2021

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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Cam Curtiss, Klamath Falls, OR

Commissions and Associations

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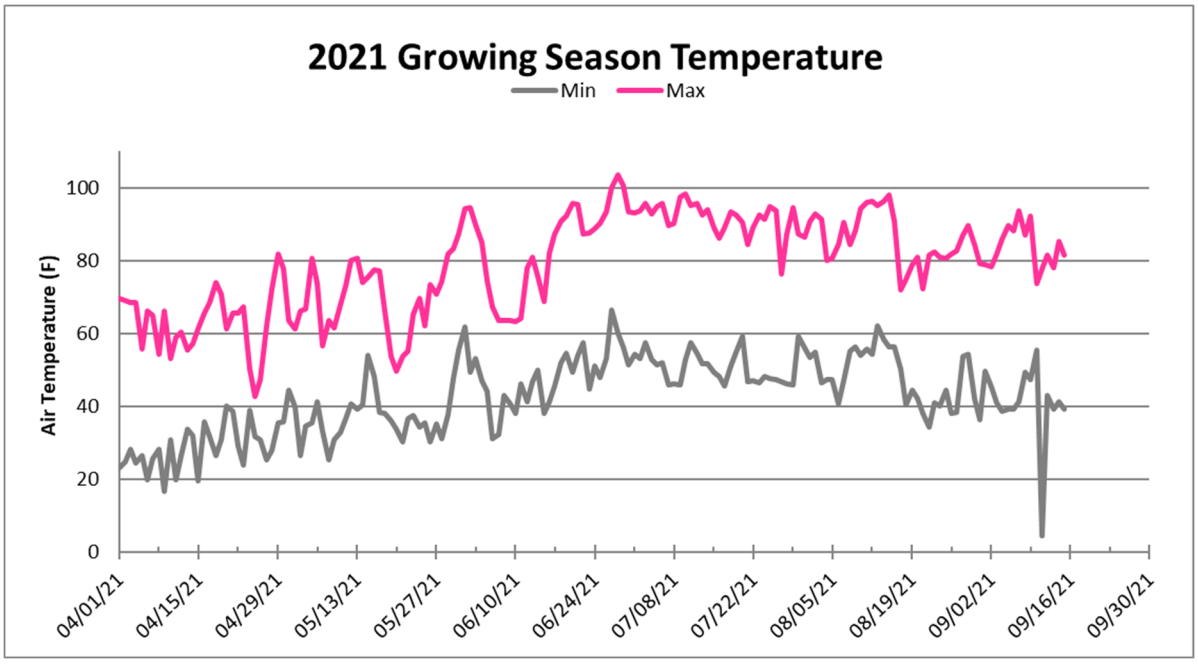
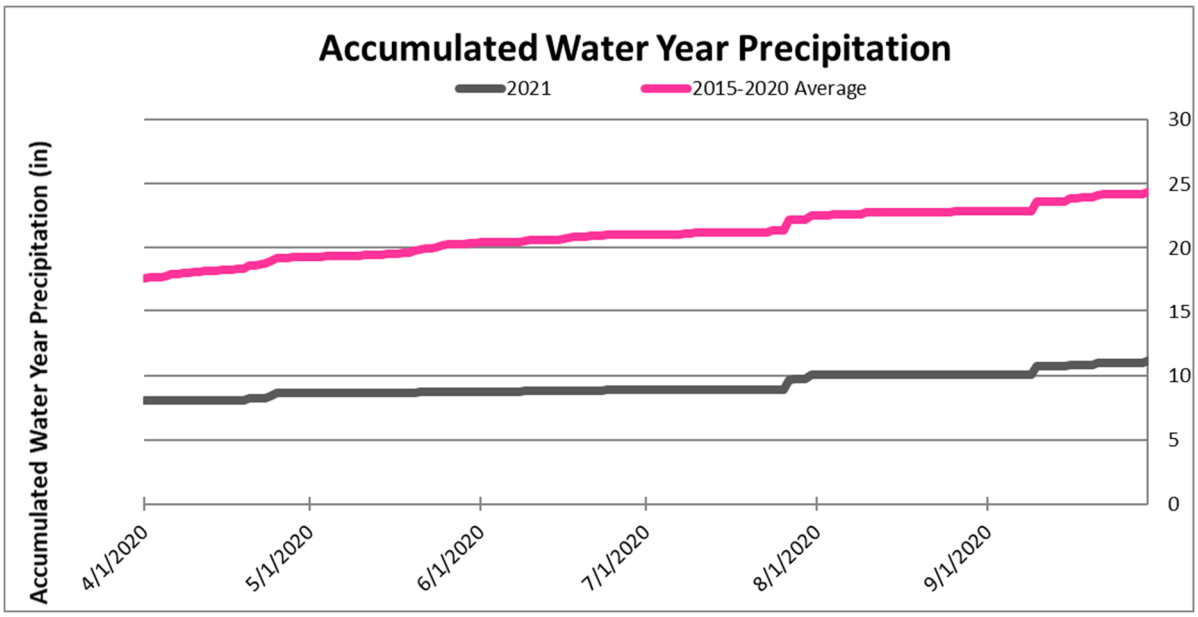
