.9	40.9	39.9	4+	5.4	0	1.082	4
3 Russet Burbank	30.0	36.4	33.2	3+	6.5	1	1.076	1
4 A10020-3sto	36.2	42.7	39.4	4+	6.9	0	1.075	0
5 A10071-1	31.9	36.3	34.1	3+	5.2	0	1.063	0
6 A12304-1sto	25.0	34.1	29.6	2-	9.7	1	1.080	3
7 A12327-5VR	39.8	41.1	40.5	5+	5.1	0	1.068	0
8 A13036-1	34.1	42.2	38.1	4+	8.2	0	1.072	0
9 A13072-7	41.9	41.6	41.8	5+	2.7	0	1.069	0
10 A13091-5	46.1	47.8	46.9	5+	3.5	0	1.076	1
11 AOR10071-8	43.2	43.8	43.5	5+	3.0	0	1.086	5
12 AOR15166-2	43.3	46.2	44.8	5+	4.2	0	1.085	5
13 AOR15227-2	43.5	46.6	45.1	5+	5.2	0	1.096	1
14 AOR15421-4	23.7	26.9	25.3	2+	4.0	2	1.065	0
15 COA15494-8	40.3	44.7	42.5	5+	4.6	0	1.068	0
Average	LSD 0.05		2.9	3.4		0.007		
	36.5	40.9	38.7	5.7	0	1.076		
Idaho								
1 Clearwater Russet	29.8	31.6	30.7	3+	7.3	1	1.073	0
2 Ranger Russet	31.8	36.3	34.0	3+	6.5	0	1.085	5
3 Russet Burbank	24.4	34.6	29.5	2-	11.1	2	1.072	0
4 A10020-3sto	37.0	41.0	39.0	4+	4.4	0	1.082	4
5 A10071-1	38.9	39.3	39.1	4+	4.6	0	1.071	0
6 A12304-1sto	27.8	33.0	30.4	2+	6.4	1	1.073	0
7 A12327-5VR	38.1	37.5	37.8	4+	3.6	0	1.075	0
8 A13036-1	35.2	40.0	37.6	4+	6.3	0	1.087	5
9 A13072-7	24.5	33.9	29.2	2-	9.4	2	1.091	4
10 A13091-5	44.0	43.6	43.8	5+	3.3	0	1.081	4
11 AOR10071-8	44.8	42.0	43.4	5+	3.7	0	1.078	2
12 AOR15166-2	41.2	41.1	41.2	5+	3.7	0	1.093	3
13 AOR15227-2	37.2	44.6	40.9	5+	7.5	0	1.098	1
14 AOR15421-4	15.9	21.7	18.8	0+	7.0	3	1.069	0
15 COA15494-8	35.5	43.1	39.3	4+	7.5	0	1.078	2
Average	LSD 0.05		3.4	3.2		0.004		
	33.7	37.5	35.6	6.1	1	1.080		
Oregon								
1 Clearwater Russet	43.6	44.9	44.2	5+	3.2	0	1.088	5
2 Ranger Russet	41.2	41.6	41.4	5+	3.0	0	1.084	5
3 Russet Burbank	37.9	41.3	39.6	4+	5.5	0	1.076	1
4 A10020-3sto	46.8	47.1	46.9	5+	1.1	0	1.083	5
5 A10071-1	40.8	42.2	41.5	5+	3.8	0	1.072	0
6 A12304-1sto	41.0	41.2	41.1	5+	2.4	0	1.084	5
7 A12327-5VR	42.7	42.8	42.8	5+	3.4	0	1.075	0
8 A13036-1	49.3	50.1	49.7	5+	1.9	0	1.081	4
9 A13072-7	50.9	47.2	49.0	5+	4.1	0	1.078	2
10 A13091-5	53.6	52.8	53.2	5+	2.3	0	1.085	5
11 AOR10071-8	52.4	51.8	52.1	5+	2.0	0	1.092	3
12 AOR15166-2	53.9	52.7	53.3	5+	1.9	0	1.092	3
13 AOR15227-2	50.9	52.5	51.7	5+	2.6	0	1.103	1
14 AOR15421-4	47.5	49.9	48.7	5+	3.6	0	1.099	1
15 COA15494-8	46.7	47.2	47.0	5+	3.3	0	1.078	2
Average	LSD 0.05		2.2	2.0		0.007		
	46.6	47.0	46.8	2.9	0	1.085		

Date test performed:

**Washington**  
**Idaho**  
**Oregon**

Oct. 2  
Oct. 4  
Oct. 6

Sept. 29  
Oct. 3  
Oct. 5

§ 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.

# 2023 Late Harvest Tri-State Trial

Stored at 48°F after Arrival

FRENCH FRY TASTE PANEL		BRUISE POTENTIAL			
Clone	rating	(percent)		[color 5=darkest]	
		stem	bud	stem	bud
Washington					
1 Clearwater Russet	3.6	29	29	1.7	1.8
2 Ranger Russet	3.0	96	0	3.5	1.0
3 Russet Burbank	2.9	71	4	2.6	1.1
4 A10020-3sto	3.6	58	0	2.3	1.1
5 A10071-1	2.6	42	0	1.9	1.0
6 A12304-1sto	3.1	100	25	4.0	1.5
7 A12327-5VR	3.0	17	0	1.3	1.0
8 A13036-1	3.2	71	13	2.8	1.3
9 A13072-7	3.0	13	0	1.3	1.0
10 A13091-5	3.4	4	0	1.1	1.0
11 AOR10071-8	3.8	8	0	1.2	1.0
12 AOR15166-2	3.8	63	0	2.5	1.0
13 AOR15227-2	4.0	25	13	1.6	1.5
14 AOR15421-4	1.6	0	0	1.0	1.0
15 COA15494-8	3.1	4	4	1.1	1.1
<i>LSD</i> <sub>0.05</sub>	0.7	23	13		
Average	3.2	40	6	2.0	1.2
Idaho					
1 Clearwater Russet	2.9	8	4	1.2	1.1
2 Ranger Russet	3.4	79	29	3.3	1.7
3 Russet Burbank	2.8	46	4	2.1	1.1
4 A10020-3sto	3.3	58	17	2.3	1.3
5 A10071-1	3.3	8	0	1.2	1.0
6 A12304-1sto	2.8	71	42	2.8	1.9
7 A12327-5VR	2.6	38	21	1.8	1.5
8 A13036-1	3.9	63	38	2.4	1.8
9 A13072-7	2.9	88	63	3.0	2.3
10 A13091-5	3.9	67	13	2.5	1.3
11 AOR10071-8	3.4	0	0	1.0	1.0
12 AOR15166-2	3.8	17	0	1.3	1.0
13 AOR15227-2	3.6	17	0	1.3	1.0
14 AOR15421-4	2.4	0	13	1.0	1.3
15 COA15494-8	4.0	4	0	1.1	1.0
<i>LSD</i> <sub>0.05</sub>	0.6	23	21		
Average	3.3	38	16	1.9	1.3
Oregon					
1 Clearwater Russet	3.7	29	21	1.7	1.4
2 Ranger Russet	3.4	88	17	3.6	1.3
3 Russet Burbank	2.6	21	0	1.4	1.0
4 A10020-3sto	3.7	46	8	2.0	1.2
5 A10071-1	2.9	54	0	2.2	1.0
6 A12304-1sto	3.3	63	8	2.5	1.2
7 A12327-5VR	3.3	21	0	1.4	1.0
8 A13036-1	3.5	50	0	2.0	1.0
9 A13072-7	3.2	13	0	1.3	1.0
10 A13091-5	4.1	4	8	1.1	1.2
11 AOR10071-8	3.5	17	0	1.3	1.0
12 AOR15166-2	4.0	21	0	1.5	1.0
13 AOR15227-2	3.7	13	4	1.3	1.1
14 AOR15421-4	3.8	13	0	1.3	1.0
15 COA15494-8	3.5	4	0	1.1	1.0
<i>LSD</i> <sub>0.05</sub>	0.5	26	12		
Average	3.5	30	4	1.7	1.1

Date test performed:

**Washington**

Oct. 24

Nov. 3

**Idaho**

Oct. 25

Nov. 9

**Oregon**

Oct. 26

Nov. 16

# 2023 Late Harvest Tri-State Trial

Stored at 48°F for 60 Days

Clone	PHOTOVOLT READING					USDA COLOR	% REDUCING SUGAR		SPROUTING	
	stem	bud	ave	rtg §	DIFF		stem	bud	(%)	length (in)
Washington										
1 Clearwater Russet	36.3	45.0	40.6	5+	8.7	0	0.9	0.6	67	0.13
2 Ranger Russet	34.4	40.1	37.2	4+	5.7	0	1.0	0.7	87	0.25
3 Russet Burbank	26.3	34.1	30.2	2+	7.7	1	1.8	1.1	0	0.00
4 A10020-3sto	30.9	38.7	34.8	3+	8.5	1	1.3	0.8	87	0.50
5 A10071-1	28.6	37.0	32.8	3+	8.9	1	1.5	0.9	60	0.75
6 A12304-1sto	27.3	35.7	31.5	3+	8.6	1	1.7	1.0	0	0.00
7 A12327-SVR	34.3	41.7	38.0	4+	7.9	0	1.0	0.7	67	0.25
8 A13036-1	34.2	41.8	38.0	4+	7.6	0	1.0	0.7	40	0.13
9 A13072-7	42.2	43.0	42.6	5+	2.6	0	0.6	0.6	0	0.00
10 A13091-5	47.9	48.5	48.2	5+	1.8	0	0.5	0.5	0	0.00
11 AOR10071-8	42.6	44.8	43.7	5+	3.0	0	0.6	0.6	20	0.13
12 AOR15166-2	46.3	46.7	46.5	5+	4.1	0	0.5	0.5	0	0.00
13 AOR15227-2	41.3	47.7	44.5	5+	6.6	0	0.7	0.5	0	0.00
14 AOR15421-4	22.7	29.3	26.0	2+	6.6	2	2.3	1.5	No Sample	0.00
15 COA15494-8	43.0	45.7	44.3	5+	3.3	0	0.6	0.6	0	0.00
Average	LSD 0.05		2.9	3.7					20	
	35.9	41.3	38.6		6.1	0	1.1	0.7	30	0.14
Idaho										
1 Clearwater Russet	30.9	41.8	36.3	4-	10.9	1	1.3	0.7	0	0.00
2 Ranger Russet	33.7	41.9	37.8	4+	8.7	0	1.1	0.7	40	0.13
3 Russet Burbank	25.5	35.6	30.5	3-	10.7	1	1.9	1.0	0	0.00
4 A10020-3sto	43.2	41.6	42.4	5+	2.9	0	0.6	0.7	87	0.50
5 A10071-1	40.2	42.7	41.4	5+	4.5	0	0.7	0.6	40	0.25
6 A12304-1sto	28.9	37.9	33.4	3-	9.0	1	1.5	0.8	0	0.00
7 A12327-SVR	35.0	42.0	38.5	4+	7.3	0	1.0	0.7	0	0.00
8 A13036-1	34.3	38.6	36.5	4+	4.9	0	1.0	0.8	22	0.13
9 A13072-7	30.2	38.2	34.2	3+	8.5	1	1.4	0.8	0	0.00
10 A13091-5	51.8	50.5	51.2	5+	2.2	0	0.5	0.5	0	0.00
11 AOR10071-8	46.3	44.9	45.6	5+	3.9	0	0.5	0.6	0	0.00
12 AOR15166-2	45.0	46.9	45.9	5+	3.5	0	0.6	0.5	0	0.00
13 AOR15227-2	43.7	49.8	46.7	5+	6.5	0	0.6	0.5	0	0.00
14 AOR15421-4	17.9	28.0	22.9	1-	10.1	3	3.0	1.6	0	0.00
15 COA15494-8	37.5	46.1	41.8	5+	8.6	0	0.8	0.5	0	0.00
Average	LSD 0.05		2.6	3.5					15	
	36.3	41.8	39.0		6.8	0	1.1	0.7	13	0.07
Oregon										
1 Clearwater Russet	45.4	46.9	46.2	5+	3.0	0	0.6	0.5	80	0.25
2 Ranger Russet	38.3	39.5	38.9	4+	3.1	0	0.8	0.8	93	0.75
3 Russet Burbank	34.5	38.1	36.3	4+	3.6	0	1.0	0.8	0	0.00
4 A10020-3sto	40.7	45.9	43.3	5+	5.2	0	0.7	0.5	93	0.50
5 A10071-1	40.0	41.6	40.8	5+	4.0	0	0.7	0.7	85	1.00
6 A12304-1sto	38.5	40.4	39.4	4+	3.6	0	0.8	0.7	47	0.50
7 A12327-SVR	44.7	41.1	42.9	5+	4.5	0	0.6	0.7	27	0.75
8 A13036-1	44.4	47.5	45.9	5+	4.0	0	0.6	0.5	53	0.50
9 A13072-7	50.6	46.9	48.8	5+	3.7	0	0.5	0.5	53	0.50
10 A13091-5	53.4	51.7	52.6	5+	2.0	0	0.6	0.5	20	0.25
11 AOR10071-8	49.3	48.1	48.7	5+	2.2	0	0.5	0.5	73	0.50
12 AOR15166-2	53.4	53.3	53.3	5+	1.6	0	0.6	0.6	47	0.25
13 AOR15227-2	50.1	51.8	50.9	5+	2.4	0	0.5	0.5	33	0.25
14 AOR15421-4	50.4	50.8	50.6	5+	1.8	0	0.5	0.5	40	0.25
15 COA15494-8	46.7	46.9	46.8	5+	2.5	0	0.5	0.5	67	0.50
Average	LSD 0.05		1.8	2					22	
	45.4	46.0	45.7		3.1	0	0.6	0.6	54	0.45

Date test performed:

**Washington**

Nov. 30

Nov. 30

Dec. 18

**Idaho**

Dec. 6

Dec. 6

Dec. 18

**Oregon**

Dec. 12

Dec. 12

Dec. 18

§ 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.



# 2023 Late Harvest Tri-State Trial

Stored at 44°F for 45 Days

PHOTOVOLT READING								
Clone	stem	bud	ave	rtg §	DIFF	USDA COLOR	% REDUCING SUGAR stem	bud
Washington								
1 Clearwater Russet	36.2	42.8	39.5	4+	6.7	0	0.9	0.6
2 Ranger Russet	27.2	37.0	32.1	3-	9.9	1	1.7	0.9
3 Russet Burbank	21.2	29.4	25.3	2+	8.6	2	2.5	1.4
4 A10020-3sto	32.8	38.9	35.8	4+	6.2	0	1.2	0.8
5 A10071-1	26.9	33.3	30.1	2+	6.4	1	1.7	1.1
6 A12304-1sto	24.5	33.0	28.7	2+	8.5	2	2.0	1.1
7 A12327-5VR	30.2	35.5	32.8	3+	6.9	1	1.4	1.0
8 A13036-1	25.6	32.4	29.0	2+	8.3	1	1.9	1.2
9 A13072-7	40.8	41.0	40.9	5+	2.3	0	0.7	0.7
10 A13091-5	44.7	48.1	46.4	5+	3.6	0	0.6	0.5
11 AOR10071-8	37.9	44.6	41.2	5+	6.6	0	0.8	0.6
12 AOR15166-2	40.6	45.8	43.2	5+	5.3	0	0.7	0.6
13 AOR15227-2	37.7	46.5	42.1	5+	8.8	0	0.8	0.5
14 AOR15421-4	21.4	25.4	23.4	1+	4.3	2	2.5	1.9
15 COA15494-8	34.6	40.6	37.6	4+	6.1	0	1.0	0.7
Average	32.1	LSD 0.05 38.3	35.2		3.2 6.6	1	1.4	0.9
Idaho								
1 Clearwater Russet	28.0	36.1	32.1	3+	8.4	1	1.6	0.9
2 Ranger Russet	32.2	38.8	35.5	4+	6.8	0	1.2	0.8
3 Russet Burbank	23.8	29.7	26.7	2+	6.6	2	2.1	1.4
4 A10020-3sto	32.4	35.9	34.2	3+	5.7	0	1.2	0.9
5 A10071-1	37.7	38.2	37.9	4+	3.3	0	0.8	0.8
6 A12304-1sto	26.6	30.3	28.5	2+	3.8	1	1.7	1.4
7 A12327-5VR	34.5	38.1	36.3	4+	4.9	0	1.0	0.8
8 A13036-1	23.9	30.1	27.0	2+	6.7	2	2.1	1.4
9 A13072-7	22.2	33.5	27.8	2-	11.3	2	2.3	1.1
10 A13091-5	39.1	42.3	40.7	5+	4.8	0	0.8	0.6
11 AOR10071-8	32.8	34.3	33.5	3+	4.7	0	1.2	1.0
12 AOR15166-2	36.1	41.5	38.8	4+	6.1	0	0.9	0.7
13 AOR15227-2	36.9	43.5	40.2	4+	7.1	0	0.9	0.6
14 AOR15421-4	14.0	19.8	16.9	0+	5.8	4	3.9	2.7
15 COA15494-8	35.8	42.6	39.2	4+	7.5	0	0.9	0.6
Average	30.4	LSD 0.05 35.6	33.0		3.5 6.2	1	1.5	1.1
Oregon								
1 Clearwater Russet	44.3	47.4	45.9	5+	4.6	0	0.6	0.5
2 Ranger Russet	33.8	39.3	36.5	4+	6.1	0	1.1	0.8
3 Russet Burbank	29.9	34.4	32.2	3+	4.5	1	1.4	1.0
4 A10020-3sto	39.2	41.5	40.3	4+	3.5	0	0.8	0.7
5 A10071-1	34.3	36.2	35.3	3+	5.8	0	1.0	0.9
6 A12304-1sto	36.2	38.3	37.2	4+	6.7	0	0.9	0.8
7 A12327-5VR	41.7	41.0	41.4	5+	3.0	0	0.7	0.7
8 A13036-1	39.9	40.7	40.3	4+	2.6	0	0.7	0.7
9 A13072-7	48.0	44.3	46.2	5+	3.7	0	0.5	0.6
10 A13091-5	52.7	51.2	51.9	5+	2.1	0	0.5	0.5
11 AOR10071-8	43.5	47.6	45.6	5+	4.7	0	0.6	0.5
12 AOR15166-2	51.8	51.9	51.9	5+	2.7	0	0.5	0.5
13 AOR15227-2	50.3	50.9	50.6	5+	2.7	0	0.5	0.5
14 AOR15421-4	46.2	48.0	47.1	5+	3.2	0	0.5	0.5
15 COA15494-8	38.7	42.3	40.5	5+	4.0	0	0.8	0.6
Average	42.0	LSD 0.05 43.7	42.9		2.5 4.0	0	0.8	0.7

Date test performed:

**Washington**

Dec. 15

Dec. 15

**Idaho**

Dec. 15

Dec. 15

**Oregon**

Dec. 15

Dec. 15

§ 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.

# 2023 Late Harvest Tri-State Trial

## Stored at 40°F for 60 Days and Reconditioned

PHOTOVOLT READING (60 Days at 40°F)												
SPROUTING								PHOTOVOLT AFTER RECONDITIONING				
Clone	(%)	stem	bud	ave	rtg	DIFF	USDA COLOR	stem	bud	ave	Diff	USDA COLOR
<b>Washington</b>												
1 Clearwater Russet	0	21.3	35.9	28.6	2	14.6	2	24.4	41.3	32.9	16.9	2
2 Ranger Russet	0	20.7	28.3	24.5	2	7.6	2	26.1	37.8	32.0	11.7	1
3 Russet Burbank	0	13.7	20.8	17.3	0	7.2	4	17.5	26.5	22.0	8.9	3
4 A10020-3sto	0	21.3	27.1	24.2	1	6.5	2	24.5	34.0	29.2	9.6	2
5 A10071-1	0	17.7	24.5	21.1	1	7.1	3	30.1	39.3	34.7	9.6	1
6 A12304-1sto	0	15.8	21.4	18.6	0	5.6	3	21.4	32.0	26.7	10.6	2
7 A12327-5VR	0	23.4	29.8	26.6	2	7.2	2	31.1	39.4	35.3	8.3	0
8 A13036-1	0	13.6	20.7	17.2	0	7.3	4	17.8	26.7	22.3	8.9	3
9 A13072-7	0	20.5	24.3	22.4	1	4.0	2	29.3	34.4	31.9	6.1	1
10 A13091-5	0	27.7	35.9	31.8	3	8.1	1	32.5	43.4	37.9	10.9	0
11 AOR10071-8	0	21.9	28.6	25.2	2	6.8	2	27.1	36.6	31.8	9.4	1
12 AOR15166-2	0	27.2	33.8	30.5	2	7.4	1	30.9	34.1	32.5	7.5	1
13 AOR15227-2	0	21.8	31.8	26.8	2	10.7	2	27.2	39.3	33.3	12.2	1
14 AOR15421-4	No Sample	12.4	14.0	13.2	0	2.1	4	16.3	19.7	18.0	4.0	3
15 COA15494-8	0	15.4	25.4	20.4	1	10.1	3	24.5	34.4	29.4	9.8	2
LSD 0.05	ns			2.9		3.6				3	3.8	
Average	0	19.6	26.8	23.2		7.5	2	25.4	34.6	30.0	9.6	2
<b>Idaho</b>												
1 Clearwater Russet	0	24.4	27.7	26.1	2	4.0	2	27.0	34.9	30.9	8.8	1
2 Ranger Russet	0	19.2	27.9	23.5	1	8.8	3	25.9	34.4	30.2	8.6	1
3 Russet Burbank	0	13.3	20.0	16.6	0	6.8	4	19.6	29.4	24.5	10.6	3
4 A10020-3sto	0	25.2	26.4	25.8	2	2.7	1	28.9	37.5	33.2	9.0	1
5 A10071-1	0	30.6	29.3	29.9	2	3.3	1	31.6	34.5	33.0	5.4	0
6 A12304-1sto	No Sample	19.1	25.2	22.1	1	6.1	3	23.6	28.2	25.9	5.7	2
7 A12327-5VR	0	29.1	33.1	31.1	3	4.2	1	32.3	41.8	37.1	9.7	0
8 A13036-1	0	14.9	21.2	18.0	0	6.8	4	19.6	26.5	23.0	6.9	3
9 A13072-7	0	14.6	21.8	18.2	0	7.1	4	20.6	31.8	26.2	11.2	2
10 A13091-5	No Sample	24.3	31.2	27.7	2	7.2	2	29.9	35.4	32.7	6.3	1
11 AOR10071-8	0	20.5	23.7	22.1	1	4.6	2	26.9	28.0	27.5	3.6	1
12 AOR15166-2	0	24.2	29.9	27.0	2	6.1	2	31.4	37.0	34.2	8.1	0
13 AOR15227-2	0	22.5	31.9	27.2	2	9.4	2	27.0	39.0	33.0	12.0	1
14 AOR15421-4	0	13.9	19.8	16.8	0	5.9	4	14.4	18.9	16.7	4.7	4
15 COA15494-8	0	20.8	33.9	27.3	2	13.2	2	24.8	37.5	31.2	12.7	2
LSD 0.05	ns			2.5		3.2				3.8	4.1	
Average	0	21.1	26.9	24.0		6.4	2.5	25.6	33.0	29.3	8.2	1.5
<b>Oregon</b>												
1 Clearwater Russet	0	31.6	39.3	35.5	3	7.6	0	36.6	47.2	41.9	10.7	0
2 Ranger Russet	0	20.1	26.3	23.2	1	7.2	2	23.6	35.4	29.5	12.3	2
3 Russet Burbank	0	18.4	24.4	21.4	1	6.0	3	19.9	26.5	23.2	6.6	3
4 A10020-3sto	0	29.2	35.2	32.2	3	6.3	1	32.4	39.4	35.9	7.0	0
5 A10071-1	0	28.8	31.3	30.0	2	5.6	1	33.9	39.2	36.5	7.9	0
6 A12304-1sto	0	25.2	32.7	29.0	2	7.5	1	30.3	37.5	33.9	7.6	1
7 A12327-5VR	0	27.5	33.4	30.4	2	7.9	1	33.2	35.2	34.2	6.9	0
8 A13036-1	0	22.7	34.3	28.5	2	11.6	2	28.2	34.1	31.2	6.0	1
9 A13072-7	0	35.6	34.5	35.0	3	2.4	0	39.4	38.9	39.2	4.8	0
10 A13091-5	0	36.3	42.4	39.3	4	6.2	0	45.7	50.1	47.9	4.5	0
11 AOR10071-8	0	31.0	38.7	34.9	3	7.7	0	28.3	36.2	32.3	7.9	1
12 AOR15166-2	0	39.5	42.0	40.8	5	4.3	0	38.4	46.2	42.3	8.1	0
13 AOR15227-2	0	36.2	42.6	39.4	4	6.4	0	42.1	49.8	45.9	8.0	0
14 AOR15421-4	0	34.3	45.1	39.7	4	10.8	0	39.1	49.1	44.1	10.2	0
15 COA15494-8	0	25.8	28.5	27.2	2	3.7	1	32.6	41.7	37.2	9.0	0
LSD 0.05	ns			3.6		3.1				4.0	4.0	
Average	0	29.5	35.4	32.4		6.7	1	33.6	40.4	37.0	7.8	1

Date test performed:

**Washington**

Dec. 18

Dec. 1

Dec. 13

**Idaho**

Dec. 18

Dec. 8

Dec. 14

**Oregon**

Dec. 18

Dec. 13

Dec. 14

DIFF = Absolute difference between bud and stem Photovolt reading.

Sprouting was rated after approximately 3 months in storage.

