Oregon State University OSU Klamath Basin Research and Extension Center

2009

Klamath Basin Potato Variety Development Summary

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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, single-hill selections, and specialty 4-hill selections are also included in this research summary.

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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Basin Fertilizer & Chemical, Merrill, OR

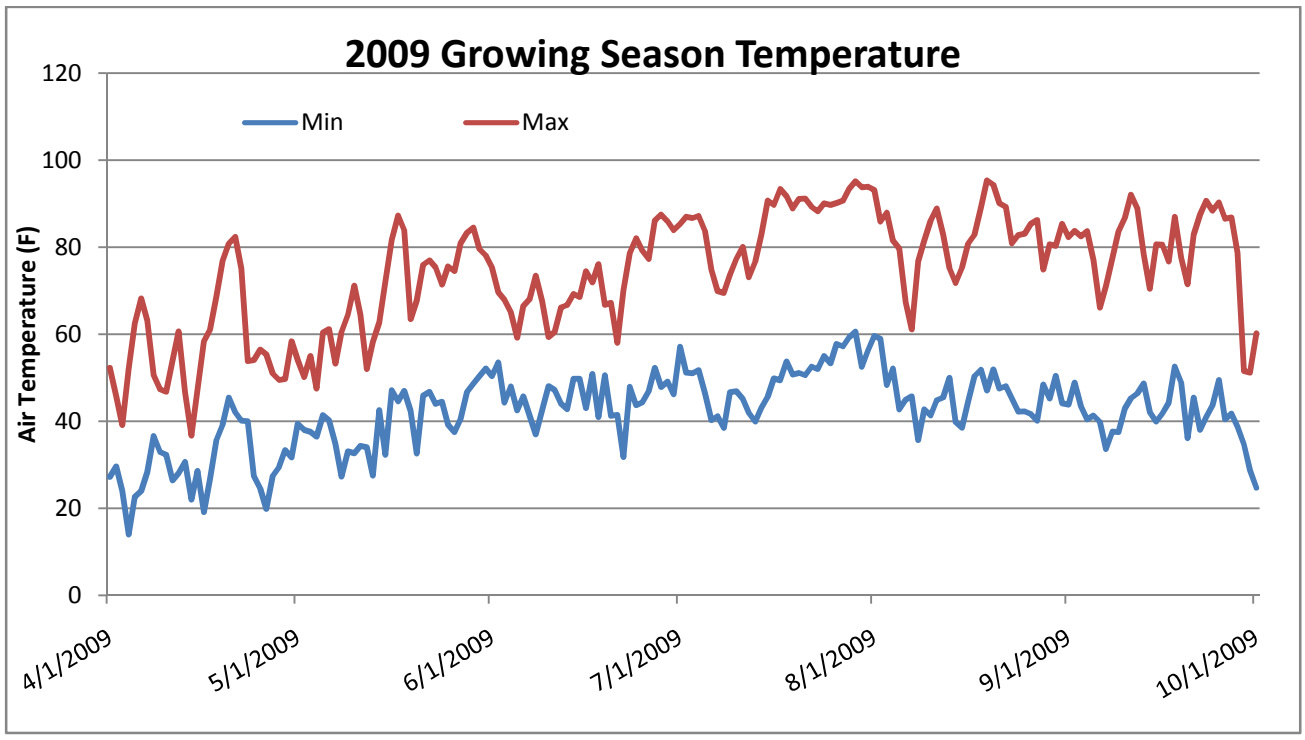
Macy Flying Service, Newell, CA

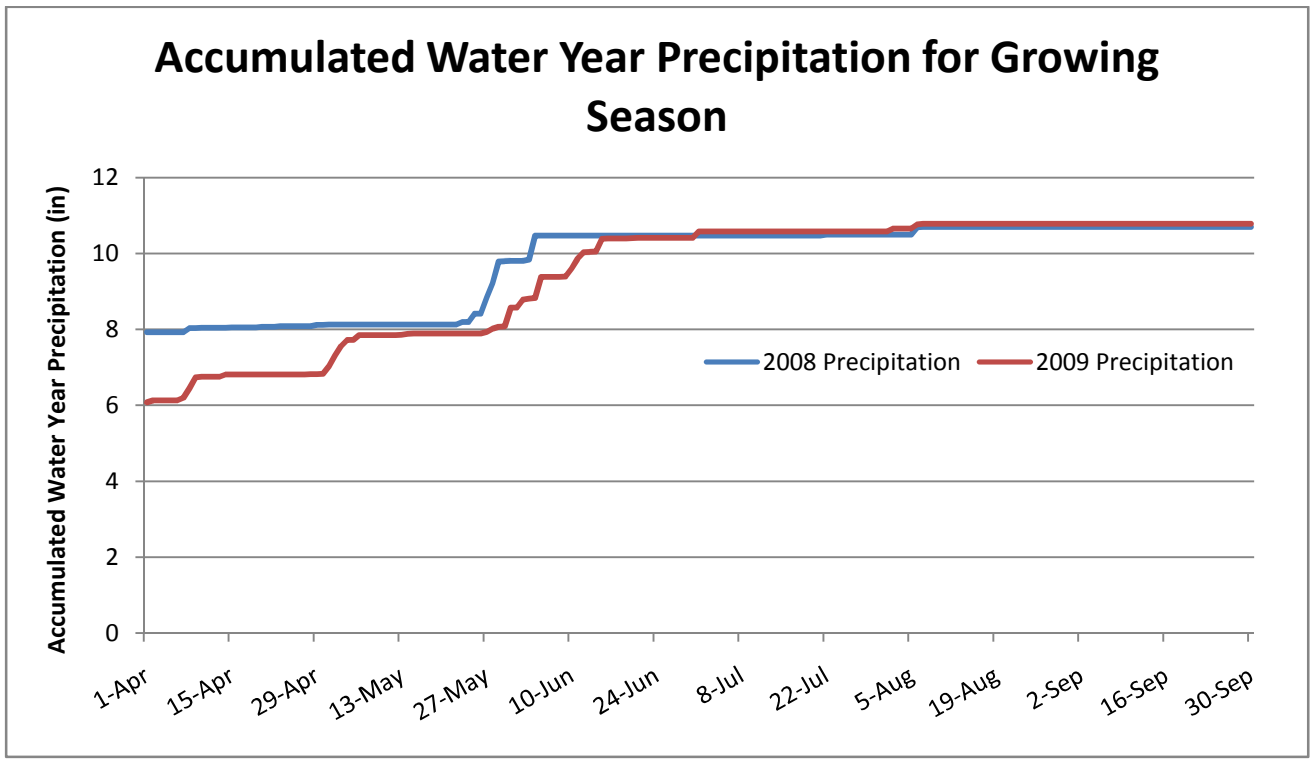
Commissions and Associations

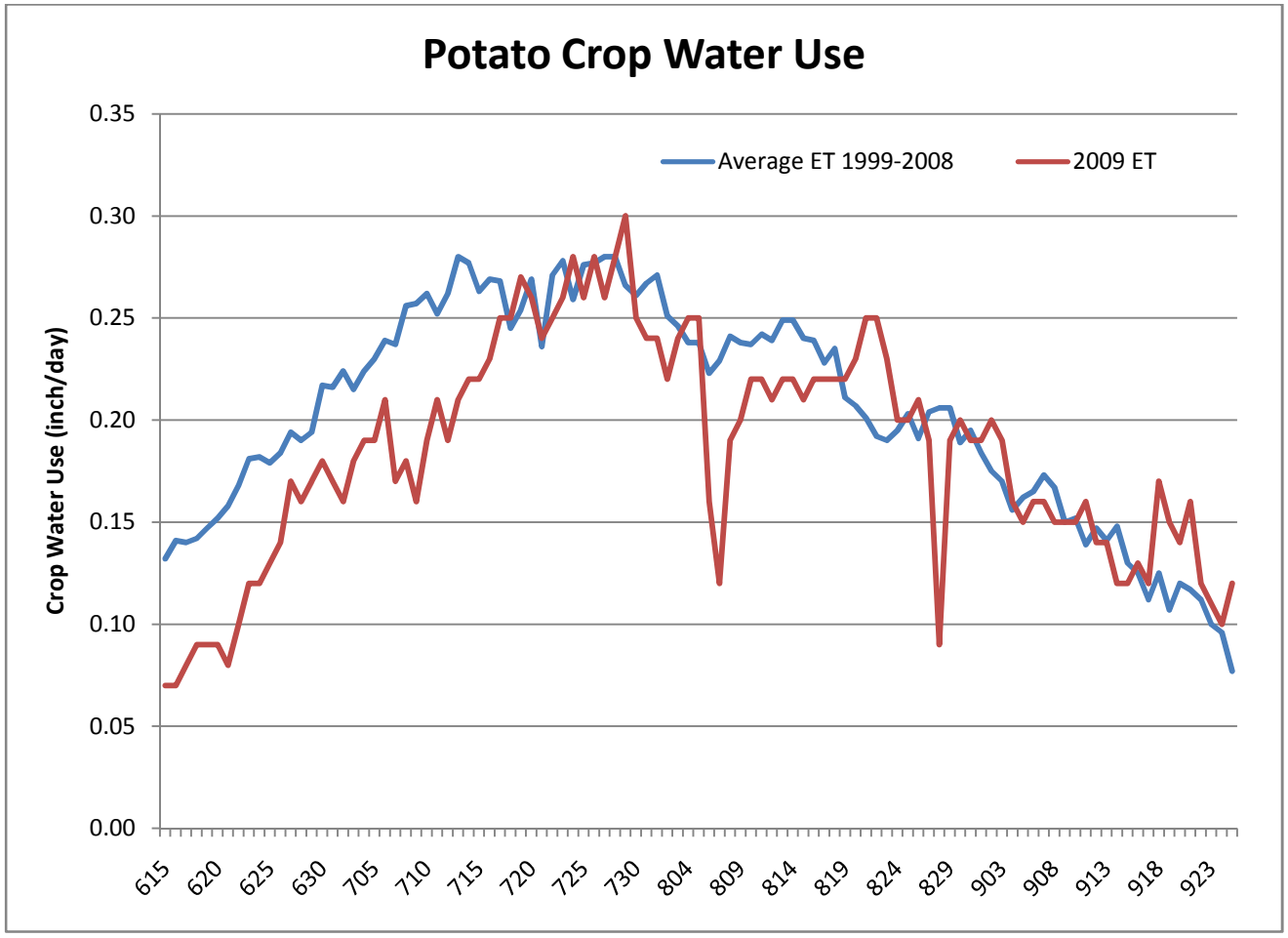
Bill Brewer, Jennifer Fletcher, Judy Schwartz, Oregon Potato Commission, Portland, OR