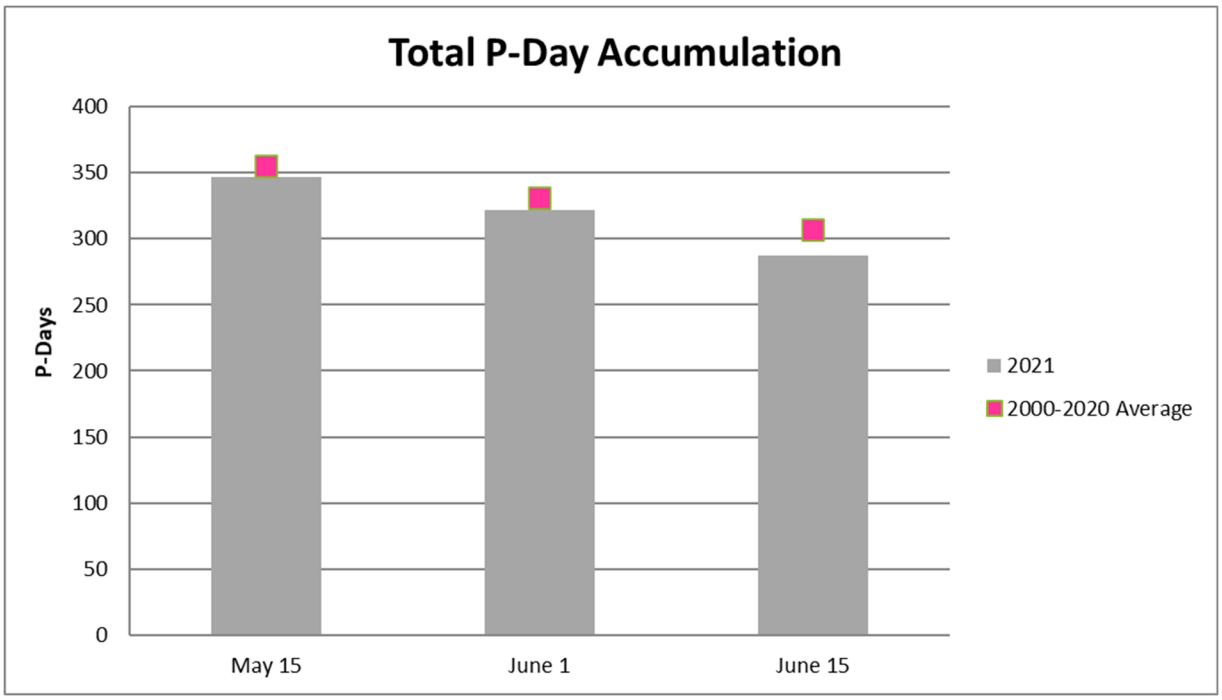
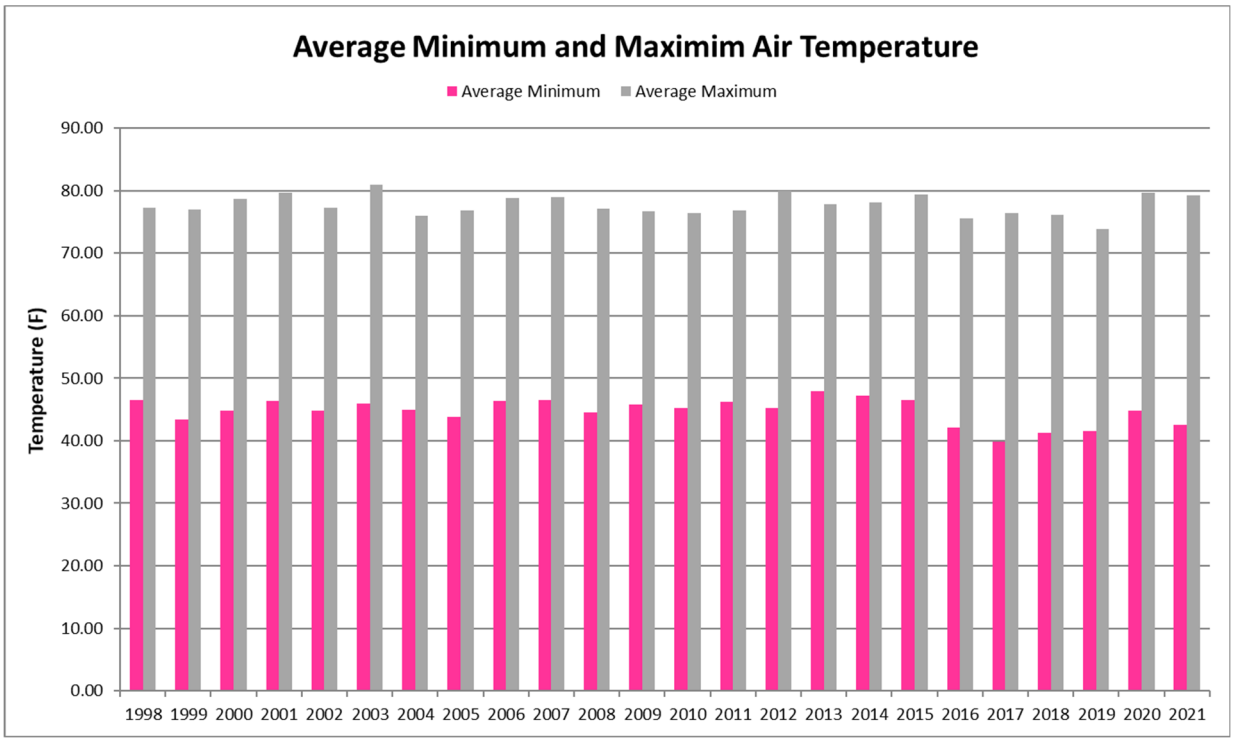
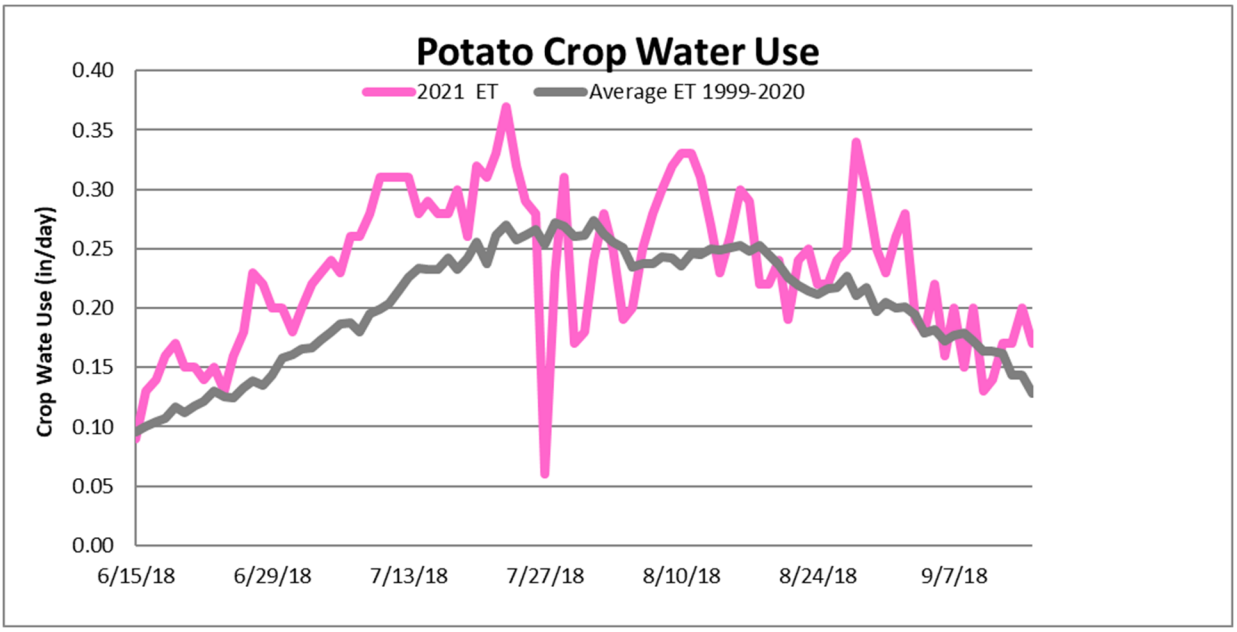
Weather Data





