

2019

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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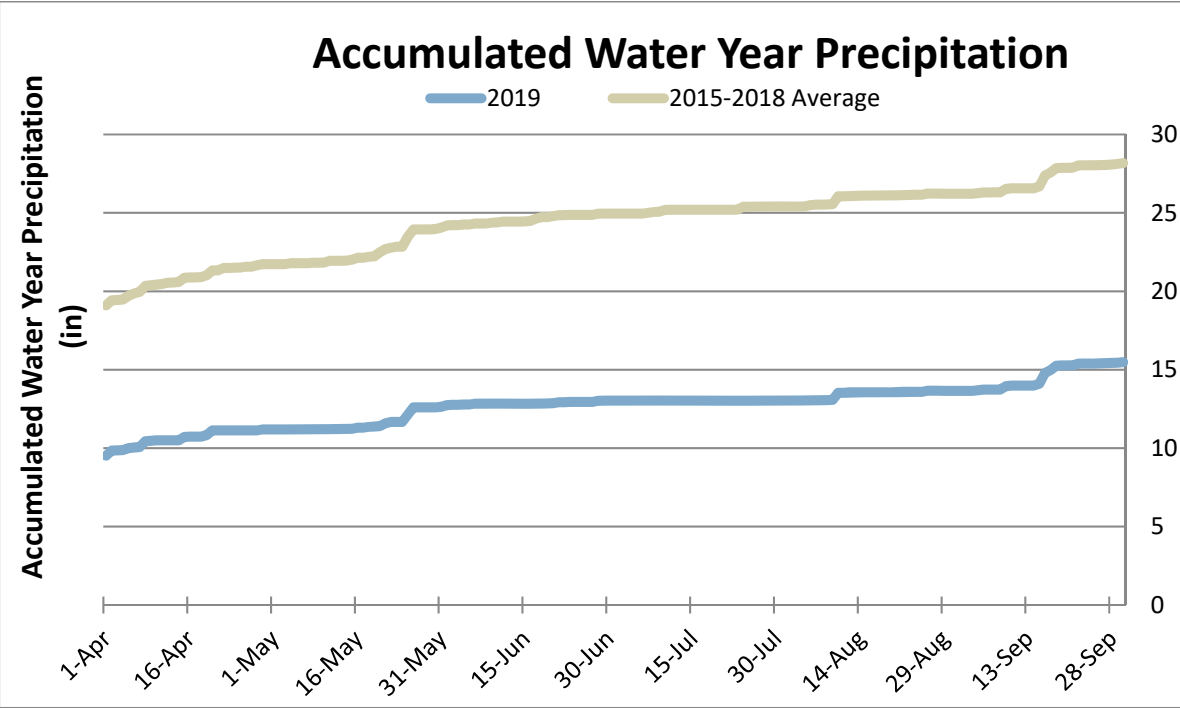
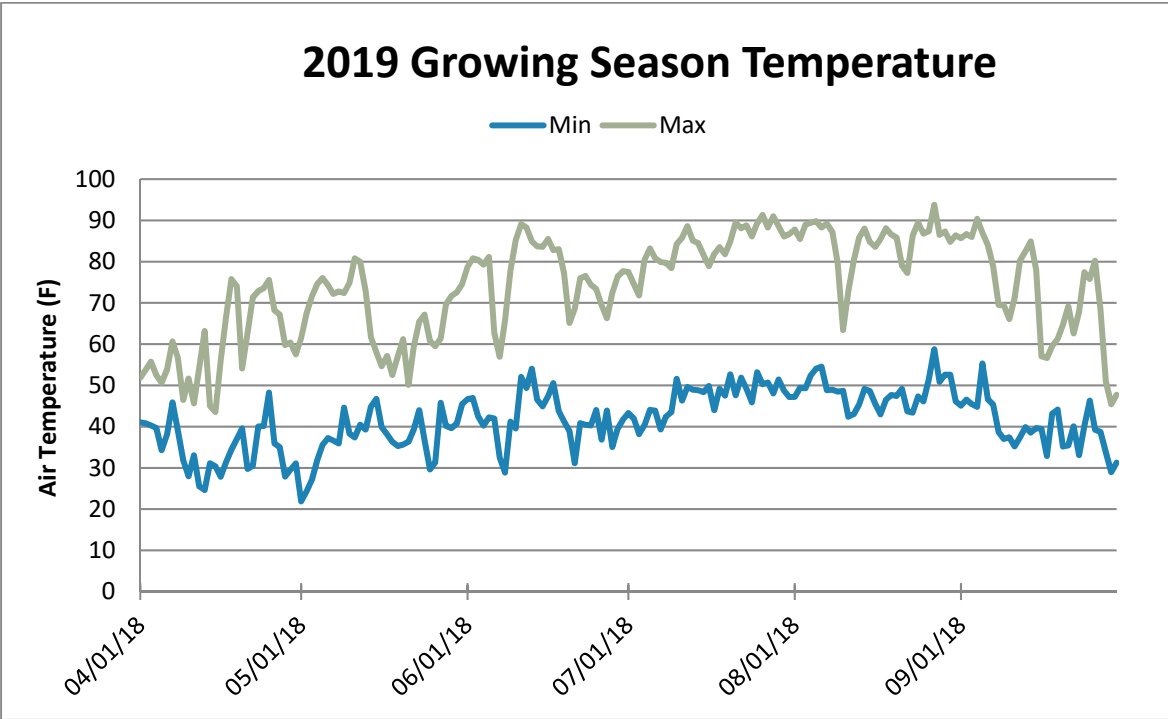
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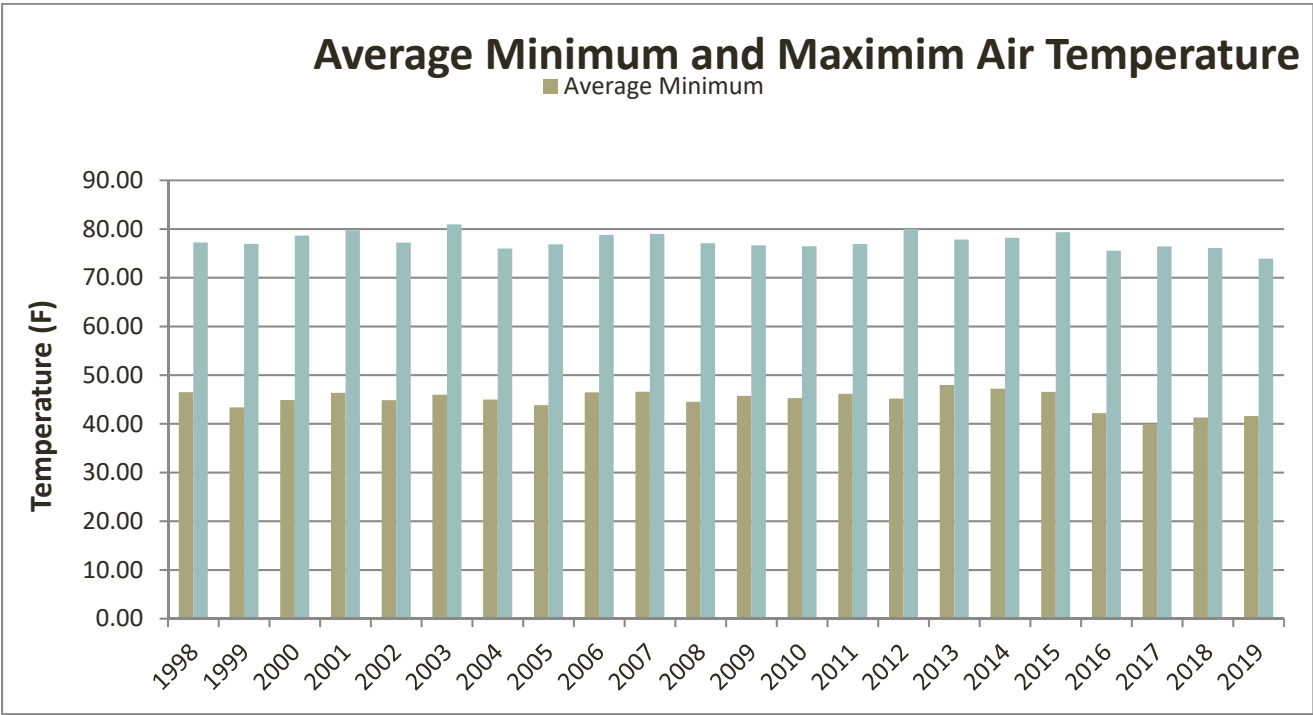
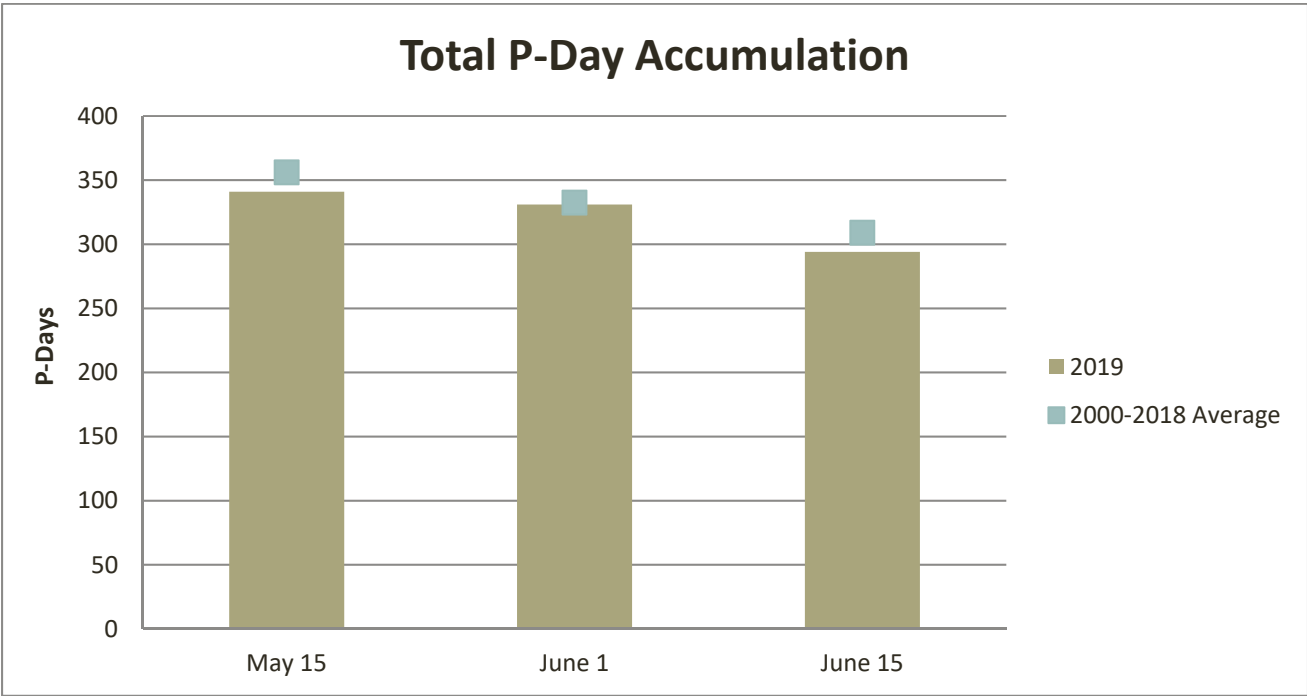
Commissions and Associations

