2018

Klamath Basin Potato Variety Development Summary

Oregon State University
Klamath Basin Research and Extension Center

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Introduction

Since its inception in 1985, the Tri-State variety development program has primarily focused on the development of processing and dual-purpose (process and fresh) russets. Recent breeding efforts have focused more on improving genetic resistance to various pests and diseases as a means of lowering production costs. During the past decade, Oregon has been the lead state in the release of eleven russet varieties. Although the development of russet varieties remains the primary focus, recent efforts have included red-skinned and specialty-type selections. Many of these selections offer unique skin and/or flesh color combinations along with enhanced nutritional qualities including elevated antioxidant and Vitamin C content. In total, more than 25 new varieties have been released by the Tri-State variety development program since 1985. More recently Klamath Basin growers have identified the need for chipping potatoes suitable for export markets. Trials were initiated in 2008 and 2009, with funding from the Oregon Potato Commission, to identify acceptable chipping varieties using advanced selections and recently released varieties from the Tri-State, Southwest, North-central, and Eastern breeding programs.

Screening for resistance to various species of nematodes and related diseases is being accomplished at several locations. The Klamath Basin Research and Extension Center (KBREC) routinely screens selections for resistance to root-knot nematode (*Meloidogyne chitwoodi* and *Meloidogyne hapla*) and corky ringspot disease (CRS) resulting from infection of Tobacco rattle virus which is vectored by stubby-root (*Paratrichodorus* spp.) nematodes. Other cooperating sites within the Tri-State area also work on resistant screening and other production limitations most suited to their respective location. The overall objective is that future releases will offer genetic resistance to many economically important pests and diseases which will help reduce production inputs as these costs continue to rise.

The Klamath Basin Research and Extension Center (KBREC) also serves as an initial field screening location for first-generation selections of russet, specialty, and chipping clones (single-hills). Second-year evaluations of four-hill red/specialty and chip selections also take place in Klamath; however, russet selections are currently sent to the Central Oregon Agricultural Research Center (COARC). Breeding progeny are supplied by programs at the USDA Agricultural Research Service (ARS) facility in Prosser, Washington, and Aberdeen, Idaho, as well as, Oregon State University (OSU), Colorado State University, and North Dakota State University.

The purpose of this summary booklet is to report the results of our variety trial efforts. In 2009, KBREC participated in the following research trials: Russet Preliminary Yield 2 (PYT-2), Statewide Russet, Tri-state Russet, Western Regional Russet, Red/Specialty PYT- 1, Statewide Specialty, Tri-state Specialty, Western Regional Red/Specialty, and a modified Western Regional Chip Trial. A brief summary of weather during the growing season, insect trapping results, and single-hill selections.

Acknowledgements

The ultimate goal of variety development at OSU-KBREC and cooperating Tri-state partners is the development and commercialization of new potato varieties to benefit the Northwest potato industry. The effect of the Tri-state Potato Variety Development Program on the Northwest potato industry has been substantial. The fresh market industry, French fry processors and chippers have incorporated many varieties developed through this program into their businesses. Ranger Russet, Western Russet, Umatilla Russet, and Alturas are examples of russet cultivars released from the Tri-State program that have greatly benefited the Northwest potato industry, being the 3rd, 5th, 7th, and 8th most widely grown cultivars in Oregon and accounted for 27% of total acreage. As expected, recently released russet varieties have found greater adoption by Northwest processors compared to fresh market usage in the Klamath Basin. However, several varieties have found fresh market niches in the Klamath Basin including GemStar Russet, Premier Russet, and most recently Classic Russet.

Varieties recently released by the Tri-State program are now produced on over 140,000 acres in the Pacific Northwest with value to growers estimated at approximately $390 million. A recent economic analysis of the Tri-state breeding effort revealed that every dollar invested in the program results in a $39 return (Araji and Love, 2002). The current focus of Tri-state variety development efforts is to develop improved varieties that increase quality and production efficiency while decreasing fertilizer and pesticide inputs.

The success of OSU-KBREC potato variety development is made possible with funding from USDA CREES, USDA ARS, and the generous support of the Oregon Potato Commission. In addition, the Klamath Potato Growers Association annually contributes to OSU-KBREC research and Extension activities.

References

Araji, A.A. and S. Love. 2002. The economic impact of investment in the Pacific Northwest potato variety development program. **Amer. J. Potato Res.** 79:411-420.

Special Acknowledgment

OSU-KBREC plagiarized the design and layout for this publication from the WSU Potato Cultivar Yield and Postharvest Quality Evaluation publication. This is an excellent publication which provides a vast amount of data in a 'grower friendly' venue. The publication below, by the Washington State University Potato Research Group, can be found at the listed website.

Mark Pavek, Rick Knowles, Zach Holden, Nora Fuller. 2009. Washington State University Potato Research Group, Pullman, WA. **2009 Potato Cultivar Yield and Postharvest Quality Evaluations.** http://www.potatoes.wsu.edu

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Commissions and Associations

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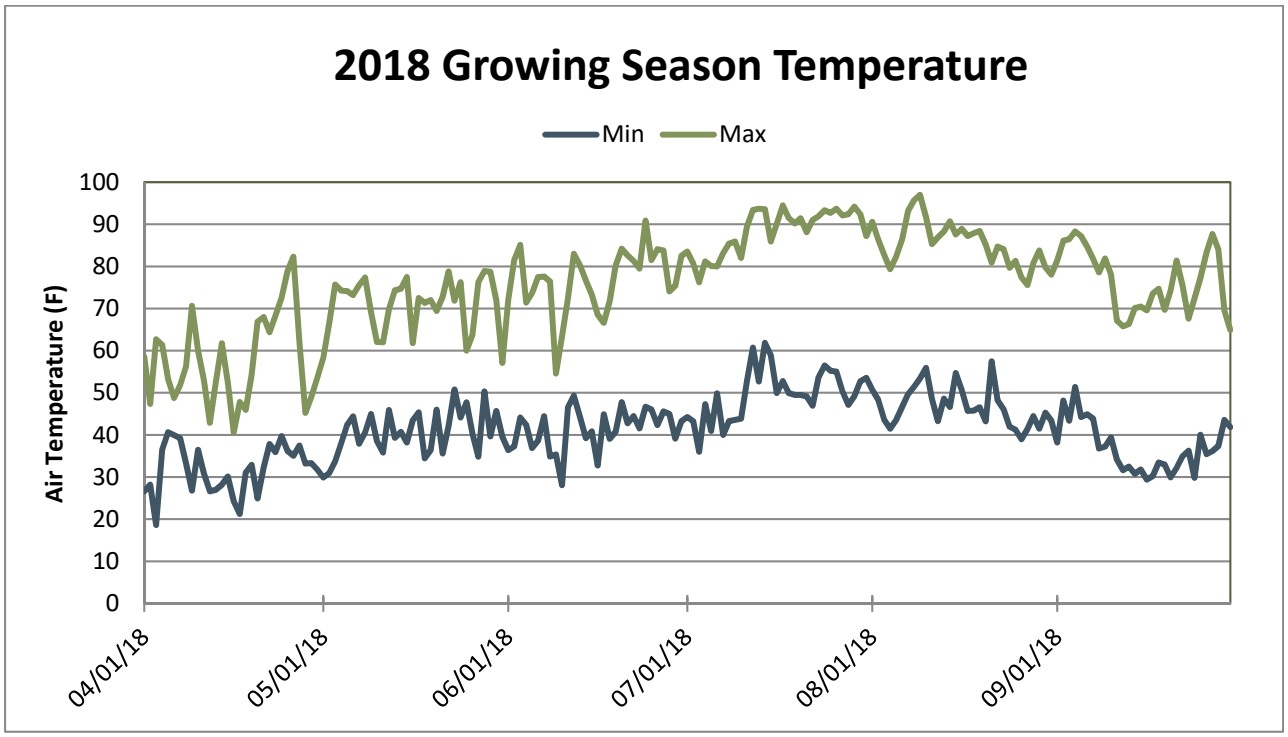
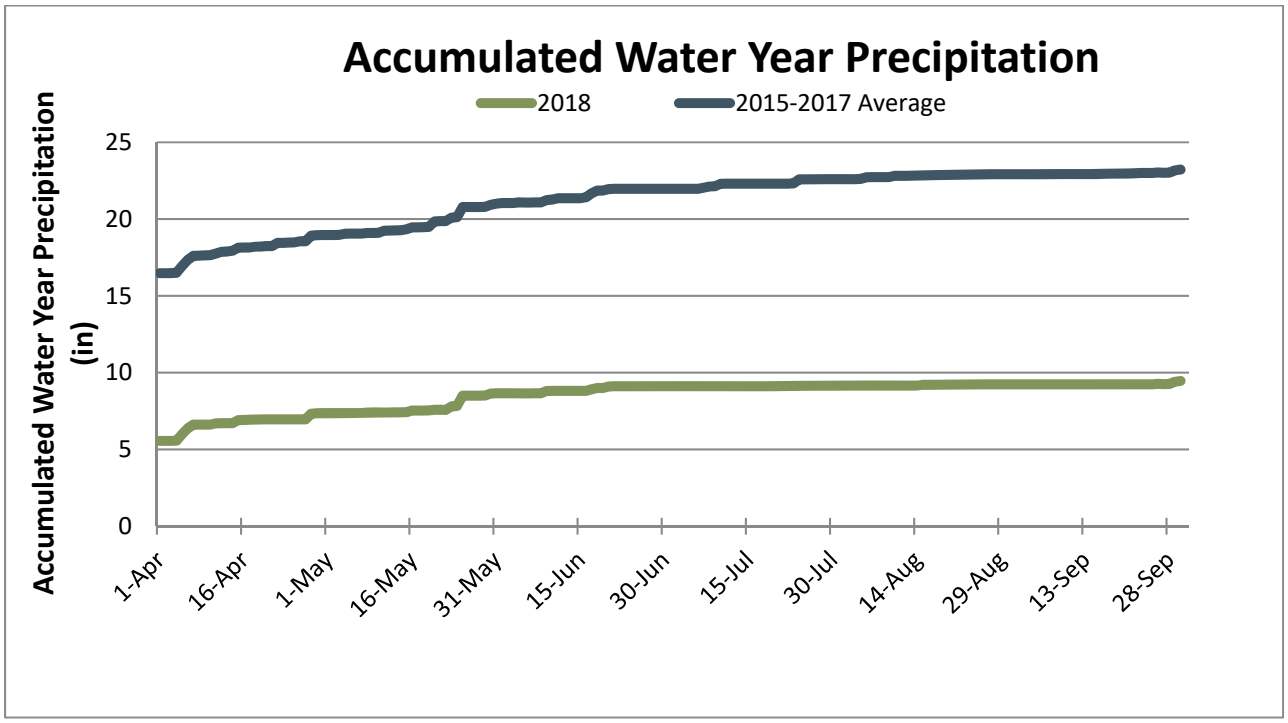
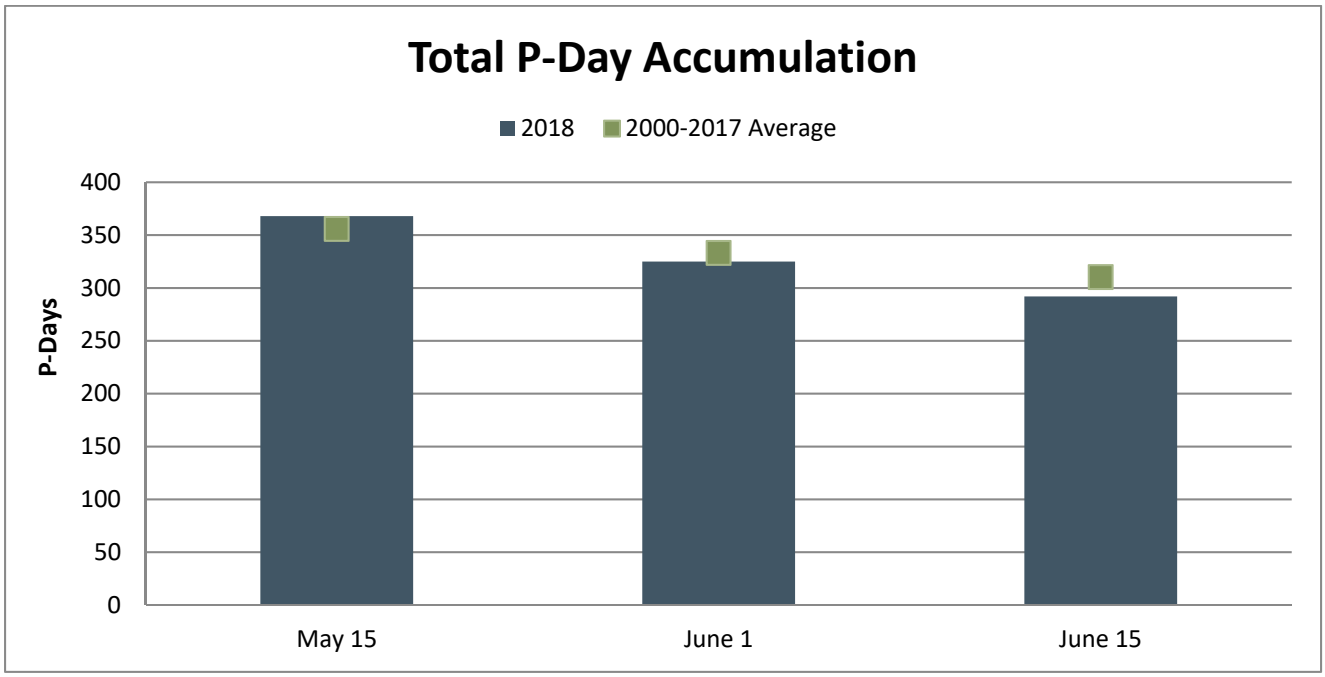
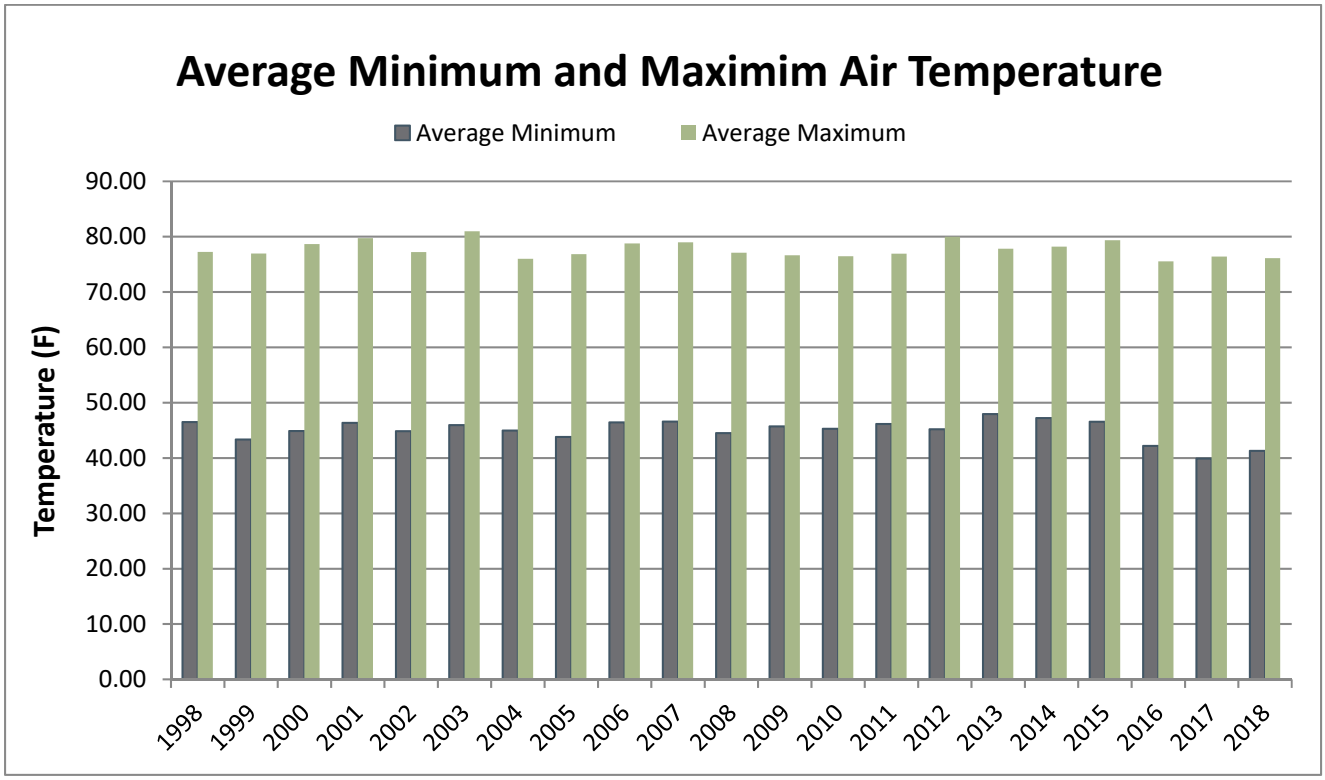
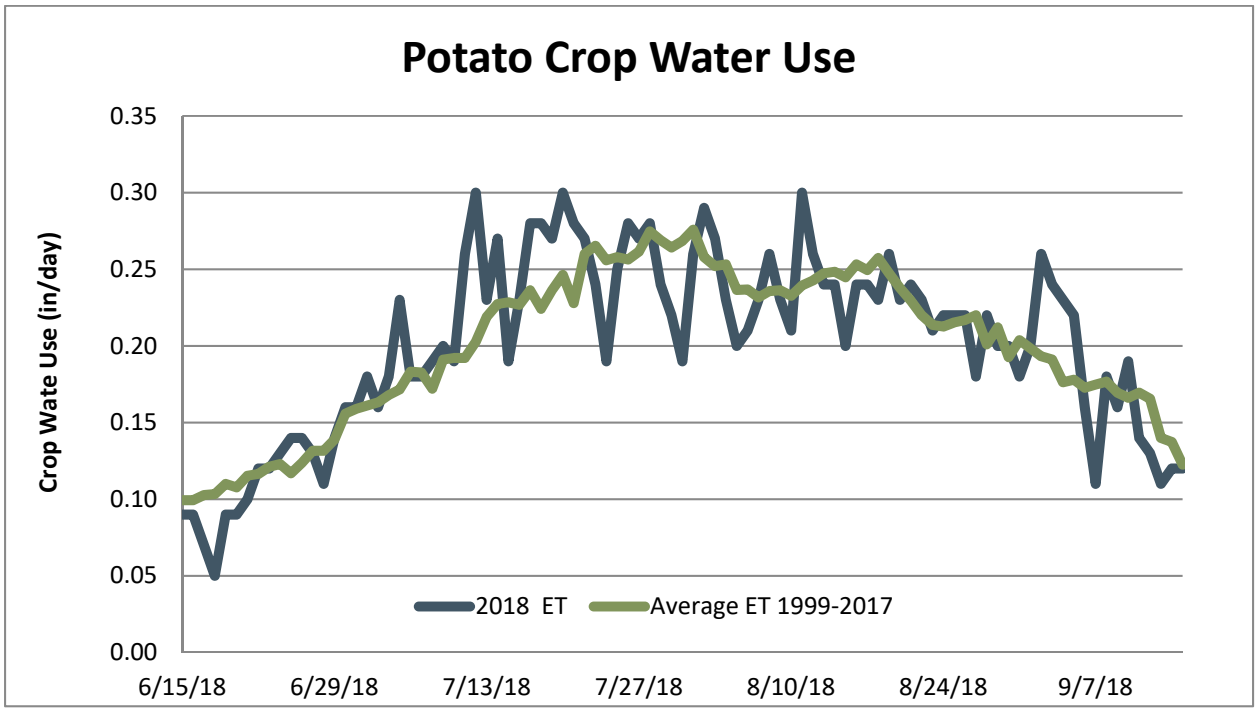
Weather Data