# 2023 Late Harvest Tri-State Trial

## Stored at 40°F for 60 Days and Water Blanched

PHOTOVOLT READING (60 Days at 40°F)							PHOTOVOLT AFTER WATER BLANCHING (10 min @ 160°F)				
Clone	stem	bud	ave	rtg \$	DIFF	USDA COLOR	stem	bud	ave	Diff	USDA COLOR
<b>Washington</b>											
1 Clearwater Russet	21.3	35.9	28.6	2	14.6	2	32.1	42.4	37.3	10.3	0
2 Ranger Russet	20.7	28.3	24.5	2	7.6	2	27.0	31.3	29.1	4.4	1
3 Russet Burbank	13.7	20.8	17.3	0	7.2	4	18.7	24.5	21.6	6.0	3
4 A10020-3sto	21.3	27.1	24.2	1	6.5	2	28.3	31.1	29.7	4.3	1
5 A10071-1	17.7	24.5	21.1	1	7.1	3	24.7	29.2	27.0	4.8	2
6 A12304-1sto	15.8	21.4	18.6	0	5.6	3	24.5	29.2	26.8	4.7	2
7 A12327-5VR	23.4	29.8	26.6	2	7.2	2	28.5	31.6	30.1	4.6	1
8 A13036-1	13.6	20.7	17.2	0	7.3	4	21.6	27.4	24.5	7.7	2
9 A13072-7	20.5	24.3	22.4	1	4.0	2	30.0	30.6	30.3	2.5	1
10 A13091-5	27.7	35.9	31.8	3	8.1	1	35.3	39.0	37.2	5.5	0
11 AOR10071-8	21.9	28.6	25.2	2	6.8	2	27.9	31.9	29.9	4.0	1
12 AOR15166-2	27.2	33.8	30.5	2	7.4	1	35.0	35.1	35.1	5.2	0
13 AOR15227-2	21.8	31.8	26.8	2	10.7	2	26.5	34.3	30.4	8.1	1
14 AOR15421-4	12.4	14.0	13.2	0	2.1	4	17.9	19.3	18.6	2.5	3
15 COA15494-8	15.4	25.4	20.4	1	10.1	3	24.7	29.7	27.2	6.1	2
<i>LSD</i> <sub>0.05</sub>			2.9		3.6				3	3	
Average	19.6	26.8	23.2		7.5	2	26.8	31.1	29.0	5.4	1
<b>Idaho</b>											
1 Clearwater Russet	24.4	27.7	26.1	2	4.0	2	35.8	35.0	35.4	3.1	0
2 Ranger Russet	19.2	27.9	23.5	1	8.8	3	29.2	35.3	32.2	6.9	1
3 Russet Burbank	13.3	20.0	16.6	0	6.8	4	22.8	27.6	25.2	5.0	2
4 A10020-3sto	25.2	26.4	25.8	2	2.7	1	32.8	34.5	33.7	4.0	0
5 A10071-1	30.6	29.3	29.9	2	3.3	1	36.7	35.6	36.2	2.5	0
6 A12304-1sto	19.1	25.2	22.1	1	6.1	3	28.9	32.8	30.8	4.3	1
7 A12327-5VR	29.1	33.1	31.1	3	4.2	1	33.3	34.9	34.1	2.6	0
8 A13036-1	14.9	21.2	18.0	0	6.8	4	20.8	24.4	22.6	4.7	2
9 A13072-7	14.6	21.8	18.2	0	7.1	4	22.5	29.1	25.8	6.7	2
10 A13091-5	24.3	31.2	27.7	2	7.2	2	31.6	36.8	34.2	5.6	0
11 AOR10071-8	20.5	23.7	22.1	1	4.6	2	29.9	29.6	29.7	3.8	1
12 AOR15166-2	24.2	29.9	27.0	2	6.1	2	30.4	36.0	33.2	7.1	1
13 AOR15227-2	22.5	31.9	27.2	2	9.4	2	29.6	37.2	33.4	7.8	1
14 AOR15421-4	13.9	19.8	16.8	0	5.9	4	18.1	23.9	21.0	5.8	3
15 COA15494-8	20.8	33.9	27.3	2	13.2	2	26.3	36.6	31.5	10.4	1
<i>LSD</i> <sub>0.05</sub>			2.5		3.2				2.7	3.2	
Average	21.1	26.9	24.0		6.4	2.5	28.6	32.6	30.6	5.3	1.0
<b>Oregon</b>											
1 Clearwater Russet	31.6	39.3	35.5	3	7.6	0	42.9	46.6	44.7	3.9	0
2 Ranger Russet	20.1	26.3	23.2	1	7.2	2	28.3	34.5	31.4	6.2	1
3 Russet Burbank	18.4	24.4	21.4	1	6.0	3	27.2	30.5	28.8	3.9	1
4 A10020-3sto	29.2	35.2	32.2	3	6.3	1	37.5	40.4	39.0	4.3	0
5 A10071-1	28.8	31.3	30.0	2	5.6	1	35.9	36.3	36.1	4.2	0
6 A12304-1sto	25.2	32.7	29.0	2	7.5	1	31.4	36.3	33.8	5.0	0
7 A12327-5VR	27.5	33.4	30.4	2	7.9	1	36.3	39.2	37.7	6.1	0
8 A13036-1	22.7	34.3	28.5	2	11.6	2	29.6	40.9	35.2	11.3	1
9 A13072-7	35.6	34.5	35.0	3	2.4	0	42.1	39.8	40.9	3.5	0
10 A13091-5	36.3	42.4	39.3	4	6.2	0	43.4	45.3	44.4	3.0	0
11 AOR10071-8	31.0	38.7	34.9	3	7.7	0	38.1	44.2	41.2	6.5	0
12 AOR15166-2	39.5	42.0	40.8	5	4.3	0	48.2	49.4	48.8	3.4	0
13 AOR15227-2	36.2	42.6	39.4	4	6.4	0	44.8	48.5	46.6	4.1	0
14 AOR15421-4	34.3	45.1	39.7	4	10.8	0	40.7	47.7	44.2	7.0	0
15 COA15494-8	25.8	28.5	27.2	2	3.7	1	30.8	32.4	31.6	4.0	1
<i>LSD</i> <sub>0.05</sub>			3.6		3.1				3.1	3.9	
Average	29.5	35.4	32.4		6.7	1	37.1	40.8	39.0	5.1	0

Date test performed:

**Washington**

Dec. 1

Dec. 1

**Idaho**

Dec. 8

Dec. 8

**Oregon**

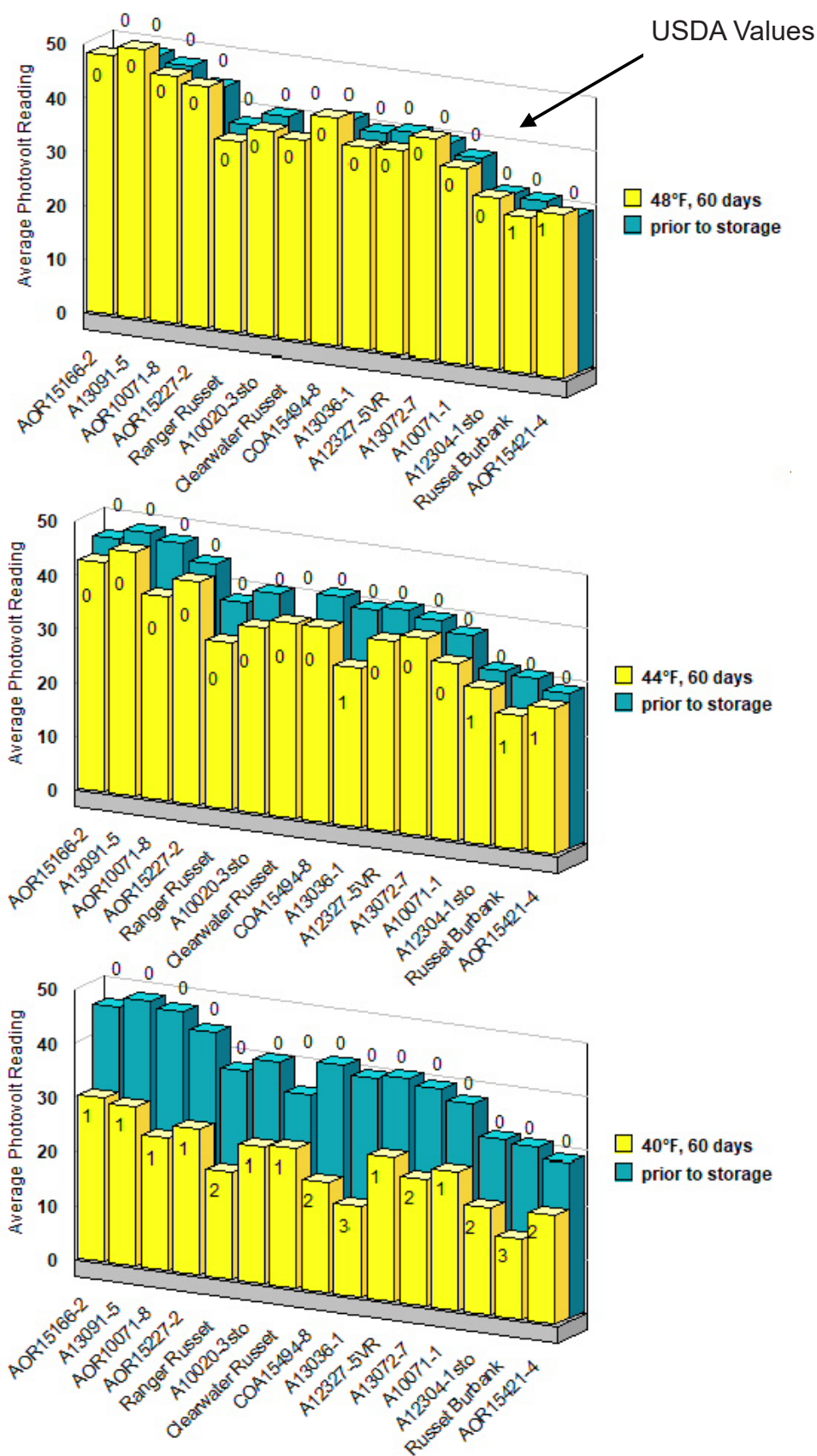
Dec. 13

Dec. 13

Diff = Absolute difference between stem and bud Photovolt reading.

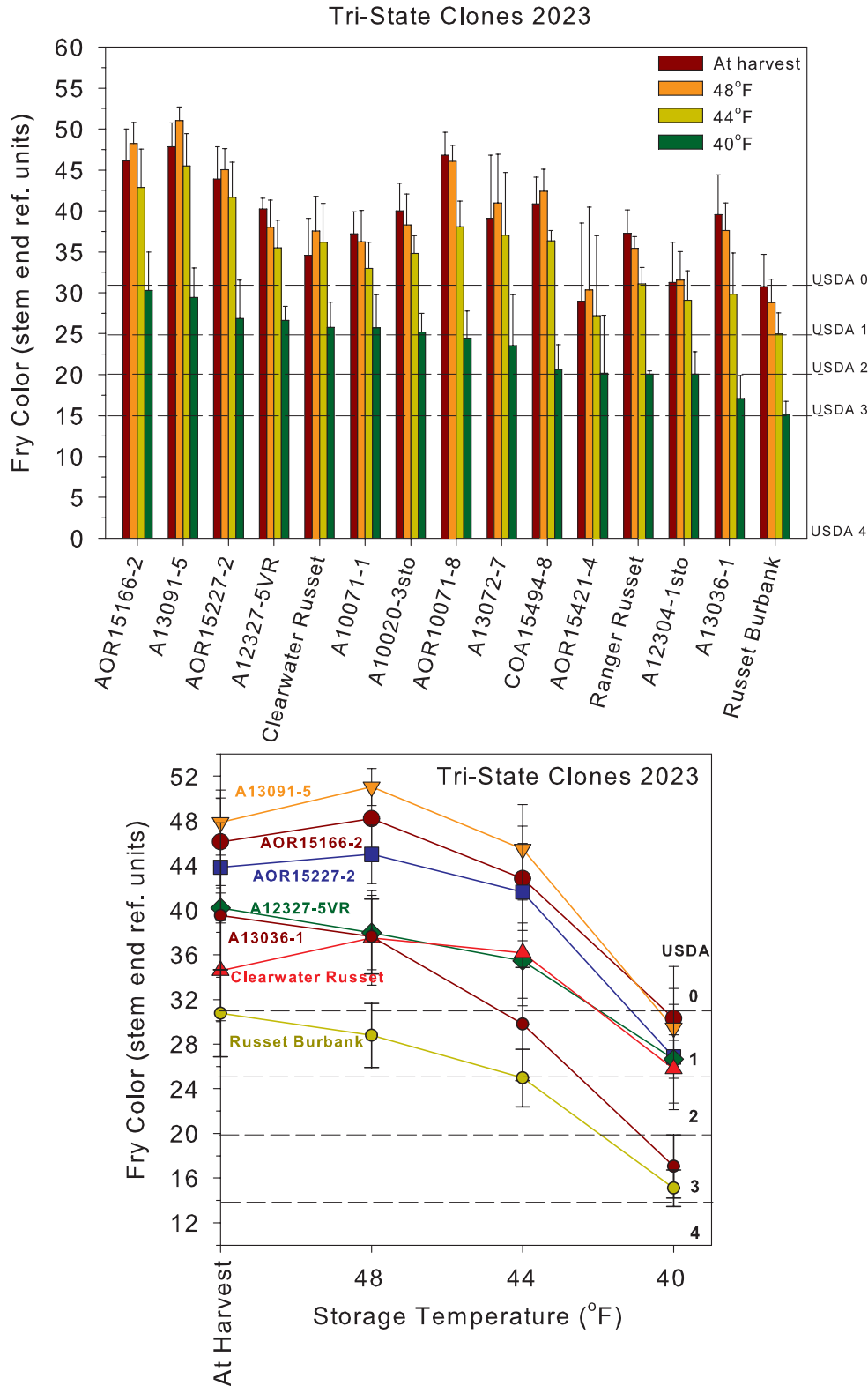
## 2023 Late Harvest Tri-State Trial

### Tri-State Trial - 3 state Average of Stem End





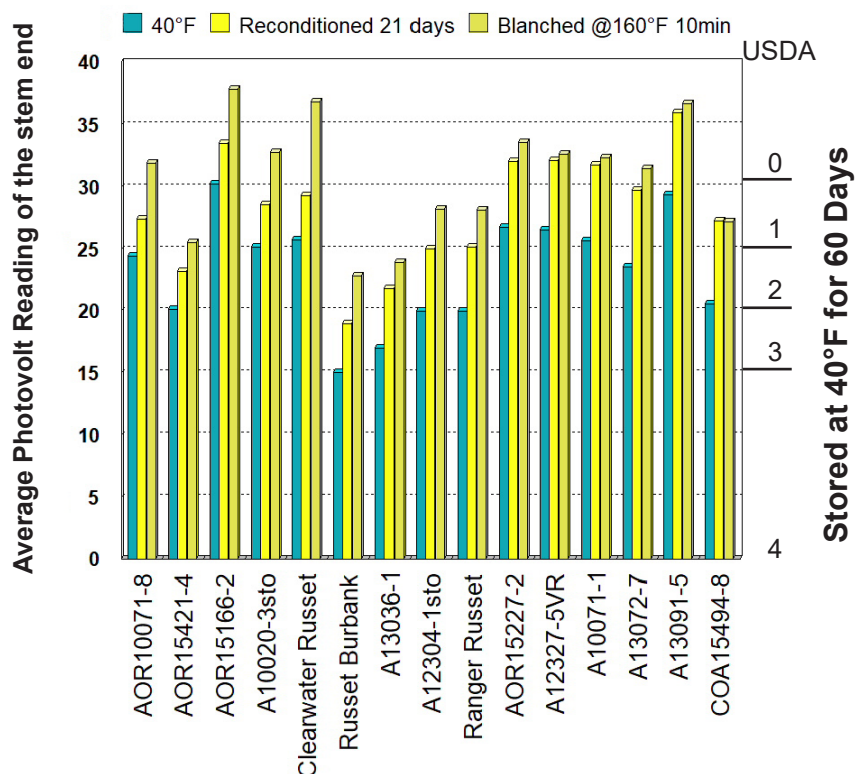
# 2023 Late Harvest Tri-State Trial



**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.

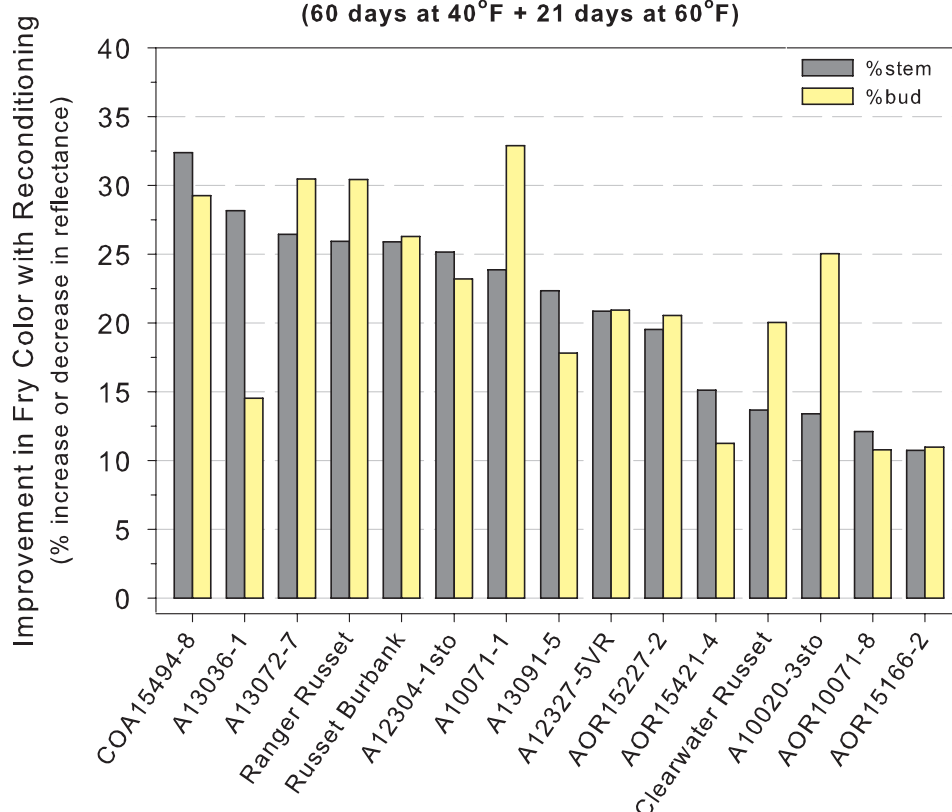
**Bottom:** Line graph depicting the effects of storage temperature on change in French fry processing quality (stem end fry color) of the most cold sweetening resistant (AOR15166-2, A13091-5\*, AOR15227-2, A12327-5VR, and Clearwater Russet\*) and susceptible (A13036-1 and RB\*) clones in the Tri-State Trial. \*Indicates similar performance of the clones last year.

## 2023 Late Harvest Tri-State Trial



### Reconditioning Ability - Tri-State Clones 2023

(60 days at 40°F + 21 days at 60°F)



Reconditioning abilities of clones in the 2023 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.

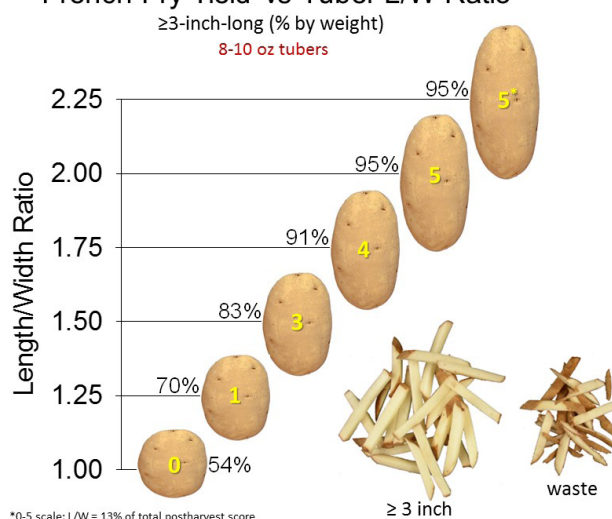
# 2023 Late Harvest Tri-State Trial

## Length to Width Ratios of 8-10 oz Tubers

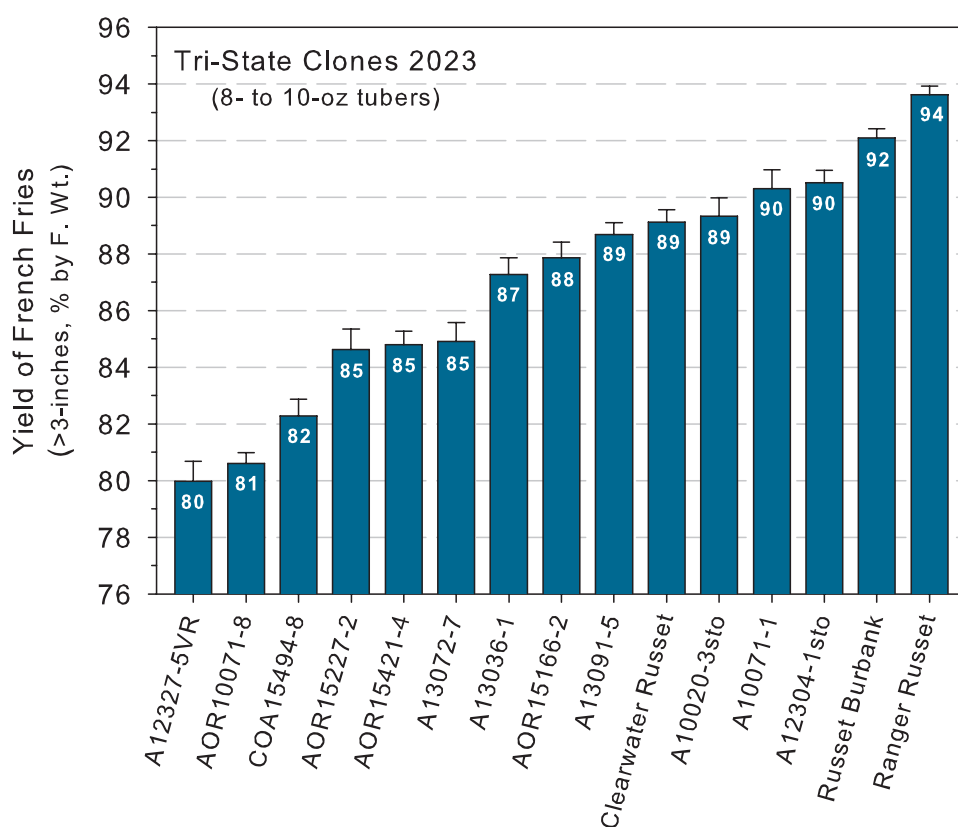
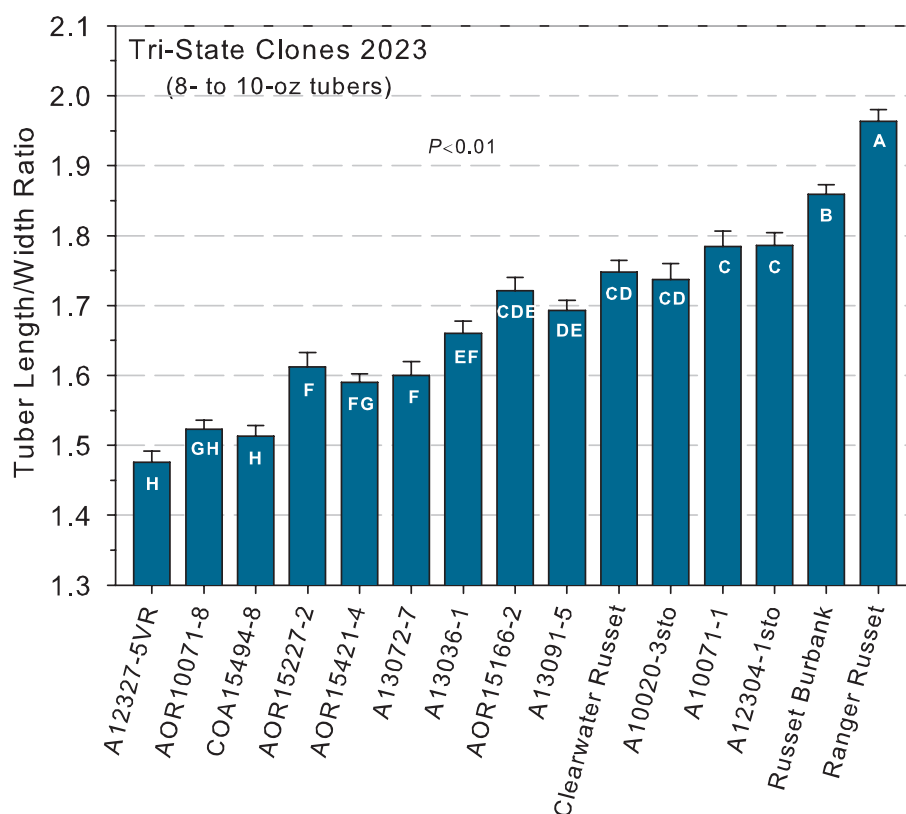
Clone	Tri-State Length to width ratio						3 State Avg.
	WA	rtg \$	ID	rtg \$	OR	rtg \$	
1 Clearwater Russet	1.58	3	1.99	5	1.68	4	1.75
2 Ranger Russet	1.84	5	2.08	5	1.97	5	1.96
3 Russet Burbank	1.73	4	2.01	5	1.84	5	1.86
4 A10020-3sto	1.66	4	1.85	5	1.70	4	1.74
5 A10071-1	1.75	4	1.89	5	1.71	4	1.78
6 A12304-1sto	1.72	4	1.96	5	1.68	4	1.79
7 A12327-5VR	1.36	2	1.73	4	1.35	2	1.48
8 A13036-1	1.65	4	1.80	5	1.53	3	1.66
9 A13072-7	1.44	2	1.79	4	1.58	3	1.60
10 A13091-5	1.68	4	1.71	4	1.69	4	1.69
11 AOR10071-8	1.30	1	1.91	5	1.36	2	1.52
12 AOR15166-2	1.62	3	2.02	5	1.52	3	1.72
13 AOR15227-2	1.50	3	1.90	5	1.44	2	1.61
14 AOR15421-4	1.53	3	1.77	4	1.47	2	1.59
15 COA15494-8	1.47	2	1.63	3	1.44	2	1.51
Average	1.59		1.87		1.60		1.68

Clone	Tri-State Width to thickness ratio				3 State Avg.
	WA	ID	OR		
1 Clearwater Russet	1.28	1.13	1.25		1.22
2 Ranger Russet	1.24	1.19	1.22		1.22
3 Russet Burbank	1.27	1.21	1.25		1.24
4 A10020-3sto	1.22	1.19	1.20		1.20
5 A10071-1	1.20	1.17	1.19		1.19
6 A12304-1sto	1.21	1.17	1.18		1.19
7 A12327-5VR	1.19	1.13	1.08		1.13
8 A13036-1	1.18	1.19	1.17		1.18
9 A13072-7	1.19	1.11	1.21		1.17
10 A13091-5	1.16	1.16	1.19		1.17
11 AOR10071-8	1.23	1.19	1.25		1.22
12 AOR15166-2	1.21	1.13	1.21		1.18
13 AOR15227-2	1.19	1.15	1.20		1.18
14 AOR15421-4	1.13	1.12	1.21		1.15
15 COA15494-8	1.31	1.21	1.33		1.28
Average	1.21	1.16	1.21		1.19

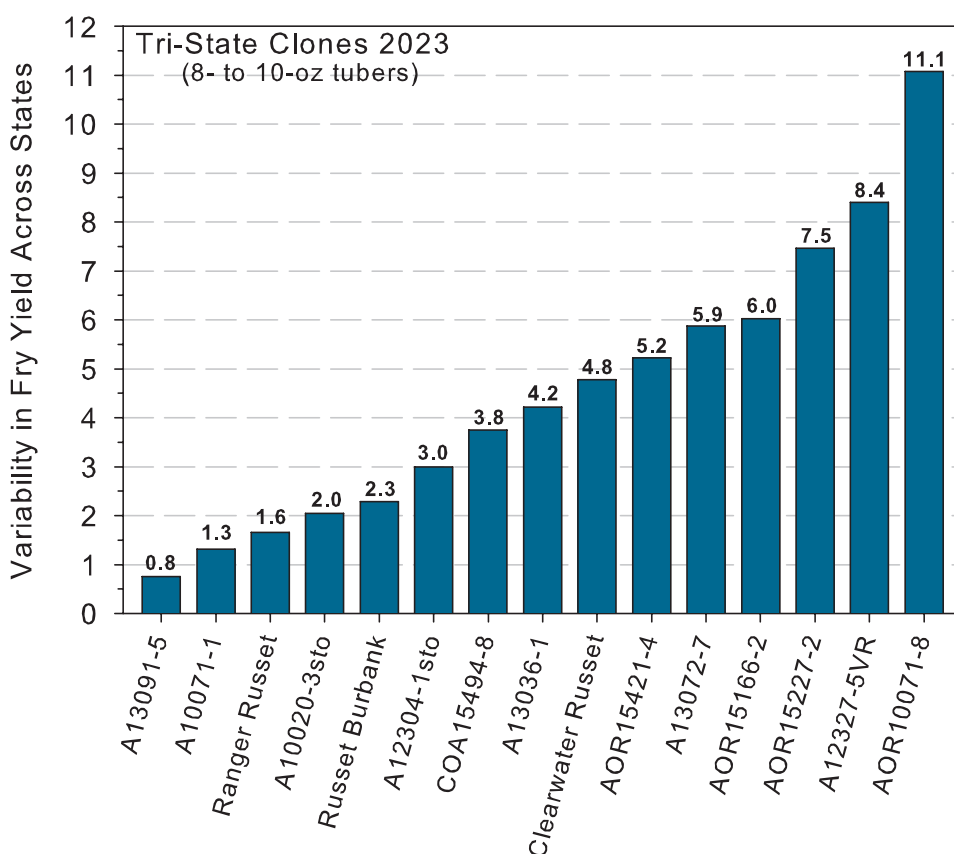
### French Fry Yield vs Tuber L/W Ratio



## 2023 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  $\geq 3$  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, AOR10071-8 had a length to width ratio of 1.52, resulting in 81% of the tuber producing usable French fries  $\geq 3$  inches in length (page 54). However, tuber shape of this entry also varied the most across production sites (see above), resulting in fry yields ranging from 75 to 87% ( $81 \pm 6.2\%$ ).

Pages 54-55: Tuber length to width ratios and the associated percentage yield of fries. Bars with same letter are not significantly different ( $P \leq 0.01$ ).

# 2023 Early Harvest Regional Trial

Location: WSU Research Center – Othello, WA

Planting Date: April 6

Vine Kill Date: July 21

Harvest Date: August 9

Days Grown: 106

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 4 local reference varieties to 12 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**

➤ **Total Yield and U.S. #1 Yield**

*Highest:* A12305-2adg had the highest total yield (712 CWT/A) and the highest U.S. #1 yield (593 CWT/A). A09086-1LB had the second highest total yield (670 CWT/A) and A13036-12 had the second highest U.S. #1 yield (581 CWT/A).

*Lowest:* Shepody had the lowest total yield (485 CWT/A and the lowest U.S. #1 yield (205 CWT/A). AC12090-3RU had the second lowest total yield (505 CWT/A).

➤ **% U.S. #1's (greater than 4 oz)**

*Highest:* A13036-12 (93%) and A12169-5 (89%).

*Lowest:* Shepody (42%) and Russet Burbank (68%).

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

*Highest:* A13036-12 (21.3 Tons/A) and A12305-2adg (20.2 Tons/A).

*Lowest:* Shepody (5.1 Tons/A) and CO13003-1RU (7.7 Tons/A).

➤ **Gross Return (\$/acre)**

*Fresh Market Highest:* A13036-12, A12305-2adg, and A12169-5.

*Fresh Market Lowest:* Shepody, CO13003-1RU, and COTX10080-2Ru.

*Process Market Highest:* A13036-12, AOR13064-2, and A12305-2adg.

*Process Market Lowest:* Shepody, CO13003-1RU, and AC12090-3RU.