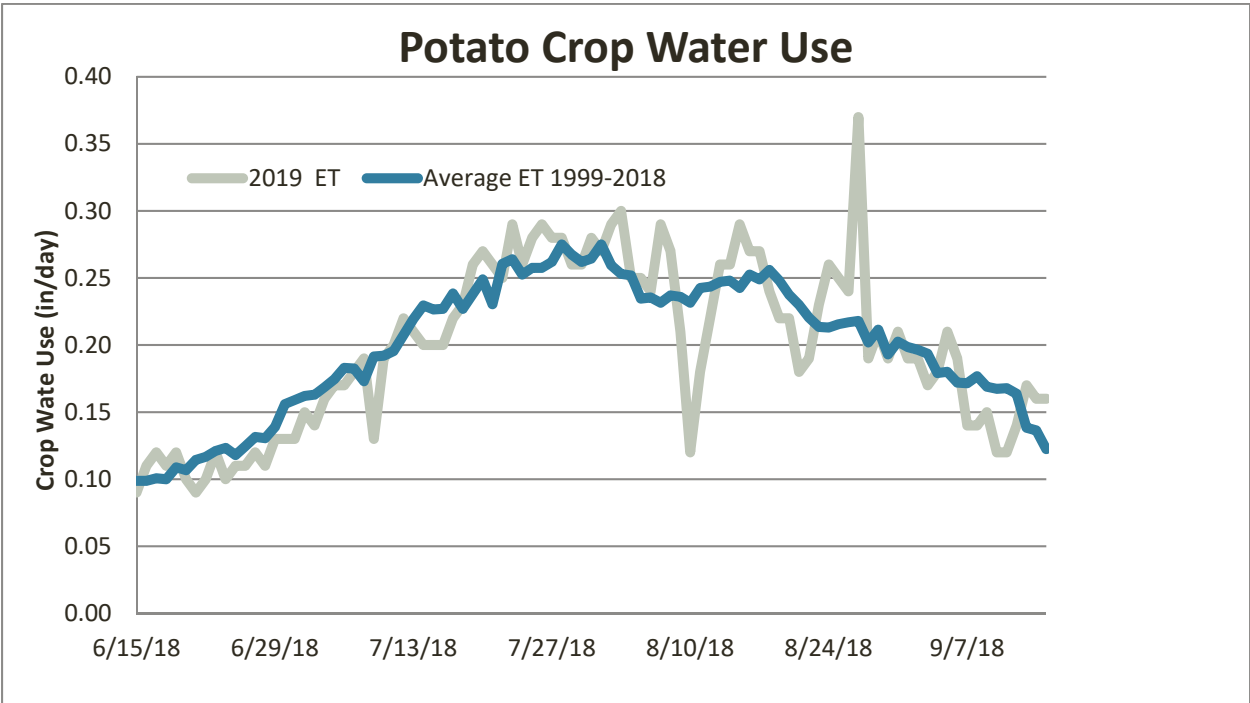
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Weather Data

