2018

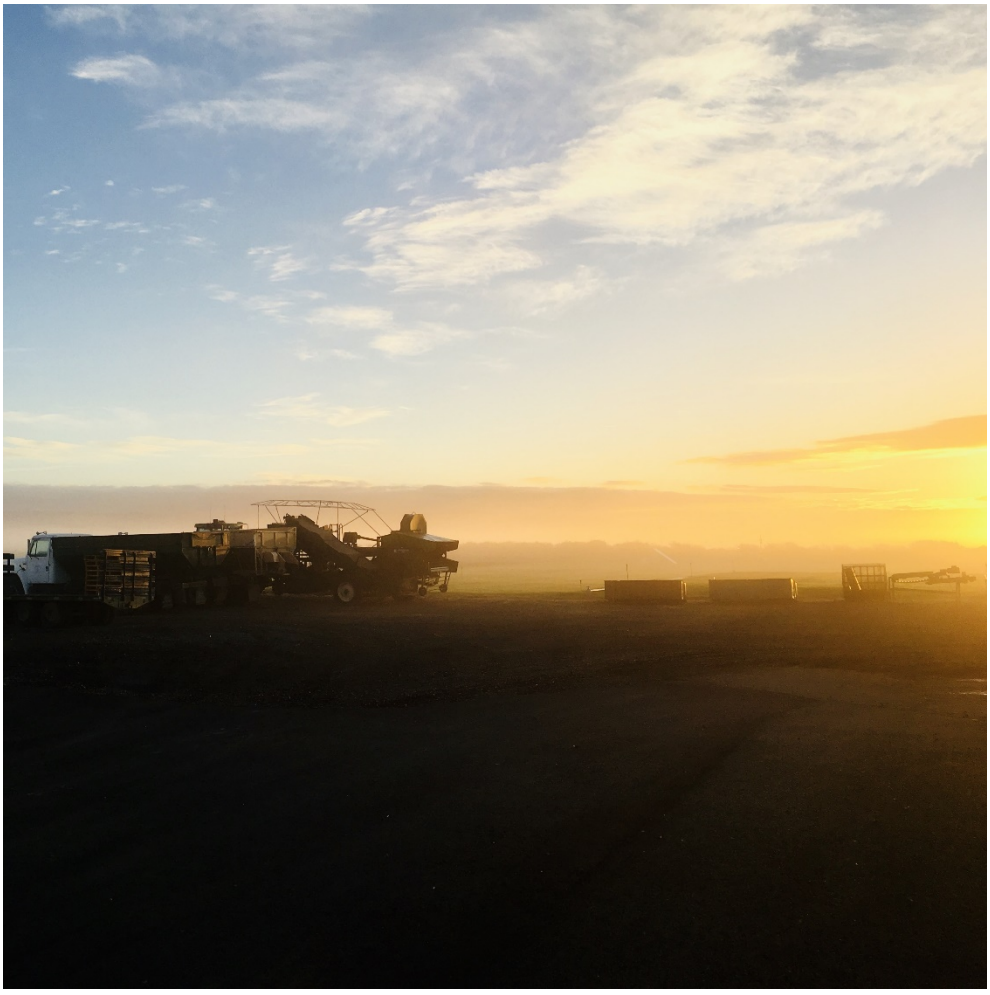
Potato Variety Development

In Tulelake, CA

Three variety trials were grown at the Intermountain Research and Extension Center during 2018.

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

Trial results are summarized in this report.



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RESEARCH REPORT
Number 186, 2018

2018 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 twenty-three entries, a Specialty trial with seventeen entries, and a Chipping trial with six 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 seventeen entries from the Western Regional Variety Trial (WR) and six 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. Data was collected for several vine and tuber characteristics. Important characteristics for the local area include total and 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

Location:	Intermountain Research and Extension Center, Tulelake, CA
Soil Type:	Tulebasin mucky silty clay loam
Planting Date:	May 21st 2018
Vine Kill Date:	September 7th and 13th 2018
Days to Vine Kill:	109
Harvest Date:	October 3rd 2018
Irrigation:	Solid-set sprinklers; applied water + precipitation = 24.67 inches
Plot Length:	18.3 Feet
In-Row Spacing:	10 Inches
Row Spacing:	36 Inches
Number of Reps:	4
# of Fertilizer/Acre:	205-0-0
Seed Treatment:	Maxim 4FS and Fir Bark Dust
Weed Control:	Prowl H2O, and Outlook (pre-emergence)
	Matrix SG (early post-emergence)
Insecticides:	Admire Pro (In-furrow)
Fungicides:	Quadris (In-furrow), Luna Tranquility (Chemigate)
Vine Kill Method:	Rolling and Reglone at labeled rates