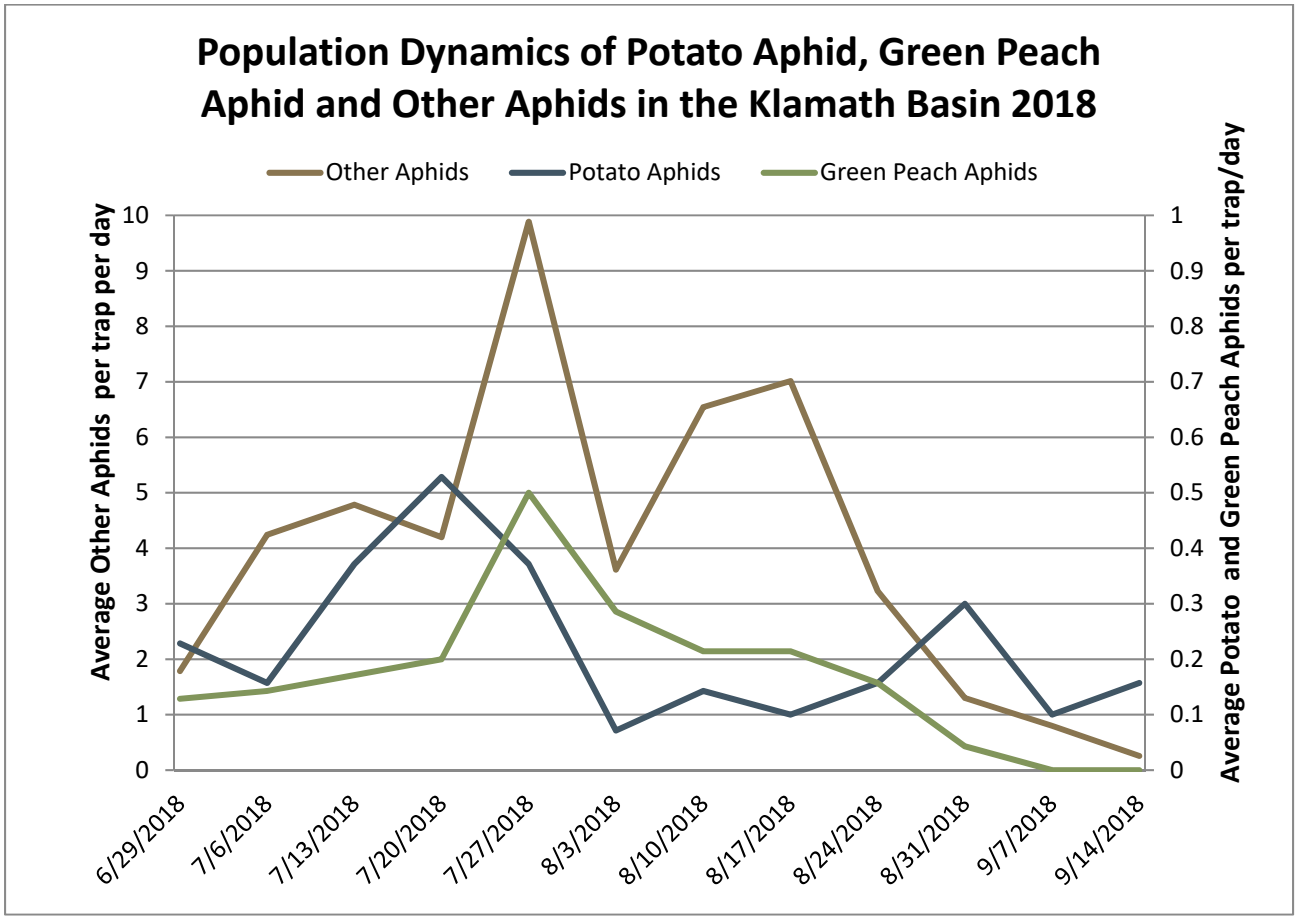

Total P-Day Accumulation
2018
2000-2017 Average
P-Days
400
350
300
250
200
150
100
50
0
May 15
June 1
June 15

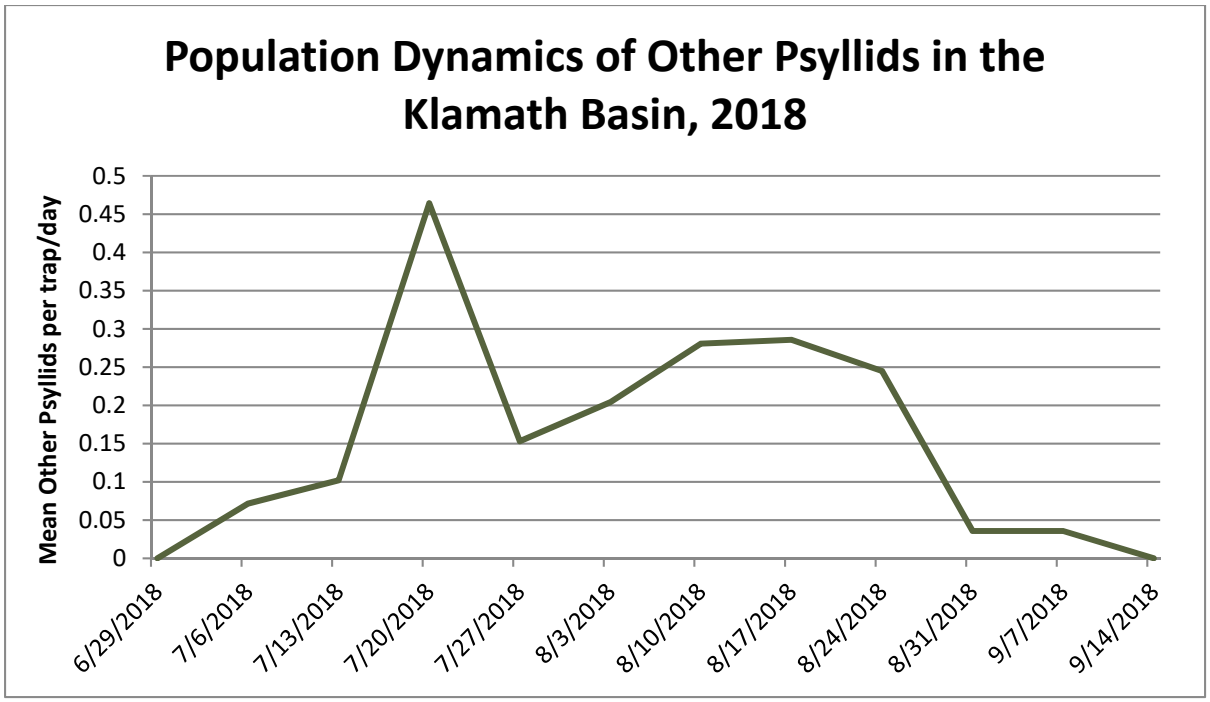

Average Minimum and Maximim Air Temperature
Average Minimum
Average Maximum
Temperature (F)
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