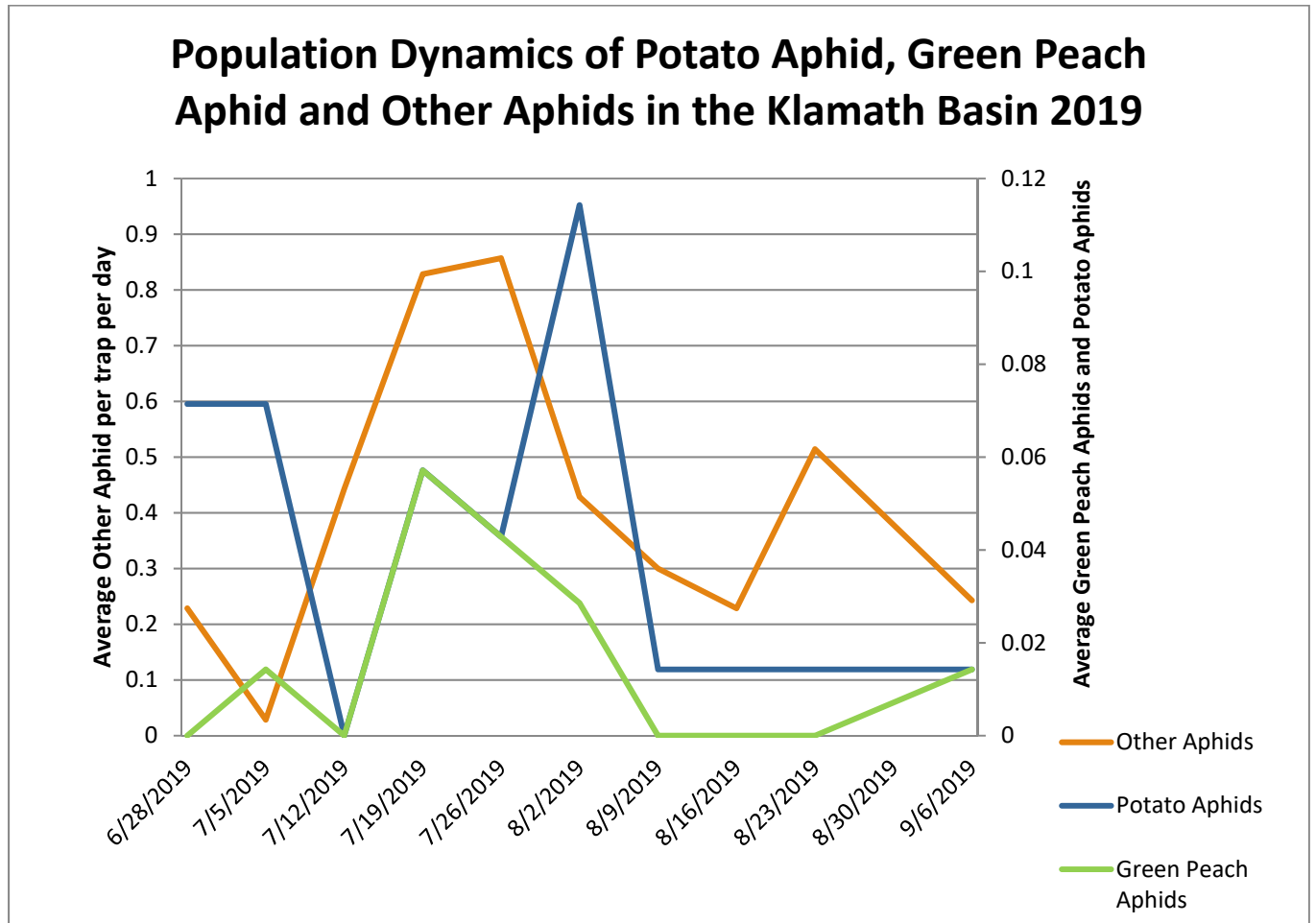


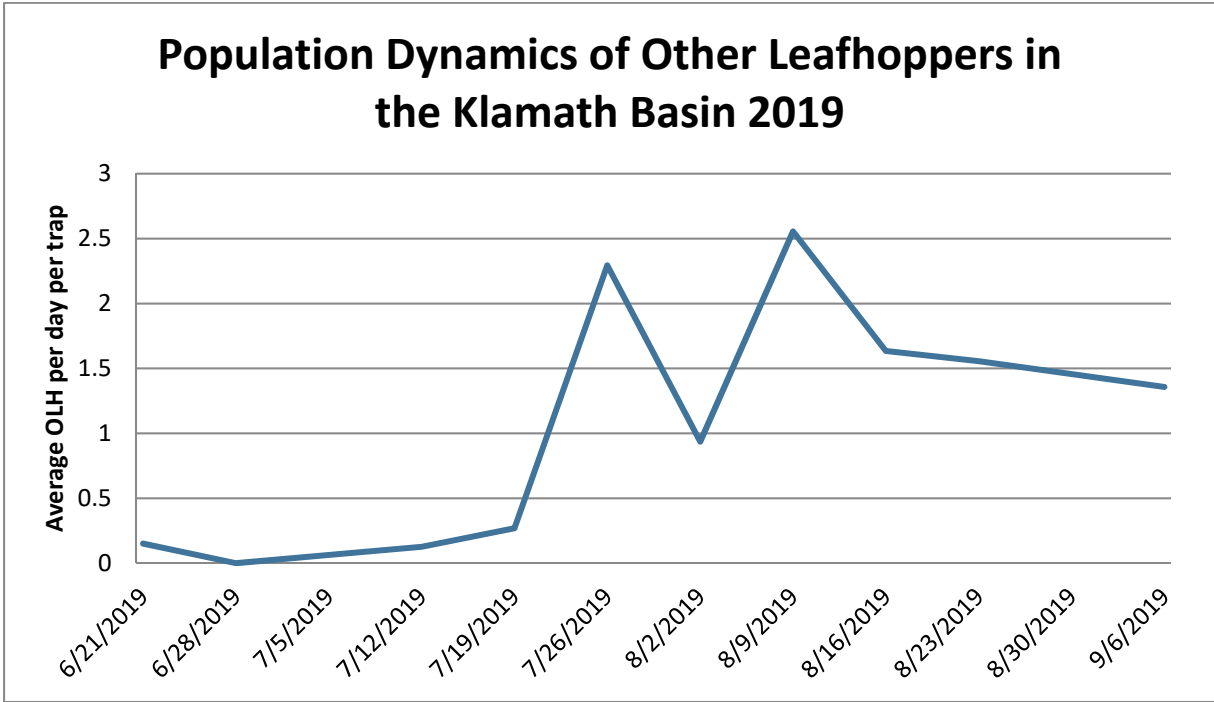
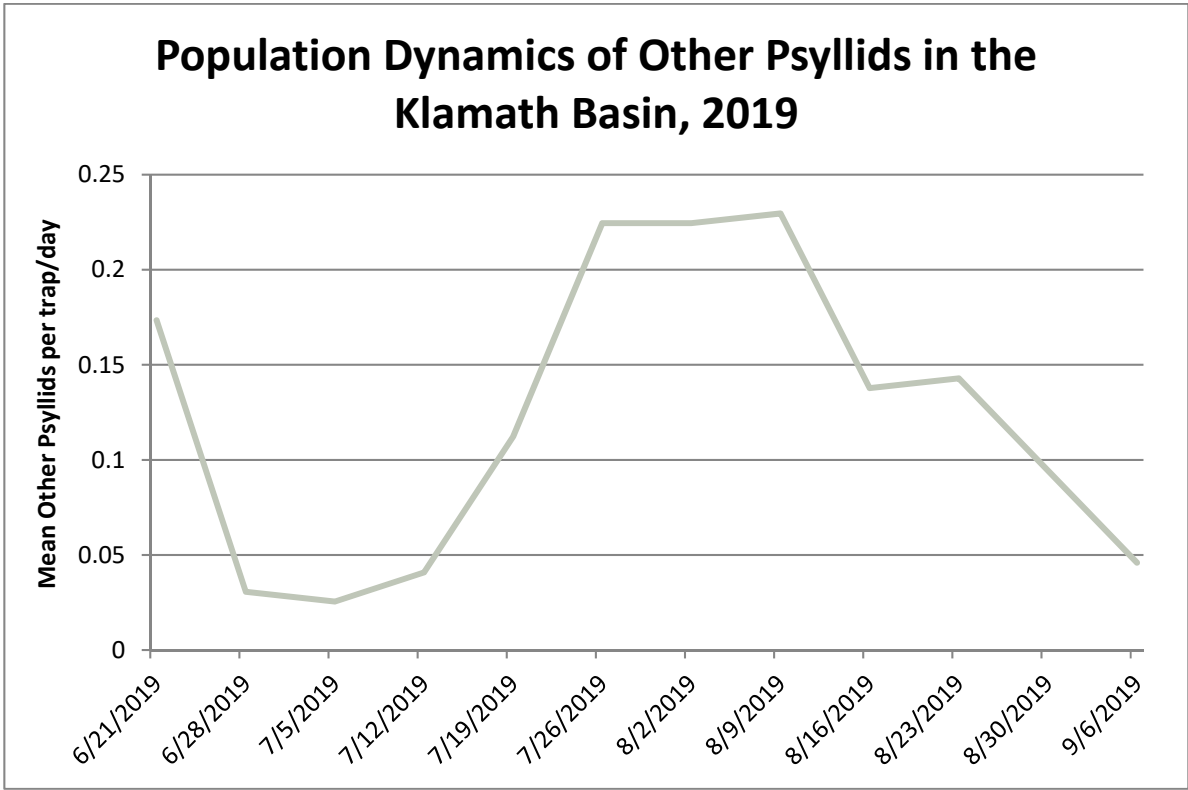


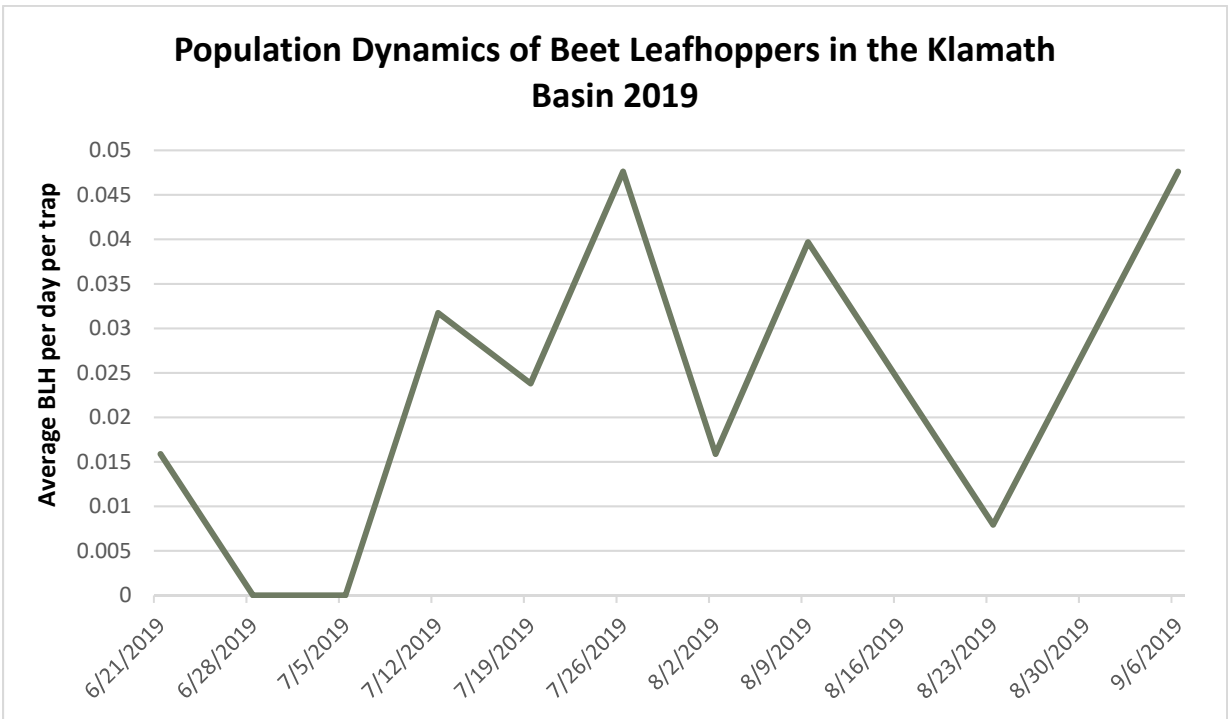


2019 Insect Trapping Results

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 thirteen year trapping program. The following graphs show population dynamic trends for aphids and leafhoppers throughout the growing season.**







Guide to Clone Designation

Example: AC99375-1RU	AC99375-1RU	Breeding Program (A berdeen, ID)
	AC99375-1RU	Selection Site (C olorado)
	AC 99 375-1RU	Year of Cross (1999)
	AC99 375 -1RU	Cross Number (375)
	AC99375- 1 RU	Tuber Selection (1)
	AC99375-1 R U	Russet (Ru)

Location Codes

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

Miscellaneous Designations

B	Chuck B rown's Cross
LS	Low S ugar
P/P	Purple skin/ P urple flesh
R	Red skin
R/R	Red skin/ R ed flesh
R/Y	Red skin/ Y ellow flesh
Ru	R usset
W/Y	White skin/ Y ellow flesh
LB	Late B light resistance
PW/Y	Purple skin with W hite eyes/ Y ellow flesh
P/Y	Purple skin/ Y ellow flesh
P/PW	Purple skin/ P urple and W hite flesh

Single Hill Results

Approximately, sixty-six thousand (66,000) greenhouse-produced seedling tubers were planted at a Rock Creek Ranch five miles west of Running Y Ranch on June 4, 2019. 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 22 families from Oregon State University; 68 from USDA, Prosser, WA; 194 from USDA, Aberdeen, Idaho; 5 from Colorado State University; 6 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 10th. 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	3,635	65	1.7
Oregon State University	Disease resistance, mixed type	7,159	149	2.0
North Dakota	Disease resistance, russet	1036	27	2.6
ARS Aberdeen, ID	Disease resistance, russet	51,511	739	1.4
Colorado State University		2,920	36	1.2
Total		66,261	1,016	1.5

Preliminary Yield (PYT-1) Russet Screening

Six hundred ninety three (693) selections from 2018 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 9, 2019. A team of about 20 research and industry personnel selected 90 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 2020.

Preliminary Yield (PYT-1) Specialty Screening

Forty six (46) selections from 2018 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 9, 2019. A team of about 20 research and industry personnel selected 13 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 2020.

Preliminary Yield (PYT-1) Chip Screening

Seventy seven (77) chip selections from 2018 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 9, 2019. Research and industry personnel selected 6 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 2020. 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

¹Count = tuber number per 50 lb. carton.

²Sales 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.

2019 Replicated Trial Cultural Information

Location: Klamath Falls, OR

Soil Type: Poe fine sandy loam, pH 6.8

Planting Date: 5/20/2019

Vine Kill Date: 9/03/2019 Reglone and Mechanical (vine chop)

Harvest Date: 9/26/2019

Irrigation: Solid-set sprinkler + natural precipitation = 23.23 inches

Plot Length: 25 hills (19.27 ft.)