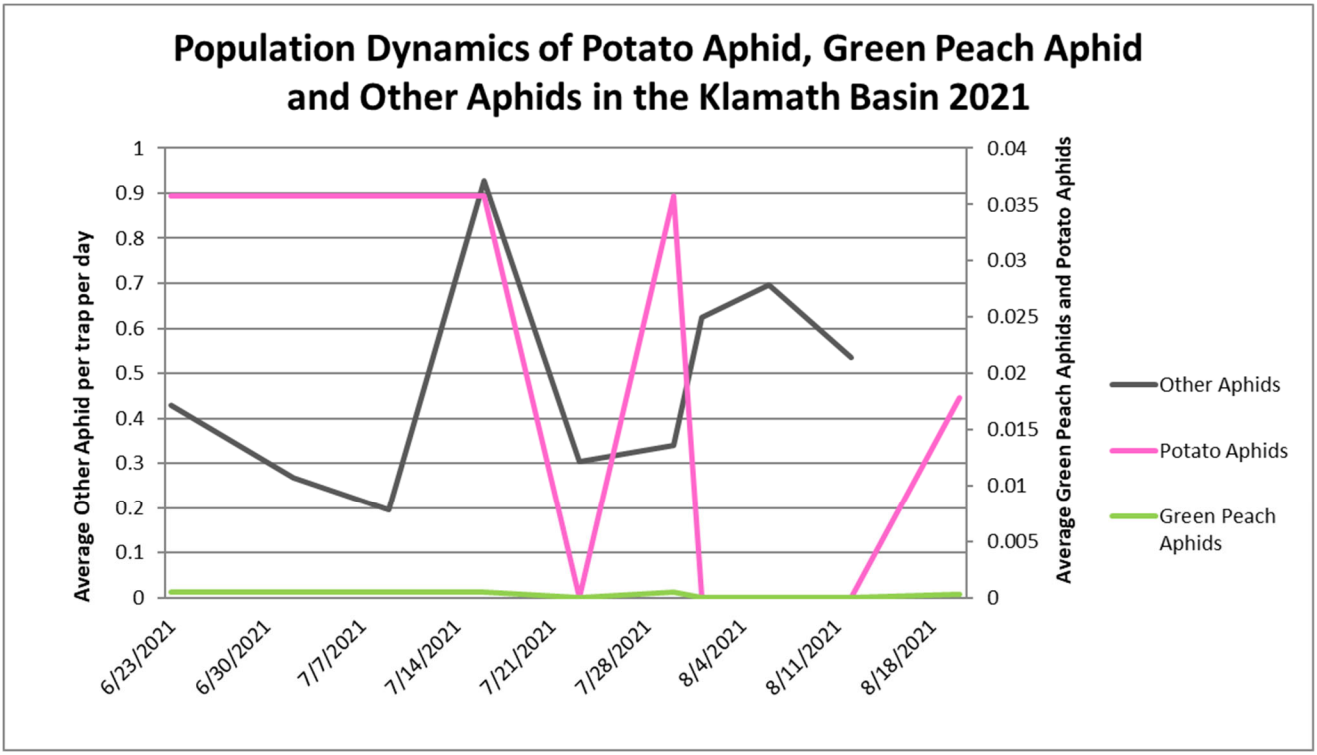

Total P-Day Accumulation
P-Days
400
350
300
250
200
150
100
50
0
May 15
June 1
June 15
2021
2000-2020 Average

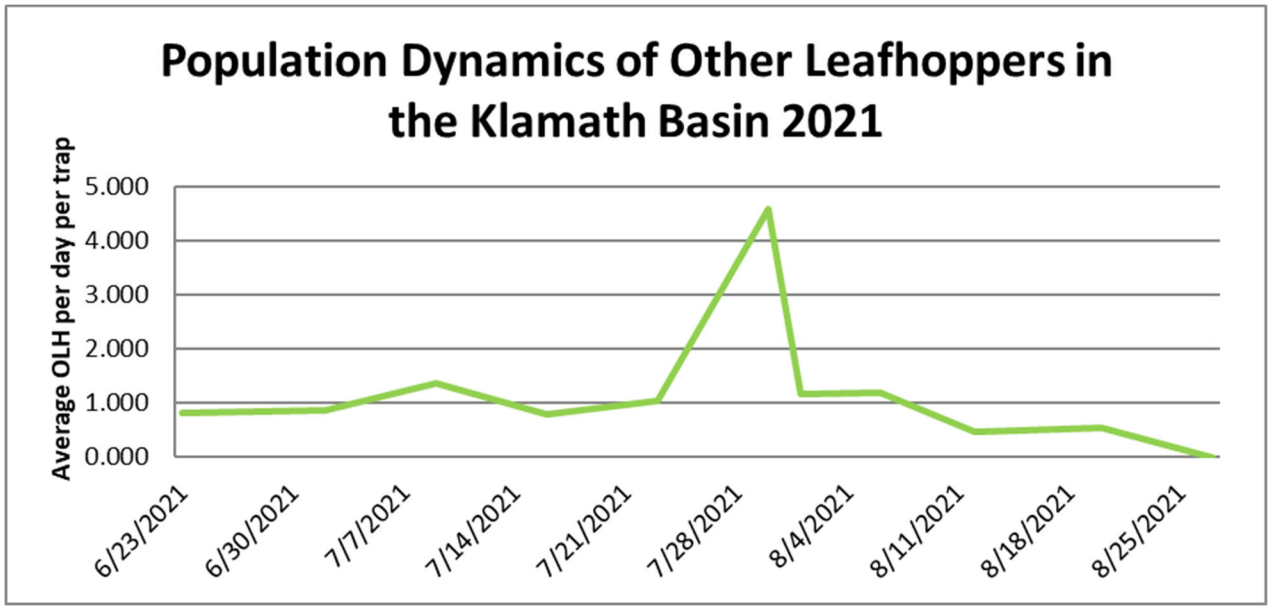

Average Minimum and Maximim Air Temperature
Average Minimum
Average Maximum
Temperature (F)
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