# 2023 Early Harvest Regional Trial

## Summaries

ENTRY	TOTAL YIELD						CARTON YIELD		PROCESS YIELD	
			US # 1's*		US # 2's*		100-50 count		US 1's and 2's	
	CWT/A	Tons/A	> 4 oz	% of Total Yield	> 4 oz	& < 4 oz	% of Total Yield	Tons/A	% of Total Yield	Tons/A
Ranger Russet	579	BCDE	29.0	77	8	14	52	15.2	70	20.4
Russet Burbank	606	ABCDE	30.3	68	8	23	45	13.6	60	18.1
A09086-1LB	670	AB	33.5	81	1	18	41	13.7	57	18.9
A10594-4sto	583	BCDE	29.2	81	6	13	55	15.9	74	21.8
A12169-5	613	ABCDE	30.6	89	4	7	65	19.8	87	26.7
A12305-2adg	712	A	35.6	83	3	14	57	20.2	68	24.4
A13036-12	623	ABCDE	31.1	93	3	4	68	21.3	90	27.9
AC12090-3RU	505	DE	25.3	80	3	17	56	14.2	68	17.1
AFA5661-8	627	ABCD	31.3	81	9	10	59	18.4	79	24.9
AOR11217-3	561	BCDE	28.0	82	3	15	57	16.0	69	19.3
AOR13064-2	667	AB	33.3	86	4	11	56	18.7	81	27.0
CO13003-1RU	541	BCDE	27.1	72	0	27	28	7.7	41	11.2
COTX08063-2Ru	608	ABCDE	30.4	79	1	20	42	12.7	56	17.3
Russet Norkotah	536	CDE	26.8	77	3	20	50	13.3	64	17.6
Shepody	485	E	24.3	42	24	34	21	5.1	48	11.6
COTX10080-2Ru	656	ABC	32.8	73	1	26	34	11.1	50	16.4

ENTRY	US # 1 YIELD						> 4 oz	INTERNAL DEFECTS (%)		
	> 4 oz		> 4 oz	4-7 oz*	7-14 oz*	> 14 oz*	SPECIFIC GRAVITY	(8-12 oz tubers)		
	CWT/A	STATS**	Tons/A	----- % -----				% HH	% BC	% IBS
Ranger Russet	452	A	22.6	32	55	13	1.071	0	0	0
Russet Burbank	411	AB	20.6	33	60	7	1.067	3	3	3
A09086-1LB	545	A	27.2	49	48	3	1.076	0	0	0
A10594-4sto	468	A	23.4	27	58	15	1.074	33	17	0
A12169-5	549	A	27.4	12	53	35	1.070	0	0	3
A12305-2adg	593	A	29.6	32	67	1	1.071	0	0	0
A13036-12	581	A	29.0	11	49	40	1.068	0	0	0
AC12090-3RU	402	AB	20.1	28	55	17	1.068	0	0	0
AFA5661-8	506	A	25.3	22	65	13	1.074	0	0	0
AOR11217-3	460	A	23.0	29	58	13	1.075	0	0	0
AOR13064-2	572	A	28.6	15	49	37	1.071	0	0	0
CO13003-1RU	391	AB	19.5	61	39	0	1.068	10	0	0
COTX08063-2Ru	485	A	24.2	45	46	8	1.085	0	0	0
Russet Norkotah	415	AB	20.7	33	56	11	1.070	0	0	0
Shepody	205	B	10.3	51	40	9	1.066	0	0	0
COTX10080-2Ru	478	A	23.9	53	43	4	1.064	0	0	0

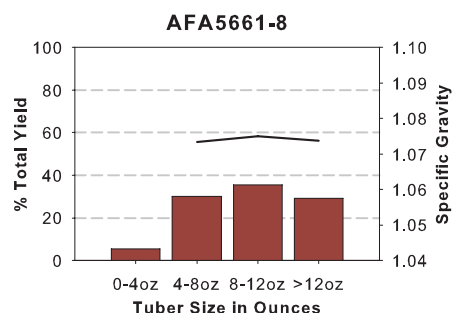
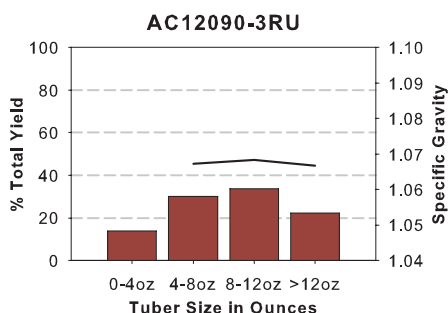
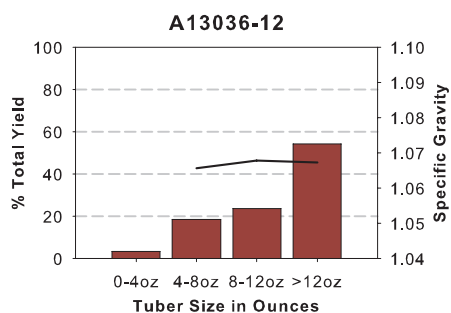
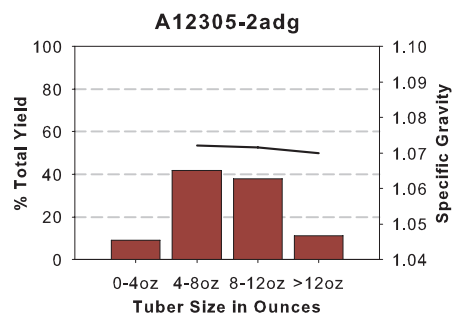
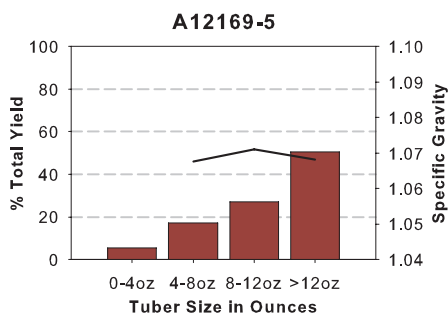
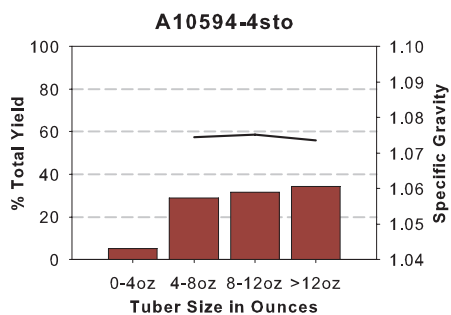
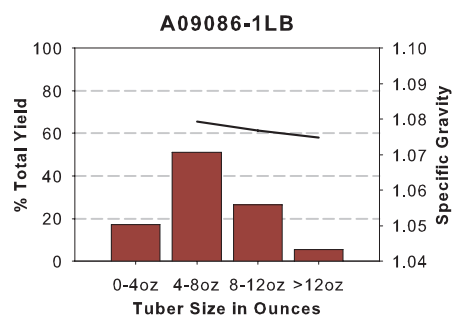
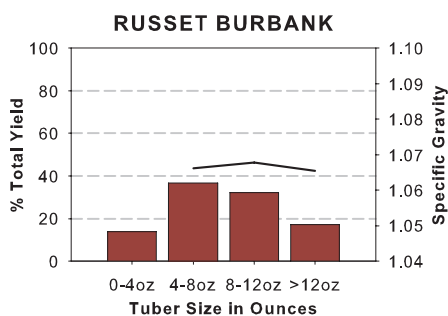
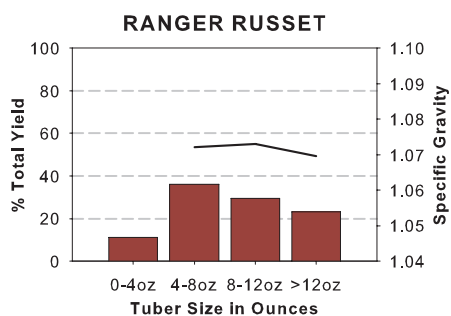
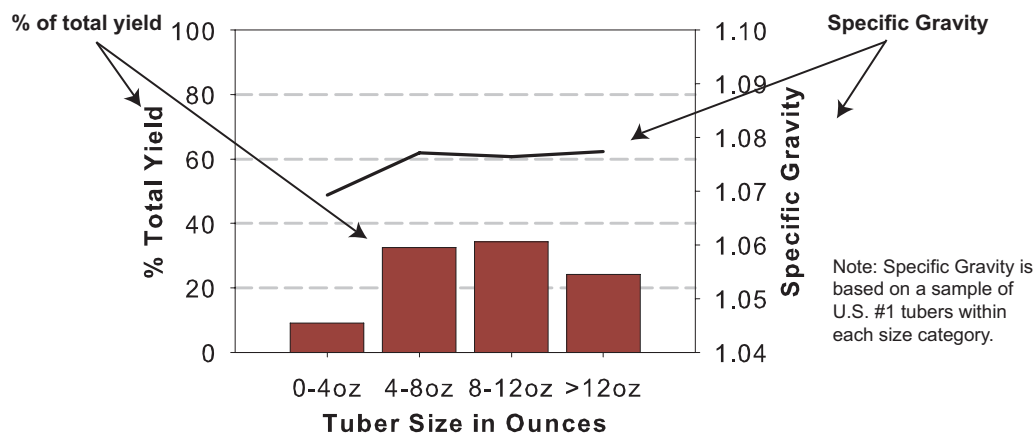
ENTRY	40 DAY	50 DAY	TUBER	STEMS PER	AVERAGE TUBER		SKIN	TUBER	BRUISE (%)	
	STAND	STAND	GREENING	PLANT	WEIGHT	NUMBER	SET	SHAPE	(8-12 oz tubers)	
	% Emerged	% Emerged	% Total Yield	Above Ground	Ounces	Tubers/Plant	1 = Poor 5 = Good	1 = Round 5 = Long	BLACKSPOT	SHATTER
Ranger Russet	80	100	0	1.9	6.7	8.4	4.0	4.0	0	0
Russet Burbank	53	71	1	2.1	6.2	9.6	3.0	3.3	0	10
A09086-1LB	67	100	1	2.6	5.4	12.1	3.0	3.0	0	30
A10594-4sto	33	87	2	1.7	8.1	7.0	3.0	3.3	0	10
A12169-5	76	93	0	1.7	9.2	6.6	3.0	2.7	0	13
A12305-2adg	69	96	2	1.9	6.6	10.6	3.0	2.7	0	7
A13036-12	80	100	0	2.1	9.8	6.3	4.0	3.0	0	20
AC12090-3RU	38	84	5	2.2	6.4	7.7	4.0	4.0	0	17
AFA5661-8	22	89	4	1.7	8.2	7.5	3.3	2.7	3	0
AOR11217-3	71	89	1	1.9	6.7	8.2	3.0	4.0	0	10
AOR13064-2	82	96	0	2.1	8.7	7.6	3.0	4.0	0	7
CO13003-1RU	64	91	0	3.1	4.6	11.4	5.0	2.3	0	7
COTX08063-2Ru	87	96	2	2.6	5.5	10.8	4.0	3.7	0	27
Russet Norkotah	47	87	3	2.1	5.9	8.9	3.7	4.0	0	0
Shepody	18	89	5	2.1	5.5	8.7	4.0	4.0	0	10
COTX10080-2Ru	69	96	2	2.3	5.1	12.6	5.0	4.0	0	10

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

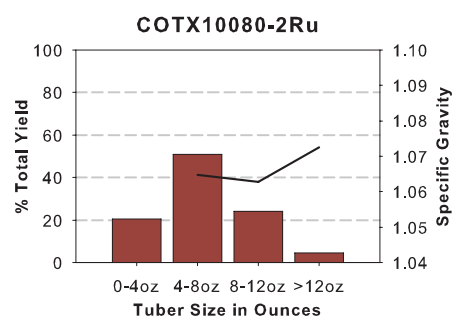
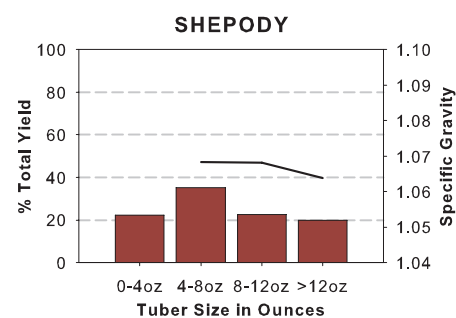
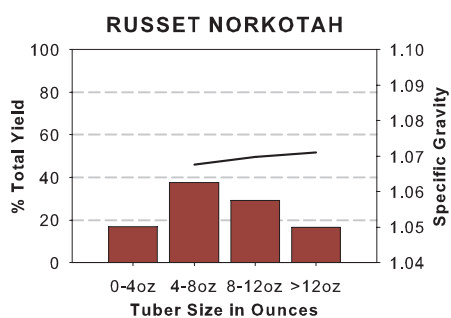
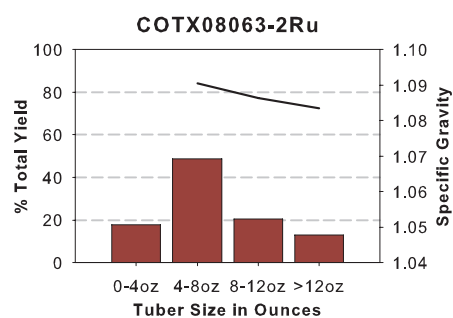
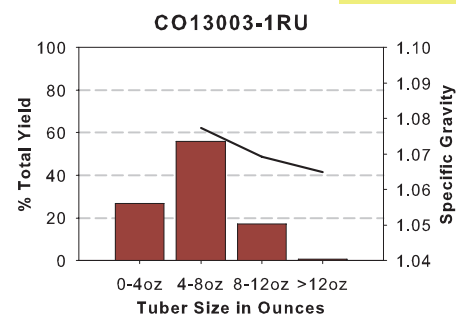
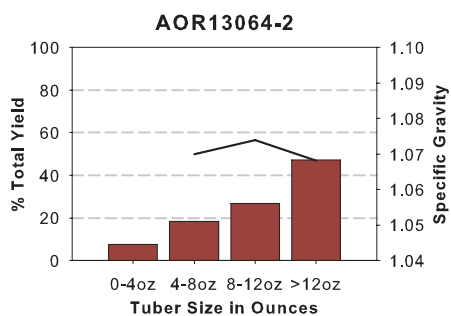
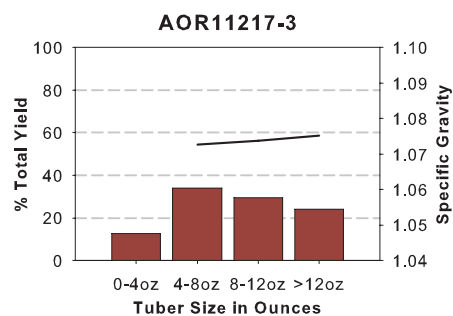
# 2023 Early Harvest Regional Trial

## Tuber Yield and Specific Gravity Distributions

### 12 inch In-Row Spacing







## 2023 Early Harvest Regional Trial

### Tubers

Ranger Russet



Russet Burbank



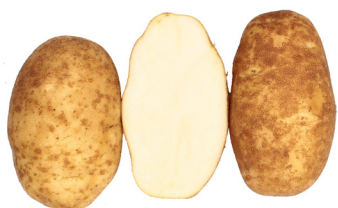
Shepody



Russet Norkotah



A09086-1LB



A10594-4sto



A12169-5



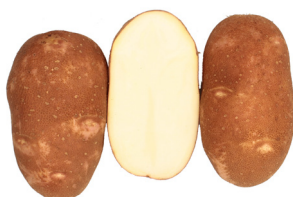
A12305-2adg



A13036-12



AC12090-3RU



AFA5661-8



AOR11217-3



AOR13064-2



CO13003-1RU

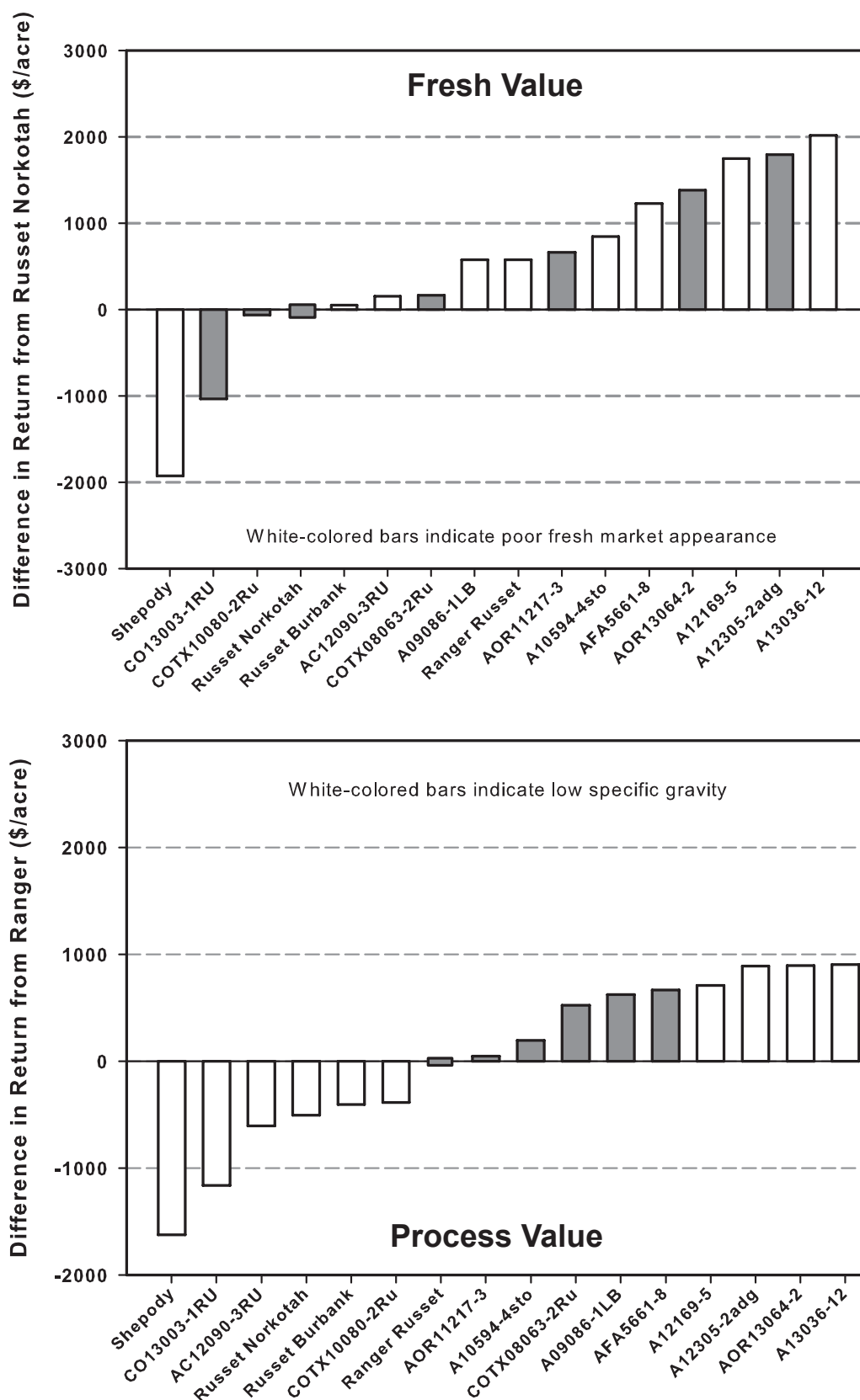


COTX08063-2Ru



COTX10080-2Ru





**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.

# 2023 Late Harvest Regional Trial

Location: WSU Research Center – Othello, WA

Planting Date: April 4

Vine Kill Date: September 1

Harvest Date: September 11

Days Grown: 152

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 12 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): None**

**Process Market Standout(s): AOR11217-3, A10594-4sto**

## Yield and Economic Data

### ➤ Total Yield and U.S. #1 Yield

*Highest:* Norkotah C-3 had the highest total yield (1022 CWT/A) and the highest U.S. #1 yield (911 CWT/A). A12305-2adg had the second highest total yield (991 CWT/A) and the second highest U.S. #1 yield (865 CWT/A).

*Lowest:* COTX0863-2Ru had the lowest total yield (732 CWT/A). A12169-5 had the lowest U.S. #1 yield (583 CWT/A).

### ➤ % U.S. #1's (greater than 4 oz)

*Highest:* Norkotah C-3 (89%) and A09086-1LB (88%).

*Lowest:* A12169-5 (72%) and Russet Burbank (74%).

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

*Highest:* A12305-2adg (32.7 Tons/A) and A09086-1LB (30.0 Tons/A).

*Lowest:* A12169-5 (15.1 Tons/A) and COTX08063-2Ru (18.4 Tons/A).

### ➤ Gross Return (\$/acre)

*Fresh Market Highest:* A12305-2adg and Norkotah C-3.

*Fresh Market Lowest:* A12169-5, COTX0863-2Ru, and Russet Burbank.

*Process Market Highest:* A09086-1LB and A12305-2adg.

*Process Market Lowest:* Russet Burbank, COTX10080-2Ru, and COTX0863-2Ru.



# 2023 Late Harvest Regional Trial

## Postharvest Information

The 2023 trial evaluated 11 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 except for CO13003-1RU received higher overall postharvest scores than Russet Burbank. An “\*” in the summary below indicates similar performance and/or ranking in trials from previous years. A “†” indicates a clone was a top performer in the Tri-State Trial the previous year.

### ➤ Overall Postharvest Ratings

*Highest scoring clones:* AOR13064-2†, A12169-5†, A13036-12

*Lowest scoring clones:* CO13003-1RU\*, Russet Burbank\*, A12305-2adg

### ➤ Low Temperature Sweetening

*Most resistant:* AOR13064-2†, A12169-5†, A13036-12†, AFA5661-8\*

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

### ➤ Tuber asparagine content (WA Regional Trial samples)

*Highest concentration:* CO13003-1RU, A13036-12, Russet Burbank\*

*Lowest concentration:* AFA5661-8, AOR11217-3, COTX08063-2RU

### ➤ French Fry Taste Panel

*Highest rated:* COTX08063-2RU, Clearwater Russet\*, AOR13064-2†

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

### ➤ Blackspot Bruise Susceptibility

*Most resistant:* A12169-5†, Clearwater Russet, A12305-2adg

*Most susceptible:* Ranger Russet\*, A09086-1LB\*, AFA5661-8

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

*Lowest L/W:* AFA5661-8\*, CO13003-1RU\*, A13036-12

*Highest L/W:* AC12090-3RU8, Russet Burbank\*, Ranger Russet\*

*Lowest W/Th:* AFA5661-8, AC12090-3RU, A12305-2adg\*

*Highest W/Th:* Russet Burbank, CO13003-1RU\*, Ranger Russet

*Least variable:* AOR13064-2, AC12090-3RU\*, A13036-12, COTX08063-2RU (Note: COTX08063-2RU was missing an ID sample so variation was between 2 states vs 3 states so it had lower variability).

*Most variable:* Clearwater Russet\*, A10594-4sto\*, AFA5661-8, A12169-5

## Details

- AOR13064-2†, A12169-5†, and A13036-12 were the highest rated entries, scoring 33.1, 29.4, and 29.4 points of 38 possible points, respectively. Overall scores (range and average across clones) were on par with last year.
- CO13003-1RU\*, Russet Burbank\*, and A12305-2adg scored the lowest on the overall postharvest performance with 13.5, 17.7, and 19.6 of 38 possible points.
- AOR13064-2†, A12169-5†, A13036-12†, and AFA5661-8\* were all rated resistant to cold sweetening with AOR13064-2 having the best fry color. AOR13064-2 and A13036-12† produced USDA 0 fries (stem end) when stored for 60 days at 40°F averaged across locations and A12169-5† and AFA5661-8\* produced USDA 1 fries under the same conditions. Russet Burbank\*, A09086-1LB\*, and CO13003-1RU\* were the most susceptible to LTS, producing USDA 4 fries after 60

days at 40°F.

- Compared as a percentage of Russet Burbank, CO13003-1RU had the highest concentration of asparagine (asn; 119%) (acrylamide precursor) followed by A13036-12 (102%) and AC13090-3RU (86%). COTX08063-2RU (51%), AOR11217-3 (39%), and AFA5661-8 (18%) produced the lowest concentration of asn. However, COTX08063-2RU and AOR11217-3 are cold sweetening susceptible and therefore would likely not have a low acrylamide forming phenotype when stored cold. By contrast, AFA5661-8 was resistant to cold sweetening, which when coupled with its low asn concentration would limit acrylamide formation during processing. Low asparagine and reducing sugars are indicators of low acrylamide forming potential.
- Average (across states) gravities of Russet Burbank\* were the lowest, 1.074, to low for frozen process contracts. The gravities of the other entries ranged from 1.075 to 1.099 when averaged across states. When averaged across the entries, gravities were 1.079 (WA), 1.082 (ID), and 1.085 (OR), lower than the 2022 season. Gravities from WA were the lowest and ranged from 1.071 to 1.100. Over all locations, COTX08063-2RU, A09086-1LB\*, AFA5661-8\* had the highest gravities (1.099, 1.091 & 1.087; span= 1.088-1.097, 1.086-1.094 & 1.083-1.090). Specific gravity span was estimated by 3 reps of 4 tubers weighed in the air and in water.
- COTX08063-2RU, Clearwater Russet\*, and AOR13064-2† were the favorites in the taste panels, scoring 3.8/5 on average across growing locations (5 is best). Russet Burbank\*, CO13003-1RU\*, and AC12090-3RU\* received the lowest taste panel score of 2.8 on average.
- On average, tubers grown in OR produced the lightest fry colors at harvest and post-storage regardless of the storage temperature. The Regional entries from all locations averaged 91% and 62% of their at-harvest process quality (stem end fry color) when stored at 44°F and 40°F for 45 and 60 days, respectively. Storage at 48°F saw no reduction in storage color during the 2023 season, similar to the 2022 results.
- Non-uniformity of color was observed in all states and storage treatments to some degree. Of the eleven experimental entries at harvest 3 entries from WA & ID and 1 from OR; 2 (WA); 3 (ID), & 1 entries (OR) at 48°F; 2 (WA) and 3 entries (ID & OR each) at 44°F; and 2 entries at 40°F (WA, ID, & OR each) were non-uniform in fry color (bud to stem end photovolt unit difference ≥9). The top-rated entries, AOR13064-2, A12169-5, and A13036-12 maintained fry color regardless of production site (WA, ID, OR) and storage temperature (48, 40°F) after 60 days (45 days for 44°F) while the commercial controls, Russet Burbank, Ranger Russet, and Clearwater Russet exhibited a range of non-uniformity.
- Retention of process quality during storage of Clearwater Russet, AFA5661-8\*, and COTX08063-2RU at 44°F (45 days) was highly variable across production sites. By contrast, growing location had the least effect on the change in fry color of Ranger Russet, A09086-1LB, and A13036-12 following 45 days at 44°F.
- COTX08063-2RU, A09086-1LB\* and CO13003-1RU showed the greatest percent photovolt improvement in stem end fry color (37%, 36% & 33%) 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 (3.4%, 5.6%, & 5.9%). A12305-2adg\* and AC12090-3RU 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. Clearwater Russet, CO13003-1RU, and A09086-1LB benefited the most and improved percent stem fry color 45%, 42%, and 41% compared to stem end fry color at 40°F storage. Blanching had the least effect on AFA5664-8, A13036-12, and AOR13064-2 (26%, 16%, and 11%). When averaged for location and entry, average fry color (bud+stem) percent recovery from 40°F storage was equivalent in blanched samples (ca. 24%) to reconditioned samples (ca.

21%) for the 2023 crop, though reconditioning resulted in an average non-uniform fry color (ca. 9.1) and blanching preserved fry color uniformity (ca. 5.7).

- In 2021 through 2023, blanching improved stem end fry color more than reconditioning, but reconditioning improved bud end fry color more than blanching.
- A12169-5†, Clearwater Russet, and A12305-2adg were the most resistant to blackspot bruise and averaged 10-39% bruise (stem end) in the controlled impact study (3-state average). These entries also scored lowest in bruise severity, averaging 1.6/5 (1 = no bruise; 5 = 100% of impact area is dark). Ranger Russet\*, A09086-1LB\*, and AFA5661-8 were highly susceptible to bruise, averaging 82% bruise. Bruise severity was also greatest in these three entries (ca. 3.2/5).
- ID grown tubers (8-10 oz) had the highest L/W ratios (1.91) compared to those grown in OR (1.69) and WA (1.64). AFA5661-8\*, CO13003-1RU\*, and A13036-12 had the lowest L/W ratios (avg. 1.56), reflecting a rounder tuber shape phenotype. AC12090-3RU8, Russet Burbank\*, and Ranger Russet\* had the highest L/W ratios (1.96-1.83). Clearwater Russet\*, A10594-4sto\*, AFA5661-8, and A12169-5 showed the greatest variation in L/W ratio 8- to 10-oz tubers across production sites. By contrast, the L/W ratios of AOR13064-2, AC12090-3RU\*, A13036-12, and COTX08063-2RU were the least affected by the growing region. It is important to note, COTX08063-2RU was missing a sample from ID so variation was only between OR and WA vs all three states. Annually, L/W is similar between OR and WA with the greatest difference from ID, so this resulted in a very low variability value for COTX08063-2RU. Width to thickness (W/Th) ratios were measured for the 2023 crop. The average difference in W/Th was minimal (max. 0.11; consistent with 2022) among all entries and production sites. AFA5661-8, AC12090-3RU, and A12305-2adg\* had the most consistent diameter (1.15, 1.14 & 1.13, respectively) and Russet Burbank, CO13003-1RU\*, and Ranger Russet were the least consistent (1.24, 1.23 & 1.22, respectively).
- Following 60 days at 48°F, 93% of A09086-1LB\* tubers were sprouting with an average sprout length of 0.4-inches, indicating a relatively short dormancy (Ranger = 82% with 0.5-inch sprouts). By contrast, no tubers had sprouted in AC12090-3RU\* and CO13003-1RU\*. Average percent sprouting and sprout lengths were greatest in the OR samples (56%; 0.6-inches) followed by WA (41%; 0.3-inches long) and then by ID (33%, ca. 0.1-inches long).
- After 7-months of storage (3 months at 48°F + 4 months at 44°F) of the 2022 crop, sprout lengths ranged from 0.8 to 2.7-inches depending on the clone and state. AOR13064-2 and A12169-5 produced the longest sprouts (avg. 2.7 & 2.6-inches), indicating a shorter dormancy than the other clones. By contrast, AC12090-3RU averaged 0.8-inch sprouts which indicates a longer dormancy than Russet Burbank and Clearwater Russet (1.8- and 1.1-inch sprouts).