In-row spacing: 9.25 inches

Row spacing: 36 inches

Number of Reps: 4

Fertilizer: 146-0-182-233

Weed Control: Prowl, Matrix, Outlook

Insecticides: Alias

Fungicides: Vertisan

General Comments:

2019 Preliminary Yield (PYT-2) Russet Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: June 3

Vine Kill Date: September 3

Harvest Date: October 9

Days to Vine kill: 92

Fertility: 146-0-182-233 Sulfur

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 99 new entries. The Oregon Potato Variety Development Team chose to advance 29 selections to the Statewide Russet Trial in 2020 and discarded the remaining selections due to poor performance. **Only retained selections are listed.**

Clone	Female Parent	Male Parent
AOR15002-3	A05084-11	A06914-3CR
AOR15033-2	Blazer Russet	A10007-3
AOR15057-2	A07390-3LB	A10007-3
AOR15067-1	A08009-2TE	A10007-3
AOR15079-9	A09117-3LB	A98345-1
AOR15091-9	AO01114-4	A09004-2TE
AOR15123-1	Dakota Trailblazer	A06084-1TE
AOR15124-1	Dakota Trailblazer	A10007-3
AOR15124-4	Dakota Trailblazer	A10007-3
AOR15124-8	Dakota Trailblazer	A10007-3
AOR15166-2	A07061-6	Dakota Trailblazer
AOR14022-1	AF3317-15	CO99100-1Ru
AOR14029-1	CO99100-1Ru	Premier Russet
AOR12069-3	A02424-83LB	A05084-11
AOR10063-2	A98345-1	Alpine Russet
AOR10071-8	Targhee Russet	AO02183-2
AOR10177-2	AO02183-2	A05012-2T
AOR13020-2	A06015-13TE	Dakota Trailblazer
AOR13020-5	A06015-13TE	Dakota Trailblazer
AOR13020-7	A06015-13TE	Dakota Trailblazer
AOR13057-4	A06029-4T	A98345-1
AOR13082-2	A08069-3	A05084-11
AOR13093-8	AO02183-2	A06084-1TE
AOR15097-19	POR06V12-3	A98345-1
AOR15180-5	A07547-4VR	AF4320-7
AOR15421-4	MN09152BW-01Rus	A10040-3TE
POR17VY2-1	PA00V6-4	Western
POR17VY3-1	PA00V6-4	PA99N2-1
AOR15415-13	A11721-1Y	A10007-3

2019 Statewide Russet Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: May 20

Harvest Date: September 26

Fertility: 146-0-182-233 Sulfur

Vine Kill Date: September 3

Days to Vine kill: 106

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 90% final emergence

Plant and Tuber Growth and Development

➤ Average Tuber Number Per Plant

Most: AOR10129-1 (11.7), AOR11237-1 (11.5)

Least: AOR13064-2 (5.5), AOR10067-6 (5.2)

➤ Average Tuber Size (oz.)

Largest: AOR12082-8 (9.5), AOR14033-1 (9.0)

Smallest: AOR11192-6 (4.5), AOR12157-16 (3.7)

➤ Undersized Tubers (<4 oz.) cwt/Acre

Most: AOR12157-16 (143.0), POR16V2-3 (123.2)

Least: AOR12082-8 (32.0), AOR13011-1 (32.0)

Yield and Economic Data

➤ Total Yield (cwt/Acre)

Highest: AOR10654-11 (729), AOR11847-15 (687.7)

Lowest: AOR12312-15 (456.5), AOR10067-6 (403.2)

➤ US No. 1 Yield (cwt/Acre)

Highest: AOR10654-11 (618.5), AOR11847-15 (584.7)

Lowest: AOR10067-6 (644.5), AOR12157-16 (344.5)

➤ Carton Yield (6-20 oz.) cwt/Acre

Highest:

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Lowest:

➤ **Gross Return (\$/acre)**

Fresh Market Highest:

Fresh Market Lowest:

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

➤ **Hollow Heart**

Notable Defects:

➤ **Corky Ringspot**

Notable Defects: **Vascular Discoloration**

Notable Defects:

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	576	CDEFGHIJ	81	5	13	1	64	369
Russet Burbank	501	HIJKL	71	8	19	3	56	283
Russet Norkotah	491	IJKL	81	2	16	1	59	288
AOR12149-1	628	ABCDE	77	7	13	3	68	430
AOR12344-21	559	CDEFGHIJK	84	2	14	1	61	344
AOR12347-5	549	DEFGHIJ	66	20	14	0	48	264
AOR12350-5	598	BCDEFGHI	81	5	15	0	65	389
AOR13011-1	514	GHIJK	88	2	8	2	79	408
OR13SPC101-8	601	BCDEFGH	77	3	20	0	59	357
AOR13064-2	547	DEFGHIJK	75	3	22	1	50	276
AOR10067-5	493	HIJKL	84	5	8	3	74	365
AOR10067-6	403	L	85	4	15	0	72	290
AOR10093-9	654	ABCD	76	5	19	0	56	369
AOR10093-11	624	ABCDEF	79	8	13	0	59	371
AOR10129-1	662	ABC	75	5	19	1	60	398
AOR10222-3	561	CDEFGHIJK	80	7	13	0	62	346
AOR11027-4	568	CDEFGHIJ	75	3	20	1	56	318
AOR11192-6	575	CDEFGHIJ	77	3	20	1	51	293
AOR11237-1	563	CDEFGHIJK	74	7	20	0	51	286
AOR12082-8	613		76	9	11	4	71	436
AOR14009-3	520	EFGHIJK	82	2	15	1	69	358
AOR14026-3	587	BCDEFGHI	76	7	17	0	58	341
AOR14033-1	631	ABCD	86	2	9	2	76	482
AOR14033-11	502	HIJKL	80	5	15	0	44	223
AOR14033-16	623	ABCDEF	82	4	12	3	62	388
AOR14051-3	516	FGHIJK	86	3	11	0	70	361

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AOR12157-16	471	JKL	68	7	32	0	47	221
AOR13091-2	476	JKL	78	3	18	1	60	287
AOR10603-5	666	ABC	81	5	10	5	72	479
AOR10654-11	729	A	85	3	10	3	68	495
AOR11847-15	688	AB	85	3	10	2	66	455
AOR13113-1	577	CDEFGHIJ	84	1	14	2	61	353
AOR12312-15	457	KL	81	3	16	0	53	243
OR13SP142-2	617	BCDEF	83	1	12	4	68	422
POR16V2-3	500	HIJKL	75	0	25	0	48	243

*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. (Cwt/A)	STATS**	%*			Specific	6-10 oz. tubers****			
			4-6 oz.	6-10 oz	>10 oz	Gravity	HH	IB	CRS	VD
Ranger Russet	467	CDEFGH	21	51	28	1.083	0	0	0	17.5
Russet Burbank	354	IJK	20	56	24	1.078	0	0	0	0
Russet Norkotah	399	FGHIJK	28	59	13	1.069	0	0	0	2.5
AOR12149-1	485	BCDEF	11	50	39	1.076	0	0	0	5
AOR12344-21	468	CDEFGH	27	56	17	1.085	0	0	0	0
AOR12347-5	363	HIJK	27	56	16	1.071	0	2.5	0	2.5
AOR12350-5	484	BCDEFG	20	58	22	1.077	0	0	0	10
AOR13011-1	455	CDEFGH	10	52	37	1.077	0	2.5	0	10
OR13SPC101-8	465	CDEFGH	23	67	10	1.078	0	2.5	0	5
AOR13064-2	408	EFGHIJK	32	56	11	1.085	0	0	0	7.5
AOR10067-5	416	JK	12	57	31	1.070	0	0	0	2.5
AOR10067-6	344	BCDE	16	63	21	1.066	0	0	0	2.5
AOR10093-9	498	BCDEF	26	56	18	1.066	0	5	0	0
AOR10093-11	494	BCDE	25	60	15	1.081	0	0	0	2.5
AOR10129-1	498	CDEFGHIJ	20	48	32	1.077	0	0	0	2.5
AOR10222-3	449	CDEFGHIJ	23	62	16	1.081	0	0	0	2.5
AOR11027-4	428	DEFGHIJK	26	55	19	1.085	0	0	0	10
AOR11192-6	441	CDEFGHIJ	34	60	6	1.086	0	0	0	0
AOR11237-1	416	EFGHIJK	31	50	19	1.083	0	2.5	0	12.5
AOR12082-8	466	CDEFGH	6	44	50	1.070	0	0	0	5
AOR14009-3	428	DEFGHIJK	16	68	15	1.074	0	2.5	0	2.5
AOR14026-3	444	CDEFGHIJ	23	64	13	1.080	0	7.5	0	0
AOR14033-1	545	ABC	12	43	45	1.086	2.5	0	0	7.5
AOR14033-11	399	FGHIJK	44	48	8	1.090	0	0	0	2.5
AOR14033-16	508	BCDEF	24	61	15	1.088	0	2.5	0	0
AOR14051-3	445	CDEFGHIJ	19	60	21	1.083	0	2.5	0	0

Klamath Basin Potato Variety Development Summary 2019

AOR12157-16	323	K	32	58	11	1.080	0	0	0	10
AOR13091-2	371	HIJK	23	57	20	1.083	0	0	0	0
AOR10603-5	537	ABCD	11	42	47	1.086	0	2.5	0	0
AOR10654-11	619	A	20	57	23	1.083	0	0	0	0
AOR11847-15	585	AB	22	41	37	1.073	0	0	0	0
AOR13113-1	484	BCDEFG	27	59	14	1.076	0	0	0	0
AOR12312-15	370	HIKL	34	52	14	1.075	0	0	0	0
OR13SP142-2	511	ABCDE	17	47	35	0.777	0	0	0	5
POR16V2-3	375	GHIJK	35	58	7	1.080	0	0	0	0

