2017

Potato Variety Development

In Tulelake, CA

Three variety trials were grown at the Intermountain Research and Extension Center during 2017.

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

Trial results are summarized in this report.

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University of California
Agriculture and Natural Resources
Intermountain Research & Extension Center
RESEARCH REPORT
Number 180, 2017

2017 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 23 entries, a Specialty trial with 18 entries, and a Chipping trial with seven 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 17 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 24th 2017
Vine Kill Date:	September 12th 2017
Days to Vine Kill:	111
Harvest Date:	October 12th 2017
Irrigation:	Solid-set sprinklers; applied water + precipitation = 26.28 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), Vydate CLV (Chemigate), Coragen (Chemigate)
Fungicides:	Quadris (In Furrow), Tanos (Chemigate), Bravo (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	80.6	abcde	396.3	abcde	491.3	abcdef	92.7	bcde	101.2	abcd	139.5	bcdef	63.0	fg	47.3	efg	47.6	bc
Russet Burbank	WR	74.5	cde	348.6	abcde	467.2	abcdef	37.4	efg	69.5	cdefgh	160.5	abcde	81.1	def	64.2	def	54.4	bc
Russet Norkotah	WR	86.2	ab	364.2	abcde	421.8	cdef	116.4	bcd	85.7	bcde	118.2	ef	43.9	gh	28.6	gh	29.0	c
A03141-6	WR	88.2	a	465.3	a	527.0	abcd	212.5	a	143.6	a	82.5	f	26.9	h	14.9	h	46.7	bc
A06030-23	WR	74.0	cdef	309.4	de	417.9	def	72.5	bcdef	74.1	bcdefgh	121.3	ef	41.5	gh	29.3	gh	79.2	ab
A07061-6	WR	81.4	abcd	463.1	ab	568.8	ab	28.7	fg	118.6	ab	205.6	a	110.2	abcd	76.6	bcde	29.1	c
A08009-2TE	WR	82.7	abcd	446.8	abc	539.2	abc	73.7	bcdef	115.7	abc	190.1	abc	67.4	fg	38.1	fgh	54.2	bc
A08433-4VR	WR	73.6	cdef	425.2	abcd	576.1	a	29.2	fg	72.6	bcdefgh	197.2	ab	126.3	a	95.2	abcd	55.7	bc
AO03123-2	WR	81.2	abcd	397.3	abcde	487.1	abcdef	66.5	bcdefg	109.2	abcd	153.2	abcde	68.4	efg	36.5	fgh	53.3	bc
AO06191-1	WR	79.6	abcde	347.6	abcde	435.2	cdef	112.8	bcd	86.0	bcde	104.5	ef	44.3	gh	29.7	gh	58.0	bc
AOR06070-1KF	WR	82.3	abcd	424.4	abcd	516.4	abcde	58.2	cdefg	82.5	bcdef	192.2	abc	91.5	bcdef	67.4	cdef	24.6	c
AOR07781-5	WR	71.7	def	348.2	abcde	482.8	abcdef	116.9	bc	97.5	abcde	101.8	ef	32.1	h	27.7	gh	106.9	a
CO08065-2RU	WR	76.0	bcde	285.8	e	375.6	f	56.0	cdefg	64.7	defgh	103.0	ef	62.1	fg	49.3	efg	40.4	bc
CO08155-2RU/Y	WR	72.3	def	352.9	abcde	486.2	abcdef	8.1	g	35.9	fgh	184.8	abcd	124.0	a	90.0	abcd	43.2	bc
CO08231-1RU	WR	72.1	def	327.7	cde	453.4	bcdef	34.9	efg	63.9	defgh	131.3	cdef	97.7	abcde	100.5	ab	25.1	c
COTX09022-3RuRE/Y	WR	84.8	abc	455.3	ab	537.1	abc	65.1	bcdefg	106.7	abcd	197.8	ab	85.7	cdef	50.3	efg	31.5	c
TX08352-5Ru	WR	77.8	abcde	367.0	abcde	471.2	abcdef	45.7	efg	91.0	bcde	153.5	abcde	76.8	ef	47.8	efg	56.4	bc
AOTX05043-1RU	SWR	72.2	def	294.8	e	408.0	ef	6.1	g	32.4	gh	141.2	bcdef	115.1	abc	96.5	abc	16.7	c
CO09036-2RU	SWR	73.7	cdef	336.7	bcde	456.5	bcdef	54.1	defg	74.1	bcdefgh	126.1	def	82.5	def	84.1	bcd	35.6	bc
CO09076-3RU	SWR	69.5	ef	360.6	abcde	518.7	abcde	122.6	b	84.1	bcdef	107.5	ef	46.4	gh	44.0	fgh	114.1	a
CO09165-6W	SWR	72.3	def	289.1	e	397.8	f	31.5	efg	49.9	efgh	118.2	ef	89.5	cdef	85.8	bcd	22.9	c
CO09205-2RU	SWR	74.1	cdef	316.0	de	425.3	cdef	30.2	efg	75.0	bcdefg	132.1	cdef	78.6	ef	67.7	cdef	41.6	bc
COTX05095-2RU	SWR	62.8	f	293.9	e	466.4	abcdef	8.5	g	26.4	h	138.2	bcdef	120.8	ab	121.3	a	51.2	bc
Mean		**76.7**		**365.9**		**475.1**		**64.4**		**80.9**		**143.5**		**77.2**		**60.6**		**48.6**	

***Mean comparisons were performed using Tukey's-Kramer HSD; means with the same letter are not signifigantly 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	3.0	abc	3.3	abc	3.4	abcd	3.9	ab	1.80	abc
Russet Burbank	WR	2.5	bcde	2.9	bcde	3.5	abcd	3.8	ab	1.99	ab
Russet Norkotah	WR	2.9	abcd	4.0	a	3.3	bcd	3.1	ab	1.89	abc
A03141-6	WR	2.1	de	2.6	cde	3.5	abcd	2.9	b	1.69	bc
A06030-23	WR	3.1	abc	3.1	abc	3.6	abcd	4.1	a	1.90	abc
A07061-6	WR	2.4	cde	2.0	e	3.0	d	3.5	ab	1.55	cd
A08009-2TE	WR	2.9	abcd	3.3	abc	4.1	a	3.5	ab	1.81	abc
A08433-4VR	WR	3.1	abc	3.4	abc	3.5	abcd	3.5	ab	1.51	cd
AO03123-2	WR	3.3	ab	3.0	bcd	3.9	abc	3.8	ab	1.81	abc
AO06191-1	WR	3.5	a	3.5	abc	3.6	abcd	4.0	ab	1.70	abc
AOR06070-1KF	WR	3.0	abc	3.3	abc	3.9	abc	3.9	ab	1.71	abc
AOR07781-5	WR	2.8	abcd	3.6	ab	3.4	abcd	3.3	ab	1.76	abc
CO08065-2RU	WR	3.1	abc	4.0	a	3.6	abcd	3.4	ab	1.56	cd
CO08155-2RU/Y	WR	2.9	abcd	2.6	cde	4.1	a	4.1	a	1.84	abc
CO08231-1RU	WR	3.1	abc	3.0	bcd	4.0	ab	3.6	ab	1.71	abc
COTX09022-3RuRE/Y	WR	1.9	e	3.8	ab	3.9	abc	3.6	ab	1.17	d
TX08352-5Ru	WR	3.1	abc	3.5	abc	3.4	abcd	3.6	ab	1.69	bc
AOTX05043-1RU	SWR	2.8	abcd	3.4	abc	3.4	abcd	3.5	ab	1.52	cd
CO09036-2RU	SWR	3.0	abc	3.1	abc	4.0	ab	3.9	ab	1.84	abc
CO09076-3RU	SWR	1.9	e	3.0	bcd	4.0	ab	3.0	ab	1.98	ab
CO09165-6W	SWR	2.4	cde	2.1	de	3.5	abcd	3.8	ab	2.10	a
CO09205-2RU	SWR	3.3	ab	3.1	abc	3.6	abcd	4.0	ab	2.03	ab
COTX05095-2RU	SWR	2.6	bcde	2.6	cde	3.1	cd	3.0	ab	1.52	cd
Mean		**2.8**		**3.1**		**3.6**		**3.6**		**1.74**	

[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]=Light,5=Heavy

[3] 1=Deep, 5=Shallow

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

[5] Ratio of 10 tubers measured from each plot, 8-16 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]		Rot[2]		Irregular Shaped[2]		Greening[2]	
		%		%		%		%		%		%		%		%	
Ranger Russet	WR	0.0	b	2.5	a	5.0	a	4.9	bcd	1.6	cd	0.3	a	0.7	a	1.2	ab
Russet Burbank	WR	0.0	b	10.0	a	2.5	a	4.4	bcd	1.5	cd	0.1	a	1.2	a	0.3	b
Russet Norkotah	WR	0.0	b	2.5	a	2.5	a	4.6	bcd	1.0	cd	0.1	a	0.8	a	0.2	b
A03141-6	WR	2.5	b	10.0	a	0.0	a	5.0	bcd	0.7	cd	0.1	a	1.5	a	2.2	ab
A06030-23	WR	0.0	b	7.5	a	0.0	a	4.5	bcd	8.3	a	1.0	a	0.0	a	1.3	ab
A07061-6	WR	0.0	b	7.5	a	5.0	a	2.8	cd	0.3	cd	0.1	a	0.4	a	0.7	ab
A08009-2TE	WR	0.0	b	12.5	a	10.0	a	6.7	bcd	1.1	cd	0.4	a	1.2	a	0.0	b
A08433-4VR	WR	0.0	b	0.0	a	2.5	a	2.1	d	2.1	cd	0.1	a	0.5	a	0.6	b
AO03123-2	WR	0.0	b	0.0	a	0.0	a	8.8	ab	0.9	cd	0.8	a	0.2	a	1.1	ab
AO06191-1	WR	0.0	b	0.0	a	5.0	a	5.7	bcd	1.4	cd	1.2	a	0.0	a	3.0	a
AOR06070-1KF	WR	2.5	b	2.5	a	0.0	a	2.3	d	0.0	d	0.7	a	0.5	a	0.8	ab
AOR07781-5	WR	0.0	b	10.0	a	2.5	a	12.6	a	6.0	ab	0.4	a	0.8	a	0.8	ab
CO08065-2RU	WR	10.0	a	0.0	a	2.5	a	3.3	cd	3.5	bc	2.0	a	0.5	a	0.8	ab
CO08155-2RU/Y	WR	0.0	b	0.0	a	2.5	a	4.2	bcd	0.7	cd	0.6	a	0.4	a	1.7	ab
CO08231-1RU	WR	0.0	b	0.0	a	7.5	a	4.0	bcd	0.3	cd	0.0	a	0.1	a	0.6	ab
COTX09022-3RuRE/Y	WR	0.0	b	0.0	a	2.5	a	1.7	d	2.6	bcd	0.5	a	0.4	a	1.1	ab
TX08352-5Ru	WR	0.0	b	0.0	a	0.0	a	6.6	bcd	0.6	cd	1.1	a	0.0	a	1.1	ab
AOTX05043-1RU	SWR	0.0	b	0.0	a	15.0	a	3.4	cd	0.0	d	0.2	a	0.4	a	0.1	b
CO09036-2RU	SWR	0.0	b	10.0	a	7.5	a	3.8	bcd	0.3	cd	0.7	a	1.3	a	1.4	ab
CO09076-3RU	SWR	0.0	b	5.0	a	0.0	a	7.9	abc	7.3	a	0.1	a	0.2	a	1.9	ab
CO09165-6W	SWR	0.0	b	5.0	a	7.5	a	3.1	cd	0.2	cd	0.5	a	1.1	a	0.8	ab
CO09205-2RU	SWR	0.0	b	2.5	a	0.0	a	2.4	d	1.6	cd	1.4	a	0.4	a	1.4	ab
COTX05095-2RU	SWR	2.5	b	0.0	a	2.5	a	4.5	bcd	2.1	cd	0.2	a	0.3	a	1.3	ab
Mean		**0.8**		**3.8**		**3.6**		**4.8**		**1.9**		**0.5**		**0.6**		**1.1**	

[1] 10, 8-16oz. tubers were evaluated from each plot.
[2] Percent of total tubers.

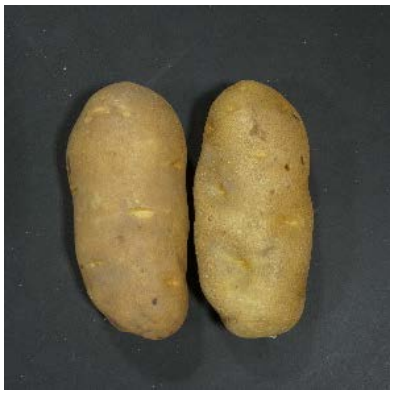
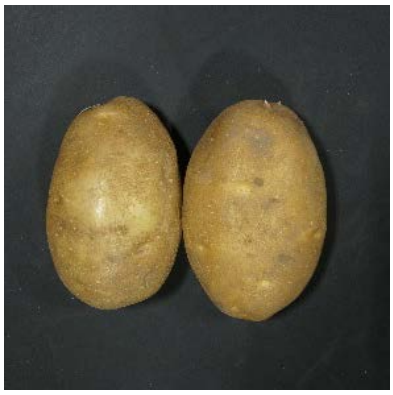
Table 4. Disease Susceptibility, Stand, Tuber Set, Average Tuber Size and Specific Gravity of Russet Potato Entries.

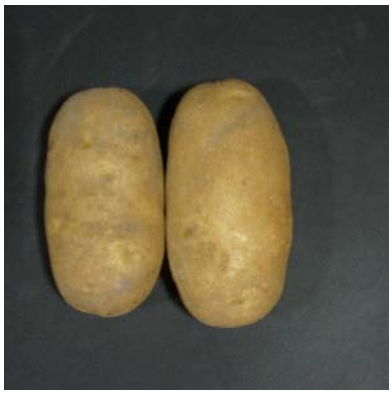
	Trial	Vert Wilt Rating[1]		Early Dying[2] (A.U.D.P.C.)		% Stand		Tubers per Plant		Average Tuber Size		Specific Gravity	
Ranger Russet	WR	4.5	cdefg	193.4	e	100.0	a	6.2	efghi	7.3	bcdefgh	1.092	abcd
Russet Burbank	WR	4.5	cdefg	124.0	e	100.0	a	6.9	bcdefghi	6.3	ghijk	1.086	cdefg
Russet Norkotah	WR	9.0	a	1134.0	a	98.9	a	4.7	i	8.3	bc	1.073	gh
A03141-6	WR	3.5	efg	40.2	e	97.2	a	4.7	i	10.6	a	1.095	abcd
A06030-23	WR	5.5	bcdef	240.3	de	99.4	a	4.9	hi	7.9	bcdef	1.085	defg
A07061-6	WR	3.8	efg	92.3	e	97.2	a	8.9	bcd	6.1	ghijk	1.082	defgh
A08009-2TE	WR	4.5	cdefg	120.2	e	97.7	a	6.9	bcdefghi	7.4	bcdefg	1.092	abcd
A08433-4VR	WR	3.8	efg	109.9	e	96.6	a	11.6	a	5.0	ijk	1.095	abcd
AO03123-2	WR	4.3	cdefg	114.7	e	97.7	a	6.4	defghi	7.2	bcdefgh	1.091	bcde
AO06191-1	WR	4.8	cdefg	118.8	e	96.0	a	5.1	ghi	8.2	bcd	1.094	abcd
AOR06070-1KF	WR	5.3	bcdefg	214.9	de	98.9	a	7.7	bcdef	6.3	fghijk	1.103	ab
AOR07781-5	WR	4.5	cdefg	117.3	e	97.2	a	5.3	fghi	8.7	b	1.106	a
CO08065-2RU	WR	4.3	cdefg	90.4	e	94.3	a	5.8	efghi	6.4	efghij	1.100	abc
CO08155-2RU/Y	WR	6.5	abcd	486.3	bcd	95.5	a	9.0	bc	5.2	ijk	1.089	bcde
CO08231-1RU	WR	4.0	defg	139.9	e	97.7	a	8.2	bcde	5.2	ijk	1.089	cdef
COTX09022-3RuRE/Y	WR	3.0	fg	25.6	e	98.9	a	7.2	bcdefghi	6.9	cdefgh	1.091	bcd
TX08352-5Ru	WR	7.8	ab	683.9	b	98.9	a	6.6	cdefghi	6.7	defghi	1.071	h
AOTX05043-1RU	SWR	5.0	cdefg	139.5	e	94.3	a	8.2	bcde	4.9	jk	1.094	abcd
CO09036-2RU	SWR	2.8	g	22.8	e	98.9	a	7.4	bcdefg	5.7	hijk	1.084	defgh
CO09076-3RU	SWR	6.0	bcde	229.9	de	97.2	a	6.2	efghi	8.0	bcde	1.088	cdef
CO09165-6W	SWR	7.8	ab	545.6	bc	98.9	a	7.3	bcdefgh	5.1	ijk	1.077	efgh
CO09205-2RU	SWR	4.5	cdefg	111.7	e	97.2	a	6.9	bcdefghi	5.8	ghijk	1.075	fgh
COTX05095-2RU	SWR	6.8	abc	303.1	cde	98.9	a	9.3	ab	4.7	k	1.083	defgh
Mean		**5.0**		**234.7**		**97.7**		**7.0**		**6.7**		**1.1**	

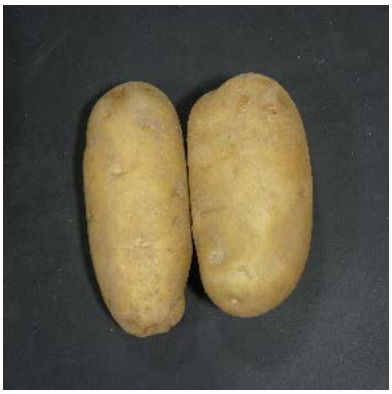
[1]Verticillium wilt Ratings based on a 0-9 scale (0=None 9=Dead).

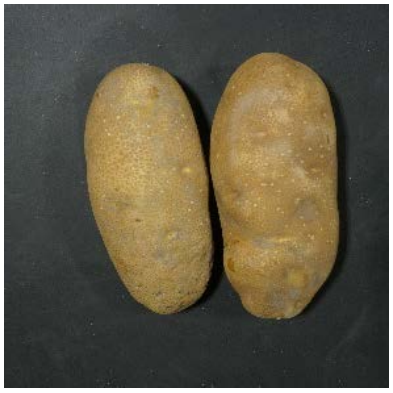
[2] Area Under Disease Progress Curve based on foliar early-dying ratings taken 82, 88, 97, and 102 days after planting. Higher value is more susceptible

Figure 1. 2017 Late Russet Trial Entries.

Ranger Russet (WR)	Russet Burbank (WR)	Russet Norkotah (WR)
		
• Check	• Check	• Check
A03141-6 (WR)	**A06030-23 (WR)**	**A07061-6 (WR)**
		
• High U.S. #1's cwt/A • Large avg. tuber size	• Good shape uniformity	• High U.S. #1's cwt/A • Low russeting
A08009-2TE	**A08433-4VR**	**AO03123-2**
		
• Shallow eyes	• High tubers per plant • Small average tuber size	• High merit score

AO06191-1	AOR06070-1KF	AOR07781-5
		
• High merit score • Low tuber set		• A lot of knobs and growth crack
CO08065-2RU	**CO08155-2RU/Y**	**CO08231-1RU**
		
• Low yield • 10% hollow heart	• Good shape uniformity • Shallow eyes	
COTX09022-3RuRE/Y	**TX08352-5Ru**	**AOTX05043-1RU**
		
• Pink Eyes • Low merit score • Round shape		• Signifigant black spot bruise

CO09036-2RU	CO09076-3RU	CO09165-6W
		
• Resistant to early dying	• Poor shape uniformity	• Long tubers • Low yield

CO09205-2RU	COTX05095-2RU
	
• Good shape uniformity • High merit score	• Deep eyes • Poor shape uniformity

Red/Specialty Variety Trial

The Red/Specialty Trial included 11 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 24th 2017
Vine Kill Date:	September 12th 2017
Days to Vine Kill:	111
Harvest Date:	October 9th 2017
Irrigation:	Solid-set sprinklers; applied water + precipitation = 26.28 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), Vydate CLV (Chemigate), Coragen (Chemigate)
Fungicides:	Quadris (In Furrow), Tanos (Chemigate), Bravo (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	2.6	c	White/Yellow	1.0	e
Red LaSoda	**WR**	Red	2.6	c	White/Yellow	1.3	de
COTX00104-6R	**WR**	Red	3.4	abc	White/Yellow	1.0	e
PORTX03PG25-2R/R	**WR**	Purple	2.8	c	Red	4.8	ab
AC03534-2R/Y	**WR**	Red	2.9	c	White/Yellow	2.6	cde
CO05035-1PW/Y	**WR**	Purple/Yellow	2.8	c	White/Yellow	3.0	c
COA07365-4RY	**WR**	Red	3.4	abc	White/Yellow	2.8	cd
NDTX059759-3RY/Y Pinto	**WR**	Red/Yellow	3.0	c	White/Yellow	3.3	bc
Yukon Gold	**WR**	Yellow	3.0	c	White/Yellow	2.9	cd
A06336-2Y	**WR**	Yellow	3.0	c	White/Yellow	2.8	cd
A06336-5Y	**WR**	Yellow	3.0	c	White/Yellow	3.8	abc
CO09079-5PW/Y	**SWR**	Purple/Yellow	2.8	c	White/Yellow	3.9	abc
CO09127-3W/Y	**SWR**	Yellow	3.3	bc	White/Yellow	3.0	c
CO09128-3W/Y	**SWR**	Yellow	3.3	bc	White/Yellow	3.8	abc
CO09128-5W/Y	**SWR**	Yellow	3.3	bc	White/Yellow	4.1	abc
CO09218-4W/Y	**SWR**	Yellow	3.1	bc	White/Yellow	4.3	abc
Purple Majesty	**SWR**	Purple	4.5	a	Purple	5.0	a
CO08037-2P/P	**SWR**	Purple	4.3	ab	Purple	5.0	a
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**	**Total Yield**		**10-14 oz**		**6-10 oz**		**4-6 oz**		**< 4oz**		**> 14 oz**		**Culls**	
Chieftan	**WR**	606.8	abc	115.5	b	203.5	a	105.2	cdef	81.5	hi	45.4	b	55.7	bcd
Red LaSoda	**WR**	657.1	a	108.3	bc	132.6	bc	56.5	gh	31.8	i	116.4	a	211.5	a
COTX00104-6R	**WR**	408.3	def	109.6	bc	119.1	cd	47.5	h	33.1	i	51.7	b	47.3	bcdef
PORTX03PG25-2R/R	**WR**	411.8	def	0.0	e	16.5	f	75.4	efgh	260.8	bcd	0.0	c	59.2	bc
AC03534-2R/Y	**WR**	614.8	abc	27.9	de	156.3	abc	163.5	a	233.3	bcde	5.0	c	28.8	cdefg
CO05035-1PW/Y	**WR**	629.0	ab	152.8	a	186.4	ab	71.7	fgh	53.6	i	125.9	a	38.6	cdefg
COA07365-4RY	**WR**	483.4	bcde	6.5	e	106.6	cd	152.7	ab	198.0	def	0.0	c	19.6	efg
NDTX059759-3RY/Y Pinto	**WR**	381.8	ef	41.1	d	93.5	cde	75.8	efgh	95.6	ghi	23.0	bc	52.9	bcde
Yukon Gold	**WR**	415.7	def	81.5	c	136.6	bc	63.0	fgh	54.3	i	41.1	b	39.2	cdefg
A06336-2Y	**WR**	488.4	bcde	16.8	de	61.3	def	128.8	abcd	204.5	cdef	0.0	c	77.0	b
A06336-5Y	**WR**	560.5	abcd	0.5	e	23.6	f	136.5	abcd	372.4	a	0.0	c	27.5	cdefg
CO09079-5PW/Y	**SWR**	412.2	def	6.0	e	30.4	ef	48.3	h	299.9	ab	4.9	c	22.7	defg
CO09127-3W/Y	**SWR**	462.1	cdef	17.5	de	105.8	cd	147.4	abc	166.6	efg	2.6	c	22.2	defg
CO09128-3W/Y	**SWR**	308.1	f	0.0	e	7.2	f	44.6	h	241.4	bcd	0.0	c	14.9	fg
CO09128-5W/Y	**SWR**	413.0	def	0.0	e	25.2	f	99.3	defg	277.0	bc	0.0	c	11.4	g
CO09218-4W/Y	**SWR**	397.2	def	4.0	e	64.2	def	120.6	abcd	192.1	def	0.0	c	16.5	fg
Purple Majesty	**SWR**	499.2	abcde	5.6	e	65.0	def	118.1	bcde	277.2	bc	0.0	c	33.2	cdefg
CO08037-2P/P	**SWR**	344.6	ef	8.8	de	64.4	def	100.2	defg	152.4	fgh	0.0	c	18.9	efg
Mean		**471.9**		**39.0**		**88.8**		**97.5**		**179.2**		**23.1**		**44.3**	

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

Table 7. External Tuber Characteristics of Specialty Potato Entries.

Clone / Variety	Trial	Merit[1]		Eye Depth[2]		Tuber Shape[3]		Shape Uniformity[4]		Length/Width Ratio[5]	
Chieftan	**WR**	2.9	abc	3.5	ab	2.9	b	3.1	ab	1.21	efghi
Red LaSoda	**WR**	2.5	bc	3.0	b	2.5	b	2.9	ab	1.10	hijk
COTX00104-6R	**WR**	3.0	ab	3.8	ab	2.6	b	3.3	ab	1.19	fghij
PORTX03PG25-2R/R	**WR**	1.8	d	3.6	ab	4.8	a	3.6	ab	2.01	a
AC03534-2R/Y	**WR**	2.8	abc	3.9	ab	2.4	b	3.5	ab	1.08	ijk
CO05035-1PW/Y	**WR**	2.6	abc	3.6	ab	2.8	b	2.8	ab	1.23	defgh
COA07365-4RY	**WR**	2.5	bc	3.4	ab	2.3	b	3.3	ab	1.04	k
NDTX059759-3RY/Y Pinto	**WR**	2.4	bcd	4.0	a	3.0	b	2.8	ab	1.25	defg
Yukon Gold	**WR**	2.6	abc	3.9	ab	2.8	b	2.5	b	1.19	fghij
A06336-2Y	**WR**	2.8	abc	3.8	ab	2.8	b	2.8	ab	1.36	cd
A06336-5Y	**WR**	3.3	a	3.8	ab	2.5	b	3.4	ab	1.18	fghij
CO09079-5PW/Y	**SWR**	2.3	cd	3.3	ab	3.0	b	2.6	b	1.30	cdef
CO09127-3W/Y	**SWR**	2.9	abc	3.6	ab	2.1	b	3.4	ab	1.06	jk
CO09128-3W/Y	**SWR**	2.5	bc	3.9	ab	2.8	b	3.3	ab	1.34	cde
CO09128-5W/Y	**SWR**	3.0	ab	3.4	ab	2.0	b	3.6	ab	1.09	ijk
CO09218-4W/Y	**SWR**	2.9	abc	4.0	a	2.5	b	3.1	ab	1.16	ghijk
Purple Majesty	**SWR**	2.3	cd	3.9	ab	4.5	a	3.9	a	1.68	b
CO08037-2P/P	**SWR**	2.4	bcd	3.6	ab	3.1	b	3.5	ab	1.39	c
Mean		**2.6**		**3.7**		**2.8**		**3.2**		**1.27**	

[1] 1=Worst, 5=Best - Specialty Merit Score takes into account important 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= No Uniformity, 5=Very Uniform
[5] Ratio of 10 tubers measured from each plot

Table 8. Tuber Defects of Specialty Potato Entries.

Clone / Variety	Trial	Hollow Heart[1]	Black Spot Bruise[1]	Vascular Dicoloration[1]	Knobs[2]	Growth Crack[2]	Irregular Shape[2]	Greening[2]
		%	%	%	%	%	%	%
Chieftan	**WR**	2.5 a	2.5 a	7.5 cd	1.8 de	2.4 bc	0.0 a	0.8 d
Red LaSoda	**WR**	2.5 a	0.0 a	5.0 cd	5.5 bc	9.0 a	0.0 a	3.5 abc
COTX00104-6R	**WR**	0.0 a	5.0 a	5.0 cd	5.1 bcd	1.9 bc	0.7 a	1.7 bcd
PORTX03PG25-2R/R	**WR**	0.0 a	0.0 a	80.0 a	6.0 b	3.2 b	0.2 a	1.2 bcd
AC03534-2R/Y	**WR**	0.0 a	0.0 a	35.0 bc	1.2 e	1.2 bc	0.0 a	0.1 d
CO05035-1PW/Y	**WR**	0.0 a	0.0 a	15.0 bcd	2.2 cde	0.1 c	0.6 a	4.0 ab
COA07365-4RY	**WR**	0.0 a	0.0 a	0.0 d	1.6 de	0.3 c	0.0 a	1.1 cd
NDTX059759-3RY/Y Pinto	**WR**	0.0 a	2.5 a	22.5 bcd	2.4 cde	1.0 bc	0.0 a	5.4 a
Yukon Gold	**WR**	7.5 a	2.5 a	7.5 cd	3.9 bcde	0.6 bc	0.1 a	0.7 d
A06336-2Y	**WR**	0.0 a	0.0 a	5.0 cd	11.7 a	0.0 c	0.0 a	1.3 bcd
A06336-5Y	**WR**	0.0 a	0.0 a	5.0 cd	3.2 bcde	0.3 c	0.0 a	0.1 d
CO09079-5PW/Y	**SWR**	0.0 a	0.0 a	35.0 bc	2.2 cde	0.0 c	0.0 a	1.5 bcd
CO09127-3W/Y	**SWR**	2.5 a	0.0 a	7.5 cd	1.3 e	0.8 bc	0.0 a	1.2 cd
CO09128-3W/Y	**SWR**	0.0 a	0.0 a	7.5 cd	2.4 cde	0.5 c	0.0 a	0.3 d
CO09128-5W/Y	**SWR**	10.0 a	2.5 a	12.5 bcd	1.4 e	0.0 c	0.0 a	0.9 cd
CO09218-4W/Y	**SWR**	7.5 a	5.0 a	0.0 d	2.2 cde	0.6 bc	0.0 a	0.7 d
Purple Majesty	**SWR**	0.0 a	0.0 a	5.0 cd	1.2 e	1.2 bc	0.2 a	0.6 d
CO08037-2P/P	**SWR**	0.0 a	7.5 a	42.5 b	0.7 e	1.9 bc	0.0 a	0.1 d
Mean		**1.8**	**1.5**	**17.1**	**3.2**	**1.3**	**0.1**	**1.4**

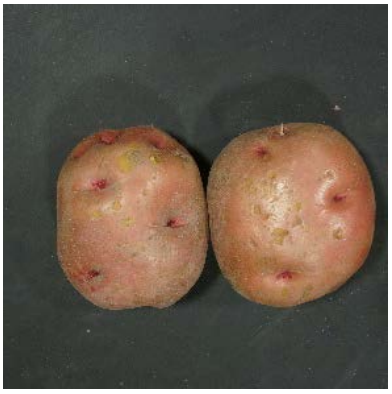
[1] 10, 6-10oz. tubers were evaluated from each plot.
[2] Percent of total tubers.

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

Clone / Variety	Trial	Early-Dying[1] (A.U.D.P.C.)		% Stand		Tubers/Plant		Average Size (oz)		Specific Gravity	
Chieftan	**WR**	710.1	ab	98.3	abc	8.9	defg	6.4	b	1.079	bcdefgh
Red LaSoda	**WR**	193.0	d	97.7	abc	7.9	efg	8.2	a	1.082	abcdef
COTX00104-6R	**WR**	293.8	bcd	93.2	abcd	5.6	g	7.2	ab	1.081	bcdefgh
PORTX03PG25-2R/R	**WR**	398.9	abcd	100.0	a	13.4	bcde	2.9	de	1.075	cdefgh
AC03534-2R/Y	**WR**	300.8	bcd	93.8	abcd	16.5	ab	3.6	de	1.073	fgh
CO05035-1PW/Y	**WR**	167.3	d	94.9	abc	8.1	efg	7.5	ab	1.086	ab
COA07365-4RY	**WR**	226.9	cd	95.5	abc	13.1	bcde	3.6	de	1.083	abcde
NDTX059759-3RY/Y Pinto	**WR**	180.4	d	97.7	abc	7.9	efg	4.5	cd	1.083	abcd
Yukon Gold	**WR**	712.5	ab	92.6	abcd	6.9	fg	6.0	bc	1.092	a
A06336-2Y	**WR**	518.8	abcd	98.9	ab	13.2	bcde	3.4	de	1.074	defgh
A06336-5Y	**WR**	655.6	abc	96.6	abc	19.0	a	2.8	e	1.072	h
CO09079-5PW/Y	**SWR**	417.0	abcd	97.7	abc	17.2	ab	2.3	e	1.082	bcdefg
CO09127-3W/Y	**SWR**	534.4	abcd	94.3	abcd	12.2	bcdef	3.7	de	1.082	abcdef
CO09128-3W/Y	**SWR**	545.8	abcd	86.4	d	15.6	abc	2.1	e	1.073	efgh
CO09128-5W/Y	**SWR**	760.6	a	97.7	abc	14.1	abcd	2.9	de	1.084	abc
CO09218-4W/Y	**SWR**	121.6	d	90.3	cd	12.7	bcde	3.2	de	1.072	gh
Purple Majesty	**SWR**	443.4	abcd	99.4	a	15.9	abc	2.9	de	1.081	bcdefg
CO08037-2P/P	**SWR**	313.0	abcd	90.9	bcd	10.6	cdefg	3.4	de	1.085	ab
Mean		**399.0**		**95.2**		**12.4**		**4.1**		**1.080**	

[1] 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.

Figure 2. 2017 Red/Specialty Entries.

Cheiftan (WR)	Red LaSoda (WR)	COTX00104-6R (WR)
		
• Check	• Check • A lot of oversized & culls	
PORTX03PG25-2R/R (WR)	**AC03534-2R/Y (WR)**	**CO05035-1PW/Y (WR)**
		
• Low merit score • High incidence of vascular discoloration	• High incidence of shatter bruise	• High yield • Skinned easily
COA07365-4RY (WR)	**NDTX059759-3RY/Y Pinto (WR)**	**Yukon Gold (WR)**
		
• Round shape	• Pointy/Flat Shape • Shallow eyes	• Check

A06336-2Y (WR)	A06336-5Y (WR)	CO09079-5PW/Y (SWR)
		
• Pear shape • High incidence of knobs	• High merit score	• Lumpy shape • Inconsistent color splash • Heavy russeting
CO09127-3W/Y (SWR)	**CO09128-3W/Y (SWR)**	**CO09128-5W/Y (SWR)**
Not Pictured		
• High incidence of shatter bruise	• Low yield	• 10% hollow heart
CO09218-4W/Y (SWR)	**Purple Majesty (SWR)**	**CO08037-2P/P (SWR)**
		
• Shallow eyes		• Brown internal vascular discoloration

Chipping Potato Variety Trial

In recent years, expanding markets have created a need for public chip varieties. The 2017 Chipping Trial included 7 entries from the Western Regional Variety Trial (WR. 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 24th 2017
Vine Kill Date:	September 12th 2017
Days to Vine Kill:	111
Harvest Date:	October 6th 2017
Irrigation:	Solid-set sprinklers; applied water + precipitation = 26.28 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), Vydate CLV (Chemigate), Coragen (Chemigate)
Fungicides:	Quadris (In Furrow), Tanos (Chemigate), Bravo (Chemigate)
Vine Kill Method:	Rolling and Reglone at labeled rates

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

			Tuber Yield (cwt/A)					
Clone / Variety	Trial	Total	>14 oz	10-14 oz	6-10oz	4-6 oz	<4 oz	Culls
Atlantic	Check	483.7 ab	20.3 a	92.5 a	156.2 ab	93.8 c	64.6 c	56.3 ab
Snowden	Check	447.5 b	17.1 a	46.4 bc	168.2 ab	114.8 bc	56.9 c	44.1 abc
AC01144-1W	WR	469.4 ab	2.8 bc	22.2 bc	137.8 b	132.0 abc	137.2 a	37.5 bc
AOR09034-3	WR	527.1 a	0.0 c	13.0 c	126.3 b	167.7 a	155.3 a	64.8 a
NDA081453CAB-2C	WR	420.8 b	15.0 ab	53.8 ab	171.2 ab	103.7 bc	56.4 c	20.6 c
NDTX081648CB-13W	WR	449.9 b	17.6 a	62.5 ab	164.7 ab	100.9 bc	76.0 bc	28.1 c
OR09256-2	WR	487.8 ab	1.8 bc	38.7 bc	190.0 a	136.3 ab	100.0 b	20.9 c
Mean		**469.4**	**10.7**	**47.0**	**159.2**	**121.3**	**92.4**	**38.9**

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**	2.6 b	3.5 a	2.1 a	2.8 a	1.08 a
Snowden	**Check**	3.0 ab	3.4 a	2.0 a	2.9 a	1.00 ab
AC01144-1W	**WR**	3.1 ab	3.5 a	2.0 a	3.1 a	1.04 ab
AOR09034-3	**WR**	2.9 ab	3.9 a	2.0 a	3.1 a	0.96 b
NDA081453CAB-2C	**WR**	3.0 ab	3.9 a	2.4 a	3.0 a	1.07 a
NDTX081648CB-13W	**WR**	3.0 ab	3.8 a	2.1 a	2.8 a	1.06 a
OR09256-2	**WR**	3.3 a	3.9 a	2.3 a	3.0 a	1.09 a
Mean		**3.0**	**3.7**	**2.1**	**2.9**	**1.04**

[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	Hollow Heart[1]		Black Spot Bruise[1]		Stem End Necrosis[1]		Knobs[2]		Growth Crack[2]		Greening[2]	
		%		%		%		%		%		%	
Atlantic	**Check**	2.5	a	2.5	ab	0.0	a	2.8	ab	0.4	b	8.5	a
Snowden	**Check**	0.0	a	0.0	b	0.0	a	3.8	a	0.0	b	8.0	a
AC01144-1W	**WR**	0.0	a	0.0	b	0.0	a	2.0	ab	0.1	b	4.7	ab
AOR09034-3	**WR**	0.0	a	15.0	a	2.5	a	1.1	b	4.8	a	4.7	ab
NDA081453CAB-2C	**WR**	0.0	a	5.0	ab	0.0	a	1.8	b	0.3	b	3.3	b
NDTX081648CB-13W	**WR**	0.0	a	2.5	ab	2.5	a	1.5	b	0.0	b	5.7	ab
OR09256-2	**WR**	5.0	a	10.0	ab	0.0	a	1.0	b	1.0	b	1.7	b
Mean		**1.1**		**5.0**		**0.7**		**2.0**		**0.9**		**5.2**	

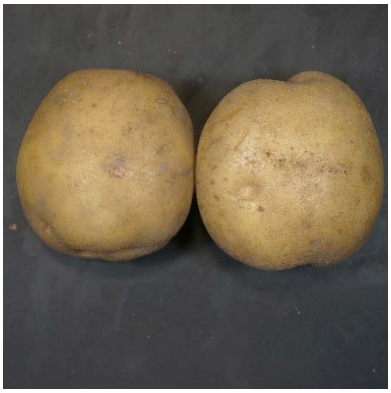
[1] 10, 6-10oz tubers were evaluated from each plot.
[2] Percent of total tubers.

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

Clone / Variety	Trial	Early-Dying[1] (A.U.D.P.C.)	% Stand	Tubers per Plant	Average Tuber Size	Specific Gravity
Atlantic	**Check**	354.5 a	97.2 a	7.6 cd	6.0 a	1.097 a
Snowden	**Check**	213.8 ab	97.7 a	7.5 cd	5.6 ab	1.097 a
AC01144-1W	**WR**	317.1 ab	97.7 a	9.6 b	4.6 cd	1.079 c
AOR09034-3	**WR**	216.0 ab	97.7 a	11.3 a	4.4 d	1.092 ab
NDA081453CAB-2C	**WR**	163.3 ab	95.5 a	7.1 d	5.8 ab	1.094 ab
NDTX081648CB-13W	**WR**	65.6 b	97.7 a	7.7 cd	5.5 ab	1.090 b
OR09256-2	**WR**	172.3 ab	99.4 a	8.7 bc	5.2 bc	1.098 a
Mean		**214.6**	**97.6**	**8.5**	**5.3**	**1.093**

[1] 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.

Figure 3. 2017 Chipping Trial Entries.

Atlantic (WR)	Snowden (WR)	AC01144-1W (WR)
		
• Check	• Check	• High merit score

AOR09034-3 (WR)	NDA081453CAB-2C (WR)	NDTX081648CB-13W (WR)
		
• High yield • Wide tuber shape		• Resistant to early dying

OR09256-2 (WR)

• Heavy russeting