

# 2020

# Potato Variety Development In Tulelake, CA

Three variety trials were grown at the Intermountain Research and Extension Center during 2020.

Trials were categorized by their market type and included russet, specialty and chip.

Trial results are summarized in this report.



**University of California**

Agriculture and Natural Resources

Intermountain Research and Extension Center

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## 2020 Annual Progress Report Potato Variety Development in Tulelake

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Prepared Report

Three potato variety trials were conducted at the Intermountain Research and Extension Center (IREC) in Tulelake, CA. Trials were categorized by market type and included a Russet trial with 19 entries, a Specialty trial with 13 entries, and a Chipping trial with 15 entries. Entries included selections from the Western Regional (WR) variety development program, Southwest Regional (SWR) variety development program, and varieties of local interest.

Weather data can be found at: <http://www.cimis.water.ca.gov> Station # 91.

## Late Russet Variety Trial

The Late Russet Variety Trial is a combination of sixteen entries from the Western Regional Variety Trial (WR) and three entries from the Southwest Regional Trial (SWR). Merit scoring and culls were evaluated considering fresh market standards, given most Russets grown in Tulelake, CA are sold for fresh market. Important characteristics for the local area include total yield, percent US No. 1 yield, fresh merit score, tuber shape uniformity, low internal and external defects, and resistance to early-dying. See Tables 1-4 for Russet results and Figure 1 for entry pictures and comments.

### Trial Information

<b>Location:</b>	Intermountain Research and Extension Center, Tulelake, CA
<b>Soil Type:</b>	Tulebasin mucky silty clay loam
<b>Planting Date:</b>	May 15 <sup>th</sup> 2020
<b>Vine Kill Date:</b>	September 3 <sup>rd</sup> 2020
<b>Days to Vine Kill:</b>	111
<b>Harvest Date:</b>	September 30 <sup>th</sup> 2020
<b>Irrigation:</b>	Solid-set sprinklers; applied water + precipitation = 27.39 inches
<b>Plot Length:</b>	18.3 Feet
<b>In-Row Spacing:</b>	10 Inches
<b>Row Spacing:</b>	36 Inches
<b>Number of Reps:</b>	4
<b># of Fertilizer/Acre:</b>	197-80-260
<b>Seed Treatment:</b>	Maxim 4FS and Fir Bark Dust
<b>Weed Control:</b>	Prowl H2O and Eptam 7E (pre-emergence) Matrix SG (early post-emergence)
<b>Insecticides:</b>	Admire Pro (In-furrow)
<b>Fungicides:</b>	Quadris (In-furrow) Luna Tranquility (chemigation)
<b>Vine Kill Method:</b>	Rolling and Reglone at labeled rates

Table 1. Tuber Yield and Size of Russet Potato Entries.

Trial	%1's	U.S. 1's	Total	Tuber Yield (cwt/A) <sup>1</sup>					Culls + 2's	
				U.S. No. 1's						
				>14oz	10-14oz	6-10oz	4-6oz	<4oz		
Ranger Russet	WR	65 de	285.9 bcdefgh	440.8 cde	64.9 bcde	101.4 abc	133.6 bcd	50.9 ghi	26.8 g	63.2 b
Russet Burbank	WR	63 de	274.8 cdefgh	436.2 cde	9.7 g	49.4 defg	147.3 bcd	78.1 efg	44.8 efg	107.0 a
Russet Norkotah	WR	80 a	310.6 bcdefg	389.3 efgh	30.6 cdefg	78.0 bcdef	165.6 b	67.0 efgh	34.6 fg	13.5 cd
Clearwater Russet	WR	78 ab	331.3 bcd	425.0 cdef	7.3 g	48.6 efg	168.7 b	114.1 abc	68.2 bcde	18.2 cd
TX13590-9Ru	WR	73 abcd	356.8 ab	486.4 bc	26.4 cdefg	65.8 bcdefg	179.5 ab	111.5 abcd	74.2 bcd	29.0 bcd
A071012-4BF	WR	44 f	251.8 defgh	569.8 a	155.1 a	112.7 ab	106.9 cd	32.3 i	36.3 fg	126.6 a
A07769-4	WR	62 e	247.7 efgh	402.8 defg	82.0 b	96.7 abcde	105.6 cd	45.4 hi	22.2 g	50.9 bc
A10021-5TE	WR	69 abcde	323.7 bcdef	466.9 cd	71.4 bcd	97.5 abcde	163.1 b	63.1 fghi	42.5 efg	29.3 bcd
AOR08540-1	WR	76 abc	364.1 ab	477.2 bc	42.1 bcdefg	114.4 ab	179.1 ab	70.6 efgh	35.0 fg	36.0 bcd
AOR10204-3	WR	69 abcde	339.2 bc	491.8 bc	72.6 bc	133.5 a	152.5 bc	53.2 fghi	20.4 g	59.6 b
CO10085-1RU	WR	77 abc	304.2 bcdefgh	396.4 efgh	14.3 fg	58.1 cdefg	148.8 bcd	97.3 bcde	68.8 bcde	9.1 d
CO10087-4RU	WR	74 abcd	245.8 efgh	333.4 h	26.0 defg	68.5 bcdefg	107.8 cd	69.6 efgh	46.4 defg	15.1 cd
CO10091-1RU	WR	74 abcd	293.1 bcdefgh	397.2 efgh	6.5 g	21.9 g	142.5 bcd	128.7 a	94.6 ab	3.0 d
CO11009-3RU	WR	73 abcde	324.9 bcde	448.5 cde	57.4 bcdef	96.4 abcde	148.2 bcd	80.3 defg	43.5 efg	22.7 bcd
OR12133-10	WR	78 ab	420.6 a	538.5 ab	60.3 bcdef	130.4 a	224.4 a	65.8 fgh	25.1 g	32.4 bcd
POR12NCK50-1	WR	77 abc	330.3 bcd	426.9 cdef	59.4 bcdef	101.0 abcd	167.3 b	61.9 fghi	28.5 g	8.8 d
CO12152-1RU	SWR	68 bcde	244.8 fgh	360.3 fgh	3.1 g	24.0 g	103.5 d	117.3 ab	87.1 abc	25.3 bcd
CO12378-1RU	SWR	67 cde	239.7 gh	361.6 fgh	1.9 g	20.8 g	108.0 cd	110.9 abcd	108.8 a	11.2 cd
COTX08063-2Ru	SWR	68 bcde	227.9 h	337.0 ghi	20.3 efg	42.8 fg	101.8 d	83.3 cdef	60.1 cdef	28.7 bcd
<b>Mean</b>		<b>70</b>	<b>300.8</b>	<b>430.8</b>	<b>42.7</b>	<b>76.9</b>	<b>144.9</b>	<b>79.0</b>	<b>50.9</b>	<b>36.3</b>

<sup>1</sup>Mean comparisons were performed using Tukey's-Kramer HSD; means with the same letter within columns are not significantly different

Table 2. External Tuber Characteristics of Russet Potato Entries.