*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

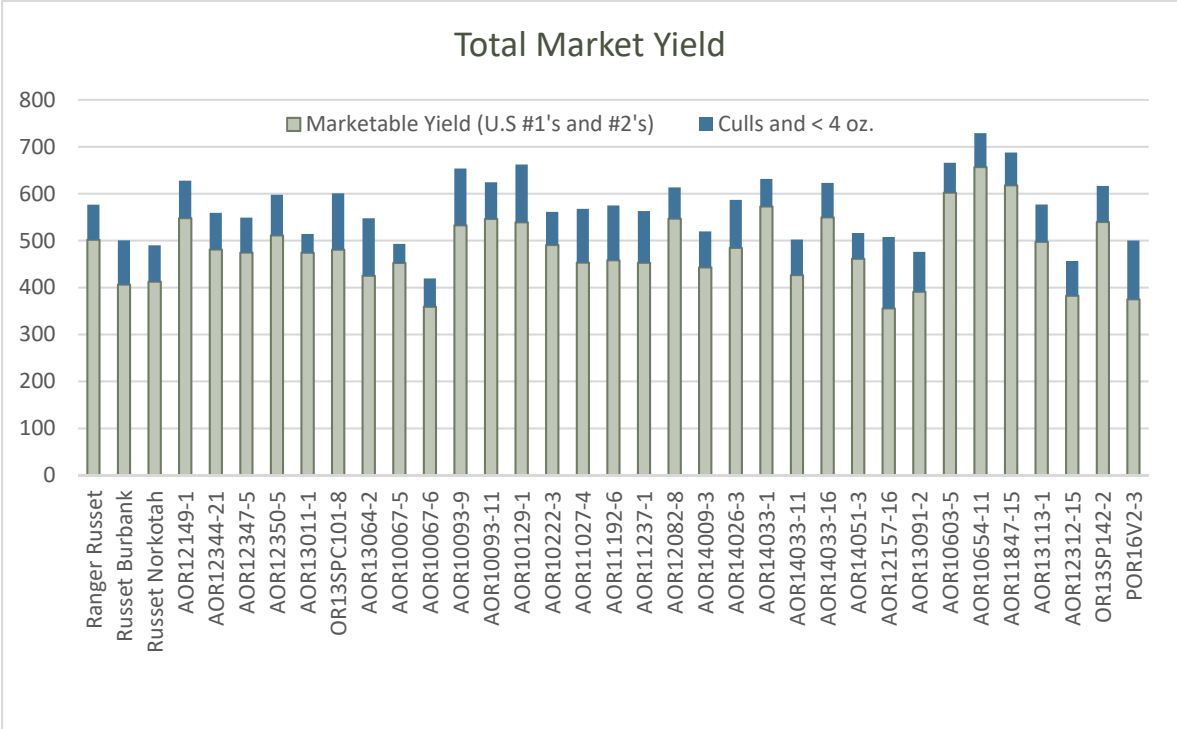
Entry	Stand %	Average Tuber		Growth Cracks (1-5 best)	Rhizoc (1-5none)	Skin Color (1-5 dark)	Russeting (1-5 hvy)	Shape (1-5 long)	Shape Uniformity (1-5 best)	Eye Depth (1-5 shal.)
		Wt. (oz.)	No. tubers/plant							
Ranger Russet	99.0	7.2	7.3	4.4	4.3	3.5	3.4	5.0	3.3	2.9
Russet Burbank	98.0	5.5	8.0	4.4	4.6	3.3	3.3	4.4	3.0	2.8
Russet Norkotah	100.0	5.6	7.4	4.9	4.8	4.5	4.4	4.1	4.1	3.6
AOR12149-1	100.0	7.2	7.4	4.8	4.8	3.3	3.3	4.4	3.3	2.8
AOR12344-21	100.0	5.9	8.2	4.8	5.0	4.3	4.3	4.4	3.4	4.3
AOR12347-5	96.0	5.6	8.8	4.9	4.8	4.0	4.0	3.8	1.6	4.3
AOR12350-5	99.0	6.1	8.8	5.0	4.8	3.4	3.6	4.1	3.6	4.0
AOR13011-1	99.0	6.7	6.7	5.0	5.0	2.1	2.4	4.4	3.9	2.9
OR13SPC101-8	99.0	4.8	10.8	5.0	4.6	3.1	3.1	3.3	3.5	2.8
AOR13064-2	101.0	4.4	10.6	4.8	5.0	3.6	3.6	3.8	3.1	3.9
AOR10067-5	96.0	6.2	7.1	5.0	4.9	4.8	4.8	3.5	2.9	2.5
AOR10067-6	100.0	6.5	5.2	4.8	4.3	5.0	5.0	4.9	3.6	4.3
AOR10093-9	100.0	5.7	9.9	5.0	4.8	4.1	4.1	4.9	4.0	3.4
AOR10093-11	98.0	6.2	8.7	3.8	3.6	2.5	2.8	4.3	2.9	2.4
AOR10129-1	100.0	4.8	11.8	5.0	5.0	3.1	3.1	4.0	3.4	2.9
AOR10222-3	100.0	6.3	7.7	5.0	4.6	5.0	5.0	4.0	3.4	3.4
AOR11027-4	97.0	4.9	10.8	4.9	3.8	4.1	3.9	4.3	4.0	4.3
AOR11192-6	100.0	4.6	11.0	5.0	3.4	3.1	3.1	3.9	3.6	3.8
AOR11237-1	96.0	4.5	11.5	4.5	3.5	71.3	4.4	4.4	3.8	3.5
AOR12082-8	100.0	9.4	5.5	4.6	4.5	3.9	4.0	5.0	3.4	3.4
AOR14009-3	99.0	5.3	8.4	5.0	5.0	3.6	3.8	4.0	3.8	3.9
AOR14026-3	99.0	5.2	10.1	5.0	4.3	3.9	4.3	4.1	3.4	3.6
AOR14033-1	100.0	9.0	6.2	4.5	4.9	3.9	4.0	4.3	3.5	2.6
AOR14033-11	101.0	4.7	9.9	5.0	4.9	4.1	4.1	3.9	4.5	3.3
AOR14033-16	99.0	6.2	8.8	4.9	5.0	4.3	4.6	4.4	3.8	4.3
AOR14051-3	97.0	6.0	7.9	4.1	5.0	2.3	2.3	3.3	3.3	3.5
AOR12157-16	100.0	3.7	10.3	5.0	4.8	3.0	3.0	3.3	3.3	4.4

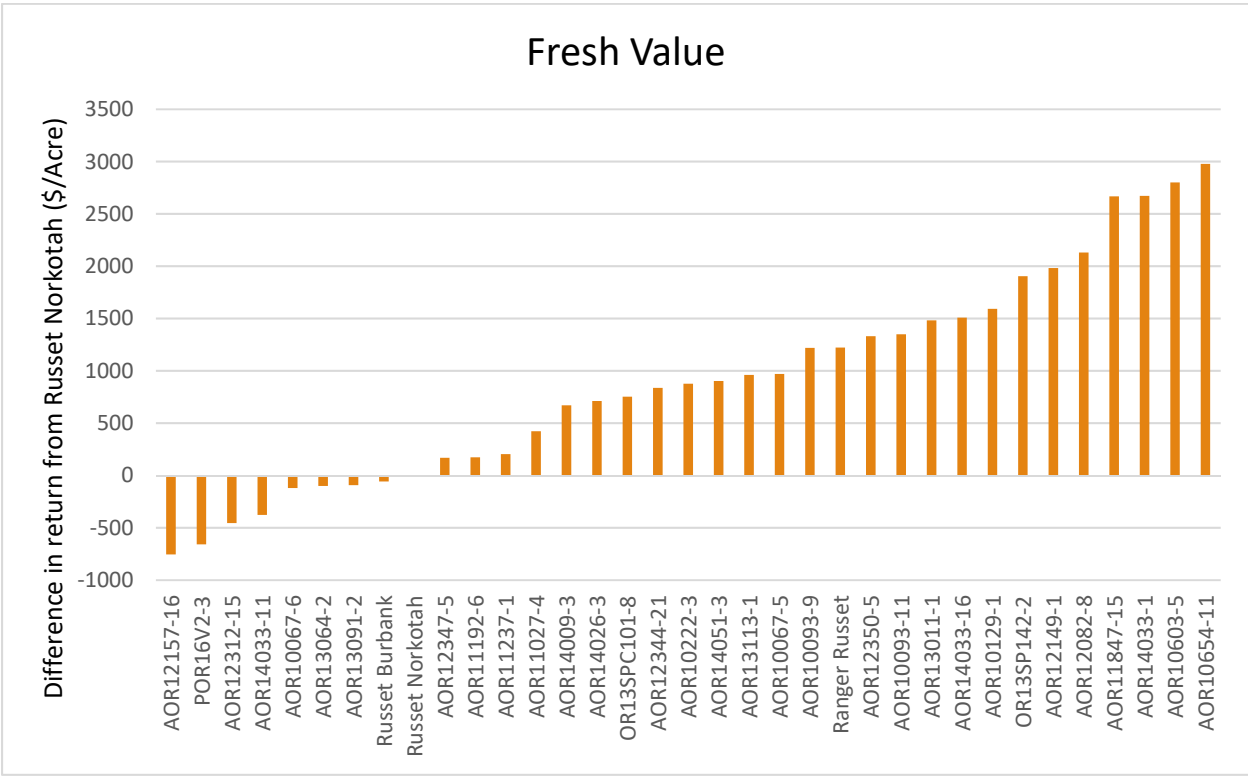
Klamath Basin Potato Variety Development Summary 2019

AOR13091-2	100.0	5.2	7.9	4.9	3.0	2.5	2.6	4.3	3.6	2.8
AOR10603-5	99.0	7.9	7.4	4.8	5.0	4.3	4.9	4.9	3.5	4.5
AOR10654-11	100.0	6.3	9.9	4.5	4.5	3.6	4.0	4.1	3.6	3.3
AOR11847-15	98.0	6.6	9.2	5.0	4.9	3.3	3.1	4.3	3.5	3.8
AOR13113-1	100.0	6.4	8.4	4.8	4.9	4.1	4.4	4.1	4.0	3.1
AOR12312-15	100.0	5.3	7.5	5.0	4.4	2.5	2.9	3.5	3.6	3.4
OR13SP142-2	98.0	7.5	7.2	4.6	4.9	3.8	4.0	4.3	4.0	3.4
POR16V2-3	100.0	4.8	9.1	5.0	5.0	4.3	4.6	3.8	4.3	3.6

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

Entry	2019 KBREC- State Russet Comment	Entry	2019 KBREC- State Russet Comment
Ranger Russet		Russet Burbank	
Russet Norkotah		AOR13064-2 (10)	
AOR10093-9	13	APR10093-11	14
AOR10129-1	15	AOR11027-4	17
AOR10654-11	30		