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

				Tuber Yield (cwt/A)															
								U.S. No. 1's											
	Trial	%1's		U.S. 1's		Total		>14oz		10-14oz		6-10oz		4-6oz		<4oz		Culls + 2's	
Ranger Russet	WR	77	abcde*	323.9	bcdef	422.0	bcde	13.0	cdef	49.1	cdefgh	156.9	abcdefg	104.9	defg	69.6	cde	28.5	bcd
Russet Burbank	WR	74	cdef	327.9	bcdef	442.1	abcd	10.7	cdef	47.2	cdefgh	147.1	abcdefg	122.9	abcd	79.7	cd	34.6	abc
Russet Norkotah	WR	68	efg	246.0	fgh	360.8	def	21.8	cdef	41.3	defgh	100.9	gh	82.0	fg	87.2	bc	27.6	bcd
A07061-6	WR	71	def	345.6	bcde	488.4	ab	5.7	def	24.5	fgh	165.0	abcde	150.4	ab	124.0	a	18.8	bcd
A071012-4BF	WR	86	a	447.7	a	519.1	a	57.6	ab	112.8	a	187.2	a	90.1	defg	48.0	ef	23.4	bcd
A07769-4	WR	85	ab	383.5	ab	450.3	abcd	38.0	bcde	78.0	abcd	173.4	abc	94.2	defg	52.7	def	14.0	bcd
A08433-4VR	WR	79	abcd	333.3	bcdef	421.0	bcde	8.9	def	52.2	bcdefg	157.5	abcdefg	114.6	cdef	67.3	cde	20.5	bcd
A10021-5TE	WR	78	abcd	375.3	abc	475.7	abc	12.0	cdef	46.5	cdefgh	178.8	abc	138.0	abc	88.0	bc	12.4	cd
AO02183-2	WR	82	abc	354.7	abcde	431.8	abcde	29.7	bcdef	64.9	bcdef	164.2	abcdef	95.9	defg	58.6	cdef	18.4	bcd
AO06191-1	WR	84	abc	331.7	bcdef	393.4	cde	84.9	a	94.0	ab	108.6	efgh	44.1	h	35.3	f	26.4	bcd
AOR06576-1	WR	83	abc	376.7	ab	455.7	abc	39.7	bcd	72.1	abcde	170.0	abcd	94.9	defg	52.4	def	26.7	bcd
AOR07781-5	WR	77	abcde	299.5	bcdefgh	389.8	cdef	33.6	bcdef	63.5	bcdef	128.8	bcdefgh	73.5	gh	51.7	def	38.7	ab
AOR07821-1	WR	85	ab	349.6	bcde	413.9	bcde	43.9	bc	68.1	bcde	154.0	abcdefg	83.6	fg	47.0	ef	17.3	bcd
AOTX05043-1Ru	WR	75	bcdef	262.2	efgh	347.6	ef	13.0	cdef	37.1	defgh	135.5	abcdefgh	76.5	gh	62.6	cdef	22.8	bcd
CO08155-2RU/Y	WR	66	fg	274.9	defgh	418.5	bcde	0.0	f	6.6	h	110.8	efgh	157.5	a	120.8	a	22.7	bcd
CO08231-1RU	WR	59	g	213.5	h	360.6	def	1.4	f	10.7	gh	87.9	h	113.5	cdef	137.2	a	10.0	cd
CO09036-2RU	WR	69	def	284.1	cdefgh	408.4	bcde	8.3	def	46.0	cdefgh	116.0	defgh	113.8	cdef	109.9	ab	14.5	bcd
CO09076-3RU	WR	71	def	316.1	bcdefg	446.4	abcd	34.1	bcdef	72.0	abcde	126.9	cdefgh	83.1	fg	72.5	cde	57.8	a
CO09205-2RU	WR	74	cdef	288.7	cdefgh	388.3	cdef	7.0	def	22.6	fgh	141.3	abcdefgh	117.9	bcde	78.2	cd	21.3	bcd
COTX05095-2Ru/Y	WR	79	abcd	385.1	ab	490.4	ab	18.2	cdef	59.7	bcdef	184.7	ab	122.5	bcd	79.6	cd	25.7	bcd
CO10087-4RU	SWR	76	bcdef	227.0	gh	298.0	f	2.8	f	31.8	efgh	107.5	fgh	85.0	efg	60.6	cdef	10.4	cd
CO10091-1RU	SWR	67	efg	241.9	fgh	358.8	def	3.7	ef	16.7	gh	111.0	efgh	110.5	cdef	110.2	ab	6.8	d
AO6030-23	OR	81	abc	362.9	abcd	445.4	abcd	28.8	bcdef	84.9	abc	173.1	abc	76.0	gh	56.2	def	26.3	bcd
Mean		**80**		**319.6**		**418.5**		**22.5**		**52.3**		**142.9**		**102**		**76.1**		**22.9**	

***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[1]		Russeting[2]		Eye Depth[3]		Shape Uniformity[4]		Length/Width Ratio[5]	
Ranger Russet	WR	3.3	ab	3.1	defg	3.5	cdef	3.5	bcd	2.29	ab
Russet Burbank	WR	3.8	ab	3.6	bcd	3.3	ef	3.6	abcd	2.04	cd
Russet Norkotah	WR	3.9	ab	4.1	abc	3.9	abcdef	4.0	abc	1.85	defgh
A07061-6	WR	2.0	d	2.0	h	3.3	ef	3.1	d	1.74	fghi
A071012-4BF	WR	3.1	b	3.1	defg	3.1	f	3.6	abcd	1.80	efgh
A07769-4	WR	3.8	ab	3.0	defg	4.0	abcdef	4.1	ab	1.75	fghi
A08433-4VR	WR	3.6	ab	3.4	de	3.4	def	3.8	abcd	1.63	hij
A10021-5TE	WR	3.6	ab	2.5	gh	4.1	abcde	4.1	ab	2.10	bc
AO02183-2	WR	3.4	ab	4.1	abc	3.6	bcdef	4.4	a	2.48	a
AO06191-1	WR	3.9	ab	4.3	ab	4.1	abcde	4.1	ab	1.84	defgh
AOR06576-1	WR	3.3	ab	2.6	fgh	3.9	abcdef	4.1	ab	2.09	bc
AOR07781-5	WR	3.0	bc	4.3	ab	3.6	bcdef	3.4	bcd	1.96	cdef
AOR07821-1	WR	3.1	b	4.4	a	4.3	abcd	4.0	abc	1.85	defgh
AOTX05043-1Ru	WR	2.1	cd	2.5	gh	3.5	cdef	3.3	cd	1.67	ghi
CO08155-2RU/Y	WR	3.0	bc	2.9	efg	4.5	ab	3.5	bcd	1.90	cdefg
CO08231-1RU	WR	3.4	ab	2.9	efg	4.0	abcdef	4.0	abc	1.57	ij
CO09036-2RU	WR	3.8	ab	4.5	a	4.4	abc	3.9	abcd	1.87	cdefg
CO09076-3RU	WR	2.1	cd	3.6	bcd	4.3	abcd	3.8	abcd	1.98	cde
CO09205-2RU	WR	4.1	a	3.3	def	4.1	abcde	4.4	a	2.05	cd
COTX05095-2Ru/Y	WR	3.8	ab	3.1	defg	3.4	def	4.1	ab	1.73	fghi
CO10087-4RU	SWR	3.8	ab	3.5	cde	4.6	a	3.9	abcd	1.87	cdefg
CO10091-1RU	SWR	3.0	bc	4.1	abc	4.4	abc	3.9	abcd	1.43	j
AO6030-23	OR	3.8	ab	4.1	abc	4.0	abcdef	4.0	abc	1.83	defgh
Mean		**3.3**		**3.4**		**3.9**		**3.8**		**1.88**	

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

[2] 1=Light,5=Heavy

[3] 1=Deep, 5=Shallow

[4] 1= Non Uniform, 5=Very Uniform

[5] Ratio of 10 tubers measured from each plot, 8-14 oz in size.