### Overall Regional Postharvest Merit Scores

		2023 LRT Postharvest Merit Scores			3 state
	Clone	WA	ID	OR	Average
12	AOR13064-2	3.9	4.6	4.6	4.4
6	A12169-5	3.2	4.1	4.3	3.9
8	A13036-12	3.3	4.3	4.0	3.9
5	A10594-4sto	3.6	3.6	4.0	3.8
11	AOR11217-3	3.6	3.5	4.1	3.7
2	Ranger Russet	3.2	3.2	4.1	3.5
14	COTX08063-2Ru	2.9	No Sample	4.0	3.5
1	Clearwater Russet	3.0	2.5	4.7	3.4
10	AFA5661-8	3.3	2.7	4.0	3.3
9	AC12090-3RU	2.4	2.7	3.2	2.8
4	A09086-1LB	2.7	2.5	2.9	2.7
7	A12305-2adg	1.8	2.2	3.7	2.6
3	Russet Burbank	1.9	1.9	3.2	2.3
13	CO13003-1RU	0.9	2.3	2.1	1.8

# 2023 Late Harvest Regional Trial

## Summaries

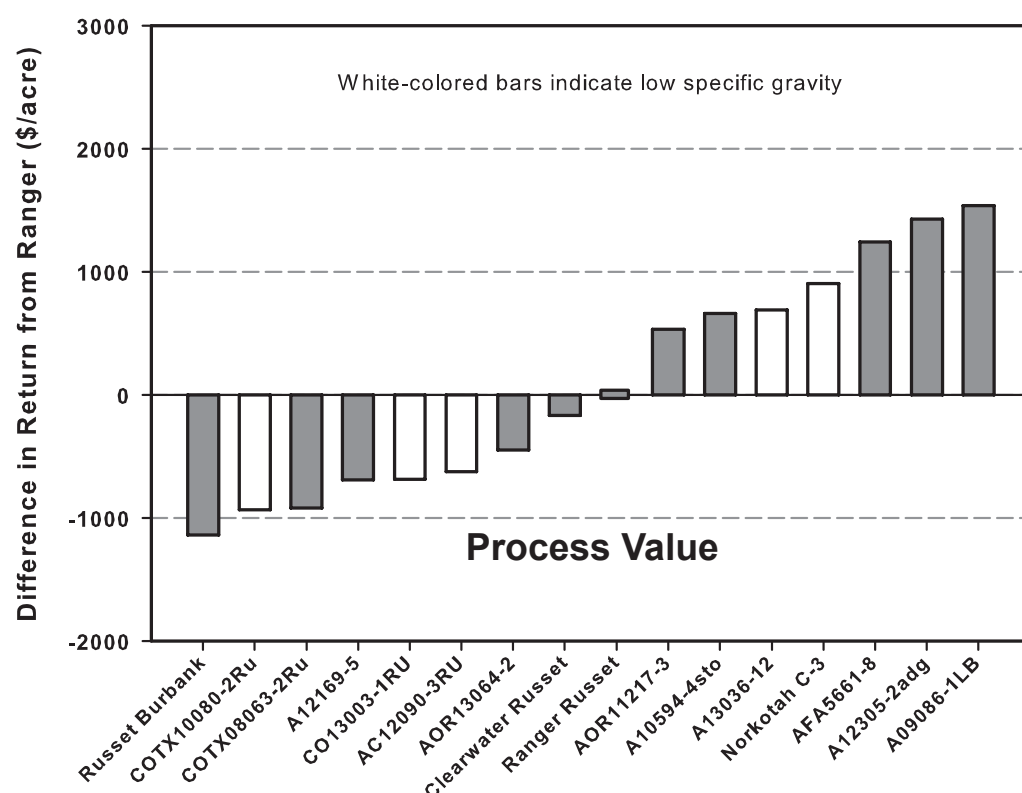
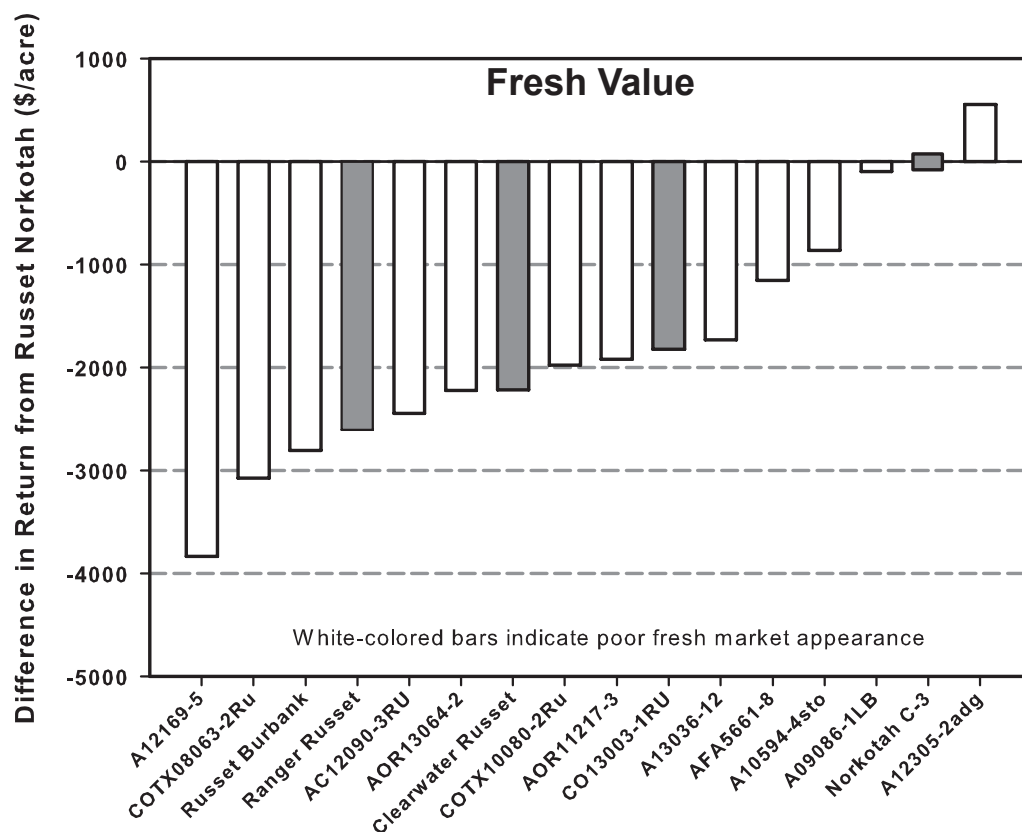
ENTRY	TOTAL YIELD			US # 1's*			CARTON YIELD		PROCESS YIELD	
	CWT/A	STATS**	Tons/A	US # 2's*			100-50 count		US 1's and 2's	
				> 4 oz	> 4 oz	& < 4 oz	(US 1's 7-18 oz)		> 6 oz	
				% of Total Yield			% of Total Yield	Tons/A	% of Total Yield	Tons/A
Clearwater Russet	790	EFG	39.5	84	3	13	54	21.3	69	27.4
Ranger Russet	862	CDEF	43.1	75	10	15	48	20.6	77	33.1
Russet Burbank	822	DEFG	41.1	74	10	17	47	19.3	71	29.1
A09086-1LB	965	ABC	48.3	88	3	9	62	30.0	78	37.6
A10594-4sto	918	BCDE	45.9	85	6	9	60	27.4	85	39.3
A12169-5	808	DEFG	40.4	72	15	12	37	15.1	83	33.7
A12305-2adg	991	AB	49.6	87	6	7	66	32.7	86	42.9
A13036-12	988	AB	49.4	87	9	4	47	23.2	91	45.3
AC12090-3RU	844	CDEF	42.2	80	5	14	50	21.0	76	32.2
AFA5661-8	941	ABCD	47.1	84	7	9	57	26.7	87	41.2
AOR11217-3	845	CDEF	42.3	86	4	10	54	22.9	77	32.7
AOR13064-2	768	FG	38.4	84	8	8	57	22.0	82	31.3
CO13003-1RU	856	CDEF	42.8	83	2	14	54	22.9	68	29.2
COTX08063-2Ru	732	G	36.6	81	3	16	50	18.4	69	25.3
Norkotah C-3	1022	A	51.1	89	6	5	58	29.6	88	45.1
COTX10080-2Ru	905	BCDE	45.2	80	1	19	50	22.4	63	28.9

ENTRY	US # 1 YIELD						> 4 oz	INTERNAL DEFECTS (%)		
	> 4 oz		> 4 oz	4-7 oz*	7-14 oz*	> 14 oz*	SPECIFIC GRAVITY	(8-12 oz tubers)		
	CWT/A	STATS**	Tons/A	----- % -----				% HH	% BC	% IBS
Clearwater Russet	667	DEFG	33.3	32	51	17	1.082	0	0	0
Ranger Russet	644	EFG	32.2	14	48	38	1.080	0	0	0
Russet Burbank	607	EFG	30.4	25	51	24	1.073	10	3	5
A09086-1LB	846	ABC	42.3	24	59	16	1.087	0	0	0
A10594-4sto	780	BCD	39.0	11	47	42	1.078	18	3	10
A12169-5	583	G	29.1	12	34	54	1.074	0	0	0
A12305-2adg	865	AB	43.2	12	55	33	1.079	0	0	0
A13036-12	856	AB	42.8	9	40	51	1.068	8	0	0
AC12090-3RU	679	DEFG	33.9	18	45	36	1.073	0	0	0
AFA5661-8	782	BCD	39.1	7	41	52	1.085	0	0	0
AOR11217-3	726	CDE	36.3	23	49	28	1.082	0	0	0
AOR13064-2	646	EFG	32.3	18	50	33	1.078	0	0	0
CO13003-1RU	712	DEF	35.6	33	56	11	1.074	5	3	0
COTX08063-2Ru	595	FG	29.7	29	50	21	1.097	0	0	0
Norkotah C-3	911	A	45.5	13	47	39	1.071	0	0	0
COTX10080-2Ru	722	DE	36.1	29	48	23	1.066	0	0	0

ENTRY	40 DAY	50 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	84	94	2.5	2	6.9	10.3	4.0	3.0	0	48
Ranger Russet	89	98	1.9	3	8.7	8.9	4.0	4.0	8	15
Russet Burbank	77	88	2.0	2	7.9	9.4	4.0	4.0	5	45
A09086-1LB	94	97	2.3	2	7.6	11.5	3.5	3.0	13	63
A10594-4sto	81	91	1.9	2	10.0	8.3	4.0	3.0	0	25
A12169-5	75	88	1.8	1	11.1	6.6	4.0	3.0	0	25
A12305-2adg	75	88	2.0	1	8.9	10.0	3.8	3.8	3	40
A13036-12	94	98	2.4	0	11.5	7.7	4.0	2.3	3	65
AC12090-3RU	86	98	2.0	6	8.0	9.4	4.0	4.0	0	60
AFA5661-8	56	91	1.8	4	11.4	7.4	4.0	3.0	0	20
AOR11217-3	83	95	2.1	1	7.8	9.7	4.0	4.0	0	25
AOR13064-2	94	95	2.3	3	8.8	7.9	4.0	3.0	0	35
CO13003-1RU	92	97	3.0	1	6.6	11.7	4.0	3.0	0	35
COTX08063-2Ru	94	98	2.5	4	7.1	9.3	4.0	3.0	0	70
Norkotah C-3	97	98	2.1	1	9.8	9.3	4.0	3.0	0	35
COTX10080-2Ru	81	95	2.3	4	6.9	11.9	4.0	4.0	0	25

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



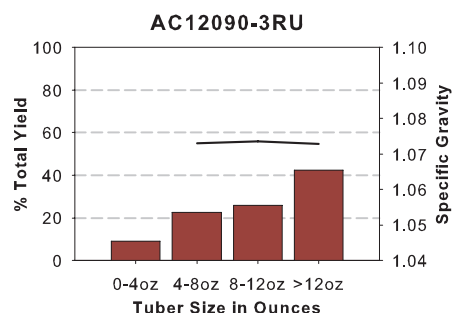
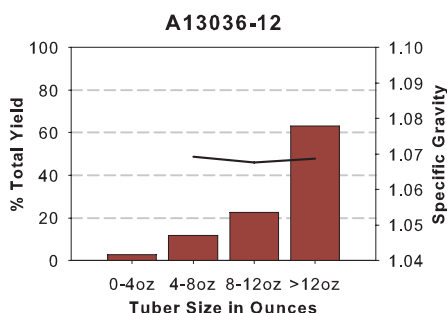
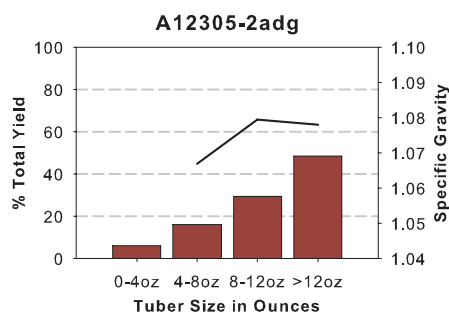
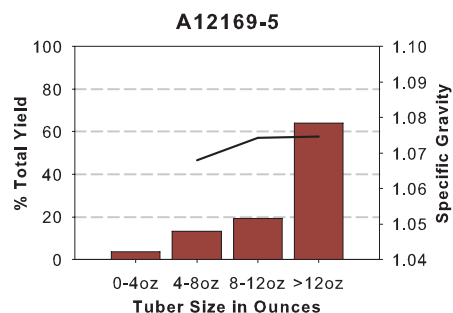
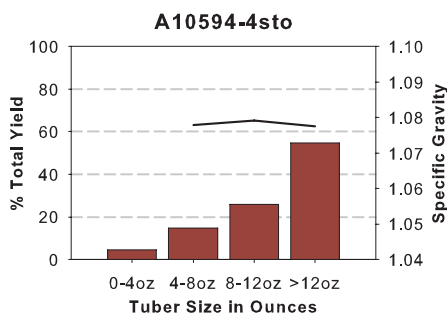
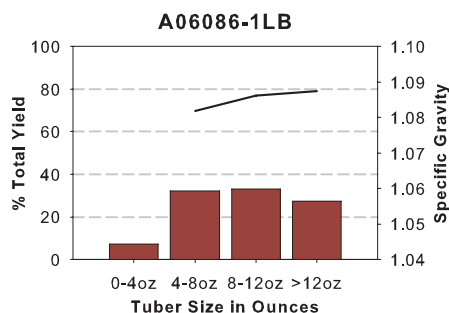
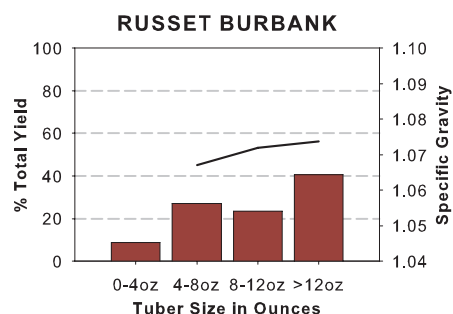
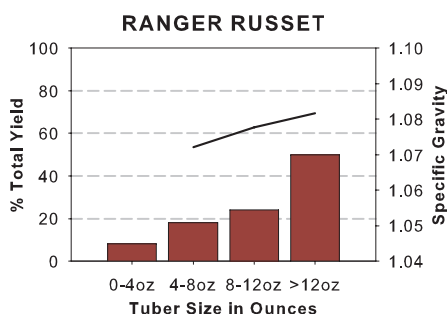
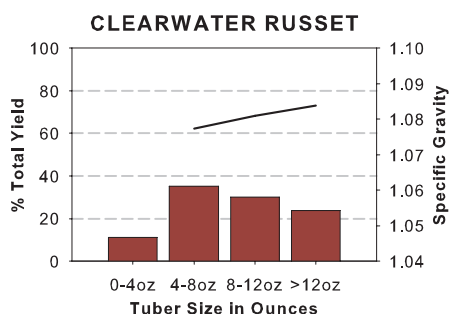
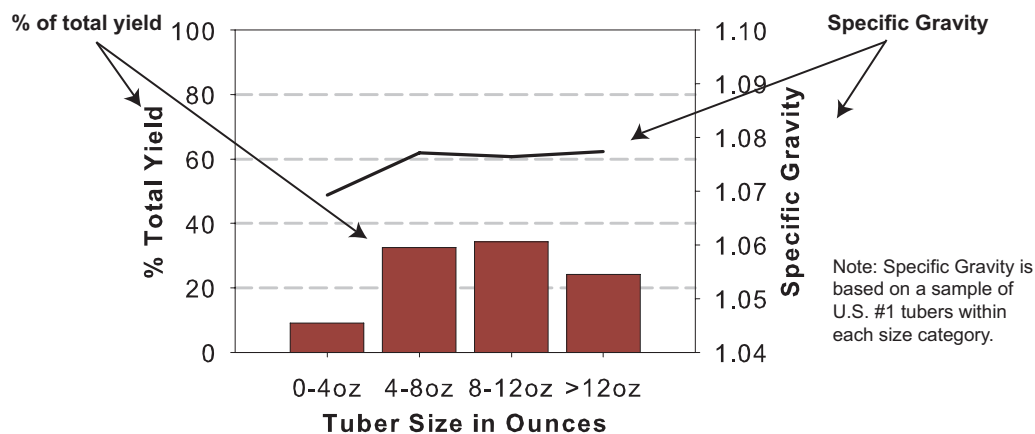


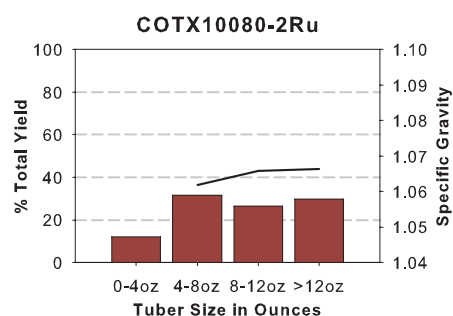
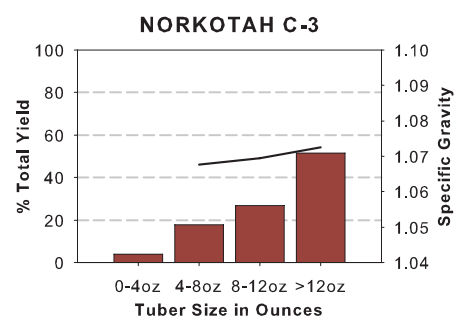
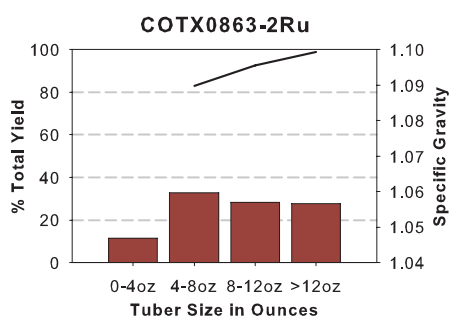
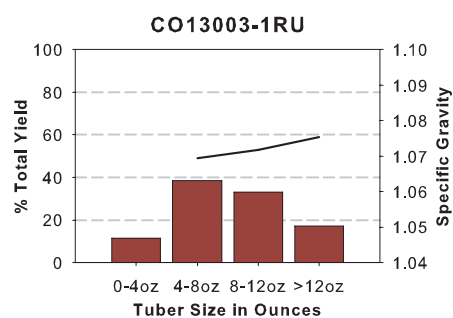
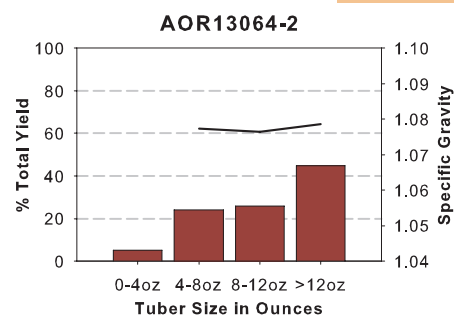
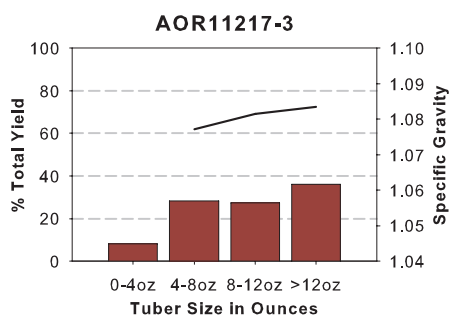
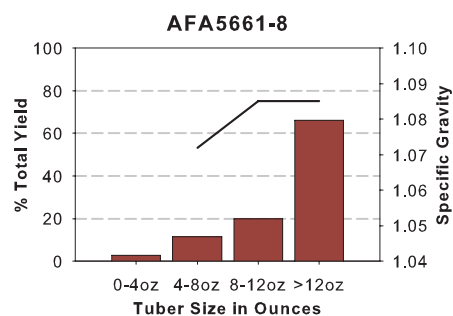
**Figure 1 (top).** Difference in gross return per acre (Fresh Market) from Russet Norkotah calculated by subtracting the gross return of Norkotah C-3 from the gross return of the particular entry. Entries with the white-colored bars may not appeal to fresh market consumers due to the undesirable shape 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.




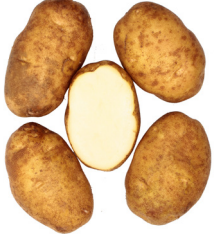
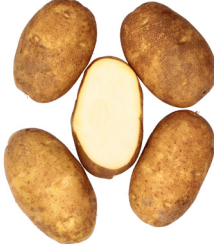
# 2023 Late Harvest Regional Trial

## Tuber Yield and Specific Gravity Distributions




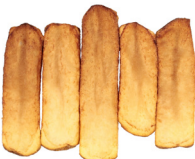



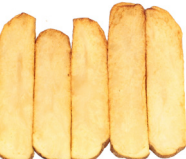
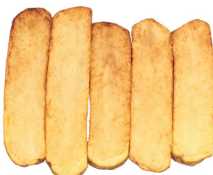







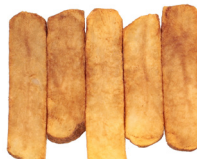

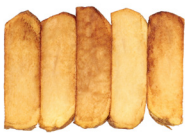







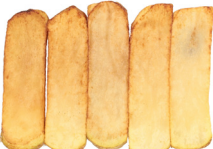



### 11 inch In-Row Spacing

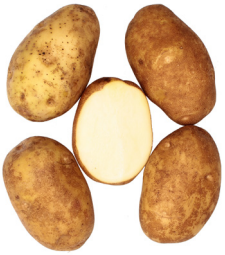



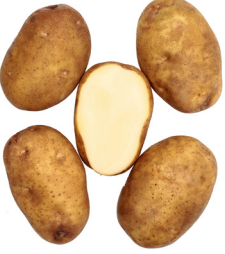





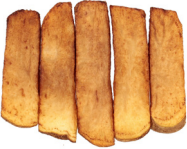






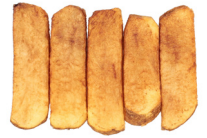





















Tubers	WA Late Harvest Regional Trial Comments
Clearwater Russet	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, non-uniform; 48°F = light, non-uniform; 44°F = light, non-uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform;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

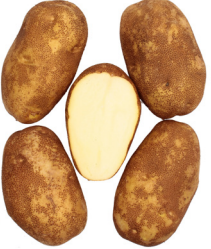


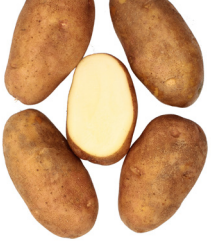


Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
Clearwater Russet					
					
Ranger Russet					
					
Russet Burbank					
					
A09086-1LB					
					
A10594-4sto					
					

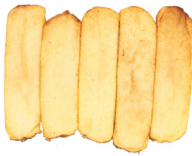
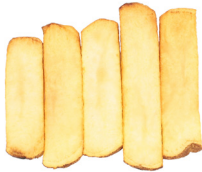
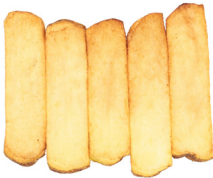
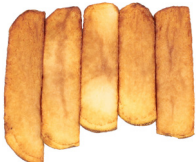

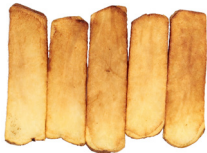
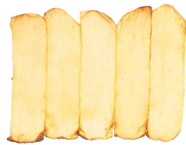

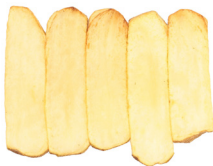
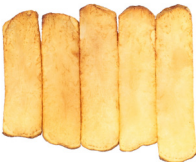
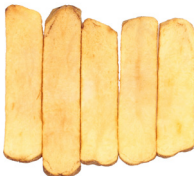



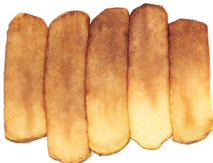


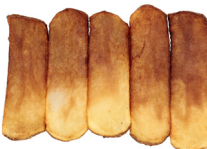

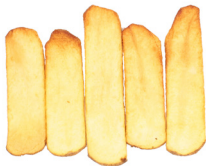
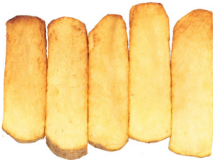
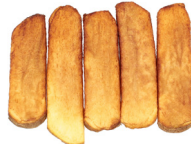


Tubers	WA Late Harvest Regional Trial Comments
A12169-5	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; moderately deep eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = relatively dark, uniform; Reconditioned = light, uniform; Blanched = relatively dark, uniform.</p>
A12305-2adg	
	<p><b>Tubers:</b> Oblong to long tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, non-uniform; 48°F = light, non-uniform; 44°F = relatively dark,non-uniform; 40°F = Unacceptably dark, uniform; Reconditioned = relatively dark, non-uniform; Blanched = relatively dark, uniform.</p>
A13036-12	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; moderately deep eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = light, uniform; Reconditioned = light, uniform; Blanched = light, uniform.</p>
AC12090-3RU	
	<p><b>Tubers:</b> Oblong to long tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = relatively dark,uniform; 40°F = Unacceptably dark, uniform; Reconditioned = Unnacceptably dark, uniform; Blanched = unacceptably dark, uniform.</p>
AFA5661-8	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light,uniform; 40°F = relatively dark, uniform; Reconditioned = relatively dark, uniform; Blanched = light, uniform.</p>

Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
A12169-5					
					
A12305-2adg					
					
A13036-12					
					
AC12090-3RU					
					
AFA5661-8					
					



Tubers	WA Late Harvest Regional Trial Comments
AOR11217-3	
	<p><b>Tubers:</b> Oblong to long tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, non-uniform; Reconditioned = light, non-uniform; Blanched = relatively dark, non-uniform.</p>
AOR13064-2	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; moderate eye depth.</p> <p><b>Fry color:</b> At harvest= light, uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = light, uniform; Reconditioned = light, uniform; Blanched = light, uniform.</p>
CO13003-1RU	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, non-uniform; 48°F = relatively dark, non-uniform; 44°F = relatively dark, non-uniform; 40°F = Unacceptably dark, non-uniform; Reconditioned = relatively dark, non-uniform; Blanched = unacceptably dark, non-uniform.</p>
COTX08063-2Ru	
	<p><b>Tubers:</b> Oblong tubers. Good skin set; shallow eyes.</p> <p><b>Fry color:</b> At harvest= light, non-uniform; 48°F = light, uniform; 44°F = light, uniform; 40°F = relatively dark, uniform; Reconditioned = light, non-uniform; Blanched = light, uniform.</p>



Initial Fries	48° F Storage	44° F Storage	40° F Storage	40° F Blanching	40° F Recon.
AOR11217-3					
					
AOR13064-2					
					
CO13003-1RU					
					
COTX08063-2Ru					
					

## 2023 Late Harvest Regional Trial

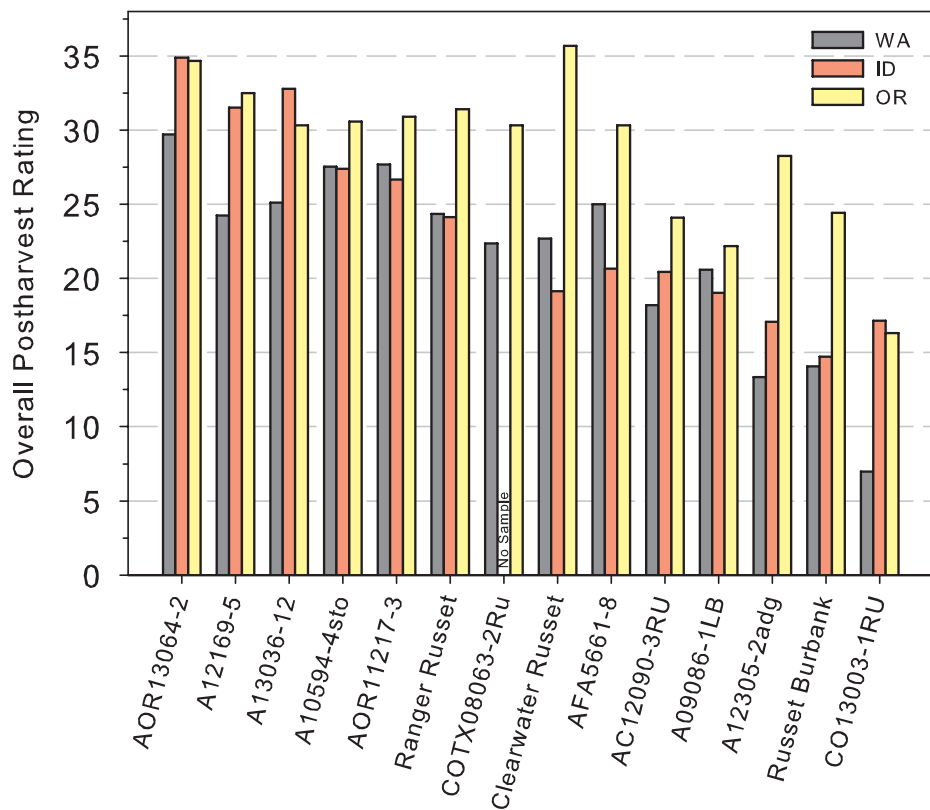
### Accumulated Total Postharvest Ratings of Clones