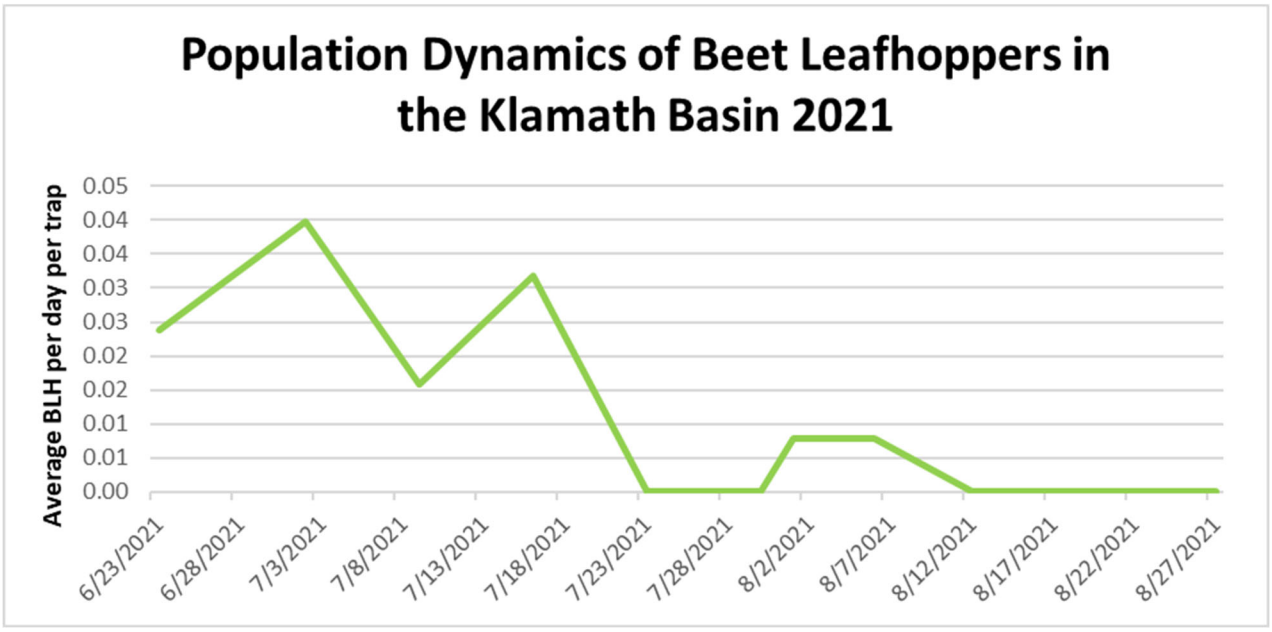

Potato Crop Water Use
2021 ET
Average ET 1999-2020
Crop Wate Use (in/day)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
6/15/18
6/29/18
7/13/18
7/27/18
8/10/18
8/24/18
9/7/18

2021 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. The following graphs show population dynamic trends for aphids and leafhoppers throughout the growing season.




Population Dynamics of Other Leafhoppers in the Klamath Basin 2021
Average OLH per day per trap
5.000
4.000
3.000
2.000
1.000
0.000
6/23/2021
6/30/2021
7/7/2021
7/14/2021
7/21/2021
7/28/2021
8/4/2021
8/11/2021
8/18/2021
8/25/2021


Population Dynamics of Beet Leafhoppers in the Klamath Basin 2021
Average BLH per day per trap
0.05
0.04
0.04
0.03
0.03
0.02
0.02
0.01
0.01
0.00
6/23/2021
6/28/2021
7/3/2021
7/8/2021
7/13/2021
7/18/2021
7/23/2021
7/28/2021
8/2/2021
8/7/2021
8/12/2021
8/17/2021
8/22/2021
8/27/2021

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

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, sixty thousand (60,000) greenhouse-produced seedling tubers were planted at a Rock Creek Ranch five miles west of Running Y Ranch on May 25, 2021. 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 112 families from Oregon State University; 40 from USDA, Prosser, WA; 109 from USDA, Aberdeen, Idaho; 13 from North Dakota State University. 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 6th. 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	5,940	26	.43
Oregon State University	Disease resistance, mixed type	27,137	396	1.45
ARS Aberdeen, ID	Disease resistance, russet	25,279	273	1.07
North Dakota		1,906	11	.57
Total		**60,262**	**706**	**1.17**

Preliminary Yield (PYT-1) Russet Screening

Seven hundred and six (706) selections from 2020 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 6, 2021. A team of about 20 research and industry personnel selected 156 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 2022.

Preliminary Yield (PYT-1) Specialty Screening

One hundred and seven (107) selections from 2020 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 6, 2021. A team of about 20 research and industry personnel selected 5 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 2022.

Preliminary Yield (PYT-1) Chip Screening

Forty-seven (47) chip selections from 2020 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 6, 2021. Research and industry personnel selected 14 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 2022. KBREC will also be increasing seed for future evaluation.

2021 Preliminary Yield (PYT-2) Russet Trial

Location: OSU KBREC – Klamath Falls, OR

Planting Date: May 25
Harvest Date: October 7
Fertility: 100-50-250

Vine Kill Date: September 1
Days to Vine kill: 97
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 143 new entries. The Oregon Potato Variety Development Team chose to advance 43 selections to the Statewide Russet Trial in 2022 and discarded the remaining selections due to poor performance. **Only retained selections are listed.**

Clone	Female Parent	Male Parent
AOR17002-3	A06084-1TE	A10007-3
AOR17002-10	A06084-1TE	A10007-3
AOR17020-2	A06021-1T	A061083-8CSR
AOR16005-1	Reveille Russet	A02060-3TE
AOR16023-2	Crestone Russet	A98345-1
AOR16035-3	A07088-6	AO01114-4
AOR16037-1	A07088-6	Crestone Russet
AOR16037-3	A07088-6	Crestone Russet
AOR16058-1	AF4320-7	AOR07821-1
AOR16060-2	AF4320-7	CW08071-2
AOR16060-3	AF4320-7	CW08071-2
AOR16062-9	AF4320-7	W8516-1rus
AOR16065-9	AF4320-7	Dakota Trailblazer
AOR16066-5	AF4320-7	Prospect
AOR16070-5	AO01114-4	CW08071-2
AOR16070-6	AO01114-4	CW08071-2
AOR16071-4	AO01114-4	Crestone Russet
AOR16071-6	AO01114-4	Crestone Russet
AOR16078-2	AW07791-2rus	CW08071-2
AOR16112-11	Crestone Russet	AW07791-2rus
AOR16118-1	Dakota Trailblazer	AO01114-4
AOR16118-3	Dakota Trailblazer	AO01114-4
AOR16123-4	Dakota Trailblazer	Crestone Russet
AOR12424-4	A06496-1LB	A06021-1T
AOR16061-8	AF4320-7	OR05039-4
AOR16097-1	W9742-3rus	OR05039-4