Klamath Potato Growers Association, Klamath Falls, OR

Weather Data

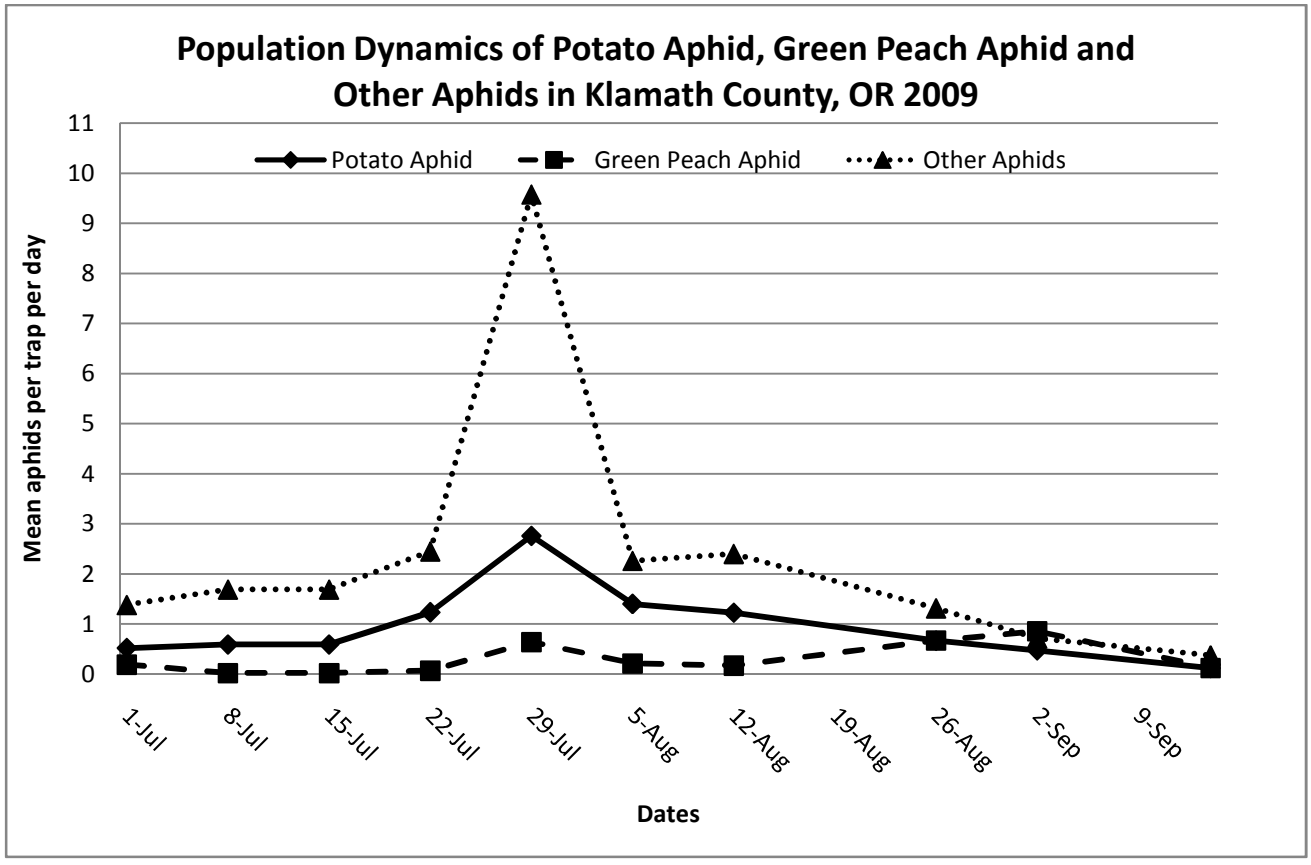


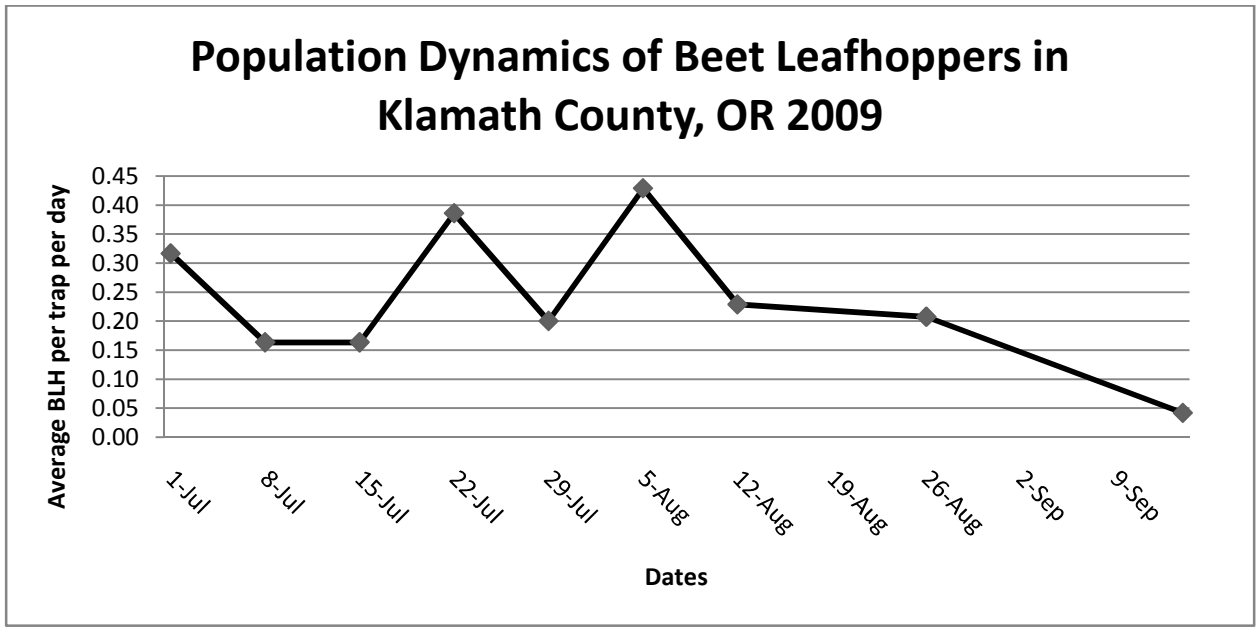


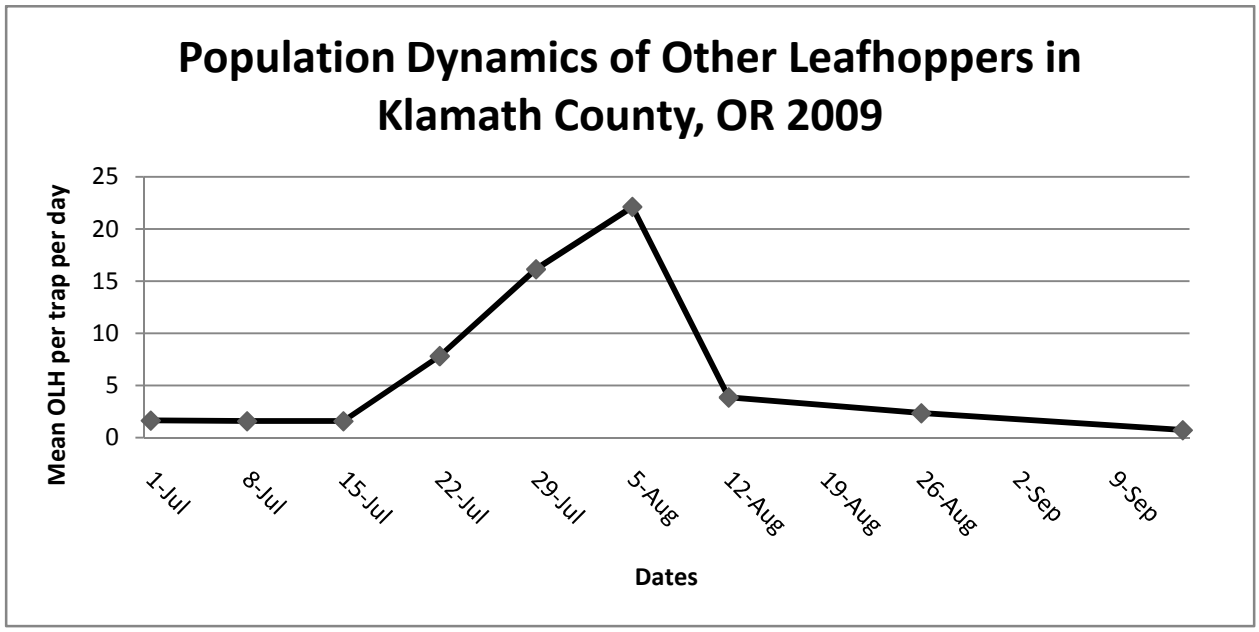

Potato Crop Water Use
Crop Water Use (inch/day)
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Average ET 1999-2008
2009 ET
615
620
625
630
705
710
715
720
725
730
804
809
814
819
824
829
903
908
913
918
923

2009 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. Twenty pheromone Delta traps (tuber moth), seven yellow water-pan traps (aphids), and twenty 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 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 four-year trapping program. The following graphs show population dynamic trends for aphids and leafhoppers throughout the growing season.