Clone	WA		ID		OR		3 State av.
	Rating Total §	Discard §§	Rating Total §	Discard §§	Rating Total §	Discard §§	Rating Total
12 AOR13064-2	29.7	Sp. Gr.	34.9		34.7		33.1
6 A12169-5	24.3		31.5		32.5		29.4
8 A13036-12	25.1	Sp. Gr.	32.8		30.3		29.4
5 A10594-4sto	27.6		27.4		30.6		28.5
11 AOR11217-3	27.7		26.7		30.9		28.4
2 Ranger Russet	24.4		24.1		31.4		26.6
14 COTX08063-2Ru	22.4		No Sample		30.3		26.3
1 Clearwater Russet	22.7		19.1	Sp. Gr.	35.7		25.8
10 AFA5661-8	25.0		20.7		30.3		25.3
9 AC12090-3RU	18.2	Sp. Gr., 40°F	20.5	40°F	24.1	Sp.Gr.	20.9
4 A09086-1LB	20.6	40°F	19.0	40°F	22.2		20.6
7 A12305-2adg	13.4	Sp. Gr., 40°F	17.1		28.3		19.6
3 Russet Burbank	14.1	Sp. Gr., 40°F	14.7	Sp. Gr., 40°F	24.4		17.7
13 CO13003-1RU	7.0	Sp. Gr., 44, 40°F	17.1		16.3		13.5
	21.6		23.5		28.7		24.7

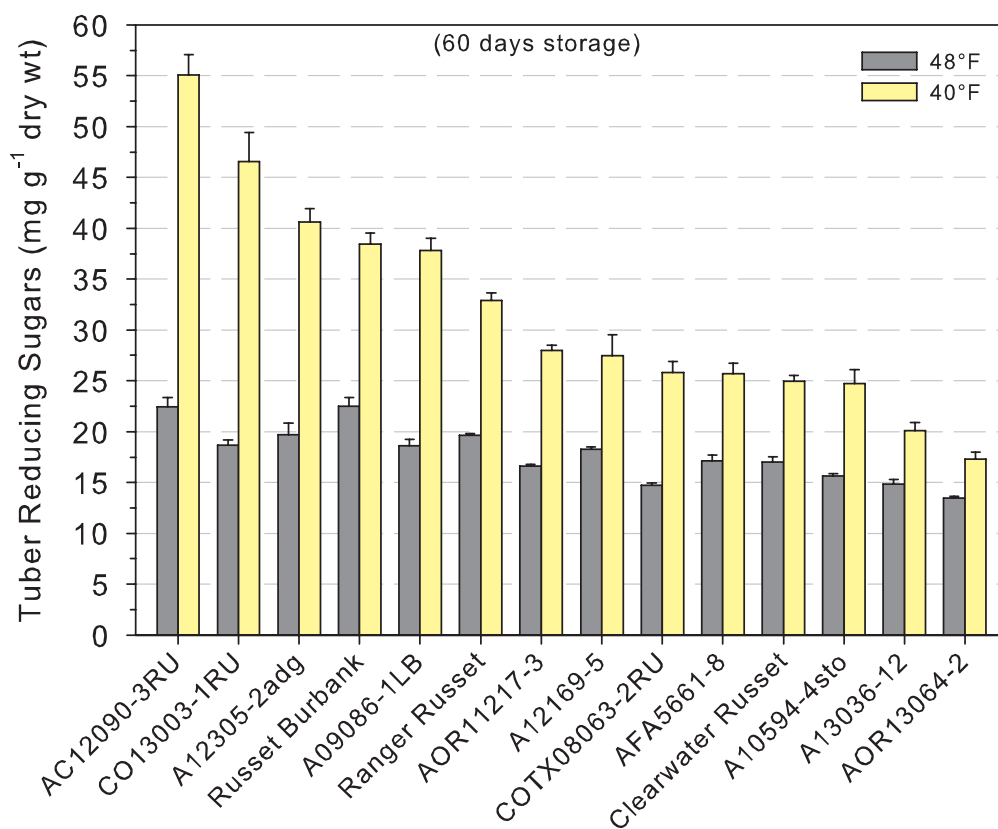
§ maximum rating possible = 38

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

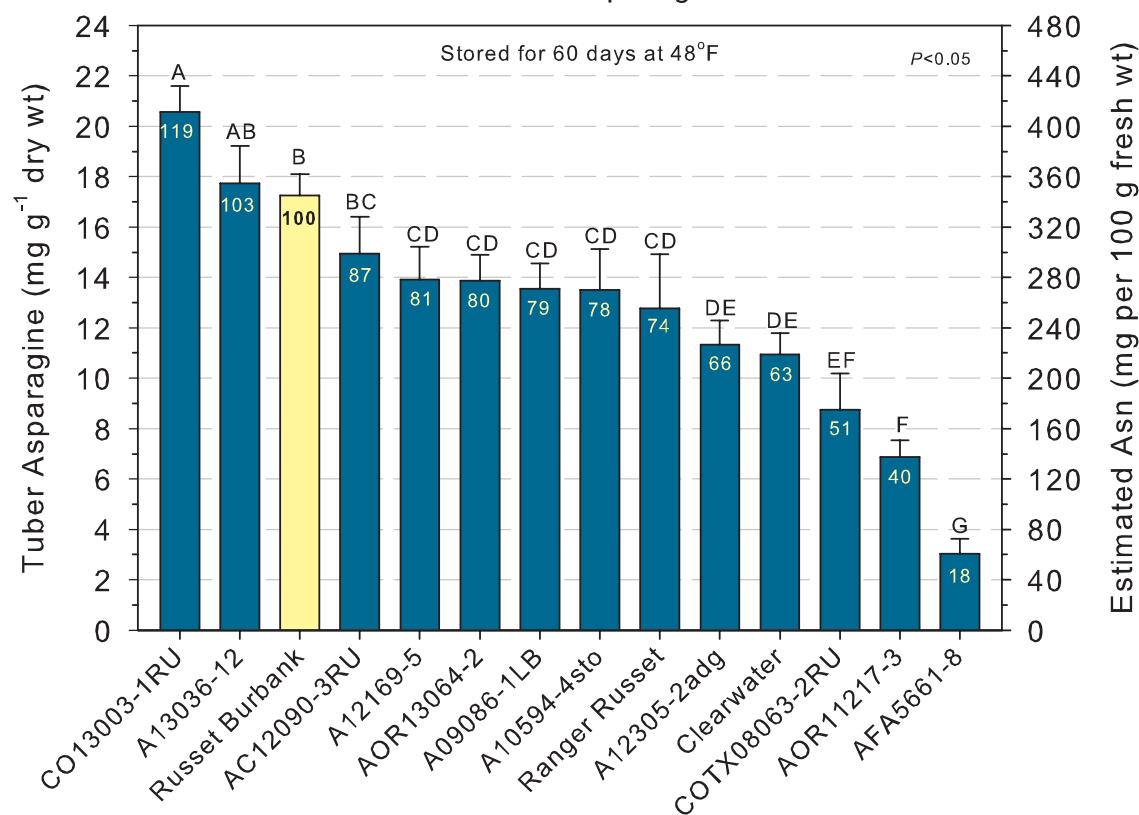
2023 Late Harvest Regional Trial  
Postharvest Ratings



## 2023 WA LRT Reducing Sugars



## 2023 WA LRT Tuber Asparagine Content



# 2023 Late Harvest Regional Trial

## Prior to Storage

\* \*\* \*\*\*

PHOTOVOLT READING										USDA		SPECIFIC	
Clone	stem	bud	ave.	rtg §	DIFF	COLOR	GRAVITY	rtg	Range				
Washington													
1 Clearwater Russet	28.9	43.4	36.2	4-	14.5	1	1.084	5	1.078	- 1.086			
2 Ranger Russet	35.1	39.1	37.1	4+	4.7	0	1.079	2	1.077	- 1.083			
3 Russet Burbank	28.6	37.8	33.2	3-	9.3	1	1.075	0	1.072	- 1.078			
4 A09086-1LB	24.7	32.7	28.7	2+	8.2	2	1.086	5	1.079	- 1.090			
5 A10594-4sto	35.8	38.8	37.3	4+	4.1	0	1.081	4	1.080	- 0.108			
6 A12169-5	34.9	40.3	37.6	4+	6.3	0	1.079	2	1.078	- 1.081			
7 A12305-2adg	24.9	40.3	32.6	3-	15.4	2	1.075	0	1.070	- 1.081			
8 A13036-12	42.2	43.3	42.8	5+	3.3	0	1.071	0	1.068	- 1.073			
9 AC12090-3RU	32.4	35.0	33.7	3+	3.7	0	1.071	0	1.066	- 1.075			
10 AFA5661-8	31.5	38.1	34.8	3+	7.1	0	1.080	3	1.077	- 1.083			
11 AOR11217-3	38.1	45.7	41.9	5+	8.1	0	1.078	2	1.073	- 1.084			
12 AOR13064-2	44.1	42.1	43.1	5+	4.0	0	1.074	0	1.071	- 1.079			
13 CO13003-1RU	15.8	34.7	25.2	2-	18.8	3	1.072	0	1.070	- 1.076			
14 COTX08063-2RU	29.5	38.8	34.1	3-	10.1	1	1.100	1	1.094	- 1.104			
Average	LSD 0.05		3.3		4.0		0.005						
	31.9	39.3	35.6		8.4	1	1.079						
Idaho													
1 Clearwater Russet	31.7	36.7	34.2	3+	5.0	0	1.075	0	1.072	- 1.078			
2 Ranger Russet	30.6	36.5	33.6	3+	6.2	1	1.082	4	1.081	- 1.086			
3 Russet Burbank	27.2	35.0	31.1	3+	8.5	1	1.071	0	1.070	- 1.072			
4 A09086-1LB	23.4	32.4	27.9	2+	8.9	2	1.095	2	1.090	- 1.097			
5 A10594-4sto	41.7	41.0	41.4	5+	4.9	0	1.082	4	1.078	- 1.084			
6 A12169-5	35.4	35.8	35.6	4+	4.3	0	1.083	5	1.081	- 1.084			
7 A12305-2adg	25.7	36.5	31.1	3-	11.6	1	1.080	3	1.078	- 1.084			
8 A13036-12	46.6	45.4	46.0	5+	2.3	0	1.082	4	1.080	- 1.083			
9 AC12090-3RU	27.6	34.5	31.0	3+	7.0	1	1.079	2	1.073	- 1.083			
10 AFA5661-8	30.3	39.7	35.0	3-	9.6	1	1.090	4	1.088	- 1.093			
11 AOR11217-3	34.3	38.8	36.6	4+	5.9	0	1.079	2	1.075	- 1.083			
12 AOR13064-2	40.1	42.1	41.1	5+	4.9	0	1.083	5	1.078	- 1.089			
13 CO13003-1RU	21.6	34.7	28.1	2-	13.1	2	1.084	5	1.080	- 1.086			
14 COTX08063-2RU	No Sample						No Sample						
Average	LSD 0.05		3.7		3.6		0.004						
	32.0	37.6	34.8		7.1	1	1.082						
Oregon													
1 Clearwater Russet	43.6	44.9	44.2	5+	3.2	0	1.088	5	1.072	- 1.078			
2 Ranger Russet	41.2	41.6	41.4	5+	3.0	0	1.084	5	1.081	- 1.086			
3 Russet Burbank	37.9	41.3	39.6	4+	5.5	0	1.076	1	1.070	- 1.072			
4 A09086-1LB	34.0	40.4	37.2	4+	8.0	0	1.092	3	1.090	- 1.097			
5 A10594-4sto	43.1	43.4	43.2	5+	3.0	0	1.084	5	1.078	- 1.084			
6 A12169-5	45.7	44.2	45.0	5+	2.6	0	1.083	5	1.081	- 1.084			
7 A12305-2adg	37.8	44.7	41.2	5+	7.0	0	1.081	4	1.078	- 1.084			
8 A13036-12	46.5	44.4	45.4	5+	2.5	0	1.082	4	1.080	- 1.083			
9 AC12090-3RU	37.7	39.7	38.7	4+	4.5	0	1.075	0	1.073	- 1.083			
10 AFA5661-8	46.5	47.4	46.9	5+	2.0	0	1.091	4	1.088	- 1.093			
11 AOR11217-3	49.8	49.0	49.4	5+	2.1	0	1.095	2	1.075	- 1.083			
12 AOR13064-2	49.1	45.7	47.4	5+	5.8	0	1.081	4	1.078	- 1.089			
13 CO13003-1RU	32.3	42.1	37.2	4-	9.8	0	1.077	1	1.080	- 1.086			
14 COTX08063-2RU	45.9	49.7	47.8	5+	5.0	0	1.097	1	1.090	- 1.101			
Average	LSD 0.05		2.4		3.0		0.007						
	42.2	44.2	43.2		4.6	0	1.085						

Date test performed:

**Washington**

Sept. 29

Sept. 28

**Idaho**

Oct. 4

Oct. 3

**Oregon**

Oct. 5

Oct. 3

§ 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.



# 2023 Late Harvest Regional Trial

Stored at 48°F after Arrival

FRENCH FRY TASTE PANEL		BRUISE POTENTIAL			
Clone	rating	(percent)		[color 5=darkest]	
		stem	bud	stem	bud
Washington					
1 Clearwater Russet	3.7	54	67	2.4	2.5
2 Ranger Russet	3.4	96	17	4.3	1.4
3 Russet Burbank	3.1	88	38	3.8	1.9
4 A09086-1LB	3.6	83	25	3.4	1.5
5 A10594-4sto	3.6	71	4	2.8	1.1
6 A12169-5	3.3	13	25	1.3	1.5
7 A12305-2adg	3.4	29	25	1.6	1.5
8 A13036-12	3.1	50	4	2.2	1.1
9 AC12090-3RU	2.2	46	29	2.0	1.7
10 AFA5661-8	3.0	79	4	3.3	1.1
11 AOR11217-3	3.7	54	4	2.3	1.1
12 AOR13064-2	3.7	71	13	2.5	1.3
13 CO13003-1RU	2.0	83	13	3.1	1.5
14 COTX08063-2RU	3.4	63	4	2.5	1.2
LSD 0.05	0.5	29	23		
Average	3.2	63	19	2.7	1.5
Idaho					
1 Clearwater Russet	3.1	13	13	1.3	1.3
2 Ranger Russet	3.1	75	21	3.0	1.4
3 Russet Burbank	2.7	42	0	1.8	1.0
4 A09086-1LB	3.0	79	29	3.1	1.6
5 A10594-4sto	3.4	67	0	2.5	1.0
6 A12169-5	3.5	0	4	1.0	1.1
7 A12305-2adg	3.1	42	13	1.9	1.3
8 A13036-12	3.8	46	13	2.0	1.3
9 AC12090-3RU	2.5	50	58	2.3	2.2
10 AFA5661-8	3.7	54	4	2.2	1.1
11 AOR11217-3	3.7	29	0	1.6	1.0
12 AOR13064-2	3.9	No Sample	No Sample	No Sample	No Sample
13 CO13003-1RU	3.1	83	38	3.3	1.8
14 COTX08063-2RU	No Sample	No Sample	No Sample	No Sample	No Sample
LSD 0.05	0.5	29	23		
Average	3.3	48	16	2.2	1.3
Oregon					
1 Clearwater Russet	4.7	29	21	1.7	1.4
2 Ranger Russet	4.4	88	17	3.6	1.3
3 Russet Burbank	3.4	21	0	1.4	1.0
4 A09086-1LB	4.2	88	21	3.2	1.4
5 A10594-4sto	3.6	75	0	2.7	1.0
6 A12169-5	4.5	17	13	1.4	1.3
7 A12305-2adg	4.3	46	0	2.0	1.0
8 A13036-12	3.3	25	4	1.5	1.1
9 AC12090-3RU	3.1	25	0	1.5	1.0
10 AFA5661-8	3.3	92	0	3.0	1.0
11 AOR11217-3	3.9	58	0	2.3	1.0
12 AOR13064-2	3.7	54	0	2.1	1.0
13 CO13003-1RU	3.3	25	8	1.5	1.2
14 COTX08063-2RU	4.3	42	0	1.8	1.0
LSD 0.05	1.2	30	14		
Average	3.9	49	6	2.1	1.1

Date test performed:

**Washington**

Oct. 18

Nov. 1

**Idaho**

Oct. 17

Nov. 7

**Oregon**

Oct. 19

Nov. 14

# 2023 Late Harvest Regional Trial

Stored at 48°F for 60 Days

Clone		PHOTOVOLT READING				USDA	% REDUCING SUGAR		SPROUTING	
	stem	bud	ave	rtg §	DIFF	COLOR	stem	bud	(%)	length (in)
Washington										
1 Clearwater Russet	34.4	43.4	38.9	4-	9.1	0	1.0	0.6	53.3	0.25
2 Ranger Russet	33.6	37.7	35.7	4+	4.4	0	1.1	0.8	86.7	0.50
3 Russet Burbank	27.2	36.0	31.6	3-	9.6	1	1.7	0.9	6.7	0.50
4 A09086-1LB	28.4	35.1	31.7	3+	7.3	1	1.6	1.0	86.7	0.25
5 A10594-4sto	39.6	41.6	40.6	5+	2.6	0	0.7	0.7	80.0	0.50
6 A12169-5	36.2	40.1	38.1	4+	4.4	0	0.9	0.7	33.3	0.50
7 A12305-2adg	29.7	41.3	35.5	4-	11.7	1	1.4	0.7	0.0	0.00
8 A13036-12	37.0	41.0	39.0	4+	5.1	0	0.9	0.7	73.3	0.50
9 AC12090-3RU	29.8	33.7	31.7	3+	5.0	1	1.4	1.1	0.0	0.00
10 AFA5661-8	34.2	40.4	37.3	4+	7.1	0	1.1	0.7	33.3	0.25
11 AOR11217-3	40.9	43.5	42.2	5+	3.9	0	0.7	0.6	46.7	0.25
12 AOR13064-2	44.1	42.4	43.2	5+	3.9	0	0.6	0.6	33.3	0.50
13 CO13003-1RU	19.4	39.4	29.4	2-	20.0	3	2.8	0.8	0.0	0.00
14 COTX08063-2Ru	38.5	46.2	42.4	5+	7.7	0	0.8	0.5	40.0	0.50
Average	LSD 0.05		2.7	3.3					22	
	33.8	40.1	37.0		7.3	1	1.2	0.7	41	0.32
Idaho										
1 Clearwater Russet	32.9	42.6	37.7	4-	9.7	0	1.1	0.6	60.0	0.13
2 Ranger Russet	35.0	40.2	37.6	4+	7.2	0	1.0	0.7	66.7	0.13
3 Russet Burbank	26.0	38.0	32.0	3-	11.9	1	1.8	0.8	0.0	0.00
4 A09086-1LB	28.9	36.8	32.9	3+	7.9	1	1.5	0.9	100.0	0.25
5 A10594-4sto	34.4	36.5	35.4	3+	4.0	0	1.0	0.9	26.7	0.13
6 A12169-5	41.1	43.1	42.1	5+	3.6	0	0.7	0.6	13.3	0.13
7 A12305-2adg	24.4	39.6	32.0	3-	15.2	2	2.0	0.7	0.0	0.00
8 A13036-12	44.7	43.0	43.9	5+	3.1	0	0.6	0.6	66.7	0.50
9 AC12090-3RU	28.9	33.3	31.1	3+	6.2	1	1.5	1.1	0.0	0.00
10 AFA5661-8	34.2	44.0	39.1	4-	10.1	0	1.1	0.6	26.7	0.13
11 AOR11217-3	40.1	45.9	43.0	5+	6.4	0	0.7	0.5	0.0	0.00
12 AOR13064-2	44.8	45.9	45.3	5+	5.7	0	0.6	0.5	66.7	0.25
13 CO13003-1RU	23.4	42.3	32.8	3-	18.9	2	2.2	0.6	0.0	0.00
14 COTX08063-2Ru	No Sample						No Sample		No Sample	
Average	LSD 0.05		2.8	4.0					21	
	33.8	40.9	37.3		8.5	1	1.2	0.7	33	0.13
Oregon										
1 Clearwater Russet	45.4	46.9	46.2	5+	3.0	0	0.6	0.5	80.0	0.25
2 Ranger Russet	38.3	39.5	38.9	4+	3.1	0	0.8	0.8	93.3	0.75
3 Russet Burbank	34.5	38.1	36.3	4+	3.6	0	1.0	0.8	0.0	0.00
4 A09086-1LB	35.3	41.6	38.4	4+	6.4	0	1.0	0.7	93.3	0.75
5 A10594-4sto	42.4	43.4	42.9	5+	3.8	0	0.6	0.6	80.0	0.75
6 A12169-5	47.4	47.3	47.4	5+	2.3	0	0.5	0.5	93.3	1.25
7 A12305-2adg	40.9	46.8	43.9	5+	6.2	0	0.7	0.5	0.0	0.00
8 A13036-12	46.6	44.9	45.7	5+	3.2	0	0.5	0.6	100.0	1.50
9 AC12090-3RU	41.0	40.7	40.9	5+	3.9	0	0.7	0.7	0.0	0.00
10 AFA5661-8	41.9	44.0	42.9	5+	3.7	0	0.7	0.6	100.0	0.75
11 AOR11217-3	48.9	49.3	49.1	5+	2.8	0	0.5	0.5	73.3	0.75
12 AOR13064-2	50.7	46.7	48.7	5+	4.4	0	0.5	0.5	6.7	0.25
13 CO13003-1RU	32.1	41.6	36.8	4-	9.5	0	1.2	0.7	0.0	0.00
14 COTX08063-2Ru	45.7	49.7	47.7	5+	4.4	0	0.6	0.5	66.7	0.75
Average	LSD 0.05		2.4	2.8					17	
	42.2	44.3	43.3		4.3	0	0.7	0.6	56	0.55

Date test performed:

**Washington**

Nov. 27

Nov. 27

Dec. 18

**Idaho**

Dec. 4

Dec. 4

Dec. 18

**Oregon**

Dec. 9

Dec. 9

Dec. 18

§ 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. Sprouting was rated after 60 days - storage.

# 2023 Late Harvest Regional Trial

Stored at 44°F for 45 Days

		PHOTOVOLT READING				USDA	% REDUCING SUGAR	
Clone	stem	bud	ave	rtg \$	DIFF	COLOR	stem	bud
Washington								
1 Clearwater Russet	34.2	45.2	39.7	4-	11.0	0	1.0	0.6
2 Ranger Russet	32.5	36.7	34.6	3+	4.8	0	1.2	0.9
3 Russet Burbank	24.7	32.7	28.7	2+	8.1	2	2.0	1.2
4 A09086-1LB	20.1	27.9	24.0	1+	7.7	2	2.7	1.6
5 A10594-4sto	30.9	35.9	33.4	3+	5.0	1	1.3	0.9
6 A12169-5	33.7	38.3	36.0	4+	6.7	0	1.1	0.8
7 A12305-2adg	23.3	37.4	30.3	2-	14.1	2	2.2	0.9
8 A13036-12	41.8	42.8	42.3	5+	2.5	0	0.7	0.6
9 AC12090-3RU	22.9	27.0	24.9	2+	5.0	2	2.2	1.7
10 AFA5661-8	33.0	38.3	35.7	4+	5.7	0	1.1	0.8
11 AOR11217-3	35.8	42.9	39.4	4+	7.7	0	0.9	0.6
12 AOR13064-2	45.5	45.1	45.3	5+	3.0	0	0.6	0.6
13 CO13003-1RU	14.1	27.7	20.9	1-	13.6	4	3.8	1.6
14 COTX08063-2Ru	33.6	42.3	38.0	4+	8.9	0	1.1	0.6
Average	30.4	LSD 0.05 37.1	2.7 33.8		3.6 7.4	1	1.6	1.0
Idaho								
1 Clearwater Russet	29.2	39.5	34.4	3-	10.3	1	1.5	0.8
2 Ranger Russet	28.5	37.6	33.1	3-	10.9	1	1.5	0.8
3 Russet Burbank	19.3	32.1	25.7	2-	12.8	3	2.8	1.2
4 A09086-1LB	21.3	27.1	24.2	1+	5.8	2	2.5	1.7
5 A10594-4sto	31.6	38.4	35.0	3+	6.8	0	1.2	0.8
6 A12169-5	39.0	36.6	37.8	4+	2.9	0	0.8	0.9
7 A12305-2adg	20.1	30.6	25.3	2-	10.6	2	2.7	1.3
8 A13036-12	41.3	40.1	40.7	5+	3.7	0	0.7	0.7
9 AC12090-3RU	22.7	27.3	25.0	2+	5.4	2	2.3	1.7
10 AFA5661-8	26.8	38.1	32.4	3-	11.3	1	1.7	0.8
11 AOR11217-3	30.3	35.8	33.0	3+	6.5	1	1.4	0.9
12 AOR13064-2	38.3	44.1	41.2	5+	7.1	0	0.8	0.6
13 CO13003-1RU	19.0	35.7	27.4	2-	16.7	3	2.8	1.0
14 COTX08063-2Ru	No Sample						No Sample	
Average	28.2	LSD 0.05 35.6	3.2 31.9		3.8 8.5	1	1.7	1.0
Oregon								
1 Clearwater Russet	44.3	47.4	45.9	5+	4.6	0	0.6	0.5
2 Ranger Russet	33.8	39.3	36.5	4+	6.1	0	1.1	0.8
3 Russet Burbank	29.9	34.4	32.2	3+	4.5	1	1.4	1.0
4 A09086-1LB	23.3	36.4	29.8	2-	13.1	2	2.2	0.9
5 A10594-4sto	37.6	41.1	39.3	4+	5.0	0	0.8	0.7
6 A12169-5	45.7	45.3	45.5	5+	2.1	0	0.6	0.6
7 A12305-2adg	28.8	41.2	35.0	3-	12.4	1	1.5	0.7
8 A13036-12	42.6	44.0	43.3	5+	3.7	0	0.6	0.6
9 AC12090-3RU	35.2	33.0	34.1	3+	3.5	0	1.0	1.1
10 AFA5661-8	41.6	42.8	42.2	5+	3.9	0	0.7	0.6
11 AOR11217-3	42.0	44.9	43.4	5+	4.3	0	0.7	0.6
12 AOR13064-2	49.8	47.0	48.4	5+	3.4	0	0.5	0.5
13 CO13003-1RU	24.0	37.7	30.9	3-	13.8	2	2.1	0.8
14 COTX08063-2Ru	44.1	47.8	45.9	5+	4.2	0	0.6	0.5
Average	37.3	LSD 0.05 41.6	2.9 39.5		2.6 6.0	0	1.0	0.7

# 2023 Late Harvest Regional Trial

## Stored at 40°F for 60 Days and Reconditioned

PHOTOVOLT READING (60 Days at 40°F)															PHOTOVOLT AFTER RECONDITIONING (21 days at 60°F)				
SPROUTING		stem	bud	ave	rtg \$	DIFF	USDA COLOR	stem	bud	ave	Diff	USDA COLOR							
Clone	(%)																		
Washington																			
1 Clearwater Russet	0	18.8	34.0	26.4	2	15.2	3	26.9	40.3	33.6	14.6	1							
2 Ranger Russet	0	18.7	26.6	22.6	1	8.0	3	22.9	34.4	28.6	11.5	2							
3 Russet Burbank	0	14.2	19.7	17.0	0	5.5	4	19.7	30.6	25.2	10.9	3							
4 A09086-1LB	0	12.4	18.5	15.4	0	6.0	4	19.6	30.1	24.8	10.5	3							
5 A10594-4sto	0	23.1	31.2	27.2	2	8.2	2	28.5	37.7	33.1	9.2	1							
6 A12169-5	0	17.6	24.6	21.1	1	7.1	3	30.4	37.3	33.9	6.9	1							
7 A12305-2adg	0	14.2	21.3	17.7	0	7.1	4	18.3	29.6	23.9	11.3	3							
8 A13036-12	0	28.7	32.8	30.7	3	4.7	1	35.2	40.0	37.6	5.9	0							
9 AC12090-3RU	0	12.5	14.8	13.6	0	2.6	4	15.9	17.3	16.6	2.1	3							
10 AFA5661-8	0	23.4	28.9	26.1	2	5.6	2	25.0	33.6	29.3	8.6	2							
11 AOR11217-3	0	18.1	29.4	23.7	1	11.4	3	25.4	40.6	33.0	15.2	1							
12 AOR13064-2	0	34.1	37.2	35.6	4	5.5	0	41.5	39.5	40.5	4.5	0							
13 CO13003-1RU	0	7.7	20.6	14.2	0	12.9	4	12.7	28.6	20.6	15.9	4							
14 COTX08063-2Ru	0	20.4	28.1	24.2	1	8.2	2	30.0	39.4	34.7	9.4	1							
LSD 0.05	ns			3.1		3.0				3.4	3.9								
Average	0	18.8	26.3	22.6		7.7	3	25.1	34.2	29.7	9.7	2							
Idaho																			
1 Clearwater Russet	0	22.1	31.4	26.8	2	9.3	2	24.9	34.3	29.6	10.7	2							
2 Ranger Russet	0	18.2	26.5	22.3	1	8.3	3	23.6	28.6	26.1	9.0	2							
3 Russet Burbank	No Sample	13.7	20.1	16.9	0	6.4	4	15.4	27.2	21.3	11.8	3							
4 A09086-1LB	0	15.7	21.4	18.5	0	5.8	3	19.8	28.3	24.0	8.4	3							
5 A10594-4sto	0	19.0	23.5	21.2	1	4.5	3	23.4	37.6	30.5	14.2	2							
6 A12169-5	0	31.7	28.7	30.2	2	4.2	0	33.7	34.1	33.9	3.5	0							
7 A12305-2adg	0	15.9	23.1	19.5	0	7.2	3	14.7	23.7	19.2	8.9	4							
8 A13036-12	No Sample	36.0	36.2	36.1	4	2.4	0	41.2	40.8	41.0	2.6	0							
9 AC12090-3RU	0	15.3	18.9	17.1	0	3.8	3	14.4	21.0	17.7	6.6	4							
10 AFA5661-8	0	21.6	31.5	26.6	2	9.9	2	22.6	33.1	27.9	10.5	2							
11 AOR11217-3	No Sample	19.4	27.2	23.3	1	8.0	3	21.9	29.8	25.8	9.6	2							
12 AOR13064-2	0	30.1	34.8	32.4	3	5.3	1	32.3	40.9	36.6	9.5	0							
13 CO13003-1RU	0	13.0	30.4	21.7	1	17.4	4	15.9	32.5	24.2	16.6	3							
14 COTX08063-2Ru	No Sample	No Sample						No Sample											
LSD 0.05	ns			2.8		3.6				3.8	4.8								
Average	0	20.9	27.2	24.0		7.1	2.4	23.4	31.7	27.5	9.4	2.1							
Oregon																			
1 Clearwater Russet	0	31.6	39.3	35.5	3	7.6	0	36.6	47.2	41.9	10.7	0							
2 Ranger Russet	0	20.1	26.3	23.2	1	7.2	2	23.6	35.4	29.5	12.3	2							
3 Russet Burbank	0	18.4	24.4	21.4	1	6.0	3	19.9	26.5	23.2	6.6	3							
4 A09086-1LB	0	17.5	25.7	21.6	1	8.2	3	22.6	30.3	26.4	7.7	2							
5 A10594-4sto	7	26.0	32.1	29.0	2	6.3	1	31.0	41.1	36.0	11.0	1							
6 A12169-5	0	32.1	36.4	34.2	3	5.5	0	39.4	43.7	41.5	6.1	0							
7 A12305-2adg	0	18.7	29.7	24.2	1	11.1	3	17.4	28.5	23.0	11.2	3							
8 A13036-12	20	34.9	35.2	35.1	3	2.2	0	41.4	43.5	42.4	4.1	0							
9 AC12090-3RU	0	21.1	20.3	20.7	1	2.8	2	21.2	21.3	21.2	2.4	2							
10 AFA5661-8	7	29.9	35.4	32.6	3	7.3	1	31.7	39.3	35.5	7.6	0							
11 AOR11217-3	0	30.0	34.3	32.1	3	4.6	1	34.9	45.1	40.0	10.3	0							
12 AOR13064-2	0	43.5	44.2	43.9	5	2.6	0	43.4	47.1	45.3	4.6	0							
13 CO13003-1RU	0	12.6	32.6	22.6	1	20.0	4	15.7	28.5	22.1	12.8	3							
14 COTX08063-2Ru	0	30.2	37.3	33.8	3	7.1	1	39.5	47.0	43.2	7.9	0							
LSD 0.05	ns			3.0		3.3				3.9	3.5								
Average	2	26.2	32.4	29.3		7.0	2	29.9	37.5	33.7	8.2	1							

Date test performed:

**Washington**

Dec. 18

Nov. 29

Dec. 13

**Idaho**

Dec. 18

Dec. 3

Dec. 14

**Oregon**

Dec. 18

Dec. 10

Dec. 14

DIFF = Absolute difference between bud and stem Photovolt reading.