	Trial	Merit Score <sup>1</sup>	Russeting <sup>2</sup>	Eye Depth <sup>3</sup>	Shape Uniformity <sup>4</sup>	Length/Depth Ratio <sup>5</sup>	Length/Width Ratio <sup>5</sup>
Ranger Russet	WR	3.3 cd	3.0 defgh	3.6 ab	4.0 a	2.36 a	1.95 a
Russet Burbank	WR	3.3 cd	3.0 defgh	4.0 ab	3.8 a	2.13 cde	1.76 cdefg
Russet Norkotah	WR	4.0 a	4.0 a	4.0 ab	3.8 a	2.14 bcde	1.83 abcd
Clearwater Russet	WR	4.0 a	3.3 bcdefg	4.5 a	3.5 a	2.12 cde	1.76 cdef
TX13590-9Ru	WR	2.9 de	3.1 cdefg	4.4 ab	3.5 a	1.81 h	1.61 hij
A071012-4BF	WR	3.0 cde	3.5 abcde	3.4 b	3.9 a	2.04 def	1.75 cdefgh
A07769-4	WR	3.4 bcd	3.8 abc	4.0 ab	3.9 a	1.92 fgh	1.68 efgh
A10021-5TE	WR	3.4 bcd	2.8 fgh	4.4 ab	3.9 a	2.18 bcd	1.88 abc
AOR08540-1	WR	3.4 bcd	3.8 abc	4.1 ab	4.0 a	2.00 efg	1.73 cdefgh
AOR10204-3	WR	3.1 cd	3.6 abcd	4.5 a	3.6 a	1.92 fgh	1.72 defgh
CO10085-1RU	WR	3.4 bcd	3.1 cdefg	3.8 ab	3.6 a	2.13 cde	1.79 bcde
CO10087-4RU	WR	3.0 cde	2.9 efgh	4.4 ab	3.9 a	2.29 ab	1.85 abcd
CO10091-1RU	WR	3.0 cde	4.0 a	4.3 ab	3.8 a	1.82 h	1.47 j
CO11009-3RU	WR	3.9 ab	4.0 a	4.0 ab	3.8 a	1.89 fgh	1.65 efghi
OR12133-10	WR	2.5 e	2.4 h	4.1 ab	3.8 a	1.88 gh	1.62 ghij
POR12NCK50-1	WR	3.5 abc	3.4 abcdef	4.0 ab	4.4 a	2.23 abc	1.93 ab
CO12152-1RU	SWR	2.9 de	3.4 abcdef	4.6 a	3.9 a	2.21 bc	1.84 abcd
CO12378-1RU	SWR	3.0 cde	3.9 ab	4.3 ab	3.8 a	1.89 fgh	1.51 ij
COTX08063-2Ru	SWR	1.9 f	2.6 gh	4.4 ab	3.8 a	1.93 fgh	1.64 fgghi
<b>Mean</b>		<b>3.2</b>	<b>3.3</b>	<b>4.1</b>	<b>3.8</b>	<b>2.05</b>	<b>1.73</b>

<sup>1</sup> 1=Worst, 5=Best - Fresh Market Russet Merit Score takes into account multiple factors including tuber shape, eye depth, russeting, and shape uniformity

<sup>2</sup> 1=Light,5=Heavy

<sup>3</sup> 1=Deep, 5=Shallow

<sup>4</sup> 1= Non Uniform, 5=Very Uniform

<sup>5</sup> Ratio of 10 tubers measured from each plot, 8-14 oz size class.

**Table 3. Tuber Defects of Russet Potato Entries.**

	Trial	Hollow Heart <sup>1</sup>	Stem-end Necrosis <sup>1</sup>	Vascular Discoloration <sup>1</sup>	Black Spot Bruise <sup>1</sup>	Knobs <sup>2</sup>	Growth Crack <sup>2</sup>	Irregular Shaped <sup>2</sup>	Greening <sup>2</sup>	
		%	%	%	%	%	%	%	%	
	Ranger Russet	WR	0.0 b	3.0 a	20.0 abc	3.0 a	2.7 bc	4.5 b	1.5 a	0.4 a
	Russet Burbank	WR	5.0 ab	13.0 a	8.0 bc	0.0 a	3.8 bc	9.3 a	0.2 a	0.2 a
	Russet Norkotah	WR	0.0 b	3.0 a	5.0 bc	3.0 a	1.6 bc	0.0 d	0.7 a	0.2 a
	Clearwater Russet	WR	0.0 b	3.0 a	18.0 abc	0.0 a	1.7 bc	0.2 d	1.2 a	0.6 a
	TX13590-9Ru	WR	0.0 b	5.0 a	15.0 abc	3.0 a	2.0 bc	0.0 d	0.2 a	0.1 a
	A071012-4BF	WR	0.0 b	0.0 a	5.0 bc	0.0 a	11.9 a	0.3 d	0.5 a	0.6 a
	A07769-4	WR	0.0 b	10.0 a	10.0 bc	0.0 a	4.2 bc	1.7 cd	0.3 a	1.6 a
	A10021-5TE	WR	0.0 b	3.0 a	15.0 abc	3.0 a	0.9 bc	1.6 cd	0.3 a	1.0 a
	AOR08540-1	WR	0.0 b	0.0 a	0.0 c	3.0 a	3.6 bc	0.1 d	0.1 a	1.0 a
	AOR10204-3	WR	0.0 b	0.0 a	3.0 bc	0.0 a	4.4 b	2.5 bc	0.5 a	0.4 a
	CO10085-1RU	WR	0.0 b	13.0 a	25.0 ab	0.0 a	1.5 bc	0.1 d	0.5 a	0.2 a
	CO10087-4RU	WR	20.0 a	3.0 a	5.0 bc	0.0 a	2.1 bc	1.0 cd	0.3 a	0.3 a
	CO10091-1RU	WR	0.0 b	0.0 a	0.0 c	0.0 a	0.3 c	0.0 d	0.0 a	0.4 a
	CO11009-3RU	WR	0.0 b	0.0 a	5.0 bc	0.0 a	1.8 bc	0.9 cd	0.2 a	0.8 a
	OR12133-10	WR	0.0 b	3.0 a	38.0 a	0.0 a	2.7 bc	0.5 d	1.5 a	0.5 a
	POR12NCK50-1	WR	0.0 b	3.0 a	13.0 bc	0.0 a	1.3 bc	0.3 d	0.4 a	0.1 a
	CO12152-1RU	SWR	0.0 b	3.0 a	0.0 c	0.0 a	3.8 bc	0.1 d	0.1 a	0.4 a
	CO12378-1RU	SWR	0.0 b	0.0 a	3.0 bc	0.0 a	0.8 bc	0.3 d	0.6 a	0.6 a
	COTX08063-2Ru	SWR	0.0 b	0.0 a	15.0 abc	0.0 a	3.8 bc	0.2 d	0.2 a	1.0 a
	<b>Mean</b>		<b>1.0</b>	<b>3.0</b>	<b>11.0</b>	<b>1.0</b>	<b>2.9</b>	<b>1.2</b>	<b>0.5</b>	<b>0.5</b>