Population Dynamics of Beet Leafhoppers in Klamath County, OR 2009
Average BLH per trap per day
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1-Jul
8-Jul
15-Jul
22-Jul
29-Jul
5-Aug
12-Aug
19-Aug
26-Aug
2-Sep
9-Sep
Dates


Population Dynamics of Other Leafhoppers in Klamath County, OR 2009
Mean OLH per trap per day
25
20
15
10
5
0
1-Jul
8-Jul
15-Jul
22-Jul
29-Jul
5-Aug
12-Aug
19-Aug
26-Aug
2-Sep
9-Sep
Dates

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

Miscellaneous Designations

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

Single Hill Results

Approximately, forty-one thousand (41,000) greenhouse-produced seedling tubers were planted at a remote site in the Yonna Valley area on May 26, 2009. Located about 25 miles east of Klamath Falls, soils are very sandy with approximately 1.0 percent organic matter and a pH of 7.0. The location provides good isolation from other potato production areas and intensively fumigated soils allows us to harvest very clean material for seed increase at Powell Butte, OR. Progeny included 42 families from Oregon State University; 35 from USDA, Prosser, WA; 186 from USDA, Aberdeen, Idaho; 63 from Colorado State University; and 34 from North Dakota State University. Several crosses included russet parents with virus, late blight and potato tuber worm resistance. North Dakota State progeny were all chipping types with several families containing cold sweetening resistant genes. Others included at least one parent with pigmented flesh color.

Tuber families were lifted with a two-row, level-bed digger on October 1. 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 Powell Butte, Oregon for storage at the Central Oregon Agricultural Research Center (COARC) potato facility with the exception of chipping clones which were retained by 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
North Dakota State	Cold sweetening, chippers	2980	59	2.0
ARS Prosser, WA	Disease resistance, pigmented	1662	24	1.4
Oregon State University	Disease resistance, mixed type	3025	27	0.9
Colorado State University	Disease resistance, russet	12144	98	0.8
ARS Aberdeen, ID	Disease resistance, russet	21224	297	1.4
Total		**41035**	**505**	**1.2**

Second-year 4-hill Specialty Screening

One-hundred fifty-three (153) selections from 2008 single-hills were planted in 4-hill observational plots at KBREC and 18-hill seed increase plots at Powell Butte, OR. The KBREC site is on a Poe fine sandy loam soil with a pH of 6.8 and an organic matter content of 1.02 percent in the plow layer. Potato tubers were lifted using a single-row, level-bed digger on October 1, 2009. A team of about 15 research and industry personnel selected 22 clones for further evaluation based on market potential and possible disease resistance. Seed of these selections were transported and stored at the Central Oregon Agricultural Research Center (COARC). This material will be evaluated in a Preliminary Yield Trial (PYT-2 Specialty) conducted at KBREC and possibly other locations throughout the Pacific Northwest in 2010.

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 $5.75/cwt. Consultations with several growers and shippers confirmed that these assumptions were valid comparisons to actual prices observed in the Klamath Basin. 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.

KBREC Grade Size	Markets/Packaging[1]	Range of Tuber Sizes for Each Package type	Four Year Columbia Basin Avg. $/cwt	Packaging and Handling
4-8 oz.	20% to 90 and 100 count	7-9.5 oz.	$14.13	$5.75
	80% to 10 lb. poly bags	4-7 oz.	$9.15	$5.75
8-12 oz.	70, 80, and 90 count	8.5-12.5 oz.	$16.45	$5.75
>12-20 oz.	50 and 60 count	12.5-18 oz.	$17.33	$5.75
<4 oz. and culls	bulk culls	<4 and cull	$1.15	$5.75
No. 2	100 lb burlap sacks	10-20 oz.	$8.60	$5.75

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

2009 Replicated Trial Cultural Information

Location:	Klamath Falls, OR
Soil Type:	Poe fine sandy loam, pH 6.8
Planting Date:	May 19 for State Spec., PYT Spec., State Russet & PYT Russet
Vine Kill Date:	September 11: Roll Vines and Reglone application at labeled rate
Harvest Date:	September 28 for Statewide Specialty and PYT Specialty; October 6 for Statewide Russet and PYT Russet
Irrigation:	Solid-set sprinkler + natural precipitation = 18.35 inches
Plot Length:	20 hills for PYT trials, 30 hills for statewide trials
In-row spacing:	9.0 inches
Row spacing:	36 inches
Number of Reps:	4 reps for Statewide Trials and 1 rep for PYT Trials
Fertilizer:	170-75-100-205 Sulfur
Weed Control:	Cultivation and Matrix (pre and post emergence)
Insecticides:	Admire Pro (in-furrow at planting) and Leverage flown on twice during growing season
Fungicides:	Tops MZ (seed trt.) Quadris (in-furrow at planting) Ridomil Gold Bravo (2 aerial applications)
Nematode Control:	Soil fumigation with Vapam and Vydate chemigated

General Comments:

Environmental conditions were generally favorable. Yields were above average in all variety trials. Some of the increase in yield could have been due to larger hill size and narrowing of digging chain at harvest which retained more undersize than normal. We calculated average tuber size and were able to take maturity notes. Tuber quality and uniformity were much better than previous years. There was a high amount of nematode pressure, and thus a relatively high incidence of CRS.