Sprouting was rated after approximately 3 months after storage.



# 2023 Late Harvest Regional Trial

## Stored at 40°F for 60 Days and Water Blanched

Clone	PHOTOVOLT READING (60 Days at 40°F)						PHOTOVOLT AFTER WATER BLANCHING (10 min @ 160°F)				
	stem	bud	ave	rtg \$	DIFF	USDA COLOR	stem	bud	ave	Diff	USDA COLOR
<b>Washington</b>											
1 Clearwater Russet	18.8	34.0	26.4	2	15.2	3	26.4	37.7	32.1	11.3	1
2 Ranger Russet	18.7	26.6	22.6	1	8.0	3	22.9	28.0	25.5	5.6	2
3 Russet Burbank	14.2	19.7	17.0	0	5.5	4	17.0	20.5	18.7	3.5	3
4 A09086-1LB	12.4	18.5	15.4	0	6.0	4	18.5	23.3	20.9	5.0	3
5 A10594-4sto	23.1	31.2	27.2	2	8.2	2	31.1	35.1	33.1	4.3	0
6 A12169-5	17.6	24.6	21.1	1	7.1	3	27.9	31.1	29.5	4.0	1
7 A12305-2adg	14.2	21.3	17.7	0	7.1	4	19.5	27.1	23.3	7.6	3
8 A13036-12	28.7	32.8	30.7	3	4.7	1	36.2	37.4	36.8	3.6	0
9 AC12090-3RU	12.5	14.8	13.6	0	2.6	4	16.9	19.0	18.0	3.0	3
10 AFA5661-8	23.4	28.9	26.1	2	5.6	2	29.7	31.6	30.6	3.5	1
11 AOR11217-3	18.1	29.4	23.7	1	11.4	3	25.7	35.2	30.4	9.5	1
12 AOR13064-2	34.1	37.2	35.6	4	5.5	0	37.0	37.9	37.5	4.0	0
13 CO13003-1RU	7.7	20.6	14.2	0	12.9	4	11.0	20.4	15.7	9.4	4
14 COTX08063-2Ru	20.4	28.1	24.2	1	8.2	2	28.6	33.7	31.1	6.4	1
<i>LSD</i> <sub>0.05</sub>			3.1		3.0				2.8	2.7	
Average	18.8	26.3	22.6		7.7	3	24.9	29.9	27.4	5.8	2
<b>Idaho</b>											
1 Clearwater Russet	22.1	31.4	26.8	2	9.3	2	35.7	39.3	37.5	4.5	0
2 Ranger Russet	18.2	26.5	22.3	1	8.3	3	24.9	33.3	29.1	8.4	2
3 Russet Burbank	13.7	20.1	16.9	0	6.4	4	19.3	24.8	22.1	6.3	3
4 A09086-1LB	15.7	21.4	18.5	0	5.8	3	22.1	26.1	24.1	4.3	2
5 A10594-4sto	19.0	23.5	21.2	1	4.5	3	27.8	29.8	28.8	4.1	1
6 A12169-5	31.7	28.7	30.2	2	4.2	0	39.9	34.8	37.4	5.2	0
7 A12305-2adg	15.9	23.1	19.5	0	7.2	3	23.4	28.0	25.7	5.4	2
8 A13036-12	36.0	36.2	36.1	4	2.4	0	38.9	38.7	38.8	2.1	0
9 AC12090-3RU	15.3	18.9	17.1	0	3.8	3	17.1	19.3	18.2	2.8	3
10 AFA5661-8	21.6	31.5	26.6	2	9.9	2	27.6	29.8	28.7	3.9	1
11 AOR11217-3	19.4	27.2	23.3	1	8.0	3	28.5	32.3	30.4	4.0	1
12 AOR13064-2	30.1	34.8	32.4	3	5.3	1	35.6	37.7	36.6	3.2	0
13 CO13003-1RU	13.0	30.4	21.7	1	17.4	4	16.5	31.2	23.8	14.7	3
14 COTX08063-2Ru	No Sample						No Sample				
<i>LSD</i> <sub>0.05</sub>			2.8		3.6				2.7	2.9	
Average	20.9	27.2	24.0		7.1	2.4	27.5	31.1	29.3	5.3	1.4
<b>Oregon</b>											
1 Clearwater Russet	31.6	39.3	35.5	3	7.6	0	42.9	46.6	44.7	3.9	0
2 Ranger Russet	20.1	26.3	23.2	1	7.2	2	28.3	34.5	31.4	6.2	1
3 Russet Burbank	18.4	24.4	21.4	1	6.0	3	27.2	30.5	28.8	3.9	1
4 A09086-1LB	17.5	25.7	21.6	1	8.2	3	23.6	29.7	26.7	6.8	2
5 A10594-4sto	26.0	32.1	29.0	2	6.3	1	31.5	35.8	33.6	4.6	0
6 A12169-5	32.1	36.4	34.2	3	5.5	0	38.7	41.1	39.9	4.9	0
7 A12305-2adg	18.7	29.7	24.2	1	11.1	3	25.1	37.2	31.2	12.0	1
8 A13036-12	34.9	35.2	35.1	3	2.2	0	39.9	40.4	40.1	3.5	0
9 AC12090-3RU	21.1	20.3	20.7	1	2.8	2	30.0	29.9	30.0	2.7	1
10 AFA5661-8	29.9	35.4	32.6	3	7.3	1	37.1	39.3	38.2	6.2	0
11 AOR11217-3	30.0	34.3	32.1	3	4.6	1	37.9	40.4	39.1	3.4	0
12 AOR13064-2	43.5	44.2	43.9	5	2.6	0	47.0	47.8	47.4	1.9	0
13 CO13003-1RU	12.6	32.6	22.6	1	20.0	4	19.9	37.2	28.6	17.3	3
14 COTX08063-2Ru	30.2	37.3	33.8	3	7.1	1	36.8	42.5	39.6	6.2	0
<i>LSD</i> <sub>0.05</sub>			3.0		3.3				2.8	3.0	
Average	26.2	32.4	29.3		7.0	2	33.3	38.0	35.7	6.0	1

Date test performed:

**Washington**

Nov. 29

Nov. 29

**Idaho**

Dec. 3

Dec. 3

**Oregon**

Dec. 10

Dec. 10

Diff = Absolute difference between stem and bud Photovolt reading.

## Entries Retained from the 2022 Trials Currently in the Regional Trial

Three clones, A12169-5, A13036-12, & AOR13064-2 were advanced from the 2022 Tri-State Trial into the 2023 Regional Trial. Seven clones were retained in the Regional Trial. When averaged across states, AOR13064-2 produced the lightest fries (47.0 ref units). Clearwater produced the second lightest fries (44.6 ref units). The uniformity of fry color was unacceptable for RR (ID & OR) RB (WA, ID & OR), A09086-1LB (WA & OR), A123052adg (WA, ID & OR), AFA5661-8 (WA) and CO13003-1RU (WA, ID & OR). Average sprout length ranged from 0.8 to 2.7 inches. AOR13064-2 had the longest average sprouts with 3.5 (WA), 1.8 (ID) and 2.8 (OR).

		PHOTOVOLT READING				USDA	% REDUCING SUGAR			Sprouting	
Clone		stem	bud	avg	DIFF	COLOR	stem	bud	avg	percent	length (in.)
Washington											
1 Clearwater		41.6	45.6	43.6	6.7	0	0.7	0.6	0.6	100	1.0
2 Ranger Russet		29.1	30.7	29.9	4.1	1	1.5	1.3	1.4	100	2.5
3 Russet Burbank		26.0	36.2	31.1	10.2	1	1.8	0.9	1.4	100	2.0
4 A09086-1LB		23.0	38.5	30.7	15.5	2	2.2	0.8	1.5	100	1.8
5 A10594-4sto		33.7	34.8	34.2	3.6	0	1.1	1.0	1.0	100	2.5
6 A12169-5 §		40.9	41.9	41.4	3.3	0	0.7	0.7	0.7	100	2.5
7 A12305-2adg		26.5	42.0	34.2	15.5	1	1.8	0.7	1.2	100	1.8
8 A13036-12 §		41.6	42.4	42.0	2.6	0	0.7	0.6	0.7	100	2.0
9 AC12090-3Ru		28.5	31.1	29.8	4.3	1	1.5	1.3	1.4	100	0.8
10 AFA5661-8		35.6	44.5	40.1	9.3	0	1.0	0.6	0.8	100	2.0
11 AOR11217-3		42.9	44.8	43.8	3.7	0	0.6	0.6	0.6	100	2.5
12 AOR13064-2 §		47.7	46.6	47.2	3.7	0	0.5	0.5	0.5	100	3.5
13 CO13003-1Ru		20.2	30.3	25.2	10.7	2	2.6	1.4	2.0	100	2.3
Average		LSD 0.05 32.6	3.1 38.8	3.5 36.4	7.5	1	1.3	0.8	1.1	100	
Idaho											
1 Clearwater		42.1	47.2	44.6	6.9	0	0.6	0.5	0.6	100	0.8
2 Ranger Russet		31.6	40.9	36.2	9.3	0	1.2	0.7	1.0	100	2.0
3 Russet Burbank		24.7	41.1	32.9	17.2	1	2.0	0.7	1.3	100	0.3
4 A09086-1LB		33.4	35.3	34.4	5.0	0	1.1	1.0	1.0	100	1.5
5 A10594-4sto		39.2	42.1	40.6	3.1	0	0.8	0.6	0.7	100	1.8
6 A12169-5 §		44.8	46.7	45.8	3.2	0	0.6	0.5	0.6	100	2.5
7 A12305-2adg		32.3	42.8	37.5	11.1	0	1.2	0.6	0.9	100	1.5
8 A13036-12 §		42.9	39.9	41.4	3.0	0	0.6	0.7	0.7	100	2.0
9 AC12090-3Ru		31.8	35.5	33.7	4.6	0	1.2	1.0	1.1	100	0.8
10 AFA5661-8		41.3	41.5	41.4	3.4	0	0.7	0.7	0.7	100	1.3
11 AOR11217-3		43.0	43.8	43.4	4.5	0	0.6	0.6	0.6	100	1.5
12 AOR13064-2 §		49.1	47.3	48.2	3.7	0	0.5	0.5	0.5	100	1.8
13 CO13003-1Ru		26.6	38.0	32.3	11.4	1	1.8	0.8	1.3	100	1.3
Average		LSD 0.05 36.4	2.9 41.3	3.6 39.4	6.7	0	1.0	0.7	0.9	100	
Oregon											
1 Clearwater		44.2	46.7	45.4	3.8	0	0.6	0.5	0.6	100	1.5
2 Ranger Russet		24.1	32.4	28.2	10.0	2	2.1	1.2	1.6	100	2.0
3 Russet Burbank		22.6	35.3	29.0	13.1	2	2.3	1.0	1.6	100	3.0
4 A09086-1LB		19.8	33.9	26.9	15.0	2	2.7	1.1	1.9	100	2.3
5 A10594-4sto		33.2	36.9	35.1	4.2	0	1.1	0.9	1.0	100	3.0
6 A12169-5 §		37.0	40.3	38.7	6.0	0	0.9	0.7	0.8	100	2.8
7 A12305-2adg		29.7	40.2	34.9	10.6	1	1.4	0.7	1.1	100	2.3
8 A13036-12 §		38.9	43.2	41.1	5.8	0	0.8	0.6	0.7	100	3.3
9 AC12090-3Ru		21.2	26.5	23.8	5.8	2	2.5	1.8	2.1	100	1.0
10 AFA5661-8		40.4	44.3	42.3	5.7	0	0.7	0.6	0.6	100	2.0
11 AOR11217-3		38.8	43.3	41.1	5.8	0	0.8	0.6	0.7	100	2.3
12 AOR13064-2 §		46.7	44.7	45.7	5.0	0	0.5	0.6	0.6	100	2.8
13 CO13003-1Ru		19.3	30.6	25.0	12.0	3	2.8	1.3	2.1	100	2.5
Average		LSD 0.05 31.1	4.0 38.0	3.8 34.5	8.0	1	1.5	0.9	1.2	100	

Date test performed:

**Washington** April 29

**Idaho** April 29

**Oregon** April 29

§ Advanced from 2022 Tri-State Trial.

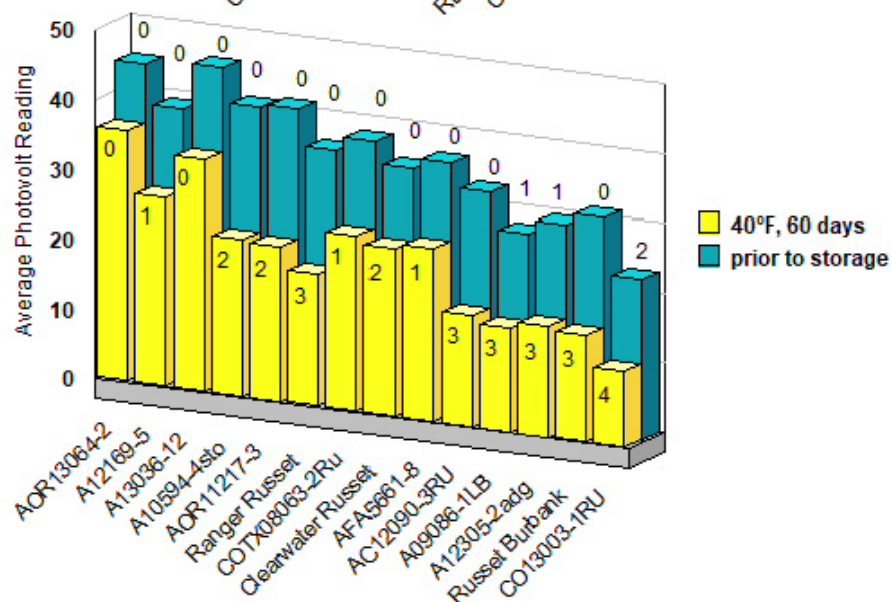
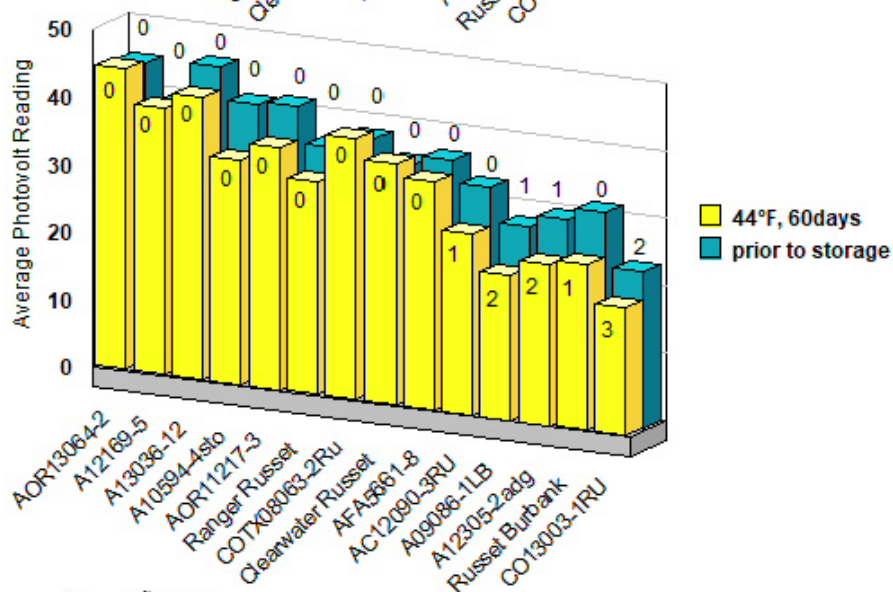
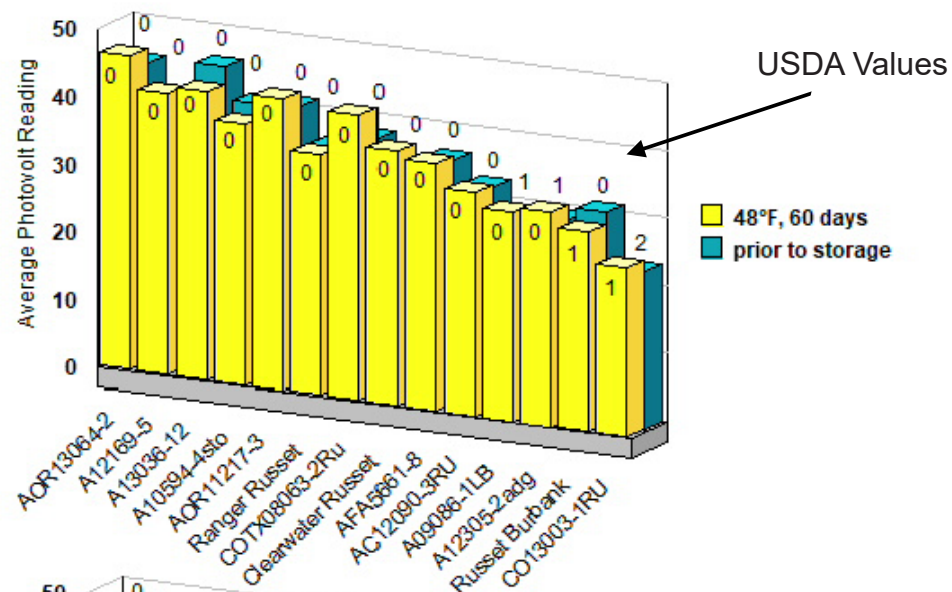


# Seed lot readings and WSU Potato Field Day 2023

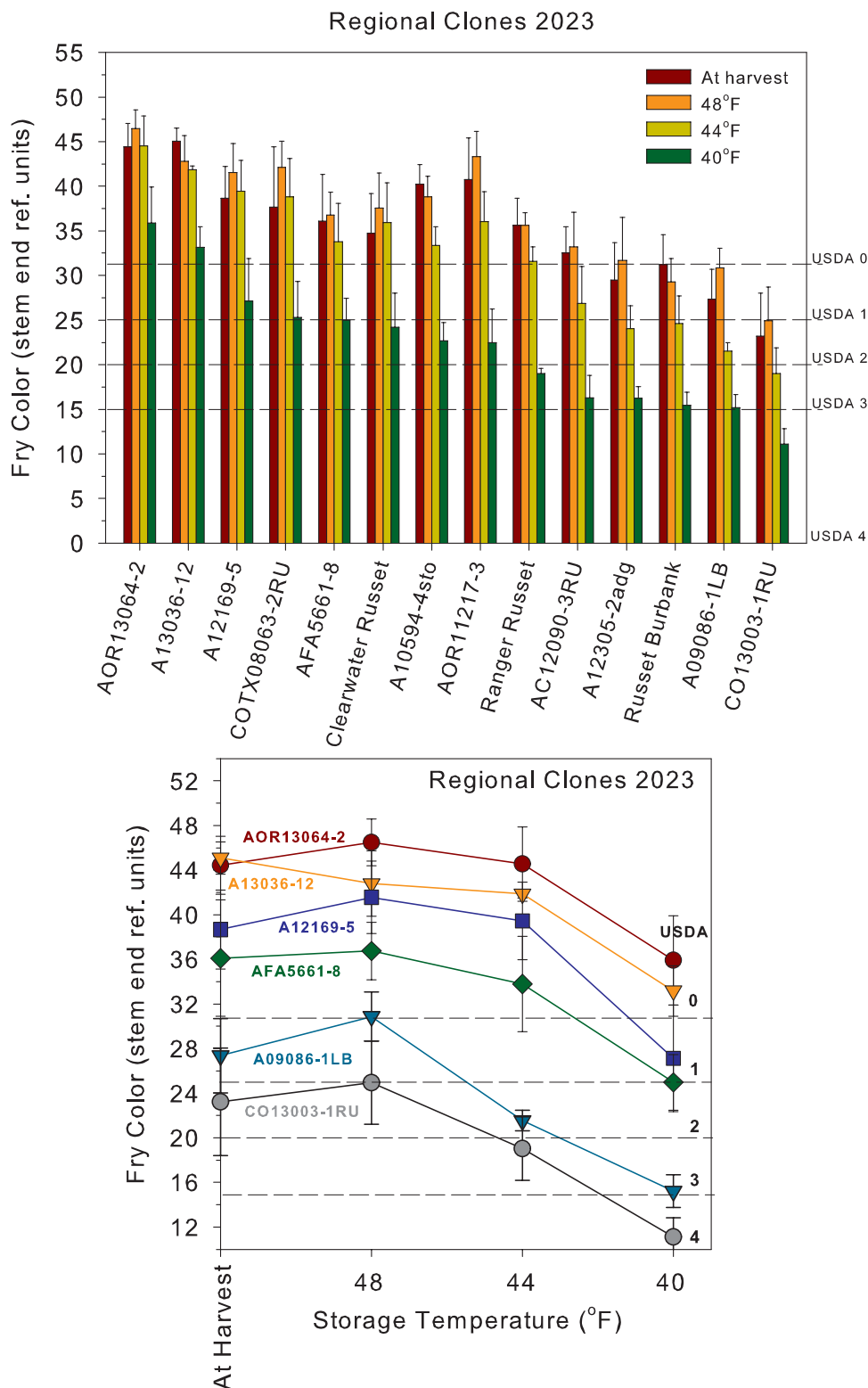




## 2023 Late Harvest Regional Trial



# 2023 Late Harvest Regional Trial

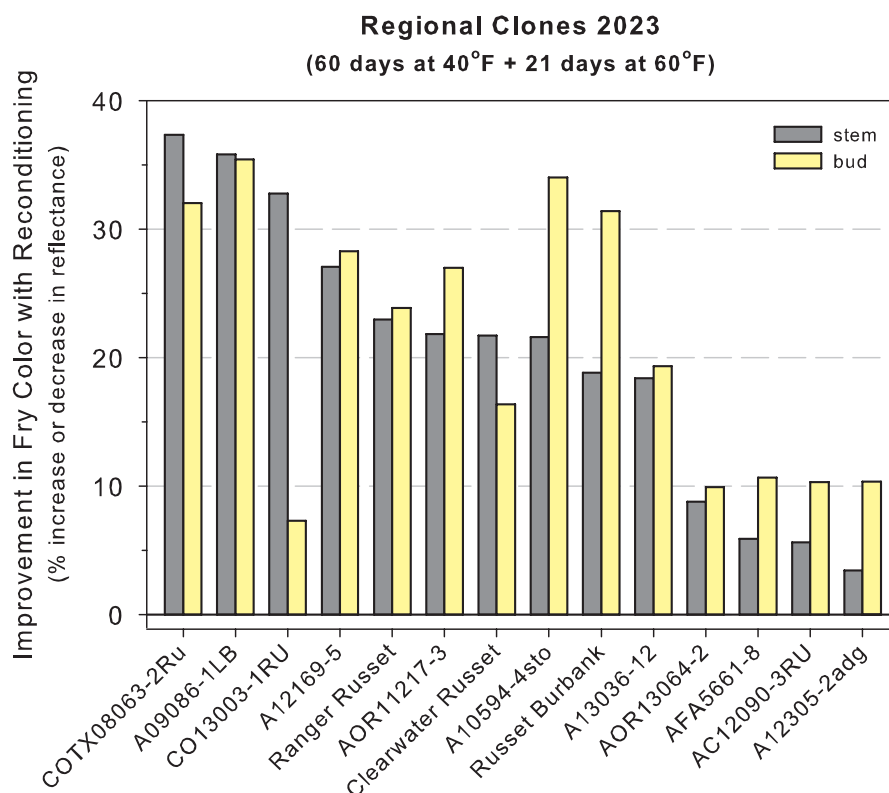
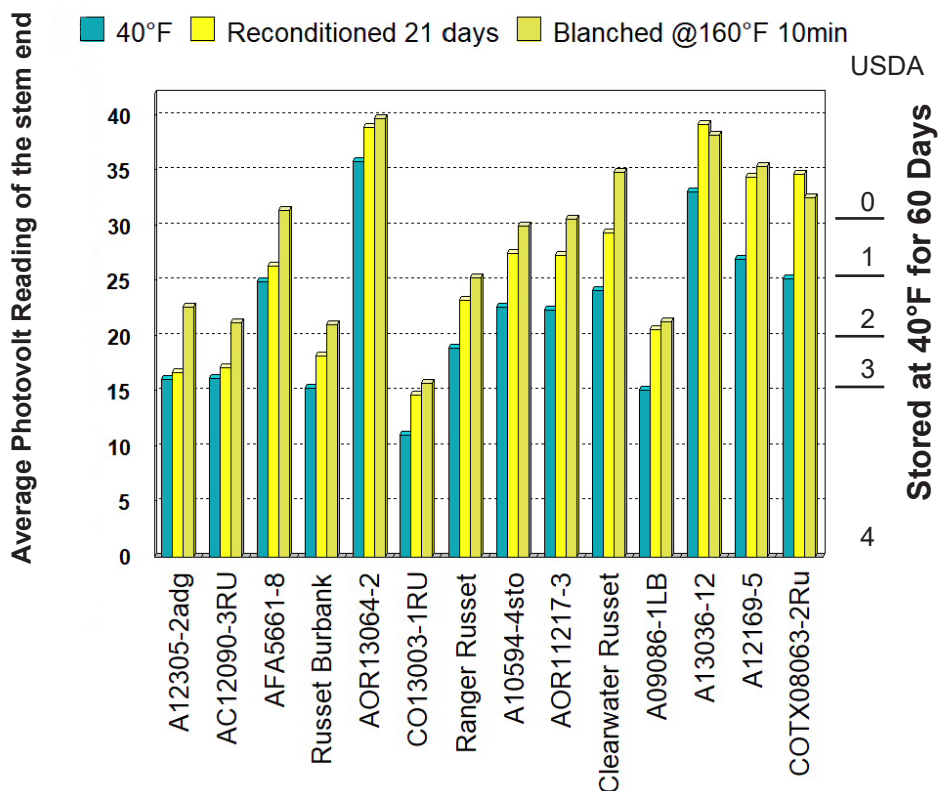


**Top:** At-harvest and after-storage French fry colors (stem end) of clones in the Regional Trial. Tubers were stored for 60 days at 48, 44 and 40°F. The clones are ranked from best to worst based on fry color of the 40°F-stored tubers. High reflectance values indicate light colored fries.

**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 (AOR13064-2†, A13036-12†, A12169-5†, and AFA5661-8\*) and susceptible (A09086-1LB and CO13003-1RU\*) clones in the Regional Trial. \*Indicates similar performance of the clones last year. †Indicates top performance in Tri-State trials before advancement to the Regional trials.



## 2023 Late Harvest Regional Trial



Reconditioning abilities of clones in the 2023 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.