<sup>1</sup> Ten, 8 to 14 oz. tubers were evaluated from each plot.

<sup>2</sup> Percent of total tubers.

**Table 4. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Russet Potato Entries.**










	Trial	Vert Wilt Rating <sup>1</sup>		Early Dying <sup>2</sup> (A.U.D.P.C.)		% Stand		Tubers per Plant		Average Tuber Size		Specific Gravity		
	Ranger Russet	WR	5.0	efg	441.3	efghi	98	a	5.1	gh	8.1	bc	1.086	hi
	Russet Burbank	WR	7.3	bc	951.3	b	100	a	6.0	defg	6.7	defgh	1.084	i
	Russet Norkotah	WR	9.0	a	1590.0	a	99	a	5.3	efgh	6.8	defg	1.073	j
	Clearwater Russet	WR	4.0	g	174.4	i	96	a	7.5	abc	5.4	hijk	1.095	cdef
	TX13590-9Ru	WR	6.5	bcd	608.8	cdefg	97	a	7.7	ab	6.0	fghij	1.095	cdef
	A071012-4BF	WR	4.5	fg	313.8	ghi	100	a	4.9	gh	10.7	a	1.100	abcd
	A07769-4	WR	6.3	cde	737.5	bcde	95	a	4.6	h	8.6	b	1.087	ghi
	A10021-5TE	WR	5.8	def	486.3	defghi	100	a	5.9	defg	7.4	bcde	1.093	efg
	AOR08540-1	WR	6.5	bcd	550.6	cdefgh	98	a	6.1	defg	7.4	bcde	1.091	fgh
	AOR10204-3	WR	5.0	efg	231.8	hi	98	a	5.4	efgh	8.6	b	1.085	hi
	CO10085-1RU	WR	5.0	efg	260.5	hi	100	a	6.4	cdef	5.8	fghijk	1.094	def
	CO10087-4RU	WR	7.5	bc	868.8	bc	98	a	5.2	fgh	6.1	efgh	1.100	abcd
	CO10091-1RU	WR	6.3	cde	483.8	defghi	98	a	7.8	a	4.8	jk	1.089	fghi
	CO11009-3RU	WR	4.8	fg	394.9	fghi	99	a	6.1	defg	6.9	cdef	1.099	bcde
	OR12133-10	WR	6.5	bcd	776.3	bcd	98	a	6.5	bcde	7.8	bcd	1.089	fghi
	POR12NCK50-1	WR	6.8	bcd	717.5	bcdef	98	a	5.4	efgh	7.4	bcde	1.091	fgh
	CO12152-1RU	SWR	5.5	def	308.1	ghi	97	a	7.0	abcd	4.8	ijk	1.102	ab
	CO12378-1RU	SWR	5.0	efg	397.5	fghi	96	a	7.8	a	4.5	k	1.101	abc
	COTX08063-2Ru	SWR	7.8	ab	958.1	b	93	a	6.0	defg	5.5	ghijk	1.106	a
	<b>Mean</b>		<b>6.0</b>		<b>592.2</b>		<b>98</b>		<b>6.1</b>		<b>6.8</b>		<b>1.092</b>	










<sup>1</sup>Verticillium wilt ratings based on a 0-9 scale (0=None 9=Dead) for August 21<sup>st</sup> 98 days after planting.

<sup>2</sup>Area Under Disease Progress Curve based on foliar early-dying ratings taken 80, 84, 91 and 98 days after planting. Higher value is more susceptible



Figure 1. 2020 Late Russet Trial Entries.

Ranger Russet	Russet Burbank	Russet Norkotah
 <ul style="list-style-type: none"> <li>• Check</li> <li>• Pointy tuber shape</li> </ul>	 <ul style="list-style-type: none"> <li>• Check</li> </ul>	 <ul style="list-style-type: none"> <li>• Check</li> </ul>
Clearwater Russet	TX13590-9Ru	A071012-4BF
 <ul style="list-style-type: none"> <li>• Check</li> </ul>	 <ul style="list-style-type: none"> <li>• Splotchy blue color/hue on skin</li> </ul>	 <ul style="list-style-type: none"> <li>• Lumpy tuber</li> <li>• Deep eyes</li> </ul>
A07769-4	A10021-5TE	AOR08540-1
 <ul style="list-style-type: none"> <li>• Very blocky</li> <li>• Square tuber shape</li> </ul>	 <ul style="list-style-type: none"> <li>• Light skin color</li> <li>• Yellow hue on skin</li> </ul>	 <ul style="list-style-type: none"> <li>• Pink eyes</li> <li>• Some elephant hide on skin</li> </ul>