2009 Preliminary Yield (PYT-2) Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 6
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days to Vine kill: 116
In-Row Spacing: 9 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 55 new entries. The Oregon Potato Variety Development Team chose to advance 8 selections to the Statewide Russet Trial in 2010 and discarded the remaining selections due to poor performance. **Only retained selections are listed in the following tables.**

Entry	Total Yield (cwt/A)	US # 1's > 4 oz.	US # 2's > 4 oz.	Culls & <4 oz.	8-12 oz Specific Gravity	KBREC Comments
		% of Total Yield*				
R. Burbank	694	63	16	21	1.091	growth cracks, knobby, fair
Ranger Russet	663	65	18	17	1.091	lumpy, deep eye, ugly
R. Norkotah	683	86	4	11	1.078	uniform, nice
AO03123-2	571	79	5	15	1.095	root knot, bad damage, fair
AO03340-2	708	80	8	12	1.076	root knot, good shape/size
AO03919-1	628	73	17	10	1.100	ugly, knobby, junk
AO05021-3	682	81	3	16	1.086	banana, irregular shapes
AO05086-2	695	83	6	11	1.089	very large, no tubers, fair
AO05105-1	672	73	8	19	1.087	uniform shape, nice
AO05560-7	610	74	3	23	1.096	uniform, shatter, eye brow
OR06060-1	690	76	8	16	1.090	irregular shapes, rough

*Percent values may not total 100% due to rounding

Entry	US # 1 Yield				Internal Defects (%) 8-12 oz. tubers**			
	>4 oz. (cwt/A)	%*						
		4-8 oz.	8-12 oz.	>12 oz.	HH	IBS	BS	CRS
R. Burbank	435	50	42	8	2.5	35.0	0.0	12.5
Ranger Russet	431	35	38	27	0.0	10.0	2.5	35.0
R. Norkotah	584	36	36	28	12.5	2.5	0.0	0.0
AO03123-2	454	54	28	17	10.0	0.0	0.0	0.0
AO03340-2	565	29	35	36	0.0	0.0	10.0	0.0
AO03919-1	460	23	45	32	0.0	0.0	0.0	20.0
AO05021-3	554	24	43	33	0.0	0.0	0.0	10.0
AO05086-2	578	16	26	58	10.0	10.0	0.0	0.0
AO05105-1	492	36	48	16	0.0	0.0	10.0	20.0
AO05560-7	452	63	14	23	0.0	20.0	0.0	0.0
OR06060-1	523	59	25	16	0.0	0.0	0.0	0.0

*Percent values may not total 100% due to rounding

**Internal Defects: HH=hollow heart, BC=brown center, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

2009 Statewide Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 6
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days to Vine kill: 116
In-Row Spacing: 9 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: AO02118-2 (37%), AO99135-3 (70%), and AO00131-1 (70%). All other entries had >80% emergence.

- **50 Day**
  Full emergence: All entries >93% final emergence

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: OR05078-1 (9.9) and Russet Burbank (9.4)
  Least: AO02118-2 (5.0) and AOR00681-15VR (5.0)

- **Average Tuber Size (oz.)**
  Largest: AOR00681-15VR (8.4) and AO02118-2 (8.1)
  Smallest: AO99152-1 (5.0) and OR05078-1 (5.0)

- **Undersized Tubers (<4 oz.) cwt/Acre**
  Most: AO96305-3 (172) and AO02183-2 (161)
  Least: AO99135-3 (50) and AOR00681-15VR (59)

Yield and Economic Data

- **Total Yield (cwt/Acre)**
  Highest: OR04057-2 (617) and Russet Burbank (586)
  Lowest: AO99135-3 (432) and AO01114-4 (443)

- **US No. 1 Yield (cwt/Acre)- no statistical significance**
  Highest: AO02060-3 (425) and Russet Norkotah (417)
  Lowest: POR06V12-3 (295) and AOR00681-15VR (295)

- **Carton Yield (8-20 oz.) cwt/Acre**
  Highest: Russet Norkotah (278) and AO99135-3 (275)
  Lowest: AO99152-1 (156) and POR06V12-3 (158)

Tuber Defect Incidence (40 tuber sample of 8-12 oz. tubers)

- **Hollow Heart**
  Notable Defects: OR05039-4 (17.5%) and AO00131-1 (15%)