# 2023 Late Harvest Regional Trial

## Length to Width Ratios of 8-10 oz Tubers

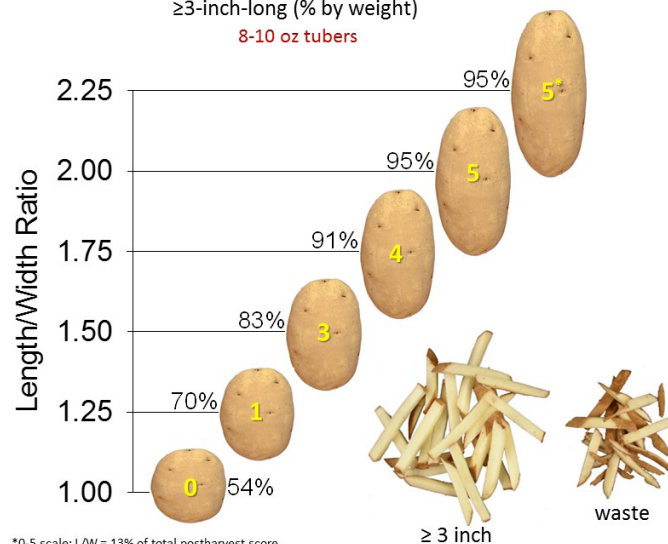
Clone	Regional Length to width ratio 8-10 oz tubers						3 State Avg.
	WA	rtg \$	ID	rtg \$	OR	rtg \$	
1 Clearwater Russet	1.56	3	2.00	5	1.68	4	1.75
2 Ranger Russet	1.78	4	2.10	5	1.97	5	1.95
3 Russet Burbank	1.68	4	1.98	5	1.84	5	1.83
4 A09086-1LB	1.56	3	1.85	5	1.58	3	1.66
5 A10594-4sto	1.64	3	2.06	5	1.59	3	1.76
6 A12169-5	1.51	3	1.91	5	1.45	2	1.63
7 A12305-2adg	1.74	4	1.94	5	1.80	5	1.83
8 A13036-12	1.47	2	1.51	3	1.49	2	1.49
9 AC12090-3RU	1.86	5	1.99	5	2.04	5	1.96
10 AFA5661-8	1.50	3	1.78	4	1.43	2	1.57
11 AOR11217-3	1.72	4	2.03	5	1.67	4	1.81
12 AOR13064-2	1.70	4	1.90	5	1.77	4	1.79
13 CO13003-1RU	1.55	3	1.75	4	1.56	3	1.62
14 COTX08063-2Ru	1.72	4	-	-	1.72	4	1.72
Average	1.64		1.91		1.69		1.74

Clone	Regional Width to thickness ratio 8-10 oz tubers				3 State Avg.
	WA	ID	OR		
1 Clearwater Russet	1.23	1.13	1.25		1.20
2 Ranger Russet	1.24	1.20	1.22		1.22
3 Russet Burbank	1.27	1.20	1.25		1.24
4 A09086-1LB	1.22	1.19	1.23		1.21
5 A10594-4sto	1.18	1.16	1.18		1.17
6 A12169-5	1.20	1.15	1.19		1.18
7 A12305-2adg	1.10	1.09	1.19		1.13
8 A13036-12	1.18	1.16	1.24		1.19
9 AC12090-3RU	1.15	1.15	1.13		1.14
10 AFA5661-8	1.15	1.14	1.17		1.15
11 AOR11217-3	1.19	1.12	1.24		1.18
12 AOR13064-2	1.19	1.14	1.18		1.17
13 CO13003-1RU	1.23	1.20	1.24		1.23
14 COTX08063-2Ru	1.20	-	1.19		1.19
Average	1.19	1.16	1.21		1.19

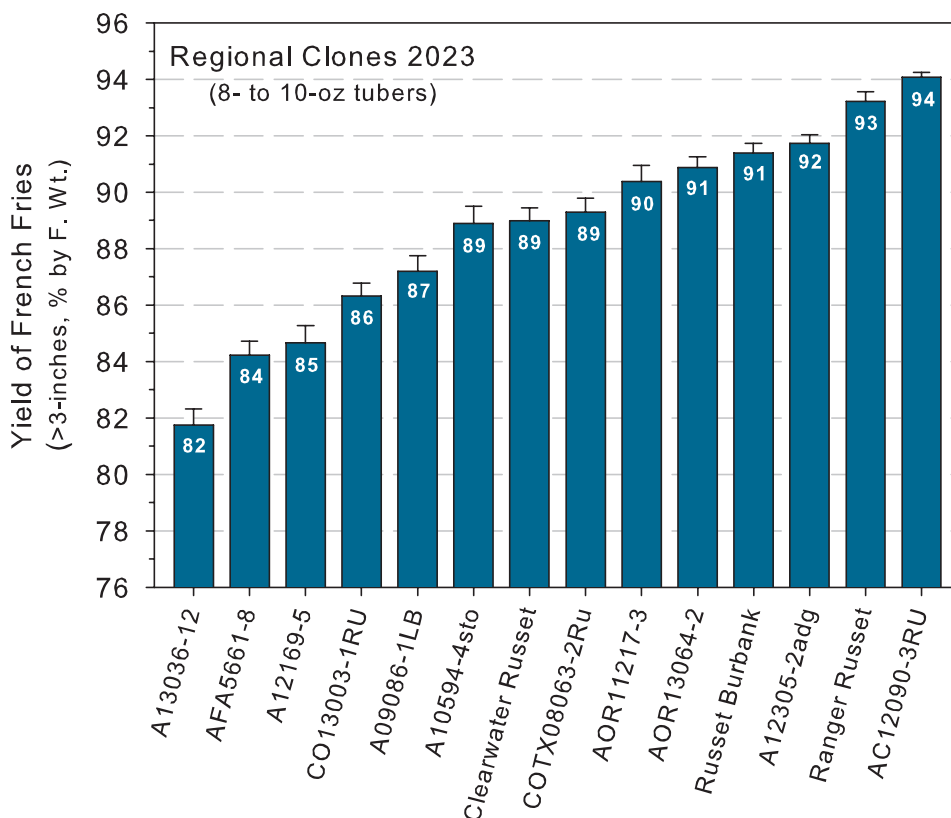
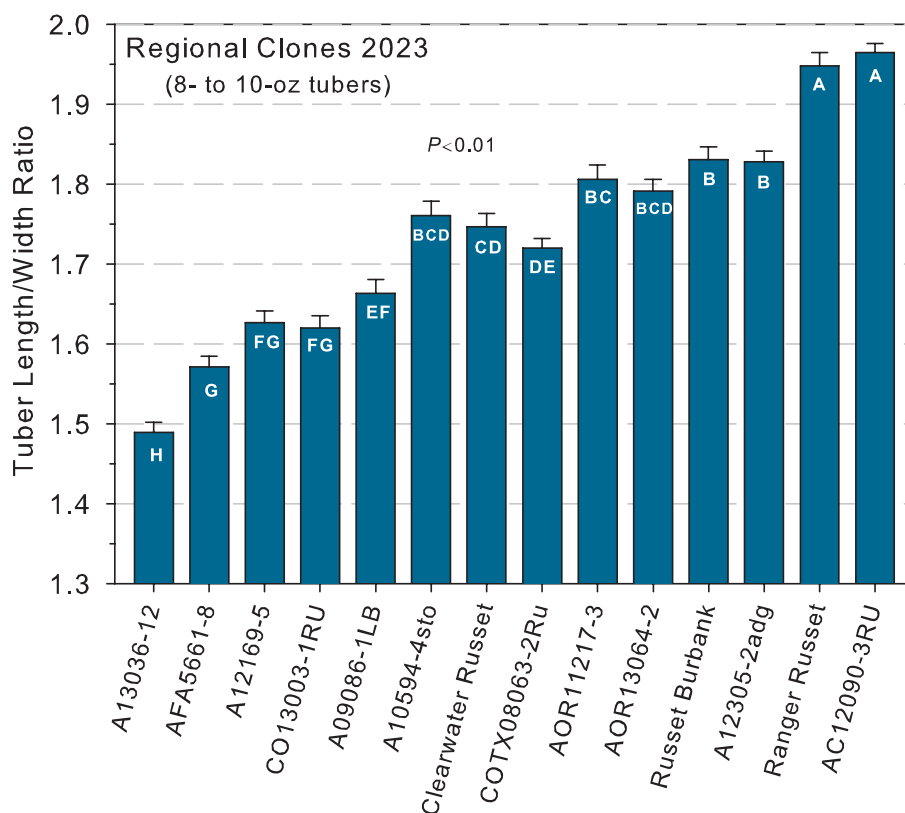
### French Fry Yield vs Tuber L/W Ratio

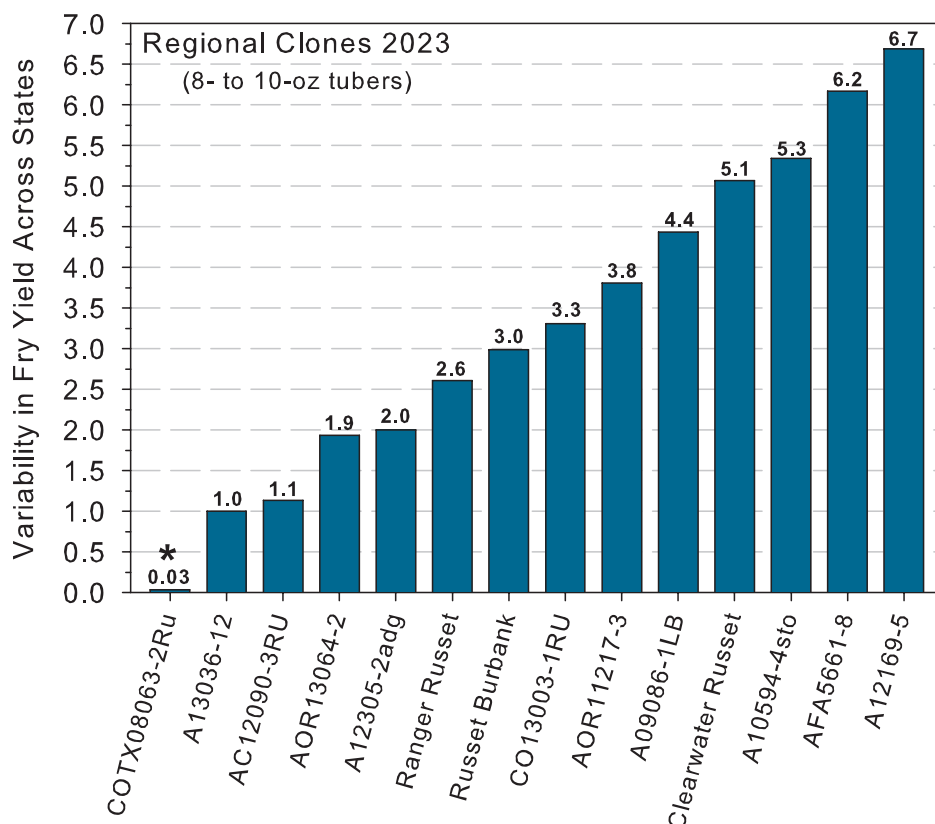
≥3-inch-long (% by weight)

8-10 oz tubers



## 2023 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  $\geq 3$  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, A12169-5 had a length to width ratio of 1.63, resulting in 85% of the tuber producing usable French fries  $\geq 3$  inches in length (page 90). However, tuber shape of this entry also varied the most across production sites (see above), resulting in fry yields ranging from 81 to 89% ( $85 \pm 3.9\%$ ). Note: ID sample for COTX08063-2RU was missing, so variability was low.

Pages 90-91: Tuber length to width ratios and the associated percentage yield of fries. Bars with same letter are not significantly different ( $P \leq 0.01$ ).



# 2023 Tri-State Specialty Trial

Location: WSU Research Center – Othello, WA

Planting Date: April 6

Vine Kill Date: July 21

Harvest Date: August 9

Days Grown: 106

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 5 local reference varieties to 10 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: A11582-1R and POR16PG25-2**

## Standcounts

### ➤ 60 Day

*Full emergence:* All entries were greater than 80% emerged at 60 days after planting, except for POR18PG37-4 (76%).

## 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:* A11576-1Ysto (15.4) and A11573-5RYsto (14.5).  
*Fewest:* POR18PG54-1 (5.1) and Yukon Gold (5.8).

### ➤ Average Tuber Size (oz)

*Largest:* POR18PG54-1 (9.0) and Yukon Gold (7.1).  
*Smallest:* POR18PG37-4 (2.6), A11573-5RYsto and COOR1508-1 (2.8).

## Standcounts

### ➤ Total Yield and U.S. #1 Yield

*Highest:* A11576-1Ysto had the highest total (850 CWT/A) and the highest U.S. #1 yield (816 CWT/A).  
POR17PG64-2 had the second highest total yield (797 CWT/A) and second highest U.S. #1 yield (784 CWT/A).  
*Lowest:* COOR15108-1 had the lowest total (494 CWT/A) and U.S. #1 yield (480 CWT/A).

# 2023 Tri-State Red/Specialty Trial

## Postharvest Information

The 2023 red & specialty trial consisted of five cultivars and ten numbered clones (6 red, 6 yellow, and 3 purple) for a total of 15 entries. An “\*” in the summary below indicates similar performance and/or ranking in trials from previous years.

### ➤ Overall Postharvest Ratings

*Highest scoring Overall:* A08122-9RY

*Highest scoring Red:* A08122-9RY\*

*Highest scoring Yellow:* POR18PG37-4

*Highest scoring Purple:* POR16PG25-2

### ➤ Boiling

*Highest scoring Overall:* Chieftain

*Highest scoring Red:* Chieftain

*Highest scoring Yellow:* Yukon Gold

*Highest scoring Purple:* POR18PG54-1

### ➤ Baking

*Highest scoring Overall:* A11573-5RYsto

*Highest scoring Red:* A11573-5RYsto

*Highest scoring Yellow:* Bintje

*Highest scoring Purple:* Purple Majesty

### ➤ Microwaving

*Highest scoring Overall:* A08122-9RY

*Highest scoring Red:* A08122-9RY

*Highest scoring Yellow:* POR18PG37-4

*Highest scoring Purple:* POR16PG25-2

### Details:

- Similar to previous years, culinary scores were high with all entries receiving 67-78% of the total points possible in the 2023 culinary evaluations.
- The top scoring clone was A08122-9RY (Red) with 59.2 points and POR18PG54-1 (Purple) was the lowest with 50.4 points. There was an 8.6 point difference between the top and bottom scoring clones.

- The top red entries were A08122-9RY\*, Chieftain\*, & COOR15108-1 (average 58.4 points). POR18PG37-4 & Bintje were the top yellow entries with 56.7 and 56.5 points respectively. POR-16PG25-2 was the top purple entry with 54.9 points.
- Modoc, COOR15108-1, POR17PG64-2, A11573-5RYsto, and POR16PG34-1 showed no sloughing in the boiling cook method evaluations. All other entries showed “slight” to “moderate” sloughing except for Purple Majesty\* which rated “severe” for sloughing. All entries showed “slight” to “moderate” after cooking darkening and a “creamy” to “fluffy” texture. The tuber center for all entries rated between “mushy” and “fully cooked”. Flavor was “bland” for all entries except POR17PG64-2 & POR16PG34-1 which scored unacceptable. Yukon Gold & Chieftain rating the highest.
- In baked evaluations, all entries had “slight” to “none” after cooking darkening with Modoc, COOR15108-1, Yukon Gold, Bintje, POR18PG37-4, Purple Majesty, and POR18PG54-1 having no darkening. POR18PG37-4, POR16PG34-1, POR16PG25-2, Modoc\*, POR17PG64-2, A11582-1R had a “pasty” texture and all other entries had a “creamy” texture with the exception of A11573-5RYsto which had a “fluffy” texture. The baked samples of all entries had acceptable flavor (“good” to “bland”) with the exception of A11576-1Ysto which was “unacceptable” for flavor. 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” darkening in all entries except for COOR15108-1 and A11573-5RYsto which rated as “moderate” darkening. The texture of the microwaved samples was favorably rated as “fluffy” or “creamy” in all entries. Furthermore, all entries rated as “bland” to “good” for flavor with skin ratings of “steamy” to “fully cooked”. Finally, tuber centers of all entries rated as “mushy” to “fully cooked” except for POR18PG54-1 which had a “somewhat raw” center rating.
- COOR15108-1 (Red) produced the lightest chips with a SFA color rating of 2.3 and purple entries, POR18PG54-1 and POR16PG25-2, produced the darkest color of 4.5 and 4.9, respectively (1-5 scale). All other entries rated 3.3 to 4.3 with an average color of 3.8 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 5.1 minutes to cook compared with 4.0 minutes for bud end cores. Cooking times (stem end) ranged from 3.8 min (POR18PG37-4) to 7.4 min (Modoc\*). Overall average cooking time, regardless of tuber portion, was 4.6 minutes.

## Overall Culinary Evaluation Scores

	Clone	Boiled (25 max)	Baked (25 max)	Microwaved (25 max)	Total (75 max)
5	A08122-9RY	18.6	19.9	20.8	59.2
1	Chieftain	19.5	19.3	19.6	58.5
3	COOR15108-1	19.1	20.0	18.4	57.5
11	A11573-5RYsto	18.8	20.1	17.9	56.8
10	POR18PG37-4	17.5	18.9	20.4	56.7
8	Bintje	18.0	20.0	18.5	56.5
2	Modoc	18.9	17.9	18.8	55.5
6	A11582-1R	18.0	17.7	19.6	55.3
9	A11576-1Ysto	17.3	18.0	19.6	54.9
15	POR16PG25-2	17.3	17.7	19.9	54.9
12	POR16PG34-1	18.0	16.9	19.6	54.5
7	Yukon Gold	18.3	19.1	16.5	53.9
13	Purple Majesty	15.3	18.6	19.1	53.0
4	POR17PG64-2	18.0	17.1	17.6	52.8
14	POR18PG54-1	18.1	16.6	15.8	50.4

**Chipped:** Aug. 21  
**Boiled:** Aug. 24  
**Microwaved:** Aug. 30  
**Baked:** Aug. 22  
**Cooking Time:** Aug. 18



# 2023 Tri-State Specialty Trial

## Summaries

ENTRY	TOTAL YIELD					EXTERNAL DEFECTS		
	CWT/A	Tons/A	US # 1's*	US # 2's*	Culls*	1 = Severe	5 =None	
			> 0 oz	> 0 oz	> 0 oz	Growth		
			----- % of Total Yield -----					Knobs
Red Skin/White Flesh								
Chieftain	786	39.3	94	3	3	5	4	5
Modoc	661	33.1	92	5	3	5	4	4
COOR15108-1	494	24.7	97	2	1	5	5	4
POR17PG64-2	797	39.8	98	1	1	5	5	4
A08122-9RY	688	34.4	97	1	2	5	5	4
A11582-1R	628	31.4	97	1	2	5	5	4
Yellow Flesh								
Yukon Gold	628	31.4	96	4	1	5	4	5
Bintje	659	32.9	79	18	3	5	5	3
A11576-1Ysto	850	42.5	96	2	2	5	5	4
POR18PG37-4	500	25.0	97	1	3	5	5	4
A11573-5RYsto	636	31.8	97	2	1	5	5	4
POR16PG34-1	546	27.3	87	2	11	5	2	5
Purple/Purple Flesh								
Purple Majesty	721	36.1	93	7	0	5	5	5
POR18PG54-1	704	35.2	85	11	4	5	4	5
POR16PG25-2	613	30.6	100	0	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	738	36.9	3	14	21	40	22	1.060
Modoc	611	30.6	6	24	28	30	12	1.057
COOR15108-1	480	24.0	18	47	23	11	0	1.068
POR17PG64-2	784	39.2	7	24	28	33	8	1.059
A08122-9RY	671	33.5	11	45	27	16	0	1.071
A11582-1R	610	30.5	12	38	31	19	0	1.054
Yellow Flesh								
Yukon Gold	600	30.0	3	9	13	25	50	1.073
Bintje	524	26.2	7	28	24	30	12	1.069
A11576-1Ysto	816	40.8	8	36	38	17	1	1.070
POR18PG37-4	484	24.2	23	51	21	6	0	1.063
A11573-5RYsto	615	30.7	17	47	27	9	0	1.071
POR16PG34-1	474	23.7	19	47	27	7	1	1.066
Purple/Purple Flesh								
Purple Majesty	672	33.6	10	38	29	19	5	1.068
POR18PG54-1	595	29.8	1	3	8	31	56	1.055
POR16PG25-2	610	30.5	9	35	34	18	4	1.068

\* 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	1 = Round					1 = Poor	1 = Poor
	5 = Good	5 = Long					% Emerged	Above Ground
Red Skin/White Flesh								
Chieftain	2.8	1.0	84	2.3	5.7	8.9	3.0	3.3
Modoc	4.0	2.0	89	2.4	4.4	9.8	3.0	2.5
COOR15108-1	2.8	1.0	90	2.6	2.8	11.6	4.0	4.0
POR17PG64-2	4.0	2.0	84	2.6	4.2	12.3	2.5	2.0
A08122-9RY	3.0	1.0	89	2.3	3.2	14.1	3.0	4.0
A11582-1R	3.3	1.8	96	2.2	3.3	12.3	3.0	3.3
Yellow Flesh								
Yukon Gold	4.0	1.0	91	2.0	7.1	5.8	2.0	2.0
Bintje	3.0	4.0	85	2.2	4.7	9.3	1.0	1.0
A11576-1Ysto	4.0	1.3	89	2.3	3.6	15.4	3.3	3.0
POR18PG37-4	3.3	1.0	76	2.5	2.6	12.5	4.0	3.0
A11573-5RYsto	3.3	1.0	88	2.5	2.8	14.5	4.0	3.5
POR16PG34-1	3.0	1.0	85	2.2	2.9	12.1	3.3	2.0
Purple/Purple Flesh								
Purple Majesty	5.0	2.3	84	2.4	3.6	13.0	2.3	1.0
POR18PG54-1	4.0	2.0	80	2.1	9.0	5.1	2.0	1.0
POR16PG25-2	5.0	2.0	91	2.5	3.6	11.1	3.0	3.0



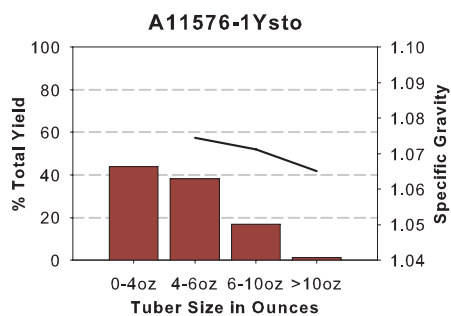
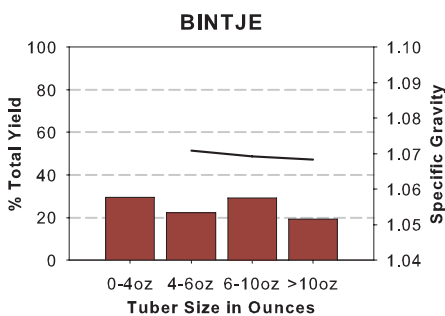
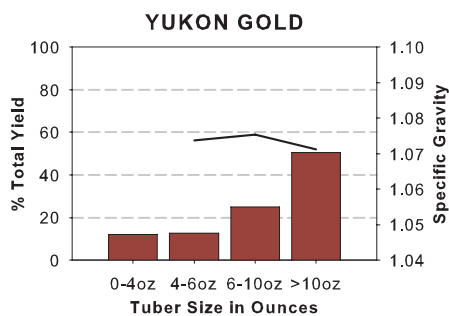
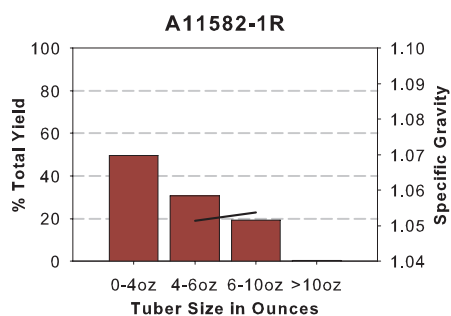
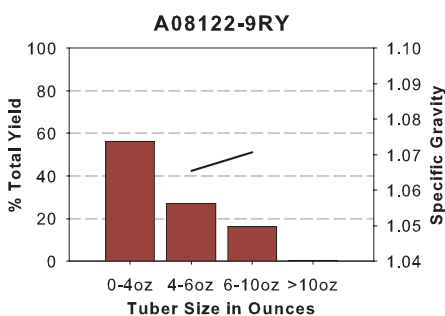
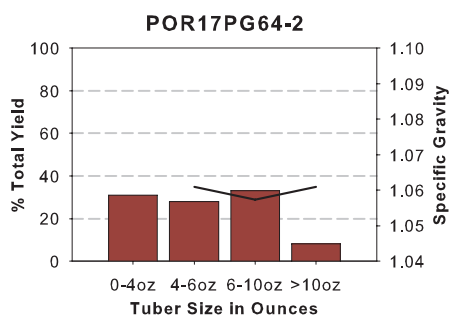
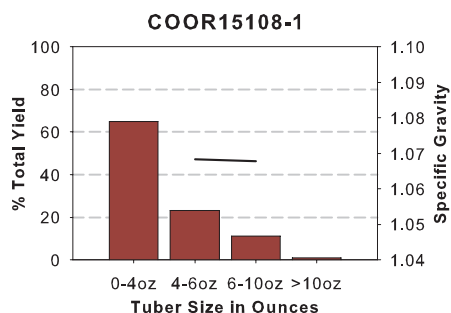
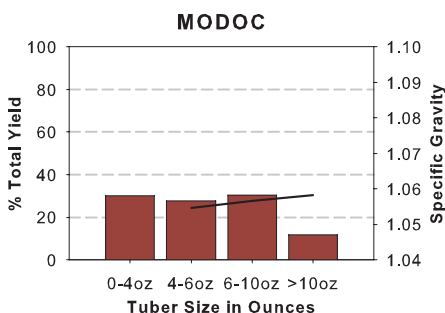
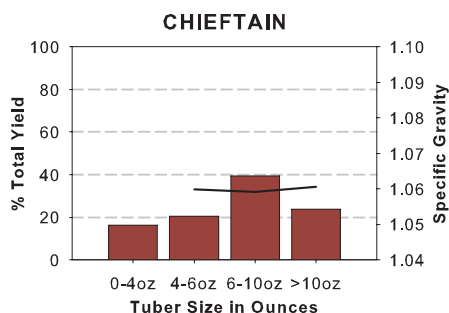
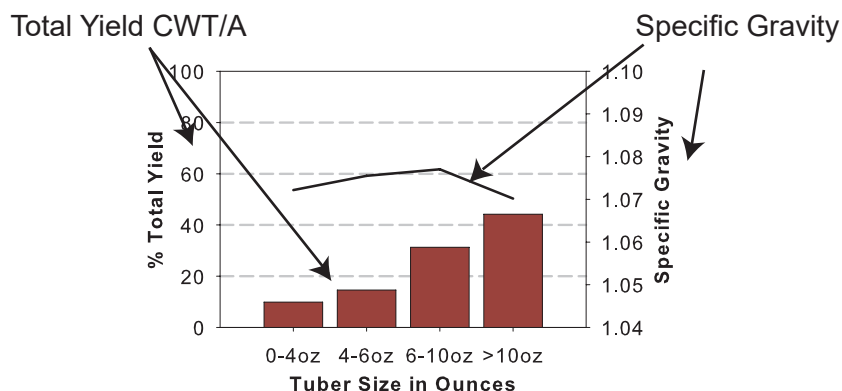
Modoc was one variety used for a seed size demonstration at this year's Othello Field Day in June.