AOR16097-3	W9742-3rus	OR05039-4
AOR16097-6	W9742-3rus	OR05039-4
AOR16097-19	W9742-3rus	OR05039-4
AOR16113-3	Crestone Russet	OR05039-4
AOR15404-17	A06862-18VRsto	A10040-3TE
AOR15422-3	MN09152BW-01Rus	A10210-7T
AOR13287-3	A07774-2VR	CO99053-3Ru
OR170014-1	AO02060-31	AOR13260-3adg
OR170028-4	AOR12330-12sto	Silverton Russet
POR19NCY2-2	POR15V001-104	PI 281017-20
OR170058-20	OR12135-1CRKN	Premier Russet
POR19NCK4-1	PA99N82-4	HIGHLAND
POR19NCK6-2	PA99N82-4	POR08BD1-3
AOR11908-2	A02782-2	AO02183-2
AOR11921-1	PA03NM5-1	A06015-6TE
AOR13205-5	A05214-3LB	A05084-11
AOR13205-14	A05214-3LB	A05084-11

2021 Preliminary Yield (PYT-2) Chip Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 25
Harvest Date: October 7
Fertility: 100-50-250
Vine Kill Date: September 1
Days to Vine kill: 97
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. 31 selections were evaluated with 10 retained for further evaluation.

Clone	Female Parent	Male Parent
AOR16147-3	A01143-3C	A11506-1C
AOR16152-3	AC01151-5W	Etb 6-5-5
AOR16159-2	NDA081453CAB-2C	A11506-1C
AOR16159-4	NDA081453CAB-2C	A11506-1C
AOR16164-1	Lamoka	A11506-1C
AOR15304-7	A01143-3C	Lamoka
COOR17160-3	AC00206-2W	Lamoka
COOR17161-3	AC01144-1W	AC11494-6W
COOR17165-1	AC01151-5W	CO02321-4W
AOR15313-4	CO03243-3W	Sandy

2021 Preliminary Yield (PYT-2) Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 25
Harvest Date: October 7
Fertility: 100-50-250
Vine Kill Date: September 1
Days to Vine kill: 97
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 3 standard varieties and 10 entries. The Oregon Potato Variety Development Team chose to advance 7 selections to the Statewide Specialty Trial in 2021 and discarded the remaining selections due to poor performance. **Only retained selections are listed in the following tables.**

Entry	Female Parent	Male Parent
NDOR1757-1	DAKOTA RUBY	NDA102573B-3R
NDOR1757-7	DAKOTA RUBY	NDA102573B-3R
NDOR14342-3	ND102765-4R	ND113046-3R
COOR17013-3	CO08029-1RF/R	CO12122-3RF/R
COOR17012-2	CO08029-1RF/R	CO09380-2RF/RW
COOR17012-13	CO08029-1RF/R	CO09380-2RF/RW
NYOR06-10	SO3-3417	CIP395011-2

2021 Statewide Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16
Harvest Date: October 12
Fertility: 180-50-156-99 Sulfur
Vine Kill Date: September 17
Days to Vine kill:
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: AOR15122-3 (80%), AOR15291-1 (89%)

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

  Most:
  Least:

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

  Largest:
  Smallest:

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

  Most:
  Least:

Yield and Economic Data

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

  Highest:
  Lowest:

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

  Highest:
  Lowest:

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

  Highest:
  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	318		47	22	31	0	25	79
Russet Burbank	239		68	10	23	0	34	81
Russet Norkotah	287		84	2	11	3	64	182
AOR15166-2	222		85	8	7	0	67	149
AOR15421-4	345		87	0	7	6	70	243
AOR15194-1	243		88	3	9	0	65	157
AOR16002-1	280		84	3	12	0	63	177
OR11222-4	324		70	11	8	11	65	211
AOR15152-4	316		84	4	12	0	59	186
AOR15292-3	307		46	21	33	0	38	116
AOR16039-4	327		86	3	10	0	65	211

*Percent values may not total 100% due to rounding

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	150		47	53	0	1.082	0	0	90	40
Russet Burbank	162		50	36	14	1.078	0	0	0	0
Russet Norkotah	240		24	57	19	1.077	0	0	0	0
AOR15166-2	188		20	63	16	1.084	0	0	0	0
AOR15421-4	299		19	45	36	1.074	0	0	0	0
AOR15194-1	214		26	42	32	1.089	0	0	0	0
AOR16002-1	237		25	50	25	1.075	0	0	20	0
OR11222-4	228		7	37	56	1.074	0	0	0	0
AOR15152-4	265		30	42	28	1.082	0	0	0	0
AOR15292-3	142		18	54	28	1.089	0	0	0	0
AOR16039-4	281		25	47	28	1.074	0	0	0	0