AOR10204-3	CO10085-1RU	CO10087-4RU
 <ul style="list-style-type: none"> <li>• Unsightly ruptured lenticils</li> </ul>	 <ul style="list-style-type: none"> <li>• Russeting rubs off fairly easily</li> <li>• Fair skinned tubers</li> </ul>	 <ul style="list-style-type: none"> <li>• Pancake shaped tubers</li> </ul>
CO10091-1RU	CO1009-3RU	OR12133-10
 <ul style="list-style-type: none"> <li>• Heavy russeting</li> </ul>	 <ul style="list-style-type: none"> <li>• Desirable tuber shape for fresh market use</li> </ul>	 <ul style="list-style-type: none"> <li>• Yellow hued skin color</li> <li>• Light russeting</li> </ul>
POR12NCK50-1	CO12152-1RU	CO12378-1RU
 <ul style="list-style-type: none"> <li>• Narrow shaped tubers</li> <li>• Susceptible to skinning</li> </ul>	 <ul style="list-style-type: none"> <li>• Pink eyes</li> <li>• Narrow shaped tubers</li> </ul>	 <ul style="list-style-type: none"> <li>• Prone to shatter bruise</li> <li>• Round tuber shape</li> </ul>

COTX08063-2Ru



- Pink splotches on skin
- Pink eyes
- Light skin russeting

## Red/Specialty Variety Trial

The Red/Specialty Trial included 13 entries from the Western Regional Variety Trial (WR). Important vine and tuber characteristics for fresh market red/specialty types include: skin and flesh color, fresh merit score, tuber shape, tuber uniformity, tubers per plant, and average tuber size. See Tables 5-9 for Red/Specialty trial results and Figure 2 for entry pictures and comments.

### Trial Information

<b>Location:</b>	Intermountain Research and Extension Center, Tulelake, CA
<b>Soil Type:</b>	Tulebasin mucky silty clay loam
<b>Planting Date:</b>	May 15 <sup>th</sup> 2020
<b>Vine Kill Date:</b>	September 3rd 2020
<b>Days to Vine Kill:</b>	111
<b>Harvest Date:</b>	September 29 <sup>th</sup> , 2020
<b>Irrigation:</b>	Solid-set sprinklers; applied water + precipitation = 27.39 inches
<b>Plot Length:</b>	18.3 Feet
<b>In-Row Spacing:</b>	10 Inches
<b>Row Spacing:</b>	36 Inches
<b>Number of Reps:</b>	4
<b># of Fertilizer/Acre:</b>	197-80-260
<b>Seed Treatment:</b>	Maxim 4FS and Fir Bark Dust
<b>Weed Control:</b>	Prowl H2O and Eptam 7E (pre-emergence) Matrix SG (early post-emergence)
<b>Insecticides:</b>	Admire Pro (In-furrow)
<b>Fungicides:</b>	Quadris (In-furrow) Luna Tranquility (chemigation)
<b>Vine Kill Method:</b>	Rolling and Reglone at labeled rates

**Table 5. Skin and Flesh Characteristics of Specialty Potato Entries.**

<b>Clone / Variety</b>	<b>Trial</b>	<b>Skin Color</b>	<b>Skin Color Rating<sup>1</sup></b>	<b>Flesh Color</b>	<b>Flesh Color Rating<sup>1</sup></b>
<b>Chieftain</b>	WR	Red	2.0	White	1.6
<b>Red LaSoda</b>	WR	Red	2.0	White	1.9
<b>Modoc</b>	WR	Red	3.8	White	1.4
<b>A08112-7R</b>	WR	Red	3.4	Red	1.6
<b>ATX06264s-4R/Y</b>	WR	Red	3.6	Yellow	3.6
<b>Yukon Gold</b>	WR	Yellow	1.3	Yellow	2.4
<b>CO10064-1W/Y</b>	WR	White	1.5	Yellow	3.6
<b>CO10098-5W/Y</b>	WR	White	2.6	Yellow	4.5
<b>CO11250-1W/Y</b>	WR	White	1.9	Yellow	3.3
<b>CO11266-1W/Y</b>	WR	White	2.0	Yellow	4.0
<b>POR14PG22-3</b>	WR	White	1.1	White	2.9
<b>La Ratte</b>	WR	Yellow	1.0	White	3.0
<b>PORTX03PG25-R/R</b>	WR	Red/Purple	4.5	Red	4.6

<sup>1</sup>1=Light, 5=Dark; Reds and purples were rated using red/purple color scale. Yellows were rated using a white/yellow color scale. All varieties were rated using the same internal flesh darkness scale.

Table 6. Tuber Yield and Size of Specialty Potato Entries.

Clone / Variety	Trial	Tuber Yield (cwt/A) <sup>1</sup>									
		Total Yield	10-14 oz	6-10 oz	4-6 oz	< 4oz	> 14 oz	Undersize	Culls		
Chieftain	WR	657.7 a	155.4 a	239.0 a	78.4 bc	37.9 f	101.2 b	3.5 g	42.3 b		
Red LaSoda	WR	642.2 a	112.7 a	158.0 bc	48.5 c	31.9 f	147.8 a	3.1 g	140.2 a		
Modoc	WR	426.1 d	61.8 b	126.4 cde	92.3 bc	87.3 ef	16.7 c	12.0 fg	29.6 b		
A08112-7R	WR	412.8 d	5.5 c	42.8 f	112.9 ab	194.3 b	0.9 c	50.4 b	6.0 b		
ATX06264s-4R/Y	WR	519.8 bc	63.4 b	190.2 ab	108.4 ab	96.5 ef	19.6 c	19.8 ef	21.8 b		
Yukon Gold	WR	528.1 bc	133.8 a	154.0 bc	55.5 c	27.3 f	118.7 ab	4.1 g	34.7 b		
CO10064-1W/Y	WR	448.5 cd	32.7 bc	127.0 cde	120.3 ab	128.1 d	1.2 c	20.2 ef	19.0 b		
CO10098-5W/Y	WR	393.5 d	14.7 c	71.1 f	110.9 ab	143.6 d	2.1 c	31.8 cd	19.3 b		
CO11250-1W/Y	WR	522.3 bc	45.9 bc	143.9 bc	128.2 ab	142.7 d	9.2 c	24.2 de	28.1 b		
CO11266-1W/Y	WR	470.7 cd	9.1 c	92.1 def	144.1 a	178.3 bc	0.0 c	36.4 c	10.7 b		
POR14PG22-3	WR	586.1 ab	12.2 c	69.5 f	150.8 a	256.2 a	3.8 c	75.6 a	17.9 b		
La Ratte <sup>2</sup>	WR	280.1 e	N/A	N/A	N/a	N/A	N/A	N/A	20.8		
PORTX03PG25-R/R	WR	403.7 d	9.5 c	75.3 ef	127.7 ab	150.7 cd	0.0 c	22.5 de	18.1 b		
<b>Mean</b>		<b>483.9</b>	<b>54.7</b>	<b>124.1</b>	<b>106.5</b>	<b>122.9</b>	<b>35.1</b>	<b>25.3</b>	<b>32.3</b>		

<sup>1</sup>Mean comparisons were performed using Tukey's-Kramer HSD; means with the same letter within columns are not significantly different

<sup>2</sup>La Ratte was evaluated separately compared to other varieties.