Table 3. Tuber Defects of Russet Potato Entries.

	Trial	Hollow Heart[1]		Stem-end Necrosis[1]		Black Spot Bruise[1]		Knobs[2]		Growth Crack[2]		Irregular Shaped[2]		Greening[2]	
		%		%		%		%		%		%		%	
Ranger Russet	WR	0	b	18	ab	13	a	1.1	b	2.4	b	0.9	a	0.6	cd
Russet Burbank	WR	18	b	18	ab	5	a	1.9	ab	1.6	b	0.2	a	0.1	d
Russet Norkotah	WR	10	b	18	ab	8	a	1.9	ab	1.9	b	1.2	a	0.4	cd
A07061-6	WR	0	b	20	ab	3	a	1.9	ab	0.8	b	0.2	a	1.3	abcd
A071012-4BF	WR	0	b	13	ab	3	a	0.9	b	1.1	b	0.9	a	0.2	cd
A07769-4	WR	0	b	10	ab	3	a	0.6	b	1.0	b	0.0	a	0.9	bcd
A08433-4VR	WR	3	b	35	a	8	a	1.2	ab	1.3	b	0.0	a	0.8	bcd
A10021-5TE	WR	3	b	15	ab	5	a	0.8	b	0.8	b	0.1	a	1.2	abcd
AO02183-2	WR	3	b	35	a	0	a	0.9	b	1.2	b	0.1	a	1.2	bcd
AO06191-1	WR	5	b	10	ab	8	a	1.5	ab	1.3	b	0.1	a	1.6	abcd
AOR06576-1	WR	3	b	28	ab	5	a	2.0	ab	2.0	b	0.0	a	0.3	cd
AOR07781-5	WR	8	b	23	ab	8	a	2.8	a	2.7	b	0.2	a	1.3	abcd
AOR07821-1	WR	15	b	13	ab	8	a	1.3	ab	1.0	b	0.0	a	1.1	bcd
AOTX05043-1Ru	WR	0	b	0	b	13	a	1.7	ab	1.3	b	0.2	a	0.6	cd
CO08155-2RU/Y	WR	0	b	0	b	3	a	0.5	b	1.5	b	0.4	a	2.9	a
CO08231-1RU	WR	10	b	13	ab	0	a	0.7	b	0.8	b	0.3	a	0.6	cd
CO09036-2RU	WR	38	a	25	ab	0	a	1.3	ab	0.5	b	0.0	a	1.6	abcd
CO09076-3RU	WR	0	b	10	ab	3	a	0.8	b	6.2	a	0.6	a	1.5	abcd
CO09205-2RU	WR	3	b	20	ab	0	a	1.2	ab	1.5	b	0.1	a	2.3	ab
COTX05095-2Ru/Y	WR	0	b	25	ab	0	a	0.6	b	1.8	b	0.4	a	1.8	abc
CO10087-4RU	SWR	40	a	18	ab	5	a	0.9	b	0.7	b	0.2	a	0.4	cd
CO10091-1RU	SWR	18	b	15	ab	0	a	0.4	b	0.7	b	0.0	a	0.5	cd
AO6030-23	OR	0	b	10	ab	8	a	0.5	b	1.5	b	1.2	a	0.6	cd
Mean		**8**		**17**		**4**		**1.2**		**1.5**		**0.3**		**1.0**	

[1] Ten, 8 to 14 oz. tubers were evaluated from each plot.
[2] Percent of total tubers.

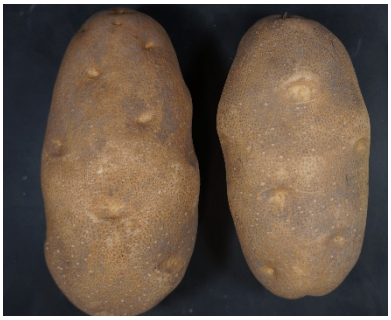
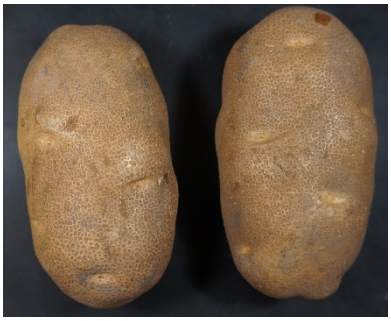
Table 4. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Russet Potato Entries.