*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 20

Harvest Date: September 26

Fertility: 146-0-182-233 Sulfur

Vine Kill Date: September 3

Days to Vine kill: 106

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 92% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
Most: COA11013-2 (7.7), AOR11217-3 (7.2)
Least: A10007-3 (4.9), A10595-13sto (4.7)
- **Average Tuber Size (oz.)**
Largest: A10007-3 (9.5), Ranger Russet (8.7)
Smallest: AOR08540-1 (6.5), A09022-4 (5.7)
- **Undersized Tubers (<4 oz.) cwt/Acre**
Most: A09022-4 (111.7), COA11013-2 (106.2)
Least: A10595-13sto (53.2), A1007-3 (31.7)

Yield and Economic Data

- **Total Yield (cwt/Acre)**
Highest:
Lowest:
- **US No. 1 Yield (cwt/Acre)**
Highest: Ranger Russet(486.5), Russet Norkotah (486.5)
Lowest: A09022-4 (283.0), A10595-13sto (275.2)
- **Carton Yield (6-20 oz.) cwt/Acre**
Highest:
Lowest:
- **Gross Return (\$/acre)**
Lowest:
Highest:

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

- **Hollow Heart**
Notable Defects:
- **Vascular Discoloration**
Notable Defects:
- **Brown Center**
Notable Defects:

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*	
Ranger Russet	589	A	83	2	13	2	64	374
Russet Burbank	542	A	79	3	15	3	53	287
Russet Norkotah	570	A	85	2	13	0	64	364
A09022-4	450	AB	63	7	30	0	35	159
A10007-3	492	AB	79	2	9	9	68	335
A10595-13sto	374	B	74	5	21	0	57	214
AOR08540-1	485	AB	72	3	23	3	50	241
AOR10204-3	567	A	76	6	17	1	61	346
AOR11217-3	581	A	79	2	19	0	61	354
COA11013-2	548	A	66	7	25	1	50	277
LSD (0.05)		158						

*Percent values may not total 100% due to rounding

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

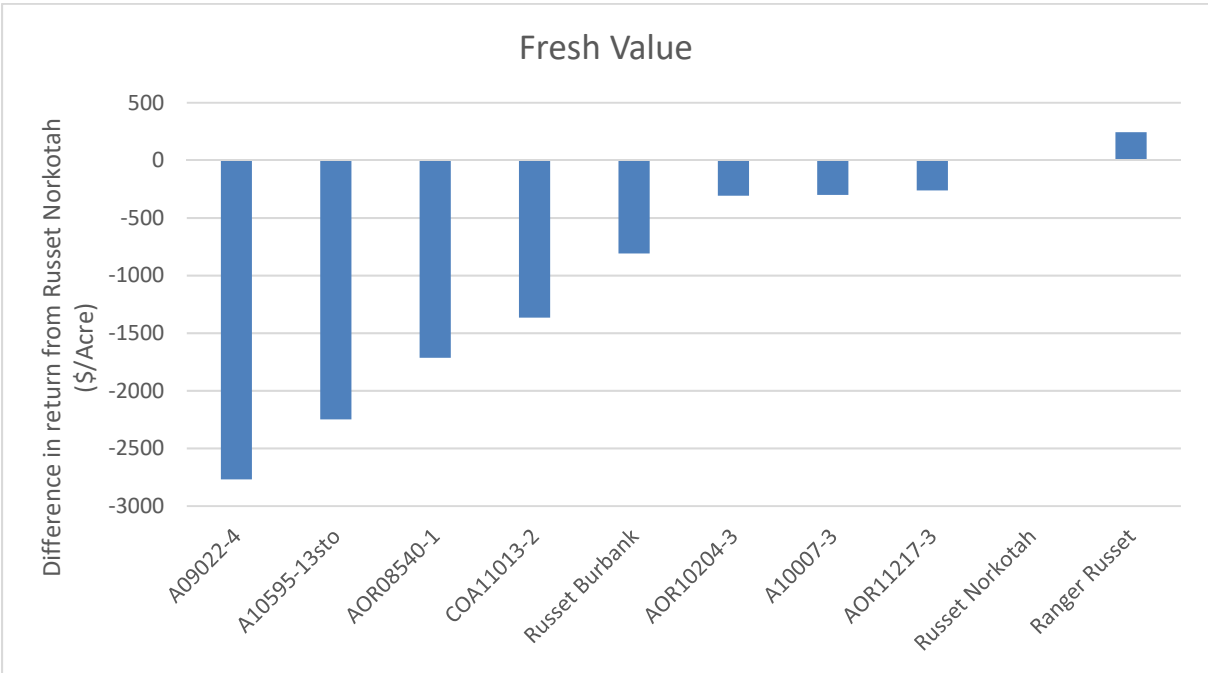
Entry	US # 1 Yield					6-10 oz. Specific Gravity	Internal Defects (%) 6-10 oz. tubers***			
	>4 oz. (cwt/A)	STATS**	%*				HH	BC	SEB	VD
			4-6 oz.	6-10 oz.	>10 oz.					
Ranger Russet	487	A	23	45	32	1.083	0	0	0	0
Russet Burbank	428	AB	33	49	18	1.079	0	0	0	0
Russet Norkotah	487	A	25	53	22	1.071	0	0	0	0
A09022-4	283	C	44	53	3	1.081	0	0	0	0
A10007-3	391	ABC	14	40	46	1.067	0	0	0	0
A10595-13sto	275	C	22	50	28	1.074	0	0	0	0
AOR08540-1	347	BC	31	52	17	1.085	0	0	0	0
AOR10204-3	433	AB	20	51	28	1.072	0	0	0	0
AOR11217-3	459	AB	23	50	27	1.084	0	0	0	0
COA11013-2	363	ABC	24	60	16	1.079	2.5	0	0	0
LSD (0.05)		136								

*Percent values may not total 100% due to rounding

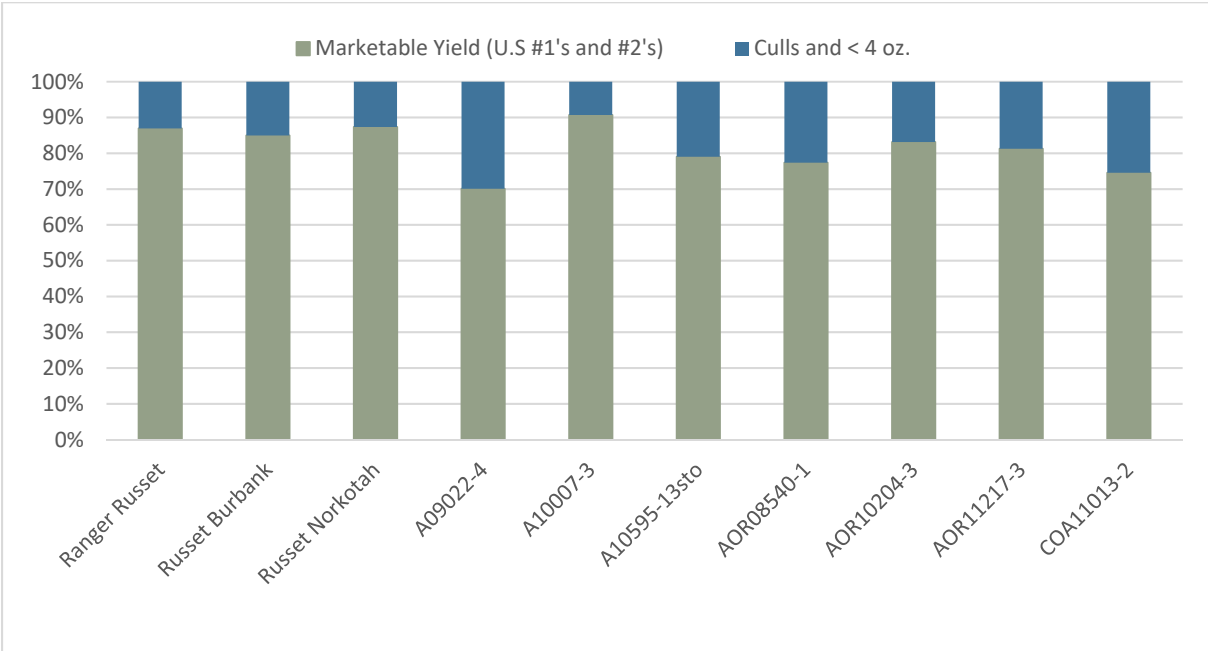
**Entries showing the same letter are not significantly different at the 5% level

***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)	Russetting (1-5 hvy)	Shape (1-5 long)	Shape Uniformity (1-5 best)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant							
Ranger Russet	98.0	8.8	5.8	4.3	4.8	3.9	3.9	5.0	4.4	3.0
Russet Burbank	100.0	7.0	6.7	4.9	5.0	3.9	3.8	4.6	3.4	3.1
Russet Norkotah	100.0	7.5	6.4	4.4	5.0	4.4	4.4	4.3	3.9	3.8
A09022-4	99.0	5.8	6.7	4.3	4.8	2.3	2.3	3.3	2.5	4.6
A10007-3	92.0	9.2	5.0	4.1	5.0	3.1	3.1	4.8	3.9	4.3
A10595-13sto	96.0	6.8	4.7	4.3	4.8	3.5	3.4	3.8	2.1	3.5
AOR08540-1	97.0	6.8	5.8	3.1	4.9	4.4	5.0	4.1	3.5	4.0
AOR10204-3	99.0	7.6	6.4	3.9	4.0	4.0	4.1	4.6	2.4	4.4
AOR11217-3	95.0	7.2	7.2	4.8	5.0	4.3	4.6	4.5	3.9	4.5
COA11013-2	93.0	6.6	7.7	4.3	4.5	4.0	4.8	3.9	2.4	3.8
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	2019 KBREC- Tri-State Russet Comment	Entry	2019 KBREC- Tri-State Russet Comment
Ranger Russet		Russet Burbank	
Russet Norkotah			

2019 Preliminary Yield (PYT-2) Specialty Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: May 20

Harvest Date: September 26

Fertility: 146-0-182-233 Sulfur

Vine Kill Date: September 3

Days to Vine kill: 106

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 11 entries. The Oregon Potato Variety Development Team chose to advance 4 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
POR17PG64-2	POR02PG5-1	POR01PG22-1
COOR15206-1	ND8555-8R	CO05228-4R
COOR15235-1	NDTX5438-11R	CO05228-4R
COOR15235-3	NDTX5438-11R	CO05228-4R

2019 Statewide Specialty Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: May 20

Harvest Date: September 26

Fertility: 146-0-182-233 Sulfur

Vine Kill Date: September 3

Days to Vine kill: 102

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: Yukon Gold (88%), All other entries had greater than 94 % final emergence

Plant and Tuber Growth and Development

➤ Average Tuber Number Per Plant

Most: POR07NCKP1-5 (16.3), POR16PG34-1 (15.2)

Least: OR11157-10 (6.5), Yukon Gold (6.5)

➤ Average Tuber Size (oz.)