Table 7. External Tuber Characteristics of Specialty Potato Entries.

Clone / Variety	Trial	Merit <sup>1</sup>	Eye Depth <sup>2</sup>	Tuber Shape <sup>3</sup>	Shape Uniformity <sup>4</sup>	Length/Depth Ratio <sup>5</sup>	Length/Width Ratio <sup>5</sup>
Chieftain	WR	3.5 ab	3.6 a	2.9 c	3.4 ab	1.51 cd	1.21 cdef
Red LaSoda	WR	2.5 def	2.1 b	2.8 cd	2.9 b	1.41 d	1.12 def
Modoc	WR	3.5 ab	4.0 a	2.9 c	3.6 ab	1.50 cd	1.28 cde
A08112-7R	WR	3.9 a	3.9 a	2.3 cd	3.6 ab	1.29 d	1.15 def
ATX06264s-4R/Y	WR	3.0 bcde	3.5 a	2.0 d	3.6 ab	1.36 d	1.04 f
Yukon Gold	WR	3.4 abc	3.9 a	2.4 cd	3.5 ab	1.44 d	1.18 cdef
CO10064-1W/Y	WR	3.3 abcd	3.5 a	2.4 cd	3.4 ab	1.41 d	1.08 ef
CO10098-5W/Y	WR	2.6 cdef	3.6 a	2.5 cd	3.3 ab	1.52 cd	1.18 cdef
CO11250-1W/Y	WR	2.3 ef	4.0 a	3.8 b	3.5 ab	1.72 c	1.38 c
CO11266-1W/Y	WR	2.1 f	3.9 a	2.8 cd	2.9 b	1.54 cd	1.30 cd
POR14PG22-3	WR	2.8 bcdef	3.4 a	2.9 c	3.1 ab	1.50 cd	1.21 cdef
La Ratte	WR	4.0 a	4.0 a	5.0 a	3.9 a	2.86 a	2.67 a
PORTX03PG25-R/R	WR	2.5 def	3.8 a	5.0 a	4.0 a	2.27 b	2.12 b
<b>Mean</b>		<b>3.0</b>	<b>3.6</b>	<b>3.0</b>	<b>3.4</b>	<b>1.64</b>	<b>1.38</b>

<sup>1</sup> 1=Worst, 5=Best - Specialty Merit Score takes into account important appearance factors of the Specialty market including tuber shape, eye depth, and shape uniformity

<sup>2</sup> 1=Deep, 5=Shallow

<sup>3</sup> 1=Round, 5=Oblong

<sup>4</sup> 1= Poor uniformity, 5=Very Uniform

<sup>5</sup> Ratio of 10 tubers measured from the 10-14 oz category in each plot

Table 8. Tuber Defects of Specialty Potato Entries.

Clone / Variety	Trial	Hollow Heart <sup>1</sup>	Stem End Necrosis <sup>1</sup>	Vascular Dicoloration <sup>1</sup>	Knobs <sup>2</sup>	Growth Crack <sup>2</sup>	Greening <sup>2</sup>
		%	%	%	%	%	%
Chieftain	WR	13.0 ab	8.0 b	8.0 a	1.3 bc	3.0 b	0.1 ab
Red LaSoda	WR	30.0 a	5.0 b	8.0 a	1.9 abc	9.4 a	0.3 a
Modoc	WR	3.0 b	5.0 b	5.0 a	4.4 a	1.2 b	0.0 b
A08112-7R	WR	0.0 b	0.0 b	18.0 a	0.6 c	0.1 b	0.0 b
ATX06264s-4R/Y	WR	0.0 b	3.0 b	3.0 a	1.6 bc	0.4 b	0.0 b
Yukon Gold	WR	3.0 b	8.0 b	5.0 a	2.8 abc	1.8 b	0.0 b
CO10064-1W/Y	WR	0.0 b	3.0 b	3.0 a	0.6 c	0.0 b	0.0 b
CO10098-5W/Y	WR	3.0 b	8.0 b	5.0 a	1.4 bc	0.1 b	0.0 b
CO11250-1W/Y	WR	0.0 b	8.0 b	5.0 a	2.1 abc	0.4 b	0.0 b
CO11266-1W/Y	WR	0.0 b	0.0 b	13.0 a	0.7 c	0.0 b	0.0 b
POR14PG22-3	WR	0.0 b	0.0 b	0.0 a	0.9 c	0.0 b	0.0 b
La Ratte	WR	0.0 b	0.0 b	10.0 a	3.8 ab	0.0 b	0.0 b
PORTX03PG25-R/R	WR	0.0 b	8.0 a	13.0 a	2.9 abc	0.6 b	0.0 b
<b>Mean</b>		<b>4.0</b>	<b>7.0</b>	<b>7.0</b>	<b>1.9</b>	<b>1.3</b>	<b>0.0</b>

<sup>1</sup> Ten, 6-10oz. tubers were evaluated from each plot.

<sup>2</sup> Percent of total tubers.