- **Blackspot Bruise**
  Notable Defects: POR06V12-3 (12.5%)

- **Corky Ringspot**
  Notable Defects: Ranger Russet (42.5%)

Entry	Total Yield		US # 1s* > 4 oz.	US # 2s* > 4 oz.	Culls* & <4 oz.	Carton Yield 100-50 count (US 1's 8-20 oz)	
	(cwt/A)	stats**	% of total yield			% of total yield	(cwt/A)
R. Burbank	586	AB	57	13	30	33	191
Ranger Russet	555	ABCD	59	17	24	44	242
R. Norkotah	585	AB	71	7	22	48	278
AO96305-3* **	512	CDEFGH	61	4	35	32	165
AO96365-2	554	ABCDE	71	5	23	34	186
AO00057-2* **	473	FGHI	68	2	30	34	161
AO02183-2* **	524	BCDEFG	60	4	36	35	182
AO01114-4* **	443	HI	72	4	25	42	187
AO02060-3* **	549	ABCDE	77	3	20	51	281
AO02118-2	456	GHI	67	15	18	47	214
OR04057-2* **	617	A	57	16	27	33	202
AO99135-3	432	I	82	2	16	64	275
AO99152-1	538	BCDEF	59	9	33	29	156
AO00131-1	491	DEFGH	67	4	29	36	177
AO03420-1	516	BCDEFG	68	15	17	48	247
OR05039-4* **	521	CDEFG	67	10	24	40	207
OR05078-1	580	ABC	63	12	26	32	186
OR05081-1	524	BCDEFG	68	10	22	37	192
POR06V12-3* **	483	EFGHI	61	5	34	33	158
AOR00681-15VR	474	FGHI	63	14	23	44	208

Entry	US # 1 Yield					8-12 oz	Internal Defects (%) 8-12 oz. tubers****			
	>4 oz.		%			Specific				
	(cwt/A)	STATS**	4-8 oz.	8-12 oz.	>12 oz.	Gravity	HH	IBS	BS	CRS
R. Burbank	332	*NS*	43	44	14	1.093	2.5	2.5	5.0	12.5
Ranger Russet	329	*NS*	26	45	29	1.096	0.0	0.0	2.5	42.5
R. Norkotah	417	*NS*	33	45	21	1.075	2.5	0.0	0.0	0.0
AO96305-3* **	312	*NS*	47	47	5	1.094	0.0	0.0	0.0	35.0
AO96365-2	394	*NS*	53	36	11	1.094	0.0	0.0	7.5	12.5
AO00057-2* **	323	*NS*	50	38	12	1.095	0.0	0.0	2.5	35.0
AO02183-2* **	314	*NS*	42	44	14	1.092	0.0	0.0	2.5	7.5
AO01114-4* **	317	*NS*	41	45	14	1.098	5.0	0.0	2.5	12.5
AO02060-3* **	425	*NS*	34	44	22	1.091	12.5	0.0	0.0	12.5
AO02118-2	305	*NS*	30	41	29	1.081	0.0	0.0	0.0	32.5
OR04057-2* **	351	*NS*	42	43	15	1.094	0.0	0.0	2.5	0.0
AO99135-3	353	*NS*	22	46	32	1.092	0.0	5.0	2.5	22.5
AO99152-1	315	*NS*	51	37	12	1.098	10.0	0.0	2.5	0.0
AO00131-1	328	*NS*	46	41	13	1.096	15.0	0.0	0.0	5.0
AO03420-1	352	*NS*	30	42	28	1.095	2.5	2.5	2.5	35.0
OR05039-4* **	347	*NS*	40	44	16	1.101	2.5	0.0	0.0	0.0
OR05078-1	363	*NS*	49	37	14	1.089	5.0	0.0	0.0	0.0
OR05081-1	354	*NS*	46	36	18	1.095	17.5	0.0	2.5	0.0
POR06V12-3* **	295	*NS*	47	37	17	1.106	7.5	0.0	12.5	0.0
AOR00681-15VR	299	*NS*	30	44	26	1.105	2.5	7.5	7.5	15.0

Entry	Stand %	Average Tuber		Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Skin Color (1-5 dark)	Russeting (1-5 hvy)	Shape (1-5 long)	Uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
		Wt. (oz.)	No. tubers/plant							
R. Burbank	97	5.4	9.4	3.8	3.5	3.6	4.1	4.0	3.3	3.6
Ranger Russet	100	6.3	7.4	3.4	4.5	3.9	4.0	5.0	3.1	2.3
R. Norkotah	98	6.3	7.9	2.9	3.1	4.0	4.0	4.0	4.1	4.0
AO96305-3* **	99	5.1	8.5	3.4	3.3	3.3	3.3	4.0	4.1	4.4
AO96365-2	99	5.5	8.4	3.9	4.4	3.8	4.4	2.3	3.5	4.4
AO00057-2* **	97	5.5	7.4	3.5	3.8	3.3	4.0	3.4	3.5	4.1
AO02183-2* **	98	5.9	7.6	4.3	4.0	3.4	4.0	4.8	3.8	3.8
AO01114-4* **	98	6.1	6.1	3.9	3.9	3.5	4.0	3.5	3.6	3.9
AO02060-3* **	99	7.3	6.3	3.6	3.6	3.5	4.0	4.0	4.4	4.5
AO02118-2	93	8.1	5.0	3.5	3.4	4.3	4.8	3.6	4.0	4.3
OR04057-2* **	98	5.6	9.4	3.9	3.4	3.6	4.4	4.1	2.9	4.6
AO99135-3	99	7.9	4.6	3.0	3.8	3.3	4.0	3.9	4.2	4.4
AO99152-1	99	5.0	9.0	4.1	3.0	3.4	4.0	3.6	3.1	3.6