Largest: Yukon Gold (6.7), Chieftain (6.2)

Smallest: OR11157-10 (2.5), POR16PG35-4 (1.1)

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

Most: POR16PG35-4 (128.0), POR07NCKP1-5 (56)

Least: Yukon Gold (14.0), Chieftain (8.0)

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

Most: POR16PG34-1 (212.0), POR07NCKP1-5 (214)

Least: Yukon Gold (47.0), POR16PG34-4

Yield Data

➤ Total Yield (cwt/Acre)

Highest: Cheiftain (688.0), POR16PG25-2 (658.2)

Lowest: OR11157-10 (252.7), PRO16PG35-4 (189.7)

➤ **US No. 1 Yield (cwt/Acre)**

Highest: Chieftain (599.2), POR16PG25-2 (596.5)
 Lowest: OR11157-10 (243.5), POR16PG35-4 (181.5)

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

Brown Center:

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
Yukon Gold		1.4	Y	2.0	450	D	90	10	4.5	4.8	4.5
Chieftain		2.5	R	1.0	688	A	87	13	4.3	4.8	4.9
Purple Majesty		5.0	P	4.5	508	DC	88	12	4.9	4.9	4.4
POR16PG17-2		5.0	P	5.0	578	BC	91	9	4.9	5.0	4.6
POR16PG25-2		5.0	P	5.0	658	AB	91	9	5.0	4.5	4.6
POR16PG34-1		1.8	Y	1.3	487	D	95	5	4.8	4.8	4.5
POR16PG35-4		1.5	Y/P	2.5	190	F	96	4	4.4	5.0	4.5
POR16PG42-4		4.0	R	2.8	508	DC	85	15	5.0	4.6	4.1
NDOR13136Y-1		2.9	R	1.0	491	D	87	13	4.8	4.8	4.8
OR11157-1		5.0	P	3.3	311	E	79	21	5.0	5.0	4.1
OR11157-10		5.0	P	4.4	253	EF	96	4	5.0	5.0	5.0
NDOR13140B-1		3.4	R	1.5	475	D	100	0	4.9	5.0	5.0
POR07NCKP1-5		2.0	Y	1.6	635	AB	91	9	3.8	4.4	4.9
LSD (0.05)											

*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.

Klamath Basin Potato Variety Development Summary 2019

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	354	C	1	12	24	42	22	1.080	0.0	0.0	0.0	0.0
Chieftain	524	A	1	11	25	40	22	1.070	0.0	0.0	0.0	5.0
Purple Majesty	269	BC	8	31	34	23	4	1.076	0.0	0.0	2.5	0.0
POR16PG17-2	368	AB	6	24	35	27	9	1.069	0.0	0.0	0.0	0.0
POR16PG25-2	430	A	5	22	28	35	10	1.076	0.0	0.0	2.5	0.0
POR16PG34-1	199	BC	11	46	26	13	4	1.073	0.0	0.0	0.0	0.0
POR16PG35-4	5	D	71	27	3	0	0	1.078	0.0	0.0	0.0	0.0
POR16PG42-4	165	C	13	49	29	9	0	1.075	5.0	0.0	32.5	5.0
NDOR13136Y-1	258	C	6	33	31	26	4	1.062	0.0	2.5	2.5	0.0
OR11157-1	101	D	21	38	31	10	0	1.075	0.0	0.0	0.0	0.0
OR11157-10	79	D	20	48	25	7	0	1.077	0.0	0.0	0.0	0.0
NDOR13140B-1	296	BC	5	32	39	21	2	1.068	0.0	0.0	0.0	0.0
POR07NCKP1-5	306	A	10	37	31	21	1	1.064	0.0	0.0	2.5	10.0
LSD (0.05)												

Entry	Stand %	Average Tuber		Rhizoc (1-5none)	Russetting (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	88.0	6.7	6.5	3.9	1.9	2.8	2.6	3.3	3.6
Chieftain	100.0	6.4	9.1	3.4	1.8	3.1	2.5	3.0	2.5
Purple Majesty	99.0	3.6	12.0	5.0	3.6	3.0	2.1	2.6	3.6
POR16PG17-2	95.0	4.6	11.6	5.0	1.6	3.1	2.1	2.3	2.6
POR16PG25-2	99.0	4.6	12.3	5.0	2.6	3.8	1.9	2.3	2.9
POR16PG34-1	99.0	3.0	14.1	4.4	1.5	1.3	4.0	3.9	2.9
POR16PG35-4	98.0	1.2	14.1	4.4	2.0	1.0	4.6	4.5	4.5
POR16PG42-4	97.0	3.0	15.3	4.1	1.5	2.0	2.3	2.1	3.4
NDOR13136Y-1	94.0	3.8	11.9	4.5	1.0	2.0	2.8	2.6	4.3
OR11157-1	100.0	2.5	10.5	4.3	1.6	5.0	1.8	1.8	4.0
OR11157-10	94.0	2.7	8.6	4.6	1.3	4.9	3.3	4.1	3.8
NDOR13140B-1	99.0	3.8	10.9	5.0	1.0	1.9	3.6	4.1	4.3
POR07NCKP1-5	99.0	3.3	16.4	3.1	1.5	2.9	2.4	2.4	4.5

Entry	2019 KBREC- Statewide Specialty Comment	Entry	2019 KBREC- Statewide Specialty Comment
Yukon Gold		Chieftain	

2019 Tri-State Specialty Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: May 20

Harvest Date: September 26

Fertility: 146-0-182-233 Sulfur

Vine Kill Date: September 3

Days to Vine kill: 92

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 89% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

Most: A08122-12R (13.8), NDA8512C-1R (10.1)

Least: NDA8512C-1R (6.7), Yukon Gold (5.9)

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

Largest: Chieftain (7.6), Yukon Gold (6.8)

Smallest: A08122-9RY (5.3), A08122-12R (3.2)

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

Most: A08122-12R (77.0), A08122-9RY (35.0)

Least: Yukon Gold (4.0), Chieftain (10.0)

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

Most: A08122-12R (197.0), A08122-9RY (179.0)

Least: Yukon Gold (36.0), Chieftain (48.0)

Yield Data

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

Highest: Chieftain (664.7), A08122-9RY (533.0)

Lowest: Yukon Gold, 429.5), NDA8512C-1R (407.0)

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

Highest: Chieftain (566.7), A08122-9RY (518.2)

Lowest: NDA8512C-1R (363.0), Yukon Gold (359.5)

Klamath Basin Potato Variety Development Summary 2019

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

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**			Green	Growth crack	Knobs
							% of Total Yield				
Chieftain	R	3.0	R	1.3	665	A	85	15	4.6	4.1	4.6
A08122-12R	R	3.3	R	1.0	526	B	94	6	4.8	2.6	4.9
NDA8512C-1R	R	3.9	R	1.3	407	C	89	11	4.8	3.5	4.0
A08122-9RY	R	2.3	R	2.5	533	B	97	3	4.0	4.6	5.0
Yukon Gold	Y	1.3	Y	2.5	430	BC	84	16	4.6	5.0	5.0
LSD (0.05)							115				

*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	567	A	2	9	25	44	21	1.073	0	0	0	2.5
A08122-12R	259	A	16	40	22	21	1	1.074	0	0	0	0
NDA8512C-1R	345	B	4	18	25	42	11	1.073	0	0	0	2.5
A08122-9RY	359	A	7	35	29	27	2	1.079	0	0	0	0
Yukon Gold	373	B	1	10	22	41	25	1.087	0	0	0	2.5
LDS (0.05)		113										

**** 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.

Klamath Basin Potato Variety Development Summary 2019

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	98.0	7.7	7.6	3.4	1.3	3.1	1.9	2.3	2.4
A08122-12R	99.0	3.3	13.9	4.1	1.4	1.8	3.3	3.8	3.9
NDA8512C-1R	91.0	5.8	6.7	4.5	1.3	2.5	3.3	2.9	3.6
A08122-9RY	95.0	5.3	10.1	4.1	1.3	2.3	3.5	3.0	3.6
Yukon Gold	89.0	6.8	5.9	4.5	1.5	3.0	1.9	2.5	4.8

Entry 2019 KBREC- Tri-State specialty Comments	Entry 2019 KBREC- Tri-State Specialty Comment

2019 Preliminary Yield (PYT-2) Chip Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: June 4

Harvest Date: October 9

Fertility: 146-0-182-233 Sulfur

Vine Kill Date: September 3

Days to Vine kill: 102

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. 27 selections were evaluated with 7 retained for further evaluation.