**Table 9. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Specialty Potato Entries.**





Clone / Variety	Trial	Vert Wilt Rating <sup>1</sup>	Early-Dying <sup>2</sup> (A.U.D.P.C.)	% Stand	Tubers/Plant	Average Size (oz)	Specific Gravity
Chieftain	WR	6.3 cde	580.38 cd	97 a	7.9 def	12.2 b	1.079 f
Red LaSoda	WR	7.0 bcd	671.13 bcd	94 ab	6.9 ef	14.2 a	1.083 ef
Modoc	WR	7.8 abc	1133.13 ab	83 c	9.8 cde	7.5 c	1.078 f
A08112-7R	WR	6.0 de	516.88 cd	92 abc	14.6 b	4.3 fg	1.089 cde
ATX06264s-4R/Y	WR	8.0 ab	1020.50 abc	85 bc	11.9 bc	7.5 c	1.080 f
Yukon Gold	WR	8.3 ab	1016.88 abc	94 ab	6.3 f	12.6 b	1.092 bcd
CO10064-1W/Y	WR	5.8 de	504.75 cd	97 a	11.2 c	5.9 de	1.099 ab
CO10098-5W/Y	WR	6.0 de	789.13 bc	97 a	11.2 c	5.2 def	1.103 a
CO11250-1W/Y	WR	7.0 bcd	792.38 bc	98 a	11.9 bc	6.4 cd	1.095 bc
CO11266-1W/Y	WR	5.0 e	262.50 d	98 a	14.9 b	4.8 ef	1.092 bcd
POR14PG22-3	WR	6.3 cde	564.43 cd	99 a	19.5 a	4.3 fg	1.085 def
La Ratte	WR	9.0 a	1421.88 a	99 a	12.5 bc	3.2 g	1.084 ef
PORTX03PG25-R/R	WR	8.5 ab	1323.75 a	97 a	11.2 cd	5.3 def	1.080 f
<b>Mean</b>		<b>7.0</b>	<b>815.21</b>	<b>94</b>	<b>11.5</b>	<b>7.2</b>	<b>1.087</b>

<sup>1</sup>Verticillium wilt ratings based on a 0-9 scale (0=None 9=Dead) for August 21<sup>st</sup> 98 days after planting.

<sup>2</sup>Area Under Disease Progress Curve based on foliar early-dying ratings taken 80,84,91 and 98 days after planting. Higher value is more susceptible.

**Figure 2. 2020 Red/Specialty Entries.**

Cheiftain	Red LaSoda	Modoc
 <ul style="list-style-type: none"> <li>• Check</li> </ul>	 <ul style="list-style-type: none"> <li>• Check</li> <li>• Some powdery scab</li> <li>• High amount of culls</li> </ul>	 <ul style="list-style-type: none"> <li>• Check</li> </ul>
A08112-7R	ATTX06264s-4R/Y	Yukon Gold
 <ul style="list-style-type: none"> <li>• Small tuber size</li> </ul>	 <ul style="list-style-type: none"> <li>• Pancake shaped tubers</li> </ul>	 <ul style="list-style-type: none"> <li>• Check</li> </ul>
CO10064-1W/Y	CO10098-5W/Y	CO11250-1W/Y
 <ul style="list-style-type: none"> <li>• Pancake shaped tubers</li> <li>• Pink eyes</li> </ul>	 <ul style="list-style-type: none"> <li>• Black dot highly visible on skin</li> </ul>	 <ul style="list-style-type: none"> <li>• Large pink eyes</li> <li>• Heavy skin russetting</li> </ul>

CO11266-1W/Y	POR14PG22-3	La Ratte	
 <ul style="list-style-type: none"> <li>• Pink splotching and eyes</li> <li>• Heavy skin russeting</li> </ul>	 <ul style="list-style-type: none"> <li>• Lumpy tuber shape</li> <li>• High tubers per plant</li> <li>• Many small tubers</li> </ul>	 <ul style="list-style-type: none"> <li>• Fingerling</li> <li>• Check</li> </ul>	
<th data-bbox="191 709 607 749">PORTX03PG25-R/R</th> <td colspan="2"></td>	PORTX03PG25-R/R		
 <ul style="list-style-type: none"> <li>• Pointy tuber shape</li> <li>• Fingerling</li> </ul>			

## Chipping Potato Variety Trial

The 2020 Chipping Trial included nine entries from the Western Regional Variety Trial (WR) and six entries from the Southwest Region (SWR). Important characteristics for processing chippers include: total yield, tubers per plant, tuber shape, tuber uniformity, average tuber size, and specific gravity. See Tables 10-13 for Chipping Trial results and Figure 3 for entry pictures and comments.

### Trial Information

<b>Location:</b>	Intermountain Research and Extension Center, Tulelake, CA
<b>Soil Type:</b>	Tulebasin mucky silty clay loam
<b>Planting Date:</b>	May 15 <sup>th</sup> 2020
<b>Vine Kill Date:</b>	September 3 <sup>rd</sup>
<b>Days to Vine Kill:</b>	111
<b>Harvest Date:</b>	September 2 <sup>th</sup> 2020
<b>Irrigation:</b>	Solid-set sprinklers; applied water + precipitation = 27.39 inches
<b>Plot Length:</b>	18.3 Feet
<b>In-Row Spacing:</b>	10 Inches
<b>Row Spacing:</b>	36 Inches
<b>Number of Reps:</b>	4
<b># of Fertilizer/Acre:</b>	197-80-260
<b>Seed Treatment:</b>	Maxim 4FS and Fir Bark Dust
<b>Weed Control:</b>	Prowl H2O and Eptam 7E (pre-emergence) Matrix SG (early post-emergence)
<b>Insecticides:</b>	Admire Pro (In-furrow)
<b>Fungicides:</b>	Quadris (In-furrow) Luna Tranquility (chemigation)
<b>Vine Kill Method:</b>	Rolling and Reglone at labeled rates

Table 10. Tuber Yield and Size of Chipping Potato Entries.