AO00131-1	93	5.4	8.1	3.4	3.9	4.1	4.3	3.6	3.7	4.5
AO03420-1	98	8.0	5.6	4.4	4.0	3.0	4.5	3.1	2.4	4.0
OR05039-4* **	98	6.3	7.0	4.0	3.0	1.3	1.8	4.0	3.8	3.9
OR05078-1	98	5.0	9.9	4.6	3.6	3.6	5.0	1.9	3.4	4.1
OR05081-1	97	5.9	7.6	4.0	3.3	4.4	4.3	1.6	3.1	4.3
POR06V12-3* **	97	6.7	6.3	4.3	4.1	3.6	4.3	3.8	3.5	4.5
AOR00681-15VR	96	8.4	5.0	3.3	3.3	2.6	3.3	3.9	2.1	2.1

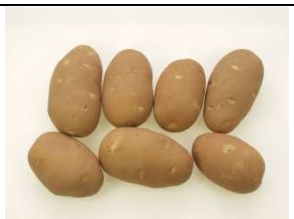
*Percent values may not total 100% due to rounding

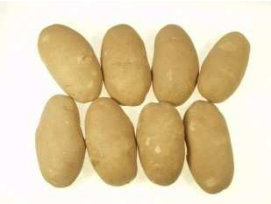
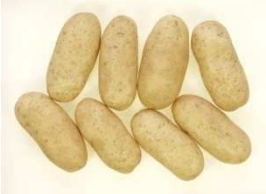
**Entries showing the same letter are not significantly different at the 5% level

***Entries retained for further testing in 2011

****Internal Defects: HH=hollow heart, BC=brown center, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

Entries Retained for Further Evaluation in 2011

Entry	2009 KBREC-Statewide Russet Comment	Entry	2009 KBREC-Statewide Russet Comment
Russet Burbank		AO02183-2	
	growth cracks, irregular shape, fair		long, many eyes, skinny, uniform, fair
Ranger Russet		AO01114-4	
	long, banana, deep eye, ugly		no yield, small, fair
Russet Norkotah		AO02060-3	
	nice, uniform		very nice, uniform, best of trial, keep

Entry	2009 KBREC-Statewide Russet Comment	Entry	2009 KBREC-Statewide Russet Comment
AO96305-3		OR04057-2	
	small, good shape, keep		curved, pointy, ugly
OR05039-4		POR06V12-3	
	white skin, uniform, possible shepody replacement		small, nice color, fair
AO00057-2			
	blocky, nice skin, fair		

2009 Tri-state Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 6
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days to Vine kill: 116
In-Row Spacing: 9 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

- **30 Day**
  Slow emergence: All entries above 90% emergence.

- **50 Day**
  Full emergence: All entries above 99% emergence.

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: Russet Burbank (9.2) and AO1010-1 (8.2)
  Least: AO0324-1 (5.7)

- **Average Tuber Size (oz.)**
  Largest: AO0324-1 (9.1)
  Smallest: AO02183-2 (6.0)

- **Undersized Tubers (<4 oz.) cwt/Acre**
  Most: Russet Burbank (152)
  Least: AO0324-1 (48)

Yield and Economic Data

- **Total Yield (cwt/Acre)**
  Highest: Russet Burbank (677)
  Lowest: AO00057-2 (509)

- **US No. 1 Yield (cwt/Acre)**
  Highest: A01010-1 (455)
  Lowest: AO02183-2 (320)

- **Carton Yield (8-20 oz.) cwt/Acre**
  Highest: AO0324-1 (336)
  Lowest: AO02183-2 (192)

- **Gross Return ($/acre)**
  Fresh Market Highest: AO0324-1 (poor tuber appearance) and A01010-1
  Fresh Market Lowest: AO02183-2 and Russet Burbank

Tuber Defect Incidence (40 tuber sample of 8-12 oz. tubers)

- **Hollow Heart**
  Notable Defects: Russet Norkotah (5%) and AO0324-1 (5%)

- **Blackspot Bruise**
  Notable Defects: Ranger Russet (17.5) and Russet Burbank (12.5)

- **Corky Ringspot**
  Notable Defects: AO02183-2 (42.5) and Russet Burbank (37.5)