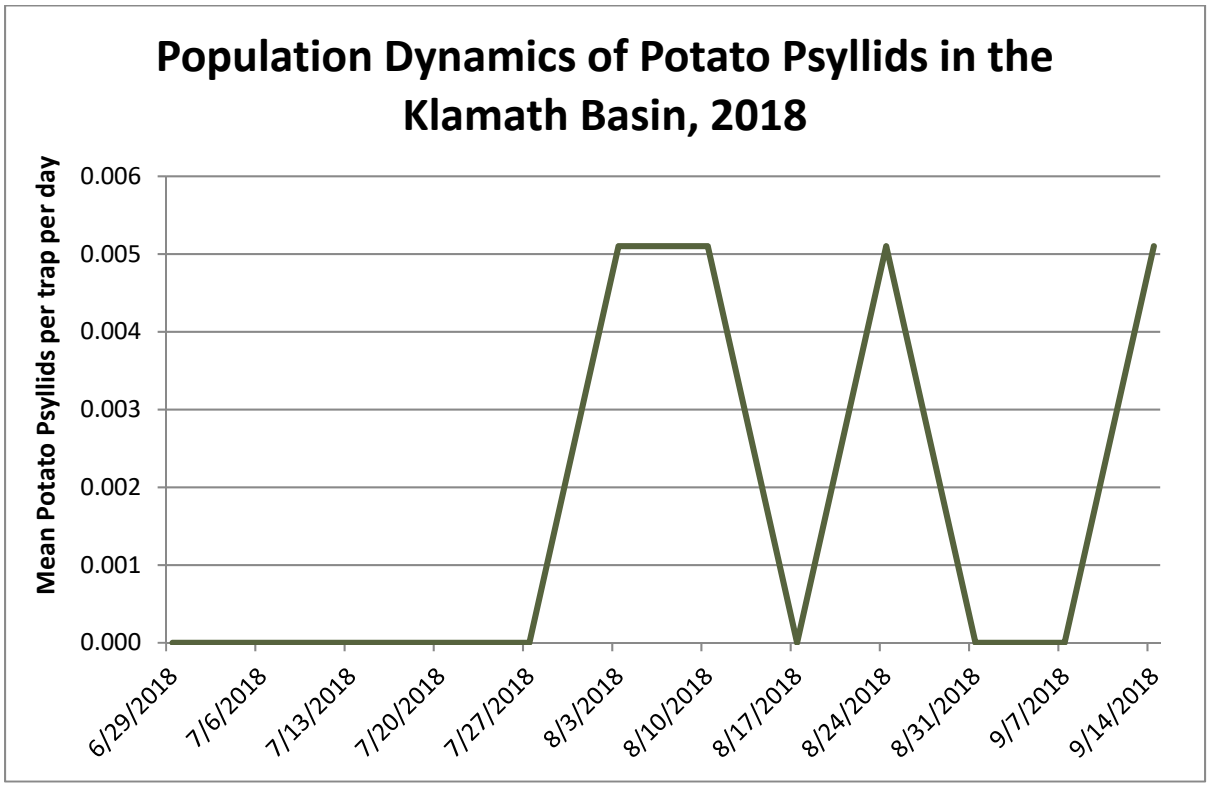

Potato Crop Water Use
Crop Wate Use (in/day)
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
6/15/18
6/29/18
7/13/18
7/27/18
8/10/18
8/24/18
9/7/18
2018 ET
Average ET 1999-2017

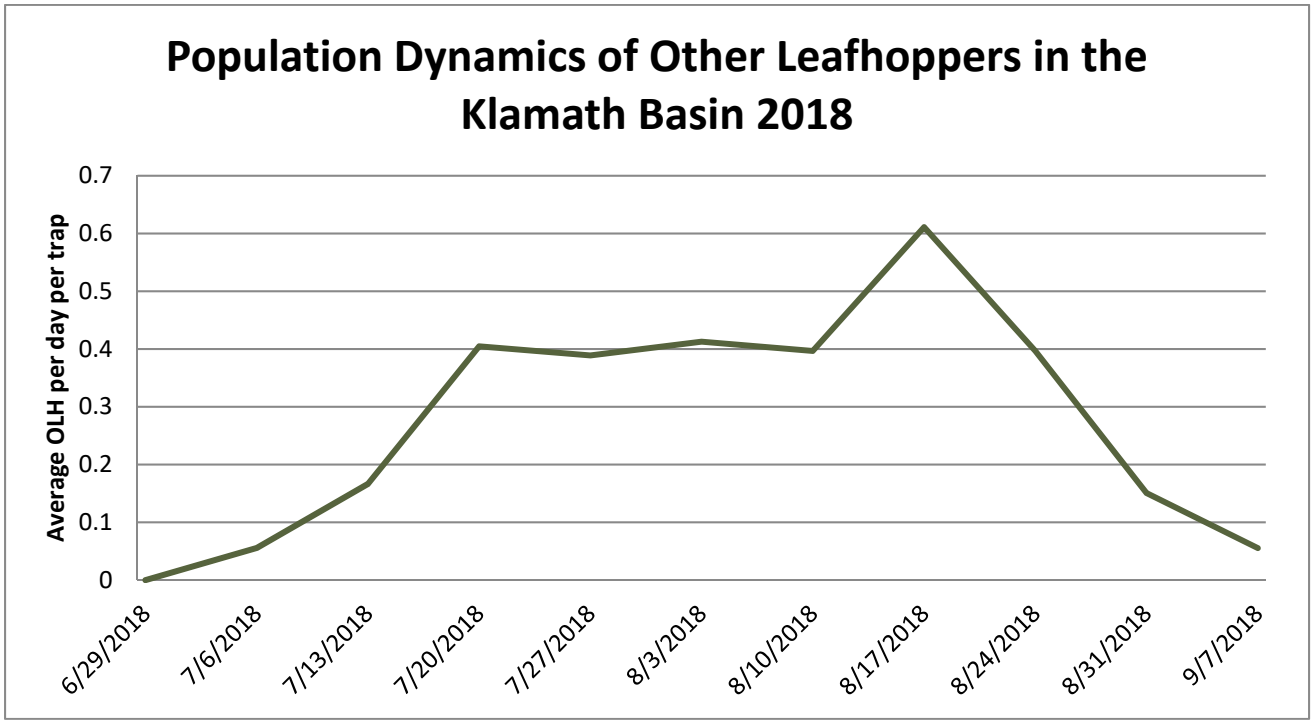
2018 Insect Trapping Results

Potato tuberworm was first detected in the Klamath Basin in late August of 2005. KBREC initiated an extensive trapping program the following year (2006) and have continued this effort annually. In 2009, we expanded our trapping efforts to include aphids, leafhoppers, and psyllids. Eighteen Delta traps (tuber moth), ten yellow water-pan traps (aphids), and eighteen sticky cards (leafhoppers and psyllids) were placed in growers' fields shortly after crop emergence. Traps were checked weekly during the growing season and results were tabulated and made available to growers, crop consultants, and other industry personnel electronically in a newsletter titled *Potato Bytes.* This newsletter was also published on the KBREC website at http://oregonstate.edu/dept/kbrec/. Collected data provided Basin producers with pertinent information to improve pest management strategies. Potato tuberworm has not been found despite an extensive twelve year trapping program. The following graphs show population dynamic trends for aphids and leafhoppers throughout the growing season.




Population Dynamics of Other Psyllids in the Klamath Basin, 2018
Mean Other Psyllids per trap/day
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
6/29/2018
7/6/2018
7/13/2018
7/20/2018
7/27/2018
8/3/2018
8/10/2018
8/17/2018
8/24/2018
8/31/2018
9/7/2018
9/14/2018


Population Dynamics of Potato Psyllids in the Klamath Basin, 2018
Mean Potato Psyllids per trap per day
0.006
0.005
0.004
0.003
0.002
0.001
0.000
6/29/2018
7/6/2018
7/13/2018
7/20/2018
7/27/2018
8/3/2018
8/10/2018
8/17/2018
8/24/2018
8/31/2018
9/7/2018
9/14/2018


Population Dynamics of Other Leafhoppers in the Klamath Basin 2018
Average OLH per day per trap
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
6/29/2018
7/6/2018
7/13/2018
7/20/2018
7/27/2018
8/3/2018
8/10/2018
8/17/2018
8/24/2018
8/31/2018
9/7/2018

Guide to Clone Designation

Example: AC99375-1RU		
	AC99375-1RU	Breeding Program (**A**berdeen, ID)
	A**C**99375-1RU	Selection Site (**C**olorado)
	AC**99**375-1RU	Year of Cross (19**99**)
	AC99**375**-1RU	Cross Number (**375**)
	AC99375-**1**RU	Tuber Selection (**1**)
	AC99375-1**RU**	Russet (**Ru**)

Location Codes

Designation	Breeding Program	Selection Program	Other
A	**A**berdeen, Idaho	**A**berdeen, Idaho	
AO	**A**berdeen, Idaho	**O**regon	
AOA	**A**berdeen, Idaho	**O**regon	
AOR	**A**berdeen, Idaho	**O**regon	
ATX	**A**berdeen, Idaho	**Tex**as	
BTX	**B**eltsville, Maryland	**T**exas	
CO	**C**olorado		
MWTX	**M**adison, **W**isconsin	**Tex**as	
NDA	**N**orth **D**akota	**A**berdeen, Idaho	
NY	**N**ew **Y**ork		
PA	**P**rosser, Washington	**A**berdeen, Idaho	
POR	**P**rosser, Washington	**Or**egon	
TC	**T**exas	**C**olorado	
TE	**Te**tonia, Idaho		
TXA	**T**exas	**A**berdeen, Idaho	
TXNS	**Tex**as		**N**orkotah **S**train

Miscellaneous Designations

B	Chuck **B**rown's Cross
LS	**L**ow **S**ugar
P/P	**P**urple skin/**P**urple flesh
R	**R**ed skin
R/R	**R**ed skin/**R**ed flesh
R/Y	**R**ed skin/**Y**ellow flesh
Ru	**Ru**sset
W/Y	**W**hite skin/**Y**ellow flesh
LB	**L**ate **B**light resistance
PW/Y	**P**urple skin with **W**hite eyes/ **Y**ellow flesh
P/Y	**P**urple skin/**Y**ellow flesh
P/PW	**P**urple skin/**P**urple and **W**hite flesh

Single Hill Results

Approximately, eighty thousand (80,000) greenhouse-produced seedling tubers were planted at a Rock Creek Ranch five miles west of Running Y Ranch on May 23, 2018. Located about 20 miles west of Klamath Falls, soils are approximately 6.1 percent organic matter and a pH of 6.3. The location provides good isolation from other potato production areas and intensively fumigated soils allow us to harvest very clean material for seed increase. Progeny included 46 families from Oregon State University; 41 from USDA, Prosser, WA; 129 from USDA, Aberdeen, Idaho; 19 from Colorado State University; 14 from University of North Dakota. Several crosses included russet parents with virus, late blight and potato tuber worm resistance.

Tuber families were lifted with a two-row, level-bed digger on October 3rd. A selection team including researchers, extension agents, growers and industry personnel selected desirable clones from various families immediately after lifting. As expected, selection was based primarily on external appearance; however, internal evaluation was performed on a limited number of selections. All retained material was transported to Klamath Falls, Oregon for storage at the Klamath Basin Research and Extension Center (KBREC). The following table outlines the number of single- hills provided by each breeding program and selection rate.

Location	General Cross Types	Number of Progeny Planted	Number of Progeny Selected	% Selection Rate
ARS Prosser, WA	Disease resistance, pigmented	5,303	24	0.45
Oregon State University	Disease resistance, mixed type	7,037	61	0.86
North Dakota	Disease resistance, russet	3,174	38	1.19
ARS Aberdeen, ID	Disease resistance, russet	60,213	673	1.11
Colorado State University		4,087	55	1.34
Total		**79,814**	**851**	**1.06**

Preliminary Yield (PYT-1) Russet Screening

Four hundred eighty seven (487) selections from 2017 single-hills were planted in 16-hill seed increase plots at Rock Creek Ranch. Potato tubers were lifted using a two-row, level-bed digger on October 4, 2018. A team of about 20 research and industry personnel selected 96 clones for further evaluation based on market potential and possible disease resistance. Tubers from these selections were retained and stored at KBREC for seed increase. This material will be evaluated in a Preliminary Yield Trial (PYT-2 Russet) conducted at KBREC and other locations throughout the Pacific Northwest in 2019.