Clone / Variety	Trial	Total	Tuber Yield (cwt/A) <sup>1</sup>					Culls
			>14 oz	10-14 oz	6-10oz	4-6 oz	<4 oz	
<b>Atlantic</b>	<b>WR</b>	538.7 ab	37.7 bcd	108.4 ab	245.4 a	85.7 de	45.4 gh	16.2 b
<b>Snowden</b>	<b>WR</b>	449.0 cd	15.5 d	34.3 def	190.2 abc	132.6 abc	63.8 efgh	12.5 b
<b>AOR12197-4</b>	<b>WR</b>	524.8 abc	46.2 bcd	100.2 abc	196.7 abc	90.7 de	52.2 fgh	38.7 a
<b>CO10073-7W</b>	<b>WR</b>	522.1 abc	3.8 d	32.7 def	204.2 abc	164.0 a	101.5 bcd	15.9 b
<b>CO10076-4W</b>	<b>WR</b>	530.5 abc	7.0 d	53.0 cdef	232.9 ab	140.1 ab	88.3 cde	9.3 b
<b>CO11023-2W</b>	<b>WR</b>	516.5 abc	75.6 ab	103.3 ab	159.7 bcd	93.3 cde	70.1 defg	14.5 b
<b>CO11023-9W</b>	<b>WR</b>	450.6 cd	2.0 d	46.9 def	200.3 abc	118.5 bcd	74.0 defg	8.9 b
<b>CO11037-5W</b>	<b>WR</b>	504.6 abc	10.3 d	80.1 abcd	183.9 abcd	132.0 abc	81.5 def	16.7 b
<b>TX09403-15W</b>	<b>WR</b>	499.7 abc	75.0 ab	117.1 a	193.9 abc	59.3 e	40.5 gh	13.9 b
<b>AC11494-6W</b>	<b>SWR</b>	381.3 d	1.7 d	6.0 f	105.1 d	144.9 ab	116.2 bc	7.4 b
<b>AORTX09037-1W/Y</b>	<b>SWR</b>	486.7 abc	2.1 d	18.0 ef	139.5 cd	158.3 ab	159.3 a	9.6 b
<b>ATTX07042-3W</b>	<b>SWR</b>	554.5 a	14.0 d	60.7 bcde	192.3 abc	142.9 ab	126.9 ab	17.7 b
<b>CO12235-3W</b>	<b>SWR</b>	459.1 bcd	19.9 cd	100.6 abc	187.2 abc	81.9 de	48.5 fgh	21.1 ab
<b>CO12293-1W</b>	<b>SWR</b>	551.6 a	102.2 a	111.0 a	189.8 abc	83.9 de	38.9 h	25.8 ab
<b>TX09403-21W</b>	<b>SWR</b>	528.3 abc	67.7 abc	98.0 abc	213.3 abc	89.2 de	50.6 fgh	9.4 b
<b>Mean</b>		<b>499.9</b>	<b>32.0</b>	<b>71.4</b>	<b>189.0</b>	<b>114.5</b>	<b>77.2</b>	<b>15.8</b>

<sup>1</sup>Mean comparisons were performed using Tukey's-Kramer HSD; means with the same letter within columns are not significantly different

Table 11. Merit Score and Tuber Characteristics of Chipping Potato Entries

Clone / Variety	Trial	Merit <sup>1</sup>	Eye depth <sup>2</sup>	Tuber Shape <sup>3</sup>	Shape Uniformity <sup>4</sup>	Length/Depth Ratio <sup>5</sup>	Length/Width Ratio <sup>5</sup>
Atlantic	WR	3.3 bcd	3.0 b	2.0 abc	3.0 cd	1.28 abc	1.01 bcd
Snowden	WR	3.6 abcd	3.0 b	1.6 bc	3.1 bcd	1.19 cde	0.94 de
AOR12197-4	WR	3.3 bcd	4.0 a	2.0 abc	3.1 bcd	1.17 cde	0.98 de
CO10073-7W	WR	3.0 d	4.0 a	1.9 abc	3.0 cd	1.29 abc	1.00 bcd
CO10076-4W	WR	3.1 cd	3.6 ab	1.9 abc	3.0 cd	1.20 bcd	0.96 de
CO11023-2W	WR	3.5 abcd	3.8 a	1.8 abc	3.3 bcd	1.17 cde	0.92 de
CO11023-9W	WR	4.0 a	3.9 a	1.9 abc	4.0 a	1.14 cde	0.97 de
CO11037-5W	WR	3.3 bcd	3.6 ab	1.9 abc	3.0 cd	1.13 de	0.94 de
TX09403-15W	WR	3.1 cd	3.5 ab	1.9 abc	3.1 bcd	1.23 abcd	0.99 cde
AC11494-6W	SWR	3.8 abc	3.8 a	1.5 c	3.8 ab	1.05 e	0.88 e
AORTX09037-1W/Y	SWR	3.4 abcd	3.8 a	2.1 ab	3.3 bcd	1.36 a	1.16 a
ATTX07042-3W	SWR	3.1 cd	4.0 a	2.0 abc	3.0 cd	1.25 abcd	1.09 abc
CO12235-3W	SWR	3.4 abcd	3.8 a	1.9 abc	3.5 abcd	1.14 cde	0.97 de
CO12293-1W	SWR	3.9 ab	4.0 a	2.3 a	3.6 abc	1.34 ab	1.11 ab
TX09403-21W	SWR	3.4 abcd	3.6 ab	1.9 abc	2.9 d	1.21 abcd	0.99 cde
<b>Mean</b>		<b>3.4</b>	<b>3.7</b>	<b>1.9</b>	<b>3.2</b>	<b>1.21</b>	<b>0.99</b>

<sup>1</sup> 1=Worst, 5=Best - Chipper Merit Score takes into account multiple factors including tuber shape, eye depth, and shape uniformity<sup>2</sup> 1=Deep, 5=Shallow<sup>3</sup> 1=Round, 5=Oblong<sup>4</sup> 1= No Uniformity, 5=Very Uniform<sup>5</sup> Ratio of 10 tubers measured from 10-14 oz size category.

Table 12. Tuber Defects of Chipping Potato Entries.

Clone / Variety	Trial	Hollow Heart <sup>1</sup>	Vascular Discoloration <sup>1</sup>	Stem End Necrosis <sup>1</sup>	Knobs <sup>2</sup>	Growth Crack <sup>2</sup>	Greening <sup>2</sup>
		%	%	%	%	%	%
Atlantic	WR	2.5 b	0.0 a	7.5 a	0.3 a	0.4 a	3.0 bc
Snowden	WR	2.5 b	0.0 a	15.0 a	0.5 a	0.0 a	2.6 bc
AOR12197-4	WR	0.0 b	5.0 a	15.0 a	0.0 a	0.9 a	7.0 a
CO10073-7W	WR	20.0 a	0.0 a	5.0 a	0.5 a	0.2 a	2.3 c
CO10076-4W	WR	0.0 b	2.5 a	5.0 a	0.7 a	0.1 a	0.9 c
CO11023-2W	WR	5.0 b	0.0 a	15.0 a	0.1 a	0.9 a	0.8 c
CO11023-9W	WR	2.5 b	0.0 a	15.0 a	0.5 a	0.0 a	2.0 c
CO11037-5W	WR	0.0 b	0.0 a	15.0 a	0.9 a	0.1 a	1.9 c
TX09403-15W	WR	0.0 b	0.0 a	10.0 a	0.2 a	1.0 a	0.8 c
AC11494-6W	SWR	0.0 b	0.0 a	12.5 a	0.9 a	0.0 a	1.3 c
AORTX09037-1W/Y	SWR	2.5 b	2.5 a	10.0 a	0.5 a	0.5 a	0.9 c
ATTX07042-3W	SWR	0.0 b	2.5 a	2.5 a	0.5 a	1.2 a	1.1 c
CO12235-3W	SWR	0.0 b	5.0 a	7.5 a	0.3 a	1.0 a	1.7 c
CO12293-1W	SWR	2.5 b	0.0 a	5.0 a	0.4 a	0.2 a	5.4 ab
TX09403-21W	SWR	0.0 b	2.5 a	10.0 a	0.4 a	0.6 a	0.9 c
<b>Mean</b>		<b>2.5</b>	<b>13.3</b>	<b>10.0</b>	<b>0.3</b>	<b>0.5</b>	<b>2.1</b>

<sup>1</sup> Ten, 6-10oz tubers were evaluated from each plot.

<sup>2</sup> Percent of total tubers.

**Table 13. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Chipping Potato Entries.**










Clone / Variety	Trial	Vert Wilt Rating <sup>1</sup>	Early-Dying <sup>2</sup> (A.U.D.P.C.)	% Stand	Tubers per Plant	Average Tuber Size (oz)	Specific Gravity
<b>Atlantic</b>	<b>WR</b>	6.5 abc	701.4 bcd	99 ab	7.4 de	6.7 abc	1.102 a
<b>Snowden</b>	<b>WR</b>	7.0 ab	1033.8 ab	99 ab	7.6 de	5.5 de	1.095 bc
<b>AOR12197-4</b>	<b>WR</b>	4.8 cd	197.7 e	93 b	7.9 cde	6.5 abcd	1.095 bc
<b>CO10073-7W</b>	<b>WR</b>	6.5 abc	787.8 bc	97 ab	9.9 ab	5.0 efg	1.087 de
<b>CO10076-4W</b>	<b>WR</b>	6.0 abcd	546.8 cde	99 ab	9.1 abc	5.5 def	1.082 e
<b>CO11023-2W</b>	<b>WR</b>	5.0 bcd	263.4 e	100 a	7.8 cde	6.1 bcde	1.094 c
<b>CO11023-9W</b>	<b>WR</b>	4.8 cd	262.0 e	100 a	7.5 de	5.5 de	1.082 e
<b>CO11037-5W</b>	<b>WR</b>	6.3 abcd	578.8 cde	97 ab	8.5 bcd	5.6 cde	1.096 abc
<b>TX09403-15W</b>	<b>WR</b>	7.8 a	1266.6 a	94 ab	6.5 e	7.5 a	1.085 e
<b>AC11494-6W</b>	<b>SWR</b>	4.8 cd	354.0 de	96 ab	8.5 bcd	4.3 fg	1.100 abc
<b>AORTX09037-1W/Y</b>	<b>SWR</b>	7.0 ab	706.4 bcd	100 a	10.4 a	4.3 g	1.091 cd
<b>ATTX07042-3W</b>	<b>SWR</b>	7.8 a	1077.6 ab	99 ab	10.1 a	5.1 efg	1.091 cd
<b>CO12235-3W</b>	<b>SWR</b>	5.3 bcd	438.9 cde	96 ab	6.7 e	6.5 abcd	1.092 cd
<b>CO12293-1W</b>	<b>SWR</b>	4.3 d	230.9 e	100 ab	7.0 e	7.4 a	1.087 de
<b>TX09403-21W</b>	<b>SWR</b>	7.0 ab	805.6 bc	93 b	7.5 de	7.0 ab	1.082 e
<b>Mean</b>		<b>6.0</b>	<b>616.8</b>	<b>97</b>	<b>8.2</b>	<b>5.9</b>	<b>1.091</b>







<sup>1</sup>Verticillium wilt ratings based on a 0-9 scale (0=None 9=Dead) for August 21<sup>st</sup> 98 days after planting

<sup>2</sup> Area Under Disease Progress Curve based on foliar early-dying ratings taken 80, 84,91 and 98 days after planting. Higher value is more susceptible to early dying.



**Figure 3. 2020 Chipping Trial Entries**

Atlantic	Snowden	AOR12197-4
 <ul style="list-style-type: none"> <li>• Check</li> </ul>	 <ul style="list-style-type: none"> <li>• Check</li> <li>• Lumpy tuber shape</li> </ul>	 <ul style="list-style-type: none"> <li>• Resistant to early dying</li> </ul>
CO10073-7W	CO10076-4W	CO11023-2W
 <ul style="list-style-type: none"> <li>• Pancake shaped tubers</li> <li>• Susceptible to skinning</li> </ul>	 <ul style="list-style-type: none"> <li>• Pink eyes</li> </ul>	 <ul style="list-style-type: none"> <li>• Pancake shaped tubers</li> </ul>
CO11023-9W	CO11037-5W	TX09403-15W
 <ul style="list-style-type: none"> <li>• Uniform tuber shape</li> </ul>	 <ul style="list-style-type: none"> <li>• Pancake shaped tubers</li> </ul>	 <ul style="list-style-type: none"> <li>• Susceptible to early dying</li> <li>• Large tuber size</li> </ul>

AC11494-6W	AORTX09037-1W/Y	ATTX07042-3W
 <ul style="list-style-type: none"> <li>• Small average tuber size</li> </ul>	 <ul style="list-style-type: none"> <li>• 1/3 of total yield &lt;4 oz</li> <li>• Small average tuber size</li> </ul>	 <ul style="list-style-type: none"> <li>• Highest total yield</li> </ul>
CO12235-3W	CO12293-1W	TX09403-21W
 <ul style="list-style-type: none"> <li>• Susceptible to skinning</li> </ul>	 <ul style="list-style-type: none"> <li>• Resistant to early dying</li> <li>• Large average tuber size</li> </ul>	 <ul style="list-style-type: none"> <li>• Poor shape uniformity</li> </ul>

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