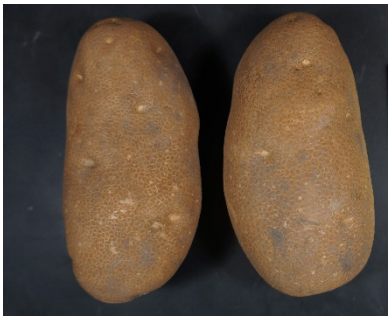
	Trial	Vert Wilt Rating[1]		Early Dying[2] (A.U.D.P.C.)		% Stand		Tubers per Plant		Average Tuber Size		Specific Gravity	
Ranger Russet	WR	6.3	abcde	533.2	abcd	100	a	7.1	bcdef	5.5	cdefghi	1.106	ab
Russet Burbank	WR	5.3	bcde	322.1	bcd	99	ab	7.7	bcdef	5.4	cdefghi	1.100	bcdefg
Russet Norkotah	WR	7.5	abc	872.4	ab	91	abcd	7.5	bcdef	4.9	efghij	1.089	hi
A07061-6	WR	4.8	cde	304.2	bcd	97	abc	9.9	a	4.7	fghij	1.092	efghi
A071012-4BF	WR	4.3	de	117.8	d	98	abc	6.7	efg	7.5	a	1.112	a
A07769-4	WR	7.3	abc	753.5	abcd	99	ab	6.8	efg	6.2	cd	1.101	bcdef
A08433-4VR	WR	3.8	e	128.0	d	98	ab	7.1	bcdef	5.5	cdefgh	1.091	ghi
A10021-5TE	WR	5.5	bcde	298.2	bcd	96	abcd	8.7	ab	5.2	cdefghi	1.107	ab
AO02183-2	WR	4.3	de	114.5	d	100	a	6.8	efg	5.9	cdef	1.103	abcd
AO06191-1	WR	6.3	abcde	627.1	abcd	95	abcd	5.1	g	7.5	ab	1.093	defghi
AOR06576-1	WR	6.0	abcde	504.7	abcd	95	abcd	7.0	bcdef	6.3	c	1.092	fghi
AOR07781-5	WR	5.8	abcde	299.2	bcd	96	abcd	6.3	fg	6.0	cde	1.105	abc
AOR07821-1	WR	4.8	cde	189.0	cd	95	abcd	6.3	fg	6.3	bc	1.098	bcdefgh
AOTX05043-1Ru	WR	7.3	abc	645.4	abcd	88	d	6.9	def	5.3	cdefghi	1.100	bcdefg
CO08155-2RU/Y	WR	6.8	abcd	638.2	abcd	91	bcd	9.9	a	4.3	ij	1.096	cdefgh
CO08231-1RU	WR	6.8	abcd	529.3	abcd	95	abcd	8.6	abc	4.0	j	1.099	bcdefg
CO09036-2RU	WR	3.8	e	123.5	d	97	abc	8.3	abcde	4.7	ghij	1.102	bcde
CO09076-3RU	WR	7.3	abc	717.4	abcd	96	abcd	7.4	bcdef	5.8	cdefg	1.093	defghi
CO09205-2RU	WR	8.5	a	994.7	a	99	ab	7.4	bcdef	4.9	efghij	1.085	i
COTX05095-2Ru/Y	WR	8.0	ab	1038.4	a	95	abcd	8.6	abcd	5.5	cdefgh	1.088	hi
CO10087-4RU	SWR	7.5	abc	790.3	abc	89	cd	6.1	fg	5.1	defghij	1.103	abcd
CO10091-1RU	SWR	5.8	abcde	408.7	abcd	97	abc	7.8	bcdef	4.4	hij	1.101	bcdef
AO6030-23	OR	6.0	abcde	614.0	abcd	99	ab	6.9	cdef	6.0	cde	1.089	hi
Mean		**6.0**		**502.8**		**96**		**7.0**		**5.5**		**1.098**	

[1]Verticillium wilt ratings based on a 0-9 scale (0=None 9=Dead) for August 31st 102 days after planting.

[2] Area Under Disease Progress Curve based on foliar early-dying ratings taken 73, 86 and 102 days after planting. Higher value is more susceptible

Figure 1. 2017 Late Russet Trial Entries.

Ranger Russet (WR)	Russet Burbank (WR)	Russet Norkotah (WR)
		
• Check	• Check • Nice appearance this year	• Check
A07061-6	**A071012-4BF**	**A07769-4**
		
• Minimal russeting • Lumpy	• Prone to skinning • Medium russeting	• Nice shape • More shatter bruise than average
A08433-4VR	**A10021-5TE**	**AO02183-2**
		
• Non uniform, lumpy • Ruptured lenticel	• Light russeting • Uniform	• Long/pointy • Lots of eyes

AO06191-1	AOR06576-1	AOR07781-5
		
• Pointy end • Inconsistent russeting	• Prone to skinning • Lumpy	• Pointy end • Prone to skinning
AOR07821-1	**AOTX05043-1Ru**	**CO08155-2RU/Y**
		
• Flat tuber shape • Ruptured lenticels	• Significant elephant hide on all tubers	• Light russeting
CO08231-1RU	**CO09036-2RU**	**CO09076-3RU**
		
• Round tuber shape • Uniform	• Pointy • Heavy russeting	• Elephant hide on most tubers • Susceptible to skinning

CO09205-2RU	COTX05095-2Ru/Y	CO10087-4RU
		
• Oblong • Ruptured lenticels	• Nice shape • Uniform	• Uniform • Prone to shatter bruise
CO10087-4RU	**CO10091-1RU**	
		
• Round tuber shape • Heavy russeting	• Nice tuber shape	

Red/Specialty Variety Trial

The Red/Specialty Trial included ten entries from the Western Regional Variety Trial (WR) and seven entries from the Southwest Regional Trial (SWR). Red and specialty type potatoes are an expanding segment of the Klamath Basin potato industry. Organic certified acreage is also increasing in these categories. 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 5-10 for Red/Specialty trial results and Figure 2 for entry pictures and comments.

Trial Information

Location:	Intermountain Research and Extension Center, Tulelake, CA
Soil Type:	Tulebasin mucky silty clay loam
Planting Date:	May 21st 2018
Vine Kill Date:	September 7th and 13th 2018
Days to Vine Kill:	109
Harvest Date:	October 8th 2018
Irrigation:	Solid-set sprinklers; applied water + precipitation = 24.67 inches
Plot Length:	18.3 Feet
In-Row Spacing:	10 Inches
Row Spacing:	36 Inches
Number of Reps:	4
# of Fertilizer/Acre:	205-0-0
Seed Treatment:	Maxim 4FS and Fir Bark Dust
Weed Control:	Prowl H2O, and Outlook (pre-emergence)
	Matrix SG (early post-emergence)
Insecticides:	Admire Pro (In-furrow),
Fungicides:	Quadris (In-furrow), Luna Tranquility (Chemigate)
Vine Kill Method:	Rolling and Reglone at labeled rates