*Percent values may not total 100% due to rounding

***Entries retained for further testing in 2022

****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	96	4.3	6.6	3.0	4.0	3.0	3.5	4.0	3.0	4.0
Russet Burbank	96	4.9	4.3	5.0	5.0	4.0	3.5	5.0	2.0	4.0
Russet Norkotah	96	6.2	4.1	5.0	4.5	3.5	3.5	3.5	4.0	4.0
AOR15166-2	100	6.8	2.8	4.0	5.0	3.5	3.0	3.5	2.5	3.5
AOR15421-4	100	6.8	4.3	5.0	5.0	4.0	6.5	3.0	4.0	3.0
AOR15194-1	92	6.4	3.5	5.0	4.0	5.0	5.0	4.0	4.0	4.0
AOR16002-1	100	6.3	3.8	3.0	3.5	2.0	2.5	2.0	4.0	3.5
OR11222-4	100	9.5	2.9	3.5	3.0	2.5	2.5	5.0	3.0	3.5
AOR15152-4	100	6.2	4.4	5.0	4.0	4.0	4.0	4.0	4.0	4.0
AOR15292-3	100	6.7	3.9	5.0	3.5	4.5	4.5	3.5	2.0	4.5
AOR16039-4	96	5.9	4.9	5.0	3.0	4.0	4.0	4.5	3.5	4.5

2021 Tri-State Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16
Harvest Date: October 12
Fertility: 180-50-156-99 Sulfur
Vine Kill Date: September 17
Days to Vine kill:
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 > 90 % final emergence

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	318.3		47	22	31	0	25	150
Russet Burbank	179.3		71	0	29	0	41	127
Russet Norkotah	257.3		81	0	19	0	55	208
A10594-4sto	364.3		71	10	14	6	57	258
A12305-2adg	431.7		90	6	5	0	75	387

*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	CRS	SEB	VD
Ranger Russet	150		47	53	0	1.082	0	90	0	40
Russet Burbank	127		41	59	0	1.073	0	0	0	0
Russet Norkotah	208		31	44	24	1.069	0	0	0	0
A10594-4sto	258		20	39	41	1.081	0	0	0	0
A12305-2adg	387		16	42	42	1.081	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

***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	96	4.3	6.6	4.5	3.0	3.0	3.5	4.0	3.0	4.0
Russet Burbank	100	4.3	3.5	5.0	5.0	3.0	3.0	4.0	4.0	4.0
Russet Norkotah	100	5.2	4.2	4.5	5.0	3.5	3.5	4.5	4.5	3.5
A10594-4sto	100	7.1	4.4	5.0	5.0	3.5	4.0	4.5	3.0	2.0
A12305-2adg	96	7.2	5.3	5.0	5.0	4.0	3.5	4.0	4.0	4.5

2021 Statewide Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16
Harvest Date: October 12
Fertility: 180-50-156-99 Sulfur
Vine Kill Date: September 17
Days to Vine kill:
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**:**

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**

  Most:
  Least:

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

  Largest:
  Smallest:

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

  Most:
  Least:

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

  Most:
  Least:

Yield Data

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

  Highest:
  Lowest:

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

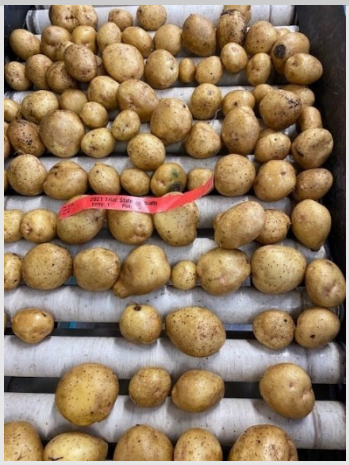
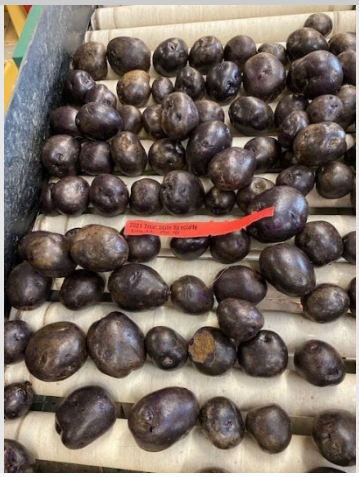
Tuber Defect Incidence (10 tuber-samples per 4 reps, 4-6 oz.)
Brown Center:

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	Knobs
Yukon Gold	Y	3	Y		247		90	2	3.5	5.0	5.0
Chieftan	R	3	Y		243		98	3	5.0	5.0	5.0
Purple Majesty	P	5	P		190		94	23	5.0	5.0	5.0
COOR15235-3	R	4	Y		201		96	25	5.0	5.0	5.0
COOR15108-1	R	4	Y		194		100	16	5.0	5.0	5.0
POR18PG37-4	Y	3	Y		298		86	16	3.5	5.0	3.5
POR18PG54-1	P	5	P		278		98	0	5.0	5.0	5.0