Clone	Female Parent	Male Parent
POR17PG57-2	POR03PG46-1	PA97B36-3
NDOR13320CAB-2	ND092217ABC-85	ND7192-1
NDOR1480Y-3	Eva	Dakota Pearl
NDOR14119B-1	Stirling	Dakota Pearl
AOR13124-6	MSR061-1	A03440-2C
AOR13124-7	MSR061-1	A03440-2C
AOR13137-2	Slaney	CO02321-4W

2018 Statewide 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: 92

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

- **45 Day:** All entries had greater than 94% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

Most: NYORN6-6 (12.0), NYOR14Q9-9 (11.1)

Least: NYORQ6-3 (6.7), NYORN18-1 (5.7)

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

Largest: AOR13136-4 and NYORN18-1 (7.3)

Smallest: NYOR14Q9-9 (4.6), NYORN6-8 (4.4)

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

Most: NYOR14W9-9 (161.7), NYORN6-8 (150.5)

Least: NYORQ6-6 (35.7), NYORN18-1 (30.7)

Yield Data

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

Highest: AOR13136-4 (667.0), Snowden (623.0)

Lowest: Atlantic (474.2), NYORN18-1 (470.5)

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

Highest: AOR13136-4 (515.5), Snowden (498.7)

Lowest: Atlantic (387.7), NYORN18-1 (349.5)

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

- **External Defects:**
 - Rhizoc: NYOR14Q9-5
 - Shatter: NYORN18-1
 - Green: AOR12197-4

- **Internal Defects**
 - Hollow Heart:
 - Hard Bite:

Entry	Total Yield		> 4 oz.	< 4 oz.	Culls	Oversize > 14 oz.	Skin color (1-5 dark)
	(cwt/A)	STATS**					
Atlantic	474	C	82	10	3	5	1.8
Snowden	623	AB	80	16	1	2	2.4
AOR12197-4	605	AB	73	15	4	8	2.0
AOR13136-4	667	AB	77	6	3	14	1.3
NYOR14Q9-5	601	AB	68	27	3	2	1.3
NYOR14Q9-9	579	AB	79	15	5	2	1.5
COOR13270-2	579	B	79	15	5	2	1.4
NYORQ2-2	586	AB	73	11	8	8	1.6
NYORQ6-3	546	BC	80	8	2	9	1.8
NYORQ6-6	560	B	79	6	2	12	2.0
NYORN6-8	618	AB	73	24	2	0	1.6
NYORN18-1	470	C	74	7	3	16	1.4
NYORN41-5	592	AB	81	10	3	6	1.9
LDS (0.05)							

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	388	DE	25	75	4.6	5.0	4.4	3.9
Snowden	499	AB	40	60	4.9	5.0	3.5	5.0
AOR12197-4	444	ABCD	24	76	2.6	4.8	4.6	4.8
AOR13136-4	515	A	18	82	4.6	4.6	5.0	4.6
NYOR14Q9-5	411	ABC	46	54	4.0	5.0	2.3	4.5
NYOR14Q9-9	455	CDE	29	71	3.9	4.9	4.3	3.9
COOR13270-2	455	ABCD	29	71	3.6	4.3	3.6	4.8
NYORQ2-2	427	BCD	26	74	4.5	4.6	5.0	4.1
NYORQ6-3	439	BCD	20	80	4.3	5.0	4.8	4.4
NYORQ6-6	443	ABCD	19	81	4.6	4.8	5.0	4.9
NYORN6-8	453	ABCD	42	58	4.6	5.0	5.0	5.0
NYORN18-1	350	E	14	86	4.1	4.6	4.6	2.1
NYORN41-5	480	ABC	27	73	4.0	5.0	5.0	5.0
LSD (0.05)								

*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	98.0	5.6	7.5	1.087	2.5	0	0	0	5	0
Snowden	100.0	5.4	9.9	1.086	0	0	0	2.5	2.5	0
AOR12197-4	99.0	5.7	9.0	1.088	0	2.5	0	0	2.5	0
AOR13136-4	100.0	7.4	7.7	1.081	0	0	0	0	7.5	0
NYOR14Q9-5	97.0	6.7	7.9	1.086	0	2.5	0	0	5	0
NYOR14Q9-9	100.0	4.6	11.1	1.088	0	0	0	0	0	0
COOR13270-2	94.0	5.1	10.2	1.083	0	0	0	0	2.5	0
NYORQ2-2	101.0	6.5	7.6	1.081	0	0	0	0	0	0
NYORQ6-3	100.0	6.9	6.8	1.082	0	0	0	0	2.5	0
NYORQ6-6	99.0	7.0	6.9	1.081	5	0	0	0	2.5	0
NYORN6-8	99.0	4.5	12.0	1.076	0	0	0	0	12.5	0
NYORN18-1	96.0	7.3	5.8	1.072	0	0	0	0	0	0
NYORN41-5	98.0	5.8	8.9	1.093	2.5	0	0	5	2.5	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	4.4	1.5	2.3	3.3	3.8	3.8
Snowden	3.5	2.9	2.3	3.1	3.1	1.6
AOR12197-4	4.6	1.5	2.3	2.8	3.4	3.5
AOR13136-4	5.0	1.4	2.4	2.1	3.0	3.8
NYOR14Q9-5	2.3	1.3	2.5	2.3	3.0	3.8
NYOR14Q9-9	4.3	1.3	2.1	3.0	3.8	3.6
COOR13270-2	3.6	1.3	2.6	2.8	2.4	3.5
NYORQ2-2	5.0	1.6	2.1	2.6	3.5	3.9
NYORQ6-3	4.8	1.6	2.1	3.9	4.0	3.4
NYORQ6-6	5.0	2.0	2.3	3.4	4.1	3.9
NYORN6-8	5.0	2.0	2.4	3.9	3.1	2.9
NYORN18-1	4.6	1.3	2.5	2.3	3.5	4.1
NYORN41-5	5.0	2.0	2.5	3.3	3.9	3.5

Entry	2018 KBREC- Statewide Chip Comment	Entry	2018 KBREC- Statewide Chip Comment

2019 Regional Chip Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: May 20

Vine Kill Date: September 3

Harvest Date: September 26

Days to Vine kill: 102

Fertility: 146-0-182-233 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. 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

45 Day

Slow emergence: AOR12197-4 (82.0) All other entries had greater than 95% final emergence.

Plant and Tuber Growth and Development

➤ Average Tuber Number Per Plant

Most: CO10073-7W (9.1), CO10073-7W (9.9)

Least: Snowden (7.7), Atlantic (6.5)

➤ Average Tuber Size (oz.)

Largest: Atlantic (7.1), Snowden (7.0)

Smallest: CO10073-7W and CO10076-4W (5.5)

➤ Undersized Tubers (<4 oz.) cwt/Acre

Most: Snowden (138.2), CO10076-4W (108.5)

Least: CO10073-7W (108.2), Atlantic (89.5)

Yield Data

➤ Total Yield (cwt/Acre)

Highest: Snowden (609.7), CO10076-4W (534.0)

Lowest: Atlantic (522.2), CO10073-7W (410.7)

➤ Marketable Yield >4 oz. (cwt/Acre)

Highest: Snowden (448.5), Atlantic (387.7)

Lowest: CO10076-4W (324.2), CO10073-7W (278.0)

➤ % Marketable Yield >4 oz.

Highest:

Lowest:

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

➤ **External Defects:**

Shatter:

Greening:

➤ **Internal Defects**

Hard Bite:

Impact Bruise:

Entry	Total Yield		> 4 oz.	< 4 oz.	Culls	Oversize > 10 oz.	Skin color (1-5 dark)
	(cwt/A)	STATS**	% of Total Yield*				
Atlantic	522	B	288	89	8	134	2.4
Snowden	610	A	395	138	11	66	2.9
CO10073-7W	411	C	255	108	22	23	1.8
CO10076-4W	534	B	308	109	21	74	1.9
LSD (0.05)		51.7					

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	288	AB	43	57	3.4	5.0	5.0	3.9
Snowden	395	A	53	47	3.5	4.9	5.0	4.3
CO10073-7W	255	C	43	57	2.9	3.6	4.3	3.9
CO10076-4W	308	BC	51	49	4.9	4.6	5.0	3.3
LSD (0.05)		81.1						

*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	95.0	7.2	6.5	1.091	0	0	0	0	0	0
Snowden	97.0	7.0	7.7	1.084	2.5	0	0	0	0	0
CO10073-7W	82.0	5.5	8.0	1.081	0	0	0	0	0	0
CO10076-4W	95.0	5.5	9.1	1.071	0	0	0	0	0	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 hv)	Shape (1-5 long)	Size uniformity (1-5 best)	Shape uniformity (1-5 best)	Eye Depth (1-5 shal.)
Atlantic	4.1	2.6	2.8	2.6	4.0	4.3
Snowden	3.1	3.1	2.5	2.9	3.3	2.3
CO10073-7W	4.1	1.8	2.1	3.0	3.5	3.5
CO10076-4W	3.8	1.9	2.1	3.0	3.1	4.6

Entry	2019 KBREC- Regional Chip Comment	Entry	2019 KBREC- Regional Chip Comment

2018 Regional Chip Processing Results

2017 Chip processing data from storage was included in the 2016 report. The processing results of the 2018 Chip Variety Trial are included in the following graphs. Potatoes were processed in April 2019.

Likewise, 2019 processing data will be included in the 2020 report.

Entry	Specific Gravity Field ¹	Fry Color	TDF % ²	Sugars	
				Dextrose	Sucrose
Atlantic	1.089	67	1.3	.20	.11
Snowden	1.088	70	.63	.11	.03
AC01144-1W	1.072	70	.92	.15	.11
AOR09034-3	1.090	70	1.7	.13	.05
NDA081453CAB-2C	1.083	54	.98	.39	.36

2018 State Chip Processing Results

Entry	Specific Gravity Field ¹	Fry Color	TDF % ²	Sugars	
				Dextrose	Sucrose
Atlantic	1.091	57	1.57	.228	.304
Snowden	1.093	70	1.53	.144	.028
AOR12197-4	1.092	57	.74	.288	.335
AOR13125-2	1.088	70	.77	.169	.053
AOR13125-9	1.099	70	.83	.232	.080
NYOR14Q9-5	1.090	70	1.57	.130	.021
NYOR14Q9-9	1.092	54	1.41	.269	.412
NYOR14Q12-1	1.082	70	.67	.134	.070
COOR13270-2	1.091	70	1.36	.149	.061
COOR13428-1	1.092	70	.60	.154	.043
MSX540-4	1.088	67	.96	.235	.105

¹Specific gravity measured out of field and after storage for 2 months at 50° F.

² % Total Defects = % of finished chips out of grade; includes internal & external defects (e.g. HH, Green, Dark Color, etc.)

³Percent fresh weight basis measured after storage for 2 months at 50° F.

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