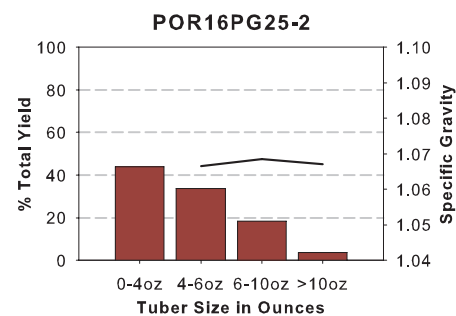
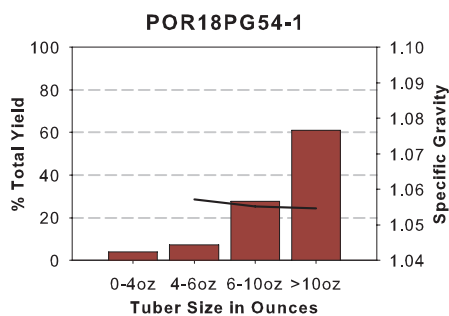
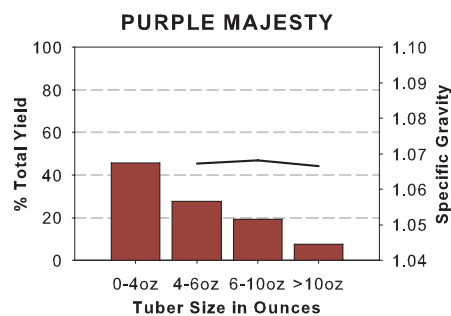
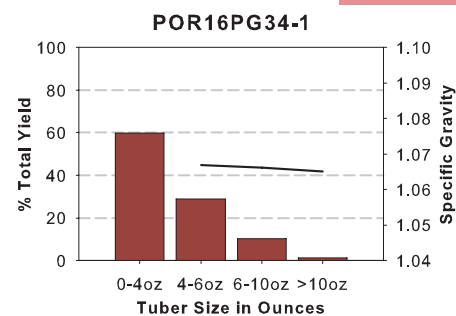
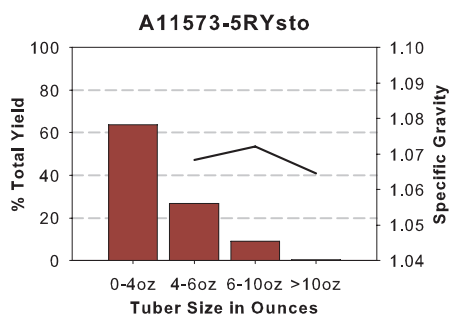
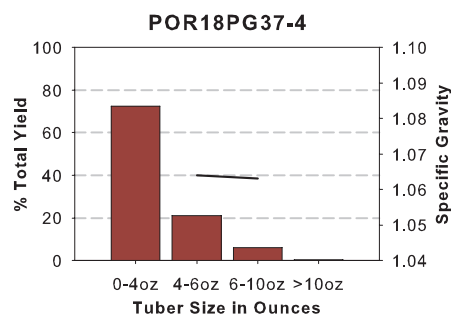
# 2023 Tri-State Specialty Trial

## 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





# 2023 Washington Tri-State Specialty Trial

## Red Clone Culinary Evaluation

### Boiled

	Clone	Flavor	After Cooking Darkening	Texture	Tuber Center	Sloughing	Total Rating
1	Chieftain	3.6	4.2	3.5	4.4	3.9	19.5
2	Modoc	2.6	4.4	2.8	4.5	4.5	18.9
3	COOR15108-1	2.9	4.2	3.0	4.5	4.5	19.1
4	POR17PG64-2	2.2	4.2	2.7	4.2	4.7	18.0
5	A08122-9RY	3.3	3.9	3.6	4.0	3.8	18.6
6	A11582-1R	3.2	3.6	2.8	3.9	4.5	18.0
11	A11573-5RYsto	3.2	3.6	3.1	4.3	4.6	18.8
	<i>LSD<sub>0.05</sub></i>	0.9	0.6	0.8	0.6	0.5	2.5
	Average	3.0	4.0	3.1	4.3	4.4	18.7

### Oven Baked

	Clone	Flavor	After Cooking Darkening	Texture	Tuber Center	Skin Rating	Total Rating
1	Chieftain	3.7	4.1	2.9	4.6	4.0	19.3
2	Modoc	3.6	4.6	2.0	3.6	4.1	17.9
3	COOR15108-1	3.6	4.6	3.0	4.6	4.3	20.0
4	POR17PG64-2	2.7	3.7	2.4	4.3	4.0	17.1
5	A08122-9RY	3.1	4.4	3.4	4.4	4.4	19.9
6	A11582-1R	3.1	4.1	2.1	4.0	4.3	17.7
11	A11573-5RYsto	3.9	4.1	3.7	4.6	3.9	20.1
	<i>LSD<sub>0.05</sub></i>	1.2	0.7	1.1	0.7	0.8	2.4
	Average	3.4	4.2	2.8	4.3	4.1	18.9

### Microwaved

	Clone	Flavor	After Cooking Darkening	Texture	Tuber Center	Skin Rating	Total Rating
1	Chieftain	4.0	4.1	2.9	4.1	4.5	19.6
2	Modoc	3.8	4.3	2.9	3.4	4.5	18.9
3	COOR15108-1	3.3	3.4	3.4	4.3	4.1	18.5
4	POR17PG64-2	2.6	4.3	2.8	3.9	4.1	17.7
5	A08122-9RY	3.9	3.5	3.8	5.0	4.6	20.8
6	A11582-1R	3.3	3.9	3.5	4.8	4.3	19.8
11	A11573-5RYsto	2.5	3.3	3.8	4.4	4.0	18.0
	<i>LSD<sub>0.05</sub></i>	1.2	0.7	1.1	1.1	0.7	3.0
	Average	3.1	3.4	3.0	3.9	3.8	17.0

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



# 2023 Washington Tri-State Specialty Trial

## Specialty Clone Culinary Evaluation

### Boiled

	Clone	Flavor	After Cooking Darkening	Texture	Tuber Center	Sloughing	Total Rating
7	Yukon Gold	3.5	3.9	3.6	4.0	3.2	18.3
8	Bintje	3.3	4.3	3.3	4.4	2.8	18.0
9	A11576-1Ysto	3.1	4.3	3.0	3.6	3.3	17.3
10	POR18PG37-4	2.6	3.7	2.6	4.1	4.4	17.5
12	POR16PG34-1	2.3	3.5	3.4	4.0	4.8	18.0
13	Purple Majesty	2.7	3.6	2.7	4.1	2.1	15.3
14	POR18PG54-1	3.0	3.5	3.0	4.3	4.4	18.1
15	POR16PG25-2	2.8	3.4	3.1	4.1	3.9	17.3
	<i>LSD<sub>0.05</sub></i>	1.0	0.6	0.9	0.7	0.6	3.4
	Average	2.9	3.8	3.1	4.1	3.6	15.9

### Oven Baked

	Clone	Flavor	After Cooking Darkening	Texture	Tuber Center	Skin Rating	Total Rating
7	Yukon Gold	3.7	4.7	3.3	2.9	4.6	19.1
8	Bintje	3.7	4.6	3.3	3.9	4.6	20.0
9	A11576-1Ysto	2.4	4.3	3.0	4.6	3.7	18.0
10	POR18PG37-4	3.1	4.6	2.3	4.3	4.6	18.9
12	POR16PG34-1	3.0	4.3	2.1	3.1	4.3	16.9
13	Purple Majesty	2.6	4.6	3.1	4.4	3.9	18.6
14	POR18PG54-1	2.9	4.6	2.7	2.9	3.6	16.6
15	POR16PG25-2	2.7	4.1	2.3	4.3	4.3	17.7
	<i>LSD<sub>0.05</sub></i>	1.2	0.7	1.4	1.1	0.8	3.1
	Average	3.0	4.5	2.8	3.8	4.2	18.2

### Microwaved

	Clone	Flavor	After Cooking Darkening	Texture	Tuber Center	Skin Rating	Total Rating
7	Yukon Gold	3.8	3.1	2.9	4.3	0.0	14.0
8	Bintje	4.0	2.9	3.1	4.5	0.0	14.5
9	A11576-1Ysto	3.9	3.0	4.5	4.8	0.0	16.1
10	POR18PG37-4	4.3	3.3	4.8	4.5	0.0	16.8
12	POR16PG34-1	4.0	3.8	3.9	4.4	0.0	16.0
13	Purple Majesty	4.0	3.3	4.1	4.6	0.0	16.0
14	POR18PG54-1	4.1	3.3	1.8	3.9	0.0	13.0
15	POR16PG25-2	3.8	3.1	4.5	4.5	0.0	15.9
	<i>LSD<sub>0.05</sub></i>	1.0	0.7	1.3	1.1	0.5	3.2
	Average	4.0	3.2	3.7	4.4	0.0	13.9

\*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 10 raters SFA	Time to Breakdown (min)		
		Stem	Bud	Average
1 Chieftain	3.9	5.2	4.0	4.6
2 Modoc	4.3	7.4	4.4	5.9
3 COOR15108-1	2.3	5.4	4.8	5.1
4 POR17PG64-2	4.4	5.0	5.3	5.1
5 A08122-9RY	3.5	5.5	4.6	5.0
6 A11582-1R	3.9	5.0	3.5	4.2
7 Yukon Gold	3.4	5.5	3.5	4.5
8 Bintje	3.6	5.2	3.5	4.4
9 A11576-1Ysto	3.3	4.9	4.1	4.5
10 POR18PG37-4	3.5	3.8	3.3	3.6
11 A11573-5RYsto	3.3	5.6	4.5	5.1
12 POR16PG34-1	3.3	4.5	4.1	4.3
13 Purple Majesty	4.3	4.7	3.6	4.2
14 POR18PG54-1	4.5	4.4	3.6	4.0
15 POR16PG25-2	4.9	4.5	3.8	4.1
LSD 0.05 *		1.2	0.8	
Average		3.8	5.1	4.0
			4.0	4.6

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



A clone is selected in Klamath Falls.



Counting stems and rating Rhizoctonia.


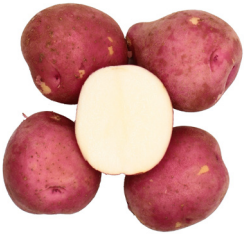


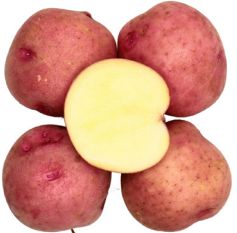










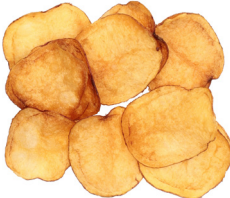




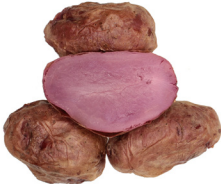
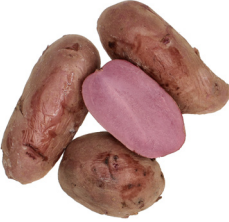





Using the back up digger.



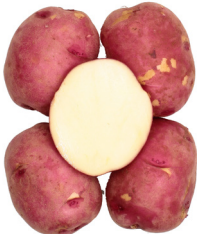


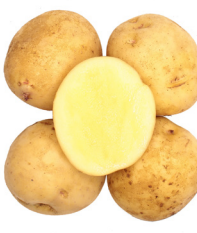
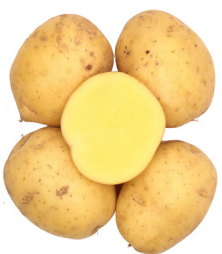
In-Season digs and tuber analysis.



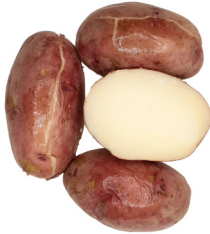




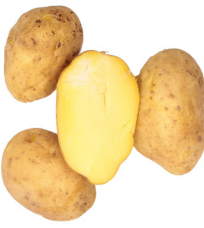



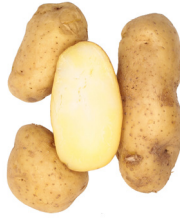















Tubers	WA Tri-State Specialty Trial Comments
Chieftain	
	<p><b>Tubers:</b> Round tubers. Fair skin set; moderate eye depth.</p> <p><b>Baked:</b> slight after cooking darkening, creamy texture, good flavor, fully cooked tuber center, steamy skin.</p> <p><b>Boiled:</b> slight sloughing, slight after cooking darkening, fluffy texture, good flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, good flavor, mushy tuber center, fully cooked skin.</p>
Modoc	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; shallow eyes.</p> <p><b>Baked:</b> none after cooking darkening, pastey texture, good flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> none sloughing, slight after cooking darkening, creamy texture, bland flavor, fully cooked tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, good flavor, mushy tuber center, fully cooked skin.</p>
COOR15108-1	
	<p><b>Tubers:</b> Round tubers. Fair skin set; shallow eyes.</p> <p><b>Baked:</b> none after cooking darkening, creamy texture, good flavor, fully cooked tuber center, steamy skin.</p> <p><b>Boiled:</b> none sloughing, slight after cooking darkening, creamy texture, bland flavor, fully cooked tuber center.</p> <p><b>Microwaved:</b> moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.</p>
POR17PG64-2	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; shallow eyes.</p> <p><b>Baked:</b> slight after cooking darkening, pastey texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> no sloughing, slight after cooking darkening, creamy texture, unacceptable flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.</p>
A08122-9RY	
	<p><b>Tubers:</b> Round tubers. Fair skin set; moderately deep eyes.</p> <p><b>Baked:</b> slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> slight sloughing, slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, fluffy texture, good flavor, fully cooked tuber center, fully cooked skin.</p>

Chips	Baked	Boiled	Microwaved
Chieftain			
			
Modoc			
			
COOR15108-1			
			
POR17PG64-2			
			
A08122-9RY			
			























Tubers	WA Tri-State Specialty Trial Comments
A11582-1R	
	<p><b>Tubers:</b> Round to oblong tubers. Fair skin set; moderate eye depth.</p> <p><b>Baked:</b> slight after cooking darkening, pastey texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> none sloughing, slight after cooking darkening, fluffy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, fluffy texture, bland flavor, fully cooked tuber center, steamy skin.</p>
Yukon Gold	
	<p><b>Tubers:</b> Round tubers. Good skin set; moderately deep eyes.</p> <p><b>Baked:</b> none after cooking darkening, creamy texture, good flavor, mushy tuber center, fully cooked skin.</p> <p><b>Boiled:</b> moderate sloughing, slight after cooking darkening, fluffy texture, good flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.</p>
Bintje	
	<p><b>Tubers:</b> Oblong to long tubers. Fair skin set; moderately deep eyes.</p> <p><b>Baked:</b> none after cooking darkening, creamy texture, good flavor, mushy tuber center, fully cooked skin.</p> <p><b>Boiled:</b> moderate sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, good flavor, mushy tuber center, fully cooked skin.</p>
A11576-1Ysto	
	<p><b>Tubers:</b> Round tubers. Good skin set; shallow eyes.</p> <p><b>Baked:</b> slight after cooking darkening, creamy texture, unacceptable flavor, fully cooked tuber center, steamy skin.</p> <p><b>Boiled:</b> moderate sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, good flavor, fully cooked tuber center, fully cooked skin.</p>
POR18PG37-4	
	<p><b>Tubers:</b> Round tubers. Fair skin set; shallow eyes.</p> <p><b>Baked:</b> no after cooking darkening, pastey texture, bland flavor, mushy tuber center, fully cooked skin.</p> <p><b>Boiled:</b> slight sloughing, moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, good flavor, fully cooked tuber center, fully cooked skin.</p>

Chips	Baked	Boiled	Microwaved
A11582-1R			
			
Yukon Gold			
			
Bintje			
			
A11576-1Ysto			
			
POR18PG37-4			
			

Tubers	WA Tri-State Specialty Trial Comments
A11573-5RYsto	
	<p><b>Tubers:</b> Round tubers. Fair skin set; moderate eye depth.</p> <p><b>Baked:</b> slight after cooking darkening, fluffy texture, good flavor, fully cooked tuber center, steamy skin.</p> <p><b>Boiled:</b> none sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> moderate after cooking darkening, fluffy texture, bland flavor, mushy tuber center, steamy skin.</p>
POR16PG34-1	
	<p><b>Tubers:</b> Round tubers. Fair skin set; moderate eye depth.</p> <p><b>Baked:</b> slight after cooking darkening, pastey texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> none sloughing, moderate after cooking darkening, creamy texture, unacceptable flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, fluffy texture, good flavor, mushy tuber center, steamy skin.</p>
Purple Majesty	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; shallow eyes.</p> <p><b>Baked:</b> no after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> severe sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, bland flavor, mushy tuber center, fully cooked skin.</p>
POR18PG54-1	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; deep eyes.</p> <p><b>Baked:</b> none after cooking darkening, creamy texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> slight sloughing, slight after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, bland flavor, Somewhat raw tuber center, steamy skin.</p>
POR16PG25-2	
	<p><b>Tubers:</b> Round to oblong tubers. Good skin set; shallow eyes.</p> <p><b>Baked:</b> slight after cooking darkening, pastey texture, bland flavor, mushy tuber center, steamy skin.</p> <p><b>Boiled:</b> slight sloughing, moderate after cooking darkening, creamy texture, bland flavor, mushy tuber center.</p> <p><b>Microwaved:</b> slight after cooking darkening, creamy texture, good flavor, fully cooked tuber center, fully cooked skin.</p>



Chips	Baked	Boiled	Microwaved
A11573-5RYsto			
			
POR16PG34-1			
			
Purple Majesty			
			
POR18PG54-1			
			
POR16PG25-2			
			

## 2023 Tri-State Chip Trial

## Summaries

ENTRY	TOTAL YIELD					EXTERNAL DEFECTS		
	CWT/A	Tons/A	US # 1's*	US # 2's*	Culls*	1 = Severe	5 = None	
			> 0 oz	> 0 oz	> 0 oz	Growth	Cracks	Green
			% of Total Yield			Knobs		
Atlantic	961	48.0	86	11	3	5	5	3
Lamoka	996	49.8	88	11	1	5	4	3
Snowden	886	44.3	95	5	0	5	5	3
A13125-3C	836	41.8	88	11	1	5	4	3
COOR13270-2	1051	52.6	93	7	0	5	5	3
NYOR14Q9-5	1052	52.6	95	5	0	5	4	3
NYOR14Q9-9	842	42.1	94	6	0	5	5	3

\* 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	826	41.3	1	6	12	23	58	1.085
Lamoka	878	43.9	0	4	10	28	57	1.086
Snowden	845	42.2	1	8	11	31	49	1.083
A13125-3C	737	36.8	1	5	8	27	59	1.083
COOR13270-2	976	48.8	0	3	4	18	75	1.075
NYOR14Q9-5	996	49.8	1	5	11	29	54	1.086
NYOR14Q9-9	792	39.6	1	11	16	35	37	1.083

\* 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	1 = Round	% Emerged	Above Ground	WEIGHT	NUMBER	1 = Poor	1 = Poor
	5 = Good	5 = Long			Ounces	Tubers/Plant	5 = Good	5 = Good
Atlantic	3.7	1.0	81	2.3	8.9	10.3	2.0	2.7
Lamoka	4.0	1.1	91	1.7	9.6	9.9	2.3	3.0
Snowden	3.7	1.0	87	2.2	8.1	10.6	2.0	1.7
A13125-3C	3.0	1.0	87	1.8	9.3	8.6	3.0	4.0
COOR13270-2	3.0	1.1	89	1.6	11.9	8.5	3.0	3.0
NYOR14Q9-5	4.0	1.0	94	2.1	8.3	12.0	3.3	4.0
NYOR14Q9-9	3.0	1.1	91	1.4	7.1	11.4	3.0	2.7

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

Planting Date: April 6th  
Harvest Date: September 6

Vine Kill Date: September 1st  
Days grown: 148



# 2023 Tri-State Chip Trial

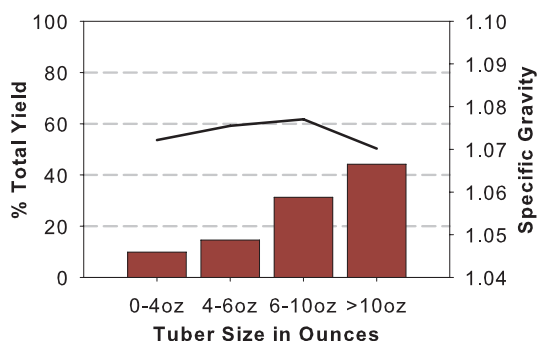
## Tuber Yield and Specific Gravity Distributions

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

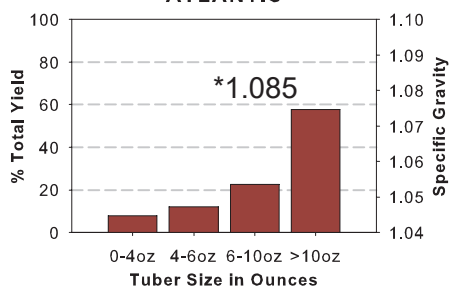
### 11 inch In-Row Spacing

Total Yield CWT/A

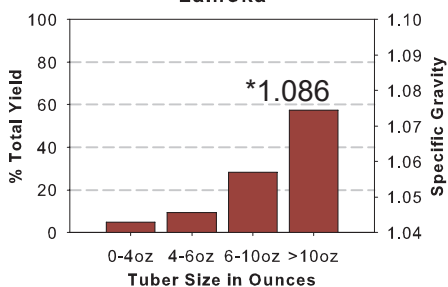
Specific Gravity



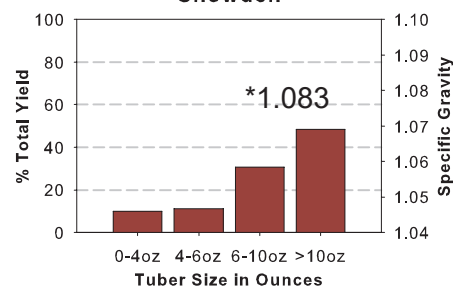
ATLANTIC



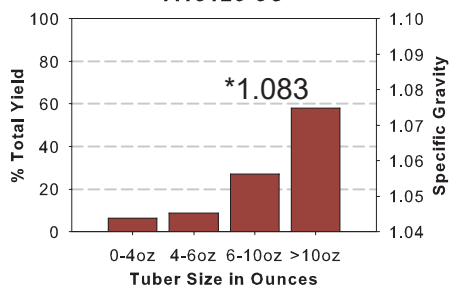
Lamoka



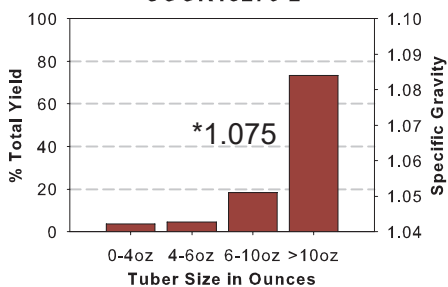
Snowden



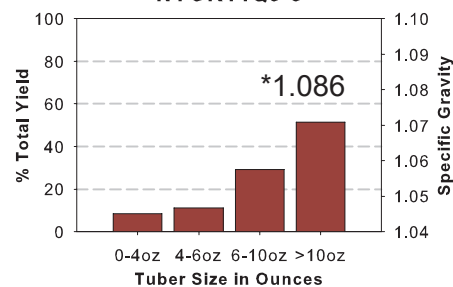
A13125-3C



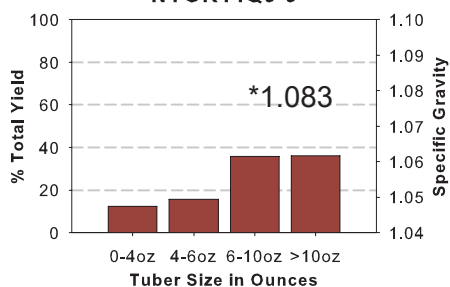
COOR13270-2



NYOR14Q9-5



NYOR14Q9-9



# 2023 WA Chip Trial

## Postharvest Information

Four experimental chipping clones were evaluated in 2023 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:* COOR13270-2

*Darkest Fry Color:* Atlantic

### ➤ Harvest Fry Color

*Lightest Fry Color:* COOR13270-2

*Darkest Fry Color:* A13125-3C

### ➤ 48°F Fry Color

*Lightest Fry Color:* COOR13270-2

*Darkest Fry Color:* Atlantic

### Details:



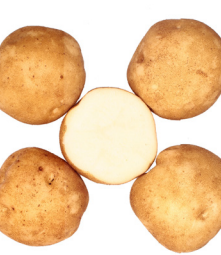
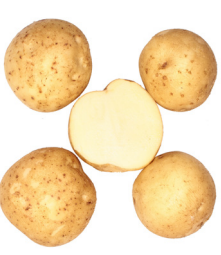

- When averaged over the two frying intervals, COOR13270-2 produced the lightest chips (1.5) as referenced with the SFA color chart (1-5 (darkest)). NYOR14Q9-9 had the second lightest overall color of the experimental clones (2.4), slightly darker than Lamoka and Snowden (2.0).
- When fried directly out of the field, COOR13270-2 averaged the lightest chips with a score of 2.0.
- COOR13270-2 had an average score of 1.0 after 60 days at 48°F.
- A13125-3C scored as the darkest out of the field at 3.2.
- NYOR14Q9-5 was the darkest scoring experimental clone out of the 48°F storage with an average score of 2.3. Atlantic scored a 3.8 under the same conditions.
- COOR13270-2 scored the darkest chip color in both the 2021 and the 2022 seasons, but uniquely was the lightest in the 2023 season.
- Chip fry color was significantly different for these entries compared to the previous two growing years. These differences in chip color are likely a function of an extended growing interval which targeted maximum total yield. While total yields did increase as expected differences in the sugar maturity profiles were observed. A darker chip color 'at harvest' indicates an over-mature crop, though storage 60-day storage at 48°F seemed able to recondition a portion of those reducing sugars resulting in a lighter chip color.

# 2023 Tri-State Chip Trial


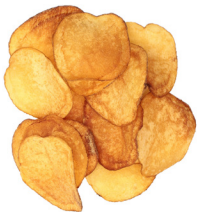


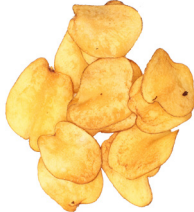
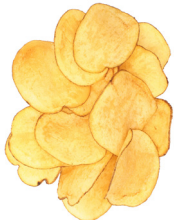



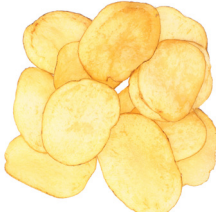
## Postharvest Assessments for Storability and Color

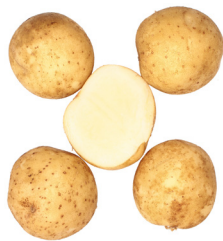
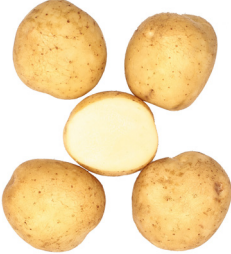
		<u>SFA Ratings</u>	
		Prior to Storage	48°F Storage
Clone			
1	Atlantic	2.6	3.8
2	Lamoka	2.2	1.9
3	Snowden	2.8	1.1
4	A13125-3C	3.2	2.0
5	COOR13270-2	2.0	1.0
6	NYOR14Q9-5	3.0	2.3
7	NYOR14Q9-9	3.0	1.7
Average		2.7	2.0
Date test performed:			
Prior to storage		Sept. 8	
48°F		Nov. 7	

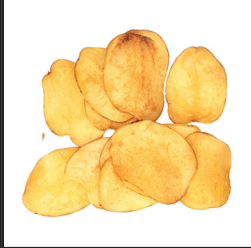
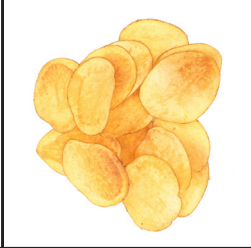
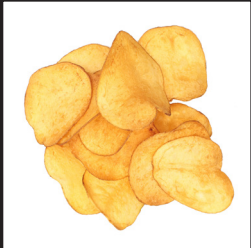
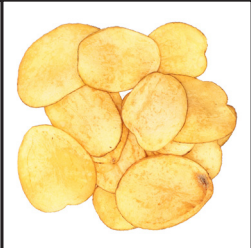
\*Chips were stored for 60 days at 48°F.

Tubers	WA Tri-State Chip Trial Comments
Atlantic	
	<p>Tubers = Round tubers. Good skin set; moderately deep eyes. Initial Chips: Acceptable 48°F = Unacceptable</p>
Lamoka	
	<p>Tubers = Round Tubers. Good skin set; moderately deep eyes. Initial Chips: Light 48°F = Light</p>
Snowden	
	<p>Tubers = Round tubers. Good skin set; deep eyes. Initial Chips: Acceptable 48°F = Light</p>
A13125-3C	
	<p>Tubers = Round tubers. Fair skin set; moderately deep eyes. Initial Chips: Acceptable 48°F = Light</p>
COOR13270-2	
	<p>Tubers = Round tubers. Fair skin set; moderately deep eyes. Initial Chips: Light 48°F = Light</p>



Initial Chips      48° F Storage	
Atlantic	
	
Lamoka	
	
Snowden	
	
A13125-3C	
	
COOR13270-2	
	

Tubers		WA Tri-State Chip Trial Comments	
NYOR14Q9-5			
		Tubers = Round Tubers. Good skin set; moderately deep eyes. Initial Chips: Acceptable 48°F = Acceptable	
NYOR14Q9-9			
		Tubers = Round tubers. Fair skin set; mooderately deep eyes. Initial Chips: Acceptable 48°F = Light	

Initial Chips      48° F Storage	
NYOR14Q9-5	
	
NYOR14Q9-9	
	

# Index of Clones and Cultivars

## Early Harvest Tri-State Trial .....22-27

A10020-3sto	A13072-5	AOR15421-4
A10071-1	A13072-7	COA15494-8
A10635-2chc	A13091-5	Ranger Russet
A11381-3	A14026-16adg	Russet Burbank
A12308-3adg	AOR10071-8	Russet Norkotah
A12327-5VR	AOR15166-2	Shepody
A13036-1	AOR15227-2	

## Late Harvest Tri-State Trial .....28-55

A10020-3sto	A13072-5	Clearwater Russet
A10071-1	A13072-7	COA15494-8
A10635-2chc	A13091-5	Norkotah C-3
A11381-3	A14026-16adg	Ranger Russet
A12304-1sto	AOR10071-8	Russet Burbank
A12308-3adg	AOR15166-2	
A12327-5VR	AOR15227-2	
A13036-1	AOR15421-4	

## Early Harvest Regional Trial .....56-61

A09086-1LB	AFA5661-8	Ranger Russet
A10594-4sto	AOR11217-3	Russet Burbank
A12169-5	AOR13064-2	Russet Norkotah
A12305-2adg	CO13003-1RU	Shepody
A13036-12	COTX08063-2Ru	
AC12090-3RU	COTX10080-2Ru	

## Late Harvest Regional Trial .....62-91

A09086-1LB	AFA5661-8	COTX10080-2Ru
A10594-4sto	AOR11217-3	Norkotah C-3
A12169-5	AOR13064-2	Ranger Russet
A12305-2adg	Clearwater Russet	Russet Burbank
A13036-12	CO13003-1RU	
AC12090-3RU	COTX08063-2Ru	

## Tri-State Specialty Trial .....92-109

Chieftain	A11582-1R	A11573-5RYsto
Modoc	Yukon Gold	POR16PG34-1
COOR15108-1	Bintje	Purple Majesty
POR17PG64-2	A11576-1Ysto	POR18PG54-1
A08122-9RY	POR18PG37-4	POR16PG25-2

## Tri-State Chip Trial .....114-117

A13125-3C	NYOR14Q9-5
Atlantic	NYOR14Q9-9
COOR13270-2	Snowden
Lamoka	