*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	CRS
			C size	B size	4-6 oz.	6-10 oz.	10-20 oz.					
Yukon Gold	223		1	17	34	41	7	1.079	0	0	0	0
Chieftan	239		1	20	34	32	12	1.072	0	0	10	10
Purple Majesty	180		22	66	11	0	0	1.089	0	0	0	0
COOR15235-3	193		25	69	7	0	0	1.083	0	0	0	0
COOR15108-1	194		16	73	9	2	0	1.081	0	0	0	0
POR18PG37-4	258		13	72	14	2	0	1.071	0	0	10	10
POR18PG54-1	273		0	8	32	36	23	1.067	0	0	10	0

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	96	12.3	4.2	3.5	1.0	2.5	2.5	2.0	3.5
Chieftan	96	4.8	4.5	5.0	2.5	3.0	2.0	3.0	3.0
Purple Majesty	100	2.1	7.7	5.0	4.0	4.0	3.0	3.0	4.0
COOR15235-3	92	1.9	9.7	3.5	5.0	2.0	3.0	3.0	2.5
COOR15108-1	100	2.2	7.4	3.0	5.0	2.0	4.0	4.0	3.0
POR18PG37-4	96	2.5	10.5	2.0	1.0	3.0	3.5	2.0	4.0
POR18PG54-1	100	6.1	3.8	5.0	1.0	2.0	3.5	4.0	5.0

2021 Statewide Specialty	2021 Statewide Specialty
Yukon Gold	COOR15235-3
	
COOR15108-1	POR18PG37-4
	
POR18PG54-1	
	

2021 Tri-State Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 16
Harvest Date: October 12
Fertility: 180-50-156-99 Sulfur
Vine Kill Date: September 17
Days to Vine kill:
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

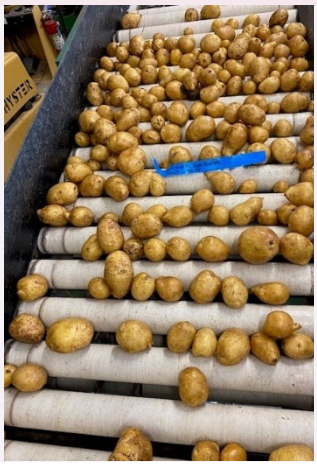
Entry	Skin Color	Primary skin color (5 dark)	Flesh Color	Primary flesh color (1-5 dark)	Total Yield*		US # 1's > 0-14 oz.	Culls > 0 oz.***	External Defects (1-5 none)		
					(cwt/A)	Stats**	% of Total Yield		Green	Growth crack	Knobs
Yukon Gold											
Chieftan											
Modoc											
A08122-9RY											
POR16PG34-1											

*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**	%*									
			C size	B size	4-6 oz.	6-10 oz.	10-14 oz.		HH	SEB	VD	IB

**** 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						

2021 Tri-State specialty	2021 Tri-State Specialty
Modoc	**A08122-9RY**
	
POR16PG34-1	
	

2021 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: 99
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*				

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.				

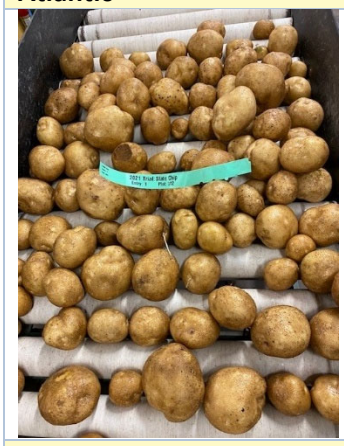
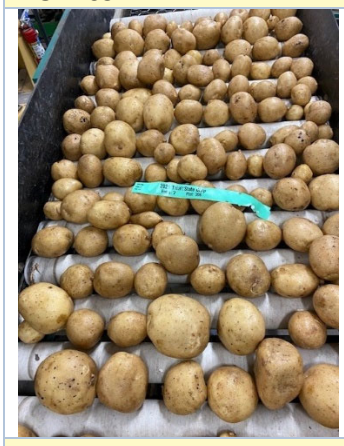
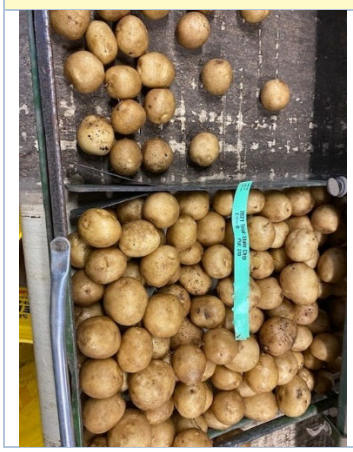
*Percent values may not total 100% due to rounding

**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

***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.)

2021 Statewide Chip	2021 Statewide Chip
Atlantic	**Snowden**
	
AOR10922-1	**AOR13124-6**
	
COOR16014-3	
	

2018 Regional 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

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*				

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.				

*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

***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.)

2021 Regional Chip	2021 Regional Chip
Atlantic	**Lamoka**
	
Snowden	**CO12235-3W**
	
CO12293-1W	**COOR13270-2**
	

NYOR14Q9-5	NYOR14Q9-9
	

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