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

Clone / Variety	Trial	Skin Color[1]	Color Rating	Flesh color	Color Rating
Chieftan	WR	Red	2.1	White	1.1
Red LaSoda	WR	Red	1.9	White	1.5
ATTX05175S-1R/Y	WR	Red	3.3	Yellow	3.4
COTX04193S-2R/Y	WR	Red	3.4	Yellow	2.5
CO08037-2P/P	WR	Purple	5.0	Purple	5.0
CO09079-5PW/Y	WR	Purple/Yellow	2.1	Yellow	3.9
Yukon Gold	WR	Yellow	2.5	Yellow	3.0
CO09128-3W/Y	WR	Yellow	2.6	Yellow	3.8
CO09128-5W/Y	WR	White	1.8	Yellow	4.1
CO09218-4W/Y	WR	Yellow	2.1	Yellow	3.8
ATX02263-1R/Y	SWR	Red	3.4	Yellow	2.5
CO06215-2R	SWR	Red	3.5	White	1.0
AC10376-1W/Y	SWR	Yellow	3.0	Yellow	4.0
CO10064-1W/Y	SWR	Yellow	3.0	Yellow	3.8
CO10097-2W/Y	SWR	Yellow	2.4	Yellow	3.3
CO10098-4W/Y	SWR	Yellow	3.1	Yellow	3.8
CO10098-5W/Y	SWR	Yellow	3.1	Yellow	5.0
Mean			**3.2**		**3.4**

[1]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.

			Tuber Yield (cwt/A)											
Clone / Variety	**Trial**	**Skin Color**	**Total Yield**		**10-14 oz**		**6-10 oz**		**4-6 oz**		**< 4oz**		**> 14 oz**		**Culls**	
Chieftan	WR	Red	631.5	a*	110.1	ab	258.4	a	122.4	abcd	73.0	fg	33.3	bc	34.3	bcd
Red LaSoda	WR	Red	613.4	ab	131.1	a	192.2	b	63.2	ef	42.7	g	70.4	a	113.8	a
ATTX05175S-1R/Y	WR	Red	550.4	abc	4.4	de	72.6	ef	133.6	abc	319.0	a	2.3	d	18.6	bcd
COTX04193S-2R/Y	WR	Red	480.4	cd	1.9	de	66.4	ef	158.9	a	236.5	bc	0.0	d	16.7	bcd
CO08037-2P/P	WR	Purple	353.5	efg	4.0	de	37.0	fgh	90.4	de	214.6	c	0.0	d	7.7	cd
CO09079-5PW/Y	WR	Purple/Yellow	432.8	de	0.0	e	10.2	gh	68.5	e	336.8	a	0.0	d	17.2	bcd
Yukon Gold	WR	Yellow	438.1	de	94.2	b	142.2	cd	63.3	ef	51.3	g	56.5	ab	30.6	bcd
CO09128-3W/Y	WR	Yellow	334.5	g	2.6	de	5.3	h	28.8	f	289.1	ab	0.0	d	8.9	cd
CO09128-5W/Y	WR	White	345.1	fg	0.0	e	2.4	h	29.0	f	307.6	a	0.0	d	6.2	d
CO09218-4W/Y	WR	Yellow	390.3	efg	1.3	de	55.0	fg	119.2	cd	201.2	cd	0.0	d	13.7	bcd
ATX02263-1R/Y	SWR	Red	425.6	def	9.0	de	79.3	ef	120.7	bcd	175.6	cde	0.9	d	40.1	bc
CO06215-2R	SWR	Red	545.9	bc	48.2	c	193.7	b	132.1	abc	142.7	de	12.3	cd	17.0	bcd
AC10376-1W/Y	SWR	Yellow	526.4	c	4.8	de	62.0	ef	136.5	abc	290.1	ab	0.0	d	33.0	bcd
CO10064-1W/Y	SWR	Yellow	487.2	cd	10.9	de	104.5	de	135.8	abc	208.5	c	1.0	d	26.6	bcd
CO10097-2W/Y	SWR	Yellow	510.5	cd	33.5	cd	175.0	bc	156.8	ab	129.0	ef	11.3	cd	4.9	d
CO10098-4W/Y	SWR	Yellow	428.5	def	7.2	de	74.3	ef	124.4	abcd	192.8	cd	0.0	d	29.9	bcd
CO10098-5W/Y	SWR	Yellow	322.0	g	2.6	de	62.6	ef	90.7	de	121.2	ef	0.0	d	44.9	b
Mean			**387.7**		**27.4**		**93.7**		**104.4**		**196.0**		**11.1**		**27.3**	

*Mean comparisons were performed using Tukey's-Kramer HSD; means with the same letter within columns are not signifigantly different

Table 7. External Tuber Characteristics of Specialty Potato Entries.

Clone / Variety	Trial	Skin Color	Merit[1]		Eye Depth[2]		Tuber Shape[3]		Shape Uniformity[4]		Length/Width Ratio[5]	
Chieftan	WR	Red	3.8	ab	3.4	abcd	2.3	abcde	4.0	ab	1.15	abc
Red LaSoda	WR	Red	2.5	de	2.5	d	2.1	bcde	2.9	c	1.12	abc
ATTX05175S-1R/Y	WR	Red	3.8	ab	3.4	abcd	1.4	de	3.9	abc	0.95	bc
COTX04193S-2R/Y	WR	Red	3.9	a	3.1	cd	1.4	de	4.0	ab	1.04	abc
CO08037-2P/P	WR	Purple	4.0	a	4.1	ab	2.5	abcd	4.0	ab	1.27	ab
CO09079-5PW/Y	WR	Purple/Yellow	2.8	cde	3.6	abc	3.4	a	3.3	abc	1.37	a
Yukon Gold	WR	Yellow	3.5	abc	4.1	ab	2.5	abcd	3.6	abc	1.15	abc
CO09128-3W/Y	WR	Yellow	2.9	bcde	4.3	a	2.4	abcde	3.6	abc	1.20	ab
CO09128-5W/Y	WR	White	3.5	abc	3.9	abc	1.9	cde	3.8	abc	1.03	abc
CO09218-4W/Y	WR	Yellow	3.1	abcd	4.1	ab	2.4	abcde	4.0	ab	1.27	ab
ATX02263-1R/Y	SWR	Red	2.6	cde	4.3	a	3.3	ab	3.1	bc	1.32	ab
CO06215-2R	SWR	Red	3.8	ab	4.1	ab	1.9	cde	3.9	abc	1.07	abc
AC10376-1W/Y	SWR	Yellow	2.0	e	3.9	abc	2.9	abc	2.9	c	1.28	ab
CO10064-1W/Y	SWR	Yellow	4.0	a	4.0	abc	1.6	de	4.3	a	1.02	abc
CO10097-2W/Y	SWR	Yellow	2.3	de	4.0	abc	1.3	e	4.1	ab	0.80	c
CO10098-4W/Y	SWR	Yellow	2.9	bcde	3.3	bcd	1.3	e	3.8	abc	1.02	abc
CO10098-5W/Y	SWR	Yellow	2.1	e	3.9	abc	3.3	ab	3.1	bc	1.33	a
Mean			**3.1**		**3.8**		**2.2**		**3.7**		**1.14**	

[1] 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
[2] 1=Deep, 5=Shallow
[3] 1=Round, 5=Oblong
[4] 1= Poor uniformity, 5=Very Uniform
[5] Ratio of 10 tubers measured from each plot

Table 8. Tuber Defects of Specialty Potato Entries.

Clone / Variety	Trial	Skin Color	Hollow Heart[1]	Stem End Necrosis	Vascular Dicoloration[1]	Knobs[2]	Growth Crack[2]	Irregular Shape[2]	Greening[2]
			%	%	%	%	%	%	%
Chieftan	WR	Red	5 bc	13 abc	3 b	0.5 bc	0.1 b	2.6 ab	0.1 f
Red LaSoda	WR	Red	5 bc	10 bc	8 ab	0.5 bc	5.0 a	1.9 b	2.0 def
ATTX05175S-1R/Y	WR	Red	0 c	13 abc	0 b	0.4 c	0.2 b	2.2 b	2.7 cde
COTX04193S-2R/Y	WR	Red	0 c	15 abc	18 ab	0.2 c	0.4 b	2.3 b	0.4 f
CO08037-2P/P	WR	Purple	0 c	23 abc	8 ab	0.0 c	0.7 b	0.8 b	0.2 f
CO09079-5PW/Y	WR	Purple/Yellow	0 c	15 abc	30 a	0.6 bc	0.0 b	2.9 ab	1.9 def
Yukon Gold	WR	Yellow	10 abc	35 a	8 ab	0.8 abc	0.2 b	1.8 b	0.8 ef
CO09128-3W/Y	WR	Yellow	3 c	10 bc	13 ab	0.3 c	0.0 b	1.9 b	0.5 ef
CO09128-5W/Y	WR	White	20 a	13 abc	3 b	0.2 c	0.0 b	1.4 b	0.8 ef
CO09218-4W/Y	WR	Yellow	5 bc	10 bc	3 b	0.9 abc	0.1 b	2.3 b	1.3 def
ATX02263-1R/Y	SWR	Red	0 c	5 c	5 b	2.3 a	0.1 b	5.2 a	0.6 ef
CO06215-2R	SWR	Red	0 c	15 abc	10 ab	0.1 c	0.1 b	1.7 b	1.9 def
AC10376-1W/Y	SWR	Yellow	3 c	18 abc	0 b	1.2 abc	0.1 b	1.5 b	4.9 abc
CO10064-1W/Y	SWR	Yellow	0 c	5 c	0 b	0.3 c	0.1 b	1.3 b	5.3 ab
CO10097-2W/Y	SWR	Yellow	0 c	30 ab	0 b	0.2 c	0.1 b	0.4 b	0.1 f
CO10098-4W/Y	SWR	Yellow	18 ab	25 abc	5 b	0.2 c	0.0 b	1.1 b	6.8 a
CO10098-5W/Y	SWR	Yellow	0 c	18 abc	5 b	1.9 abc	1.2 b	2.1 b	3.5 bcd
Mean			**4**	**16**	**7**	**0.6**	**0.5**	**2.0**	**2.0**

[1] Ten, 6-10oz. tubers were evaluated from each plot.
[2] Percent of total tubers.

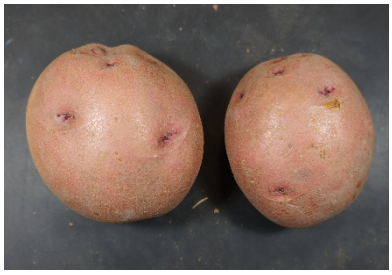
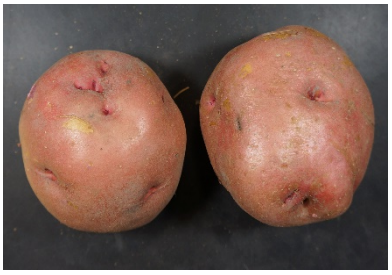
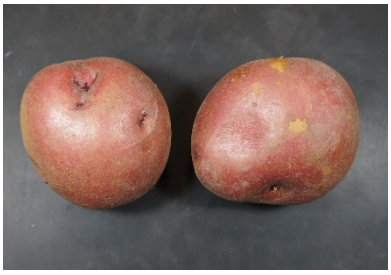
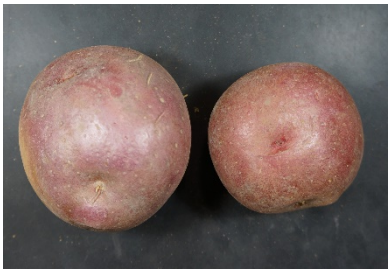
Table 9. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Specialty Potato Entries.

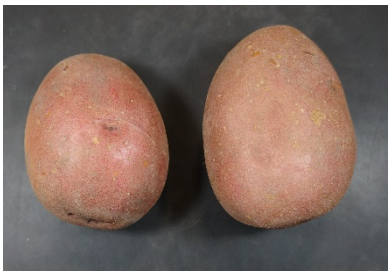
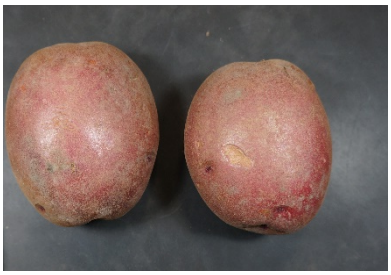
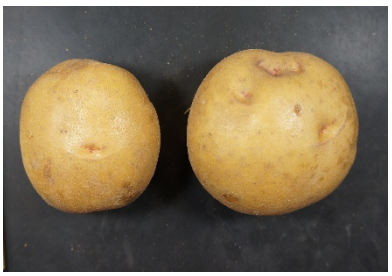
Clone / Variety	Trial	Skin Color	Vert Wilt Rating[1]		Early-Dying[2] (A.U.D.P.C.)		% Stand		Tubers/Plant		Average Size (oz)		Specific Gravity	
Chieftan	WR	Red	6.0	bcd	475.5	cdef	100	a	9.8	ef	6.2	b	1.088	a
Red LaSoda	WR	Red	4.8	de	183.7	ef	100	a	7.8	f	7.5	a	1.092	a
ATTX05175S-1R/Y	WR	Red	5.8	cde	323.7	def	100	a	18.2	a	2.9	f	1.093	a
COTX04193S-2R/Y	WR	Red	7.8	abc	896.2	bc	100	a	13.7	bcd	3.3	def	1.080	a
CO08037-2P/P	WR	Purple	7.5	abc	704.9	bcd	90	ab	12.0	cde	2.9	f	1.090	a
CO09079-5PW/Y	WR	Purple/Yellow	7.5	abc	749.1	bcd	100	a	18.0	a	2.3	g	1.093	a
Yukon Gold	WR	Yellow	8.0	ab	1133.7	ab	80	bc	7.8	f	6.4	b	1.085	a
CO09128-3W/Y	WR	Yellow	8.0	ab	855.7	bc	90	ab	17.8	a	1.9	g	1.095	a
CO09128-5W/Y	WR	White	9.0	a	1413.1	a	100	a	16.9	ab	1.9	g	1.100	a
CO09218-4W/Y	WR	Yellow	3.8	e	155.9	f	90	ab	12.5	cde	3.1	def	1.098	a
ATX02263-1R/Y	SWR	Red	7.3	abc	626.9	cde	70	c	17.1	ab	3.5	de	1.090	a
CO06215-2R	SWR	Red	7.0	abc	628.6	cde	100	a	12.1	cde	4.3	c	1.088	a
AC10376-1W/Y	SWR	Yellow	6.3	bcd	505.0	cdef	100	a	17.1	ab	3.0	ef	1.088	a
CO10064-1W/Y	SWR	Yellow	5.8	cde	370.8	def	90	ab	14.5	abc	3.4	def	1.090	a
CO10097-2W/Y	SWR	Yellow	6.3	bcd	508.3	cdef	100	a	10.5	def	4.6	c	1.093	a
CO10098-4W/Y	SWR	Yellow	6.3	bcd	454.1	cdef	90	ab	13.6	bcd	3.1	def	1.083	a
CO10098-5W/Y	SWR	Yellow	7.3	abc	745.6	bcd	70	c	12.5	cde	3.6	d	1.090	a
Mean			**6.7**		**631.2**		**90**		**13.6**		**3.8**		**1.090**	

[1]Verticillium wilt ratings based on a 0-9 scale (0=None 9=Dead). Rating occurred on August 31st, 102 days after planting.

[2] Area Under Disease Progress Curve based on foliar early-dying ratings taken 73, 86 and 102 days after planting. Higher value is more susceptible to early dying.

Figure 2. 2017 Red/Specialty Entries.

Cheiftan	Red LaSoda	ATTX0517S-1R/Y
		
• Check	• Check • High amount of powdery scab this year	• Deep eyes • Nice skin color
COTX04193S-2R/Y	**CO08037-2P/P**	**CO09079-5PW/Y**
		
• Deep red skin color • Prone to shatter bruise	• Deep purple skin color • Susceptible to black dot	• Dull purple skin color • Not visually appealing
Yukon Gold	**CO09128-3W/Y**	**CO09128-5W/Y**
		
• Check	• Pink tinge to skin • Prone to shatter bruise	• High % of small golf ball size tubers • Susceptible to black dot

CO09218-4W/Y	ATX02263-1R/Y	CO06215-2R
		
• Heavy russeting • Prone to black dot	• Pointy • Heavy russeting	• Deep red skin color • Good fresh market appearance
AC10376-1W/Y	**CO10064-1W/Y**	**CO10097-2W/Y**
		
• Irregular pink discoloration on skin • Heavy russeting	• Heavy russeting • Pink eyes	• Looks like a chip • Prone to shatter bruise and black dot
CO10098-4W/Y	**CO10098-5W/Y**	
		
• Nice tuber shape • Darker yellow than Yukon	• Orange tinge to skin color	

Chipping Potato Variety Trial

The 2018 Chipping Trial included four entries from the Western Regional Variety Trial (WR) and two 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 11-14 for Chipping Trial results and Figure 3 for entry pictures and comments.

Trial Information

Location:	Intermountain Research and Extension Center, Tulelake, CA
Soil Type:	Tulebasin mucky silty clay loam
Planting Date:	May 21st 2018
Vine Kill Date:	September 7th and 13th 2018
Days to Vine Kill:	109
Harvest Date:	October 8th 2018
Irrigation:	Solid-set sprinklers; applied water + precipitation = 24.67 inches
Plot Length:	18.3 Feet
In-Row Spacing:	10 Inches
Row Spacing:	36 Inches
Number of Reps:	4
# of Fertilizer/Acre:	205-0-0
Seed Treatment:	Maxim 4FS and Fir Bark Dust
Weed Control:	Prowl H2O, and Outlook (pre-emergence)
	Matrix SG (early post-emergence)
Insecticides:	Admire Pro (In-furrow)
Fungicides:	Quadris (In-furrow), Luna Tranquility (Chemigate)
Vine Kill Method:	Rolling and Reglone at labeled rates

Table 11. Tuber Yield and Size of Chipping Potato Entries.

Clone / Variety	Trial	Total	Tuber Yield (cwt/A) >14 oz	10-14 oz	6-10oz	4-6 oz	<4 oz	Culls
Atlantic	**Check**	438.2 ab*	10.5 a	52.5 a	193.9 a	104.8 c	50.6 e	26.0 a
AC01144-1W	**WR**	348.8 c	0.0 b	5.4 c	47.1 d	127.7 bc	161.0 a	7.7 b
AOR09034-3	**WR**	459.6 a	1.7 b	6.3 c	106.8 bc	174.1 a	148.1 a	22.5 ab
NDA081453CAB-2C	**WR**	386.6 bc	1.6 b	28.4 b	151.6 ab	118.8 bc	75.4 d	10.9 ab
CO10073-7W	**SWR**	403.1 b	0.0 b	10.4 c	99.7 c	148.0 ab	124.6 b	20.4 ab
CO10076-4W	**SWR**	387.8 bc	0.0 b	11.1 c	132.0 bc	127.9 bc	104.3 c	12.5 ab
Mean		**404.0**	**2.3**	**19.0**	**121.8**	**133.5**	**110.7**	**16.7**

*Mean comparisons were performed using Tukey's-Kramer HSD; means with the same letter within columns are not signifigantly different

Table 12. Merit Score and Tuber Characteristics of Chipping Potato Entries

Clone / Variety	Trial	Merit[1]	Eye depth[2]	Tuber Shape[3]	Shape Uniformity[4]	Length/Width Ratio[5]
Atlantic	**Check**	3.4 ab	3.3 b	1.3 a	3.9 a	1.01 ab
AC01144-1W	**WR**	4.0 a	3.9 a	1.5 a	4.1 a	1.01 ab
AOR09034-3	**WR**	3.3 ab	4.4 a	1.0 a	4.1 a	0.96 b
NDA081453CAB-2C	**WR**	3.6 a	4.4 a	1.4 a	4.0 a	0.98 ab
CO10073-7W	**SWR**	3.5 ab	4.3 a	1.5 a	3.8 a	1.07 a
CO10076-4W	**SWR**	2.6 b	4.0 a	1.0 a	3.6 a	0.99 ab
Mean		**3.4**	**4.0**	**1.3**	**3.9**	**1.00**

[1] 1=Worst, 5=Best - Chipper Merit Score takes into account multiple factors including tuber shape, eye depth, and shape uniformity
[2] 1=Deep, 5=Shallow
[3] 1=Round, 5=Oblong
[4] 1= No Uniformity, 5=Very Uniform
[5] Ratio of 10 tubers measured from each plot

Table 13. Tuber Defects of Chipping Potato Entries.

Clone / Variety	Trial	Hard Bite[1]	Black Spot Bruise[1]	Stem End Necrosis[1]	Knobs[2]	Growth Crack[2]	Greening[2]
		%	%	%	%	%	%
Atlantic	**Check**	28 a	0 a	5 b	0.6 a	0.3 a	4.9 a
AC01144-1W	**WR**	0 b	3 a	23 a	0.4 a	0.3 a	1.8 ab
AOR09034-3	**WR**	0 b	0 a	18 ab	1.0 a	1.2 a	3.9 ab
NDA081453CAB-2C	**WR**	0 b	0 a	8 b	0.4 a	0.7 a	1.3 b
CO10073-7W	**SWR**	0 b	3 a	5 b	0.5 a	1.3 a	3.9 ab
CO10076-4W	**SWR**	0 b	8 a	15 ab	0.2 a	1.2 a	2.1 ab
Mean		**5**	**2**	**1.2**	**0.5**	**0.8**	**3.0**

[1] Ten, 6-10oz tubers were evaluated from each plot.
[2] Percent of total tubers.

Table 14. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Chipping Potato Entries.

Clone / Variety	Trial	Vert Wilt Rating[1]	Early-Dying[2] (A.U.D.P.C.)	% Stand	Tubers per Plant	Average Tuber Size	Specific Gravity
Atlantic	**Check**	7.8 a	860.5 b	93 a	7.4 c	5.9 a	1.104 a
AC01144-1W	**WR**	8.0 a	1398.1 a	98 a	8.8 b	3.7 d	1.083 c
AOR09034-3	**WR**	7.0 a	691.1 b	95 a	10.6 a	4.2 c	1.097 ab
NDA081453CAB-2C	**WR**	7.8 a	1031.0 ab	98 a	7.2 c	5.1 b	1.099 a
CO10073-7W	**SWR**	7.3 a	832.8 b	97 a	9.0 b	4.2 c	1.089 bc
CO10076-4W	**SWR**	6.8 a	706.8 b	93 a	8.5 b	4.5 c	1.085 c
Mean		**7.4**	**920**	**97.6**	**8.5**	**4.6**	**1.093**

[1] Verticillium wilt ratings based on a 0-9 scale (0=None 9=Dead). The ratings occured on August 31st, 102 days after planting.
[2] Area Under Disease Progress Curve based on foliar early-dying ratings taken 82, 88, 97, and 102 days after planting. Higher value is more susceptible to early dying.

Figure 3. 2017 Chipping Trial Entries.

Atlantic	AC01144-1W	AOR09034-3
		
• Check	• Pink discoloration on skin	• Pink discoloration on skin • Susceptible to shatter bruise
NDA081453CAB-2C	**CO10073-7W**	**CO10076-4W**
		
• Pink discoloration on skin • Susceptible to shatter bruise	• Pink eyes • Flat/pancake tuber shape	• Pink discoloration on skin