Preliminary Yield (PYT-1) Specialty Screening

Thirty two (32) selections from 2017 single-hills were planted in 16-hill seed increase plots at Rock Creek Ranch. Potato tubers were lifted using a two-row, level-bed digger on October 4, 2018. A team of about 20 research and industry personnel selected 7 clones for further evaluation based on market potential and possible disease resistance. Tubers from these selections were retained and stored at KBREC for seed increase. This material will be evaluated in a Preliminary Yield Trial (PYT-2 Specialty) conducted at KBREC and other locations throughout the Pacific Northwest in 2019.

Preliminary Yield (PYT-1) Chip Screening

Ninety five (95) chip selections from 2017 single-hills were planted in 16-hill seed increase plots at Rock Creek Ranch. Potato tubers were lifted using a two-row, level-bed digger on October 4, 2017. Research and industry personnel selected 30 clones for further evaluation based on chipping potential and possible cold sweetening resistance. Seed of these selections was hand collected and stored at the KBREC potato facilities. This material will be evaluated in a Preliminary Yield Trial (PYT-2 Chip) conducted at KBREC and other locations throughout the Pacific Northwest in 2019. KBREC will also be increasing seed for future evaluation.

Fresh Market Value – Methods

Graphs showing the difference in gross returns per acre (Fresh Market Value) compared to Russet Norkotah are provided for all entries in both the Tri-state and Western Regional Russet Trials. Values were calculated by subtracting the gross return of Russet Norkotah from the gross return of each particular entry. Net packing shed returns to growers were calculated using a four-year average of fresh potato prices in the Columbia Basin and a packing shed cost of $4.00/cwt. The sales free on board shipping point is taken from the market periods 2007-2010 according to the USDA Federal-State Market News Service. Process-culls are priced at regional process-cull market value. Assessing the fresh value of a given entry is difficult as packing sheds utilize various tuber sizes to meet current market orders. For example, all tubers that meet 90 or 100 count carton specifications are sometimes used to fill 5 and 10 lb. bale orders. As expected, these types of scenarios are not accounted for in our assumptions. In addition, this type of economic analysis does not account for consumer preference. As such, entries which appear to lack fresh market appeal are highlighted as white bars. The table below lists point prices per tuber size and grade with associated pack fees for grade and size categories used.

Grade Size	Markets/Packaging[1]	Four Year Columbia Basin Avg. $/cwt[2]	Packaging and Handling
4-6 oz.	10.0 lb. poly bags	$11.07	$4.00
	5.0 lb. poly bags	$13.07	$4.00
6-10 oz.	70, 80, 90 and 100 count	$18.46	$4.00
10-20 oz.	40, 50, 60 and 70 count	$20.72	$4.00
<4 oz. and culls	Washed Processed Grade	$4.00	$4.00
No. 2	10-20 oz (50 lb. sacks)	$12.79	$4.00
	6-10 oz (50 lb. sacks)	$9.69	$4.00

[1]Count = tuber number per 50 lb. carton.

[2]Sales F.O.B. Shipping Point, market periods 2007 to 2010 (USDA Federal-State Market News Service 2007-2010). Process-culls priced at regional process-cull market value.

2018 Replicated Trial Cultural Information

Location:	Klamath Falls, OR
Soil Type:	Poe fine sandy loam, pH 6.8
Planting Date:	5/15/2018
Vine Kill Date:	8/28/2018 Mechanical (vine chop)
Harvest Date:	9/27/2018
Irrigation:	Solid-set sprinkler + natural precipitation = 23.06 inches
Plot Length:	25 hills (19.27 ft.)
In-row spacing:	9.25 inches
Row spacing:	36 inches
Number of Reps:	4
Fertilizer:	162-0-200-255
Weed Control:	Prowl, Matrix, Outlook
Insecticides:	Alias
Fungicides:	Luna, Vertisan, Ridomil Bravo
Nematode Control:	Vydate
General Comments:	

2018 Preliminary Yield (PYT-2) Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 23
Harvest Date: October 4
Fertility: 162-0-200-255 Sulfur
Vine Kill Date: August 28
Days to Vine kill: 99
In-Row Spacing: 9.25 inch

The PYT-2 Russet Trial evaluates recently selected clones, often only three years removed from single-hill selection. Retained entries are further evaluated in replicated trials at several Oregon locations before advancing (if applicable) to the Tri-state trial which includes testing locations in Washington and Idaho. This trial included 3 standard varieties and 26 new entries. The Oregon Potato Variety Development Team chose to advance 26 selections to the Statewide Russet Trial in 2017 and discarded the remaining selections due to poor performance. **Only retained selections are listed in the following tables.**

Clone	Female Parent	Male Parent
AOR10067-5	A01010-1	STAMPEDE RUSSET
AOR10067-6	A01010-1	STAMPEDE RUSSET
AOR10093-9	A03131-21	A98345-1
AOR10093-11	A03131-21	A98345-1
AOR10129-1	A05084-1	A98345-1
AOR10222-3	GEM RUSSET	DAKOTA TRAILBLAZER
AOR11027-4	A03123-4TE	A06003-3TE
AOR11192-6	A98345-1	A02093-1
AOR11237-1	A02093-1	A05066-7
AOR12082-8	A05084-1	FREEDOM RUSSET
AOR14009-3	A07547-4VR	CO99100-1U
AOR14026-3	AF3317-15	A02618-1ADG
AOR14033-1	PREMIER RUSSET	AO1114-4
AOR14033-11	PREMIER RUSSET	AO1114-4
AOR14033-16	PREMIER RUSSET	AO1114-4
AOR14051-3	A08291-99LB	A061071-3CSR
AOR12157-16	Alturas	A01025-4
AOR13091-2	AO01114-4	AO02183-2
POR07NCKP1-5	PA99N82-4	Alaska 29-7
AOR10603-5	A02466-58	CO099053-3RU
AOR10654-11	A05379-211	A93575-4
AOR11847-15	A06740-2VR	COA06191-1
AOR13113-1	Premier Russet	A061071-3CSR
AOR12312-15	A06787-2VR	A01025-4
OR13SP142-2	OR05039-4	AO00710-1FSTO
POR16V2-3	POR06V12-3	Highland Russet

2018 Statewide Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16 Vine Kill Date: September 7
Harvest Date: September 26 Days to Vine kill: 99
Fertility: 162-0-200-255 Sulfur In-Row Spacing: 9.25 inch

The Statewide Russet Trial evaluates selections retained from the PYT-2 Russet Trial at three locations in Oregon. As mentioned earlier, selections retained from this trial are advanced to the Tri-State Trial, which includes testing locations in Washington and Idaho. Testing locations in Oregon represent diverse climatic conditions (hot, long-season and cool, short-season) which allow for the retention of selections that exhibit stability over multiple locations. Oregon selections remain in the Statewide Trial until they complete Tri-State and Western Regional evaluation or are discarded. Despite a warmer season, potato plots at the KBREC site performed above average. The following is a summary of the Klamath Falls field results.

Stand Counts

- **30 Day**

  Slow emergence: All entries had greater than 92% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

  Most: OR13SPC101-8 (11.9), Russet Burbank (11.4)
  Least: AOR13107-2 (4.5), AOR12327-3 (6.3)

- **Average Tuber Size (oz.)**

  Largest:AOR13107-2 (8.2), Ranger Russet (7.7)
  Smallest: AOR13064-2 (4.3), Russet Burbank (4.5)

- **Undersized Tubers (<4 oz.) cwt/Acre**

  Most: AOR12386-5 (140.0), AOR13064-2 (124.0)
  Least: AOR13107-2 (20.5), OR14SP016-3 (34.3)

Yield and Economic Data

- **Total Yield (cwt/Acre)**

  Highest: OR13SPC101-8 (649.0), AOR10633-1 (636.2)
  Lowest: POR15NCYK022-1 (409.7), AOR13107-2 (424.0)

- **US No. 1 Yield (cwt/Acre)**

  Highest: AOR10633-1 (546.5), AOR12149-1 (500.7)
  Lowest: POR15NCYK022-1 (273.7), AOR12145-3 (316.7)

- **Carton Yield (6-20 oz.) cwt/Acre**

  Highest: AOR10633-1 (547.0), AOR12149-1 (501.0)

Lowest: POR15NCYK022-1 (274.0), AOR12145-3 (317.0)

- **Gross Return ($/acre)**

Fresh Market Highest: AOR10633-1, AOR12149-1

Fresh Market Lowest: POR15NCYK022-1, AOR12386-5

Tuber Defect Incidence (10 tuber-samples per 4 reps, 6-10 oz.)

- **Hollow Heart**

Notable Defects: AOR13075-10 (15%), AOR12386-5 (7.5%)

- **Corky Ringspot**

Notable Defects: AOR13018-5 (5.0%)

- **Vascular Discoloration**

Notable Defects: AOR13061-20 and AOR11217-3 (15%)

Entry	Total Yield		US # 1s > 4 oz.	US # 2s > 4 oz.	Culls & <4 oz.	Oversized >20 oz.	Carton Yield 100-50 count (US 1's 6-20 oz)	
	(cwt/A)	stats**	% of total yield*				% of total yield	(cwt/A)
Ranger Russet	614	ABC	479	47	17	27	78	479
Russet Burbank	592	ABCDE	433	49	16	5	73	433
Russet Norkotah	450	HIJK	381	9	10	5	85	381
AOR11217-3	534	CDEFGH	440	15	12	3	82	440
AOR10633-1	636	AB	547	16	15	0	86	547
AOR12145-3	430	IJK	317	16	15	0	74	317
AOR12149-1	609	ABCD	501	28	27	13	82	501
AOR12176-4	601	ABCDE	384	89	37	3	64	384
AOR12342-2	540	CDEFGH	468	11	19	5	87	468
AOR12344-21	487	FGHIJK	399	5	12	2	82	399
AOR12347-5	552	BCDEFG	415	31	19	2	75	415
AOR12350-5	573	ABCDEF	489	13	12	0	85	489
AOR12386-5	514	EFGHIJ	342	12	20	0	67	342
AOR13011-1	520	DEFGHI	453	8	19	5	87	453
AOR13011-2	465	GHIJK	381	9	11	7	82	381
AOR13018-5	543	BCDEFG	457	16	5	3	84	457
AOR13038-1	522	CDEFGHI	435	24	10	0	83	435
AOR13058-9	513	EFGHIJ	386	6	19	0	75	386
AOR13061-20	554	BCDEFG	418	18	22	0	75	418
AOR13063-3	541	CDEFGH	445	8	20	15	82	445
AOR13082-6	524	CDEFGH	415	13	17	5	79	415
AOR13107-2	424	JK	334	24	12	33	79	334
AOR11847-2	539	CDEFGH	405	27	19	17	75	405
POR15NCYK022-1	410	K	274	25	16	0	67	274
OR13SPC101-8	649	A	483	35	18	3	74	483

AOR13066-1	558	ABCDEF	490	12	9	13	88	490
AOR12327-3	429	IJK	327	9	28	12	76	327
AOR13343-16	526	CDEFGH	442	18	13	8	84	442
OR14SP016-3	539	CDEFGH	466	21	8	9	87	466
AOR13075-10	544	BCDEF	357	57	40	53	66	357
AOR13064-2	520	DEFGHI	354	21	17	3	68	354
LSD(0.05)		**92.8**						

*Percent values may not total 100% due to rounding

**Entries showing the same letter are not significantly different at the 5% level

***Entries retained for further testing in 2018

Entry	US # 1 Yield					6-10 oz	Internal Defects (%)			
	>4 oz.	STATS**	%*			Specific	6-10 oz. tubers****			
	(Cwt/A)		4-6 oz.	6-10 oz	>10 oz	Gravity	HH	IB	CRS	VD
Ranger Russet	479	ABCD	79	164	263	1.0875	0.0	0.0	0.0	2.5
Russet Burbank	433	BCDEFG	150	205	83	1.0843	0.0	0.0	0.0	0.0
Russet Norkotah	381	EFGHIJ	88	192	105	1.0807	0.0	0.0	0.0	0.0
AOR11217-3	440	BCDEFG	126	203	113	1.0786	0.0	0.0	0.0	15.0
AOR10633-1	547	A	126	277	144	1.0897	0.0	0.0	0.0	0.0
AOR12145-3	317	JK	105	174	38	1.0885	0.0	0.0	0.0	5.0
AOR12149-1	501	AB	97	252	164	1.0846	2.5	0.0	0.0	7.5
AOR12176-4	384	EFGHIJ	79	191	116	1.0695	0.0	0.0	0.0	2.5
AOR12342-2	468	ABCDE	94	213	167	1.0829	0.0	0.0	0.0	0.0
AOR12344-21	399	EFGHIJ	109	239	53	1.0782	5.0	0.0	0.0	0.0
AOR12347-5	415	BCDEFGHI	207	139	71	1.0776	0.0	0.0	0.0	2.5
AOR12350-5	489	ABCD	100	236	153	1.0800	5.0	0.0	0.0	0.0
AOR12386-5	342	HIJK	127	176	39	1.0906	7.5	0.0	0.0	2.5
AOR13011-1	453	BCDE	91	182	185	1.0768	0.0	0.0	2.5	5.0
AOR13011-2	381	EFGHIJ	67	204	118	1.0753	0.0	0.0	2.5	0.0
AOR13018-5	457	ABCDE	106	210	143	1.0789	0.0	2.5	5.0	0.0
AOR13038-1	435	BCDEFG	81	214	140	0.9271	0.0	0.0	0.0	2.5
AOR13058-9	386	EFGHIJ	91	209	86	1.0843	0.0	0.0	2.5	0.0
AOR13061-20	418	BCDEFGH	143	200	75	1.0850	0.0	0.0	0.0	15.0
AOR13063-3	445	BCDEF	75	202	183	1.0816	0.0	0.0	0.0	5.0
AOR13082-6	415	BCDEFGHI	105	214	101	1.0882	0.0	2.5	0.0	0.0
AOR13107-2	334	HIJK	51	164	152	1.0657	0.0	0.0	0.0	0.0
AOR11847-2	405	CDEFGHIJ	96	210	116	1.0841	0.0	0.0	0.0	12.5
POR15NCYK022-1	274	K	104	146	24	1.0777	0.0	0.0	0.0	0.0
OR13SPC101-8	483	ABCD	154	239	93	1.0761	0.0	0.0	0.0	12.5
AOR13066-1	490	ABC	82	224	198	1.0901	0.0	0.0	0.0	2.5
AOR12327-3	327	IJK	85	137	117	1.0813	0.0	0.0	0.0	5.0
AOR13343-16	442	BCDEFG	104	237	110	1.0856	5.0	0.0	2.5	0.0

OR14SP016-3	466	ABCDE	98	211	166	1.0828	0.0	0.0	0.0	0.0
AOR13075-10	357	FGHIJ	61	126	222	1.0732	15.0	0.0	0.0	2.5
AOR13064-2	354	GHIJK	139	157	61	1.0819	0.0	0.0	0.0	5.0
LSD (0.05)		**90.9**								

*Percent values may not total 100% due to rounding

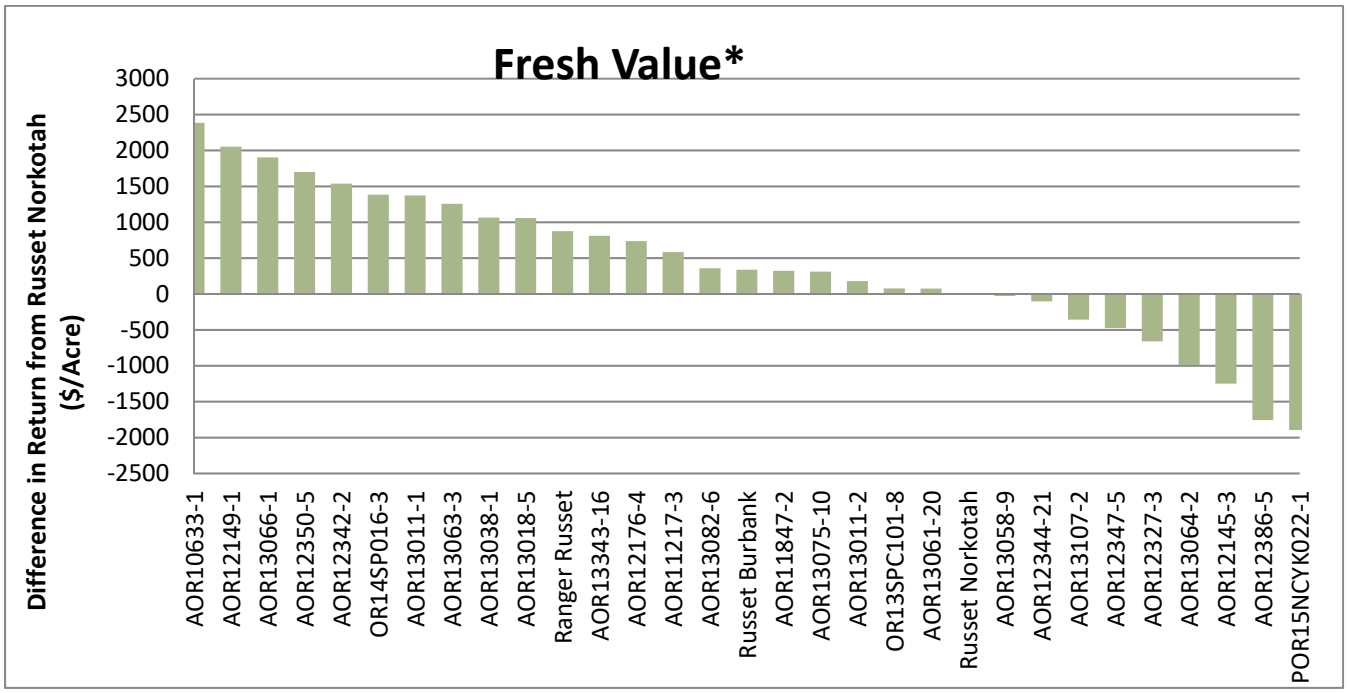
**Entries showing the same letter are not significantly different at the 5% level

***Entries retained for further testing in 2018

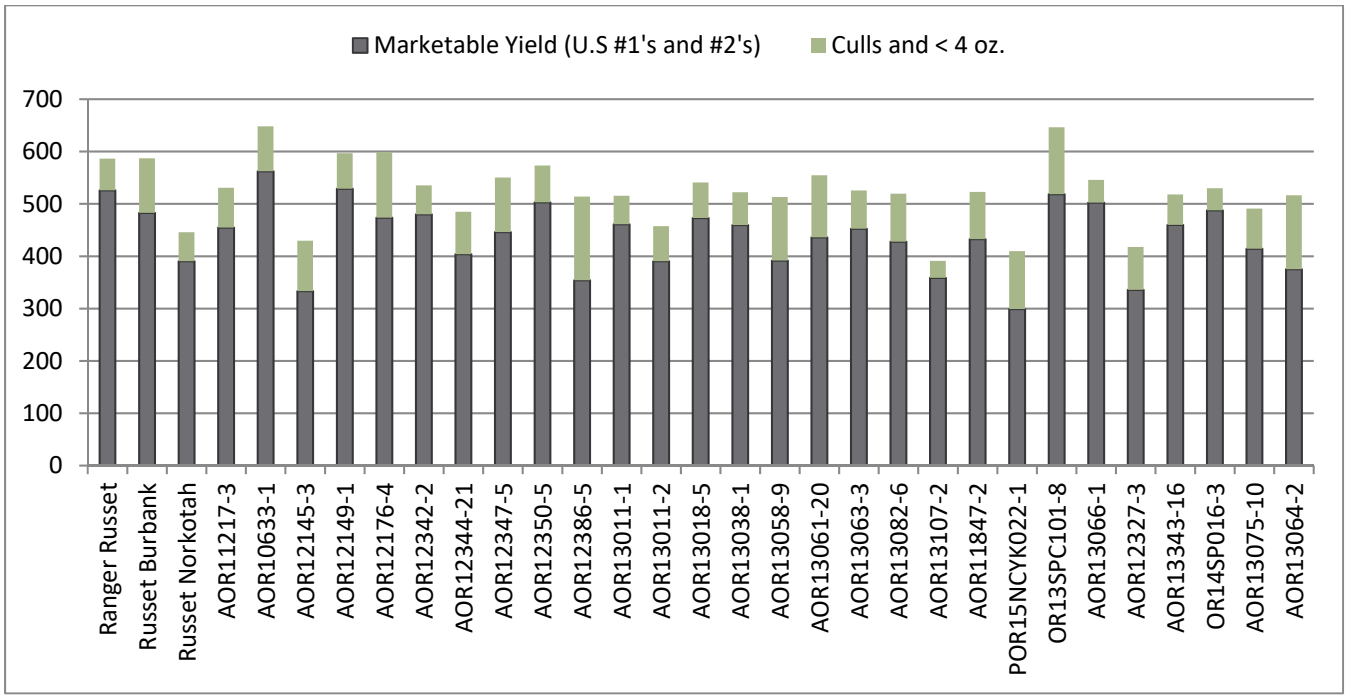
****Internal Defects: HH=hollow heart, IB=impact bruise, CRS=corky ringspot, VD=vascular discoloration

Entry	Stand %	Average Tuber		Growth Cracks (1-5 best)	Rhizoc (1-5none)	Skin Color (1-5 dark)	Russeting (1-5 hvy)	Shape (1-5 long)	Shape Uniformity (1-5 best)	Eye Depth (1-5 shal.)
		Wt. (oz.)	No. tubers/plant							
Ranger Russet	98	7.6	7.1	4.8	4.3	3.9	3.9	5.0	3.5	3.4
Russet Burbank	96	4.8	11.4	3.3	4.9	3.8	3.4	4.6	2.6	4.0
Russet Norkotah	98	5.9	6.6	4.9	4.9	4.3	4.3	4.3	4.0	3.1
AOR11217-3	93	5.6	8.8	4.8	3.8	4.0	4.8	4.6	4.3	3.5
AOR10633-1	97	5.9	9.6	5.0	3.3	2.4	2.6	3.9	3.0	3.1
AOR12145-3	96	4.8	7.9	4.1	4.5	4.0	3.8	3.6	3.5	3.5
AOR12149-1	97	6.7	8.0	4.5	5.0	3.5	3.4	4.1	3.1	2.8
AOR12176-4	99	5.8	8.9	2.6	4.6	1.4	1.5	4.8	2.1	4.4
AOR12342-2	99	6.9	6.7	4.9	4.8	3.4	3.5	3.6	3.6	3.6
AOR12344-21	92	5.5	8.3	4.4	3.8	4.1	4.3	4.1	3.9	4.8
AOR12347-5	96	5.1	9.6	4.3	4.5	4.6	4.6	4.0	3.3	3.6
AOR12350-5	96	6.1	8.4	5.0	4.8	3.6	4.0	4.1	3.6	3.2
AOR12386-5	97	4.3	10.5	4.8	4.5	3.3	2.9	4.1	3.5	4.5
AOR13011-1	99	6.5	6.9	4.8	5.0	2.4	2.3	4.9	3.8	3.4
AOR13011-2	98	6.2	6.6	4.9	4.6	2.9	2.3	4.6	3.8	3.3
AOR13018-5	93	5.7	8.7	5.0	4.5	4.0	3.3	3.6	3.3	3.6
AOR13038-1	98	6.7	6.7	5.0	4.6	4.0	4.0	4.8	4.1	4.0
AOR13058-9	97	5.1	8.9	5.0	4.6	4.3	4.0	3.6	4.0	3.9
AOR13061-20	95	4.8	10.5	3.9	3.6	3.0	3.0	3.8	2.9	3.9
AOR13063-3	95	6.6	7.3	4.6	4.8	2.3	2.6	4.1	3.4	4.0
AOR13082-6	97	5.3	8.7	4.9	4.9	2.8	2.8	4.3	3.9	3.9
AOR13107-2	97	8.2	4.5	4.8	3.4	3.9	4.0	4.0	2.9	4.0
AOR11847-2	95	5.7	8.4	3.6	3.5	4.1	4.1	4.1	3.4	3.4
POR15NCYK022-1	95	4.8	7.7	4.6	5.0	4.9	5.0	4.1	2.8	4.5
OR13SPC101-8	97	4.9	12.0	5.0	4.6	3.5	3.9	4.6	3.4	3.0
AOR13066-1	99	7.2	6.7	5.0	3.8	4.1	4.1	4.1	3.8	4.0
AOR12327-3	99	5.9	6.3	4.9	4.8	4.3	4.3	4.4	3.9	4.4
AOR13343-16	94	6.1	7.9	5.0	4.9	4.0	4.3	3.9	3.3	3.5
OR14SP016-3	98	6.7	7.0	5.0	4.0	4.0	4.4	5.0	3.5	3.8
AOR13075-10	98	7.3	6.5	3.5	4.3	3.6	3.6	4.6	2.1	3.5
AOR13064-2	99	4.3	10.4	4.3	4.9	4.1	4.1	3.5	2.6	4.1

Entry	2018 KBREC- State Russet Comment	Entry	2018 KBREC- State Russet Comment



*Difference in gross return per acre (Fresh Value) from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry. Entries with orange-colored bars may not appeal to fresh market consumers due to the undesirable shape or appearance. Refer to page 15 for parameters used to collect gross return to growers.



2018 Tri-State Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16 Vine Kill Date: September 7
Harvest Date: September 26 Days to Vine kill: 99
Fertility: 162-0-200-255 Sulfur In-Row Spacing: 9.25 inch

The Tri-state Russet Trial evaluates relatively advanced selections originally selected in both Oregon and Idaho. Entries are evaluated for both fresh market and processing potential in Washington, Idaho, and Oregon. Disposition of entries in this trial are determined by the Tri-State Technical Committee and if retained, advance to the Western Regional Russet Trial. Despite a warmer season, potato plots at the KBREC site performed above average. The following is a summary of the Klamath Falls field results.

Stand Counts

- **45 Day:** All entries had greater than 99% final emergence.

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: A07705-4 and A07098-4 (13.5)
  Least: Russet Norkotah (7.8), Ranger Russet (8.6)

- **Average Tuber Size (oz.)**
  Largest: Ranger Russet (6.5), Russet Burbank (6.2)
  Smallest: A07705-4 (3.8), A09022-4 (4.2)

- **Undersized Tubers (<4 oz.) cwt/Acre**
  Most: A07705-4 (210.0), A07098-4 (165.0)
  Least: Russet Norkotah (58.2) Ranger Russet (63.0)

Yield and Economic Data

- **Total Yield (cwt/Acre)**
  Highest: AOR10204-3 (688.7), AOR08540-1 (672.0)
  Lowest: A09022-4 (449.0), A07547-4adg

- **US No. 1 Yield (cwt/Acre)**
  Highest: AOR10204-3 (530.0), POR12NCK50-1 (672.0)
  Lowest: A09022-4 (283.2), A07547-4adg

- **Carton Yield (6-20 oz.) cwt/Acre**
  Highest: AOR10204-3 (396), Russet Norkotah (368)
  Lowest: A09022-4 (168), A07705-4 (184),
- **Gross Return ($/acre)**
  Lowest:
  Highest:

Tuber Defect Incidence (10 tuber-samples per 4 reps, 6-10 oz.)

- **Hollow Heart**
  Notable Defects: A07705-4 (2.5 %)
- **Vascular Discoloration**
  Notable Defects: A09022-4 (27.5 %)
- **Brown Center**
  Notable Defects: POR12NCK50-1 (7.5)

Entry	Total Yield		US # 1's > 4 oz.	US # 2's > 4 oz.	Culls & <4 oz.	Oversized >20 oz.	Carton Yield 100-50 count (US 1's 6-20 oz)	
	(cwt/A)	STATS**	% of Total Yield*				% of Total Yield	(cwt/A)
Ranger Russet		ABC	470	44	85	26	57	355
Russet Burbank		A	488	62	107	4	56	372
Russet Norkotah		BCD	449	15	64	3	69	368
A07098-4		AB	434	23	183	0	46	294
A07547-4adg		DC	389	10	110	2	50	256
A07705-4		ABC	346	17	226	0	31	184
A08510-1LB		BCD	389	7	132	2	46	242
A09022-4		D	283	10	156	0	37	168
AOR08540-1		A	506	20	146	0	52	347
AOR10204-3		A	530	37	122	0	57	396
OR12133-10		AB	434	26	174	0	43	270
POR12NCK50-1		A	511	18	125	0	55	362
LSD (0.05)		**120**						

*Percent values may not total 100% due to rounding

**Entries showing the same letter are not significantly different at the 5% level

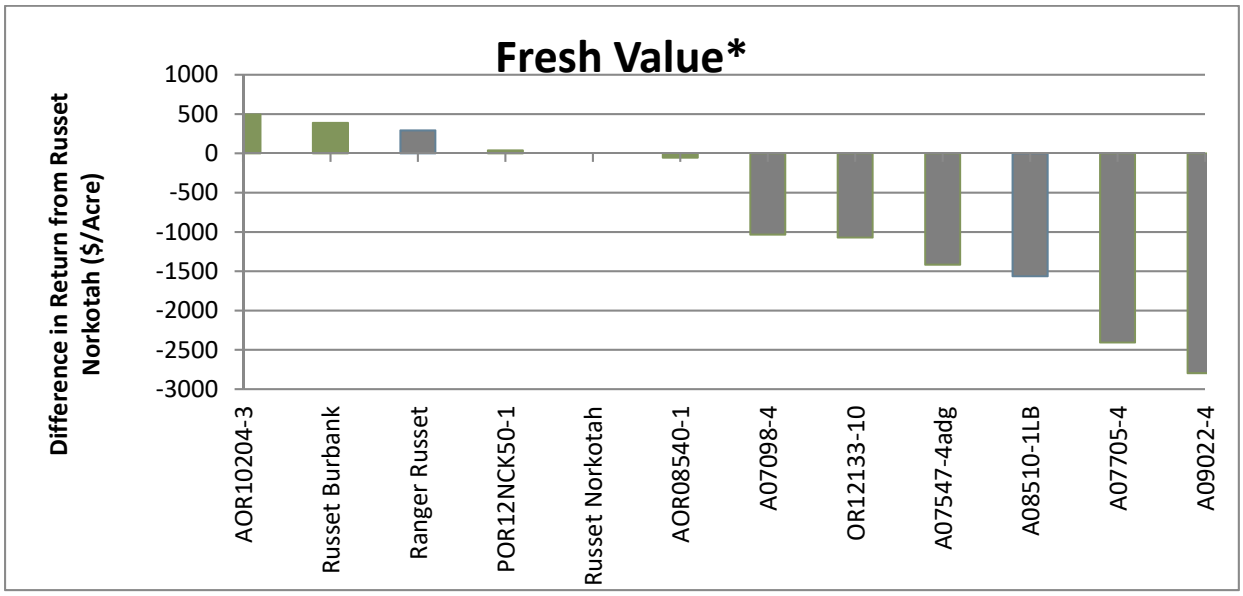
Entry	US # 1 Yield					6-10 oz. Specific Gravity	Internal Defects (%) 6-10 oz. tubers***			
	>4 oz. (cwt/A)	STATS**	%*							
			4-6 oz.	6-10 oz.	>10 oz.		HH	BC	SEB	VD
Ranger Russet	470	ABC	115	196	184	1.0894	0.00	0.00	2.50	2.50
Russet Burbank	488	AB	116	237	138	1.0648	0.00	3.33	0.00	6.67
Russet Norkotah	449	ABC	81	224	147	1.0728	0.00	2.50	0.00	2.50
A07098-4	434	ABC	140	257	36	1.0801	0.00	0.00	2.50	0.00
A07547-4adg	389	BCD	133	208	51	1.0132	0.00	0.00	0.00	0.00
A07705-4	346	CD	162	158	25	1.0772	2.50	0.00	0.00	0.00
A08510-1LB	389	BCD	147	191	53	1.0873	0.00	0.00	5.00	0.00
A09022-4	283	D	116	153	15	1.0465	0.00	0.00	0.00	27.50
AOR08540-1	506	AB	159	247	101	1.0260	0.00	0.00	2.50	0.00
AOR10204-3	530	A	134	315	81	1.0736	0.00	0.00	0.00	0.00
OR12133-10	434	ABC	163	200	70	0.9955	0.00	0.00	2.50	2.50
POR12NCK50-1	511	AB	148	292	70	1.0885	0.00	7.50	2.50	2.50
LSD (0.05)		**132**								

*Percent values may not total 100% due to rounding

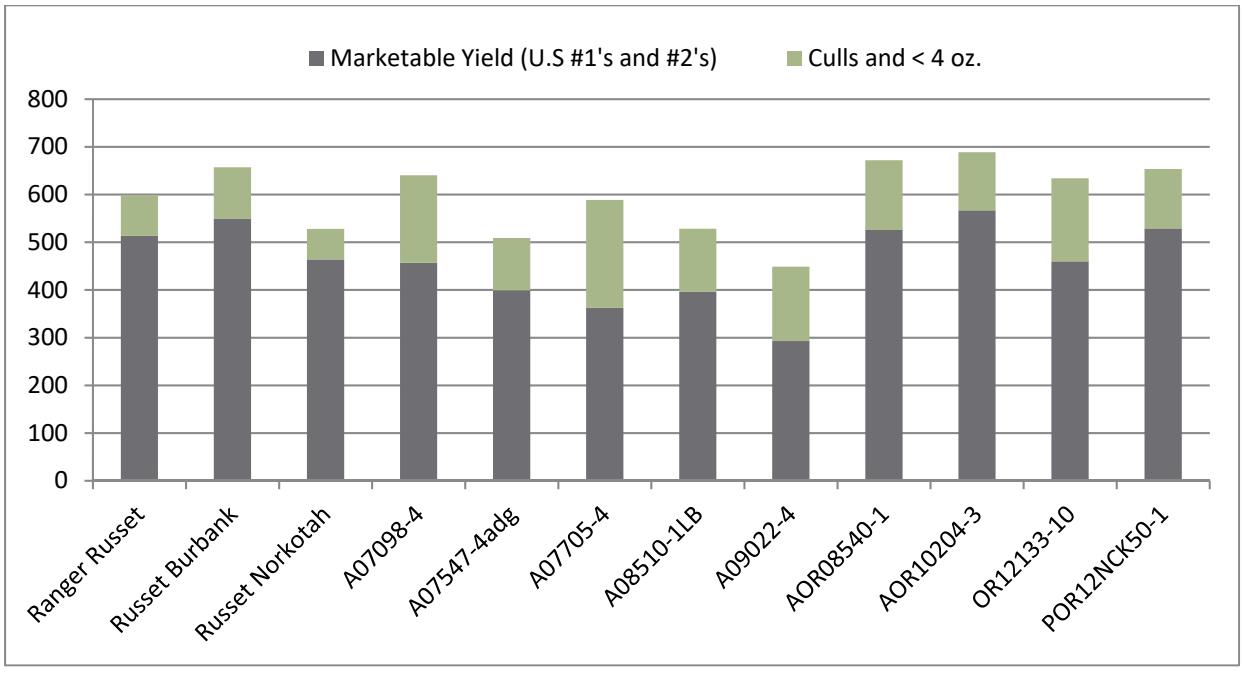
**Entries showing the same letter are not significantly different at the 5% level

***Internal Defects: HH=hollow heart, BC=brown center, SEB=stem end browning, VD= vascular discoloration

Entry	Stand %	Average Tuber		Green (1-5 none)	Growth Cracks (1-5 none)	Skin Color (1-5 dark)	Russeting (1-5 hvy)	Shape (1-5 long)	Shape Uniformity (1-5 best)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant							
Ranger Russet	100.0	6.3	8.6	4.1	4.4	4.3	4.0	5.0	3.0	2.4
Russet Burbank	100.0	6.3	8.9	4.5	2.8	4.2	4.0	4.5	2.2	3.2
Russet Norkotah	100.0	5.8	7.8	4.5	4.9	4.4	4.1	4.1	3.9	3.3
A07098-4	100.0	4.4	12.6	4.0	4.8	1.6	1.5	4.0	3.1	4.0
A07547-4adg	100.0	4.8	9.0	3.8	4.6	1.9	1.9	3.0	3.4	2.9
A07705-4	99.0	3.9	13.6	4.6	5.0	3.1	3.3	3.8	3.0	3.4
A08510-1LB	100.0	4.4	10.5	4.9	5.0	3.5	3.5	3.4	3.9	3.6
A09022-4	99.0	4.3	9.1	3.9	5.0	2.3	2.1	3.5	3.6	3.4
AOR08540-1	100.0	5.3	10.8	3.6	4.9	4.1	4.3	4.0	3.3	3.6
AOR10204-3	100.0	5.6	10.5	3.8	4.8	4.3	4.1	4.3	3.3	3.9
OR12133-10	100.0	5.0	10.9	4.6	4.8	3.1	3.1	4.0	3.4	3.1
POR12NCK50-1	100.0	5.5	10.1	4.4	4.6	4.3	4.8	4.3	3.5	3.3
LSD (0.05)										



*Difference in gross return per acre (Fresh Value) from Russet Norkotah calculated by subtracting the gross return of Russet Norkotah from the gross return of the particular entry. Entries with blue-colored bars may not appeal to fresh market consumers due to the undesirable shape or appearance. Refer to page 15 for parameters used to collect gross return to growers.



Entry	2018 KBREC- Tri-State Russet Comment	Entry	2018 KBREC- Tri-State Russet Comment
Ranger Russet		**Russet Burbank**	
	long skinny, few crooks, erratic size		small, growth cracks, few misshapes
Russet Norkotah		**A07098-4**	
	typy, nice		process only, typy, TNC
A07547-4adg		**A07705-4**	
	round and small, green ends		pointy stem ends, pears, crook and misshapes, rhizoc
A08510-1LB		**A09022-4**	
	no size, round and plump. Erratic russet patches		Shatter, pink ends, small and round
AOR08540-1		**AOR10204-3**	
	green ends, fresh potential, small, nice skin		Fresh potential, few misshapes
OR12133-10		**POR12NCK50-1**	
	erratic size, chicken tracks, rhizoc		Fresh potential, dented, rhizoc, deep eyes

2018 Preliminary Yield (PYT-2) Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16
Harvest Date: September 26
Fertility: 162-0-200-255 Sulfur
Vine Kill Date: September 7
Days to Vine kill: 99
In-Row Spacing: 9.25 inch

The PYT-2 Specialty Trial evaluates recently selected clones, often only two years removed from single-hill selection. Retained entries are further evaluated in replicated trials at several Oregon locations before advancing (if applicable) to the Tri-State trial which includes testing locations in Washington and Idaho. This trial included 2 standard varieties and 22 entries. The Oregon Potato Variety Development Team chose to advance 9 selections to the Statewide Specialty Trial in 2019 and discarded the remaining selections due to poor performance. **Only retained selections are listed in the following tables.**

Entry	Female Parent	Male Parent
POR16PG17-2	PG3-1	Bulk 2x 2015
POR16PG25-2	POR11PG48-1	Bulk 2x 2015
POR16PG34-1	POR11PG62-6	Bulk
POR16PG35-4	POR13PG111-1	Bulk
POR16PG42-4	D139 x Bulk 4 x C	Terra Rosa
NDOR13136Y-1	ND4659-5R	
OR11157-1	OR04306-5	OR05070-1
OR11157-10	OR04306-5	OR05070-1
NDOR13140B-1	ND4659-5R	ND071179B-10R

2018 Statewide Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16 Vine Kill Date: September 7
Harvest Date: September 26 Days to Vine kill: 99
Fertility: 162-0-200-255 Sulfur In-Row Spacing: 9.25 inch

The Statewide Specialty Trial evaluates selections retained from the PYT-2 Specialty Trial at three locations in Oregon. As mentioned earlier, selections retained from this trial are advanced to the Tri-State Trial, which includes testing locations in Washington and Idaho. Testing locations in Oregon represent diverse climatic conditions (hot, long-season and cool, short-season) which allow for the retention of selections that exhibit stability over multiple locations. Oregon selections remain in the Statewide Trial until they complete Tri-State and Western Regional evaluation or are discarded. Despite a warmer than average growing season and high nematode pressure, potato plots at the KBREC site performed above average. The following is a summary of the Klamath Falls field results. Yields are not adjusted for external blemishes or for internal defects. Such defects are noted under comment section.

Stand Counts

- **45 Day**

  Slow emergence**:** All entries had greater than 97% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

  Most: POR15PG036-3 (22.75), POR15PG034-1 (19.6)
  Least: Yukon Gold (7.2), Chieftain (9.2)

- **Average Tuber Size (oz.)**

  Largest: Yukon Gold (6.1), Chieftain (5.65)
  Smallest: POR15PG036-3 (1.4), POR15PG014-8 (2.1)

- **C Size Tubers (≤ 1.875 inch diameter and <4 oz.) cwt/Acre**

  Most: POR15PG036-3 (173.2), POR15PG014-8 (81.2)
  Least: Yukon Gold (4.5), Chieftain (11.7)

- **B Size Tubers (1.875-2.25 inch diameter and <4 oz.) cwt/Acre**

  Most: POR15PG034-1 (250.0), POR15PG014-8 (246.7)
  Least: Yukon Gold (51.5), Chieftain (77.7)

Yield Data

- **Total Yield (cwt/Acre)**

  Highest: Chieftain (609.2), POR15PG034-1 (527.0)
  Lowest: POR15PG036-3 (384.0), POR15PG014-8 (488.0)

- **US No. 1 Yield (cwt/Acre)**
  Highest: Chieftain (558.0), POR15PG015-3 (491.7)
  Lowest: POR15PG036-3 (347.0), POR15PG014-8 (437.5)

Tuber Defect Incidence (10 tuber-samples per 4 reps, 4-6 oz.)
Brown Center: Chieftain 10%)

Entry	Skin Color	Primary skin color (5 dark)	Flesh Color	Primary flesh color (1-5 dark)	Total Yield*		US # 1's > 0-14 oz.	Culls > 0 oz.***	External Defects (1-5 none)		
					(cwt/A)	Stats**	% of Total Yield		Green	Growth crack	Knobs
Yukon Gold	Y	1.3	Y	2.3	507	AB	89	1.4	4.6	4.8	4.8
Chieftain	R	2.0	Y	1.0	609	A	92	0.9	4.8	4.5	4.3
POR15PG014-8	R/Y	2.4	Y	5.0	488	B	90	7.4	4.4	3.4	4.4
POR15PG034-1	Y	2.0	Y	2.9	527	AB	90	5.5	3.6	4.6	3.9
POR15PG036-3	R	1.6	Y	3.0	384	C	91	7.1	3.6	4.8	4.5
POR15PG015-3	Y	3.0	Y	4.4	518	AB	95	2.5	4.4	4.8	3.8
LSD (0.05)						**103**					

*Percent values may not total 100% due to rounding
**Entries showing the same letter are not significantly different at the 5% level
***Including >14oz. and #2's
**** Internal Defects: HH=hollow heart, SEB=stem end browning, VD= vascular discoloration, BC=brown center
Yields are not adjusted for external blemishes or for internal defects. Such defects are noted under comment section.

Entry	US # 1 Yield							Specific Gravity	Internal Defects (%)****			
	(cwt/A)	STATS**	%*						HH	SEB	VD	BC
			C size	B size	4-6 oz.	6-10 oz.	10-14 oz.					
Yukon Gold	450	A	1	11	19	47	21	1.083	0.00	0.00	0.00	2.50
Chieftain	558	B	2	14	18	40	26	1.074	0.00	0.00	0.00	10.00
POR15PG014-8	438	BC	19	56	21	4	0	1.077	0.00	0.00	0.00	0.00
POR15PG034-1	475	AB	16	53	23	9	0	1.081	0.00	0.00	2.50	2.50
POR15PG036-3	347	C	50	43	7	0	0	1.074	0.00	5.00	2.50	0.00
POR15PG015-3	492	AB	15	46	25	13	1	1.081	0.00	0.00	0.00	7.50
LSD (0.05)		**100**										

Entry	Stand %	Average Tuber		Rhizoc (1-5none)	Russeting (1-5 hvy)	Shape (1-5 long)	Size Uniformity (1-5 best)	Shape Uniformity (1-5 best)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant						
Yukon Gold	97	6.2	7.3	4.1	1.3	2.6	2.9	3.8	3.9
Chieftain	100	5.6	9.2	4.1	2.1	2.8	1.6	2.9	3.5
POR15PG014-8	100	2.1	19.5	3.5	1.4	2.4	2.3	2.1	3.4
POR15PG034-1	99	2.3	19.7	2.8	1.5	3.0	2.4	1.8	3.6
POR15PG036-3	100	1.4	22.8	4.4	1.9	4.8	3.1	3.0	13.4
POR15PG015-3	98	2.4	18.6	4.8	1.0	2.0	3.6	2.9	3.6

Entry	2018 KBREC- Statewide Specialty Comment	Entry	2018 KBREC- Statewide Specialty Comment
Yukon Gold		**Chieftain**	
	erratic size, no yield, shatter bruise, impact bruise		Skinning x4, bronzed x2, shatter
POR15PG014-8		**POR15PG034-1**	
	Dingy skin, growth cracks, erratic pink splash, deep eyes		Erratic shape, rhizoc, impact bruise, drop
POR15PG036-3		**POR15PG015-3**	
No Photo Available	Sprouting x4, bronzing x3, dull and dingy skin		Small, uniform size, sprouting x 2, keep

2018 Tri-State Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16 Vine Kill Date: September 7
Harvest Date: September 26 Days to Vine kill: 99
Fertility: 162-0-200-255 Sulfur In-Row Spacing: 9.25 inch

The Tri-State Specialty Trial evaluates relatively advanced selections originally selected in both Oregon and Idaho. Entries are evaluated for both fresh market and processing potential in Washington, Idaho, and Oregon. Disposition of entries in this trial are determined by the Tri-State Technical Committee and if retained, advance to the Western Regional Russet Trial. Despite a warmer season, potato plots at the KBREC site performed above average. The following is a summary of the Klamath Falls field results. Yields are not adjusted for external blemishes or for internal defects. Such defects are noted under comment section.

Stand Counts

- **30 Day:** All entries had greater than 97% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: POR14PG22-3 (26.1), A08112-7R (18.1)
  Least: Yukon Gold (7.2), Chieftain (9.2)

- **Average Tuber Size (oz.)**
  Largest: Yukon Gold (6.1), Chieftain (5.6)
  Smallest: A08112-7R (2.1), POR14PG22-3 (2.4)

- **C Size Tubers (<1.875 inch diameter and <4 oz.) cwt/Acre**
  Most: POR14PG22-3 (114), A08112-7R (66.5)
  Least: Yukon Gold (4.5), Chieftain (11.7)

- **B Size Tubers (1.875-2.25 inch diameter and <4 oz.) cwt/Acre**
  Most: POR14PG22-3 (366), A08112-7R (117)
  Least: Yukon Gold (51), Chieftain (77)

Yield Data

- **Total Yield (cwt/Acre)**
  Highest: POR14PG22-3 (699), Chieftain (609)
  Lowest: A08112-7R (461), Yukon Gold (507)

- **US No. 1 Yield (cwt/Acre)**
  Highest: POR14PG22-3 (654), Chieftain (558)
  Lowest: A08112-7R (428), Yukon Gold (449)

Tuber Defect Incidence (10 tuber-samples per 4 reps, 4-6 oz.)

Chieftain had a high incidence of brown center (10%) and internal brown spot (5%)

Entry	Skin Color	Primary skin color (5 dark)	Flesh Color	Primary flesh color (1-5 dark)	Total Yield*		US # 1's > 0-14 oz.	Culls > 0 oz.***	External Defects (1-5 none)		
					(cwt/A)	Stats**	% of Total Yield		Green	Growth crack	Knobs
Chieftain		2.0	W	1.0	609	AB	92	1	4.8	4.5	4.3
A08112-7R		3.8	W	1.0	461	C	92	5	4.6	4.9	4.9
Yukon Gold		1.3	Y	2.3	507	BC	89	1	4.6	4.8	4.8
POR14PG22-3		1.6	Y	2.9	699	A	93	2	4.1	4.3	4.8
LSD (0.05)						**111**					

*Percent values may not total 100% due to rounding

**Entries showing the same letter are not significantly different at the 5% level

***Including >14oz. and #2's

**** Internal Defects: HH=hollow heart, SEB=stem end browning, VD= vascular discoloration, IB=impact bruise

Yields are not adjusted for external blemishes or for internal defects. Such defects are noted under comment section.

Entry	US # 1 Yield							Specific Gravity	Internal Defects (%)****			
	(cwt/A)	STATS**	%*						HH	SEB	VD	IB
			C size	B size	4-6 oz.	6-10 oz.	10-14 oz.					
Chieftain	558	AB	2	14	18	40	26	1.074	0.0	0.0	0.0	2.5
A08112-7R	428	C	17	38	31	14	0	1.073	0.0	0.0	0.0	0.0
Yukon Gold	450	BC	1	11	19	47	21	1.083	0.0	0.0	0.0	0.0
POR14PG22-3	654	A	18	56	21	6	0	1.076	0.0	0.0	0.0	0.0
LDS (0.05)		**116**										

**** Internal Defects: HH=hollow heart, SEB=stem end browning, VD= vascular discoloration, IB=impact bruise Yields are not adjusted for external blemishes or for internal defects. Such defects are noted under comment section.

Entry	Stand %	Average Tuber		Rhizoc (1-5none)	Russeting (1-5 hvy)	Shape (1-5 long)	Size Uniformity (1-5 best)	Shape Uniformity (1-5 best)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant						
Chieftain	100	5.6	9.2	4.1	2.1	2.8	1.6	2.9	3.5
A08112-7R	99	2.2	18.2	4.4	1.0	2.0	3.5	3.5	4.0
Yukon Gold	97	6.2	7.3	4.1	1.3	2.6	2.9	3.8	3.9
POR14PG22-3	97	2.4	26.1	2.3	1.3	2.3	2.1	3.3	3.8

Entry	2018 KBREC- Tri-State specialty Comments	Entry	2018 KBREC- Tri-State Specialty Comment
Chieftain		**A08112-7R**	
	Skinning x4, bronzed x2, shatter		nice skin, bright red, uniform size, some mechanical damage
Yukon Gold		**POR14PG22-3**	
	erratic size, no yield, shatter bruise, impact bruise		rhizoc, sprouting, impact bruise x3 erratic size x3

2018 Preliminary Yield (PYT-2) Chip Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16
Harvest Date: September 26
Fertility: 162-0-200-255 Sulfur

Vine Kill Date: September 7
Days to Vine kill: 99
In-Row Spacing: 9.25 inch

The PYT-2 Chip Trial evaluates recently selected clones, often only two years removed from single-hill selection. Retained entries are further evaluated in replicated trials at several Oregon locations before advancing (if applicable) to the Tri-State trial which includes testing locations in Washington and Idaho. 33 selections were evaluated with 9 retained for further evaluation.

Clone	Female Parent	Male Parent
NYORQ2-2	Andover	Waneta
NYORQ2-10	Andover	H25-4
NYORQ6-1	Andover	H25-4
NYORQ6-3	Andover	H25-4
NYORQ6-6	NY140	J100-S
NYORQ11-8	Ivory Crisp	Marcy
NYORN6-8	Ivory Crisp	Marcy
NYORN18-1	E106-4	F16-1
NYORN41-5	A00188-3C	PALLIDA CPC

2018 Statewide Chip Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16 Vine Kill Date: September 7
Harvest Date: September 26 Days to Vine kill: 99
Fertility: 162-0-200-255 Sulfur In-Row Spacing: 9.25 inch

Chipping potatoes comprise a significant portion of Klamath Basin acreage and identification of public varieties suitable for export remains a high priority for Basin producers. Trials were initiated in 2008 and 2009 with funding from the Oregon Potato Commission to identify acceptable chipping varieties for export markets using advanced selections and recently released varieties from the Tri-State, Southwest, North-central, and Eastern breeding programs and have continued annually. In 2016, seven varieties and advanced chipping selections were evaluated for yield, grade, processing quality, and storability to determine their suitability to meet existing export demands for raw product. All field data was collected at the KBREC site. Tubers from each replication were placed in both short and long-term commercial storage with processing evaluations conducted by Gold Dust Farms. Results for 2018 are listed below.

Stand Counts

- **30 Day:** All entries had greater than 97% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

Most: NYOR14Q12-1 (12.6), NYOR14Q9-9 (11.9)
Least: NYOR14Q9-5 (7.3), Atlantic (7.7)

- **Average Tuber Size (oz.)**

Largest: NYOR14Q9-5 (8.3) Atlantic (7.1)
Smallest: AOR13125-2 (4.0), NYOR14Q9-9 (4.0)

- **Undersized Tubers (<4 oz.) cwt/Acre**

Most: NYOR14Q9-9 (230.5), AOR13125-2 (188.0)
Least: NYOR14Q9-5 (88.5), Atlantic (95.7)

Yield Data

- **Total Yield (cwt/Acre)**

Highest: AOR12197-4 (493.2), NYOR14Q12-1 (492.0)
Lowest: AOR13125-2 (381.2), COOR13428-1 (408.7)

- **Marketable Yield >4 oz. (cwt/Acre)**

Highest: NYOR14Q9-9 (230.5), AOR13125-2 (188.7)
Lowest: NYOR14Q9-5 (88.5), Atlantic (97.7)

Tuber Defect Incidence (10 tuber-samples per 4 reps, 6-10 oz.)

- **External Defects:**

Rhizoc: NYOR14Q12-1

Shatter: NYOR14Q12-1
Green: AOR12197-4

- **Internal Defects**

Hollow Heart: NYOR14Q9-5 (15%),
Hard Bite: AOR12197-4 and Atlantic (10%)

Entry	Total Yield		> 4 oz.	< 4 oz.	Culls	Oversize > 14 oz.	Skin color (1-5 dark)
	(cwt/A)	STATS**	% of Total Yield*				
Atlantic	453	A	72	21	3	2	2.6
Snowden	471	A	64	31	2	1	3.1
AOR12197-4	493	A	70	23	4	1	1.8
AOR13125-2	381	A	47	50	2	0	2.1
AOR13125-9	482	A	71	26	2	0	2.5
NYOR14Q9-5	467	A	74	19	4	3	1.8
NYOR14Q9-9	467	A	48	49	2	0	1.5
NYOR14Q12-1	492	A	57	38	4	0	1.9
COOR13270-2	474	A	64	26	2	0	1.8
COOR13428-1	409	A	58	40	2	0	1.6
LDS (0.05)		**131**					

Entry	Yield US # 1 (>4 oz.)				External Defects (1-5 none)			
	(cwt/A)	STATS**	%*		Green	Growth crack	Rhizoc	Shatter
			4-6 oz.	6-14 oz.				
Atlantic	326	A	41	59	4.3	4.4	4.3	4.0
Snowden	304	AB	52	48	4.5	4.9	3.3	4.5
AOR12197-4	344	A	32	68	3.5	4.8	4.1	4.3
AOR13125-2	178	C	70	30	4.4	4.9	2.6	4.5
AOR13125-9	344	A	44	56	4.3	5.0	4.9	4.6
NYOR14Q9-5	345	A	33	67	3.3	4.6	2.4	4.6
NYOR14Q9-9	222	BC	63	37	3.6	5.0	3.4	3.6
NYOR14Q12-1	280	AB	59	41	4.4	4.8	2.6	3.4
COOR13270-2	302	AB	48	52	4.1	5.0	4.1	4.1
COOR13428-1	237	BC	57	43	4.3	4.4	4.3	4.8
LSD (0.05)		**88**						

*Percent values may not total 100% due to rounding

**Entries showing the same letter are not significantly different at the 5% level

Entry	Stand %	Average Tuber		Specific Gravity	Internal Defects (%)***					
		Wt. (oz.)	Number tubers/plant		HH	BC	SEB	VD	HB	IB
Atlantic	99	7.1	7.8	1.091	0.0	0.0	2.5	2.5	10.0	0.0
Snowden	100	5.7	9.4	1.093	0.0	0.0	0.0	7.5	2.5	0.0
AOR12197-4	100	7.0	9.3	1.092	0.0	0.0	2.5	2.5	10.0	0.0
AOR13125-2	100	4.0	9.3	1.088	0.0	0.0	0.0	2.5	5.0	0.0
AOR13125-9	100	6.2	9.3	1.099	0.0	0.0	10.0	0.0	5.0	0.0
NYOR14Q9-5	98	8.4	7.3	1.090	15.0	0.0	0.0	2.5	7.5	2.5
NYOR14Q9-9	100	4.0	12.0	1.092	5.0	0.0	2.5	0.0	0.0	0.0
NYOR14Q12-1	98	4.1	12.7	1.082	5.0	0.0	2.5	7.5	2.5	2.5
COOR13270-2	98	6.0	9.0	1.091	0.0	15.0	0.0	0.0	15.0	0.0
COOR13428-1	97	4.6	9.8	1.092	0.0	2.5	2.5	2.5	5.0	2.5

***Internal Defects: HH=hollow heart, BC= brown center, SEB=stem end browning, VD= vascular discoloration, HB= hard bite, IB= impact bruise

Entry	Rhizoc (1-5 best)	Russeting (1-5 hvy)	Shape (1-5 long)	Size uniformity (1-5 best)	Shape uniformity (1-5 best)	Eye Depth (1-5 shal.)
Atlantic	4.3	2.5	2.8	2.6	3.0	4.0
Snowden	3.3	3.3	2.3	2.9	2.8	2.6
AOR12197-4	4.1	1.5	2.3	2.9	3.1	3.1
AOR13125-2	2.6	1.9	2.1	3.3	2.9	3.9
AOR13125-9	4.9	2.6	2.0	3.4	3.9	3.3
NYOR14Q9-5	2.4	1.6	2.3	2.1	3.3	3.8
NYOR14Q9-9	3.4	1.1	1.9	4.0	3.5	3.5
NYOR14Q12-1	2.6	1.6	2.4	3.4	3.0	4.0
COOR13270-2	4.1	1.8	2.6	3.1	3.0	3.6
COOR13428-1	4.3	1.6	1.9	4.0	4.3	3.9

Entry	2018 KBREC- Statewide Chip Comment	Entry	2018 KBREC- Statewide Chip Comment
Atlantic		**Snowden**	
			
AOR12197-4		**AOR13125-2**	
			
AOR13125-9		**NYOR14Q9-5**	
			
NYOR14Q9-9		**NYOR14Q12-1**	
			
COOR13270-2		**COOR13428-1**	
		No Photo Available	

2018 Regional Chip Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16 Vine Kill Date: September 7
Harvest Date: September 26 Days to Vine kill: 99
Fertility: 162-0-200-255 Sulfur In-Row Spacing: 9.25 inch

Chipping potatoes comprise a significant portion of Klamath Basin acreage and identification of public varieties suitable for export remains a high priority for Basin producers. Trials were initiated in 2008 and 2009 with funding from the Oregon Potato Commission to identify acceptable chipping varieties for export markets using advanced selections and recently released varieties from the Tri-State, Southwest, North-central, and Eastern breeding programs and have continued annually. In 2017 Three varieties and advanced chipping selections were evaluated for yield, grade, processing quality, and storability to determine their suitability to meet existing export demands for raw product. All field data was collected at the KBREC site. Tubers from each replication were placed in both short and long-term commercial storage with processing evaluations conducted by Gold Dust Farms.

Stand Counts

30 Day

Slow emergence: All entries had greater than 99% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

  Most: AOR09034-3 (13.9), AC01144-1W (12.8)
  Least: NDA081453CAB-2C (8.9), Snowden (9.4)

- **Average Tuber Size (oz.)**

  Largest: NDA081453CAB-2C (5.9), Atlantic and Snowden (5.1)
  Smallest: AC01144-1W and AOR09034-3 (3.5)

- **Undersized Tubers (<4 oz.) cwt/Acre**

  Most: AC01144-1W (224), AOR09034-3 (216)
  Least: Atlantic (99), Snowden (115)

Yield Data

- **Total Yield (cwt/Acre)**

  Highest: Snowden (623), AOR09034-3 (617)
  Lowest: NDA081453CAB-2C (462), AC01144-1W (526)

- **Marketable Yield >4 oz. (cwt/Acre)**

  Highest: Snowden (398), Atlantic (340)
  Lowest: AC01144-1W (273), NDA081453CAB-2C (303)

- **% Marketable Yield >4 oz.**

  Highest: AOR09034-3 (79), Snowden (76)

Lowest: AC01144-1W (44), Atlantic (55)

Tuber Defect Incidence (10 tuber-samples per 4 reps, 6-10 oz.)

- **External Defects:**
  Shatter Bruise**:** AOR09034-3
  Greening: Atlantic
- **Internal Defects**

Hard Bite: Atlantic (7.5%)

Impact Bruise: NDA081453CAB-2C (5%)

Entry	Total Yield		> 4 oz.	< 4 oz.	Culls	Oversize > 10 oz.	Skin color (1-5 dark)
	(cwt/A)	STATS**	% of Total Yield*				
Atlantic	552	AB	18	62	6	14	2.0
Snowden	623	A	18	64	3	15	2.5
AC01144-1W	526	BC	43	52	4	1	1.5
AOR09034-3	617	A	35	59	5	1	1.6
NDA081453CAB-2C	462	C	26	66	3	5	1.4
LSD (0.05)		**78**					

Entry	Yield US # 1 (>4 oz.)				External Defects (1-5 none)			
	(cwt/A)	STATS**	%*		Green	Growth crack	Knobs	Shatter
			4-6 oz.	6-10 oz.				
Atlantic	340	AB	47	53	2.9	4.7	4.8	3.8
Snowden	398	A	51	49	4.0	4.9	4.8	4.4
AC01144-1W	273	C	68	32	4.6	5.0	5.0	4.1
AOR09034-3	364	AB	58	42	3.8	4.2	4.4	1.9
NDA081453CAB-2C	303	BC	49	51	4.3	4.5	4.8	3.3
LSD (0.05)	**73**							

*Percent values may not total 100% due to rounding

**Entries showing the same letter are not significantly different at the 5% level

Entry	Stand %	Average Tuber		Specific Gravity	Internal Defects (%)***					
		Wt. (oz.)	Number tubers/plant		HH	BC	SEB	VD	HB	IB
Atlantic	99	5.1	9.5	1.089	2.5	0	0	0	7.5	0.0
Snowden	99	5.1	9.4	1.088	2.5	0	0	0	0.0	0.0
AC01144-1W	100	3.5	12.8	1.072	0.0	0	0	0	2.5	2.5
AOR09034-3	100	3.5	13.9	1.090	0.0	0	0	0	2.5	2.5
NDA081453CAB-2C	99	5.9	8.9	1.083	2.5	0	0	0	0.0	5.0

***Internal Defects: HH=hollow heart, BC=brown center, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, IB=impact bruise

Entry	Rhizoc (1-5 best)	Russeting (1-5 hvy)	Shape (1-5 long)	Size uniformity (1-5 best)	Shape uniformity (1-5 best)	Eye Depth (1-5 shal.)
Atlantic	4.1	1.8	2.9	2.4	3.1	3.6
Snowden	3.3	2.5	2.4	3.0	3.3	2.0
AC01144-1W	4.5	1.5	2.1	4.0	3.8	3.6
AOR09034-3	2.0	1.8	2.4	2.9	2.9	3.8
NDA081453CAB-2C	4.6	1.3	2.3	3.5	3.4	4.0

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Entry	2018 KBREC- Regional Chip Comment	Entry	2018 KBREC- Regional Chip Comment
Atlantic		**Snowden**	
	Erratic size x2, uniform shape, nice skin appearance, some shatter bruise and impact bruise		Deep eyes x 2, thumb nail cracks, erratic size x2, folded bud ends, lenticel scaring
AC01144-1W		**AOR09034-3**	
	Small, nice skin, uniform, thumb nail cracks		Impact bruise, shatter bruise, rhizoc, chicken tracks
NDA081453CAB-2C			
	Shatter bruise x2, impact bruise, uniform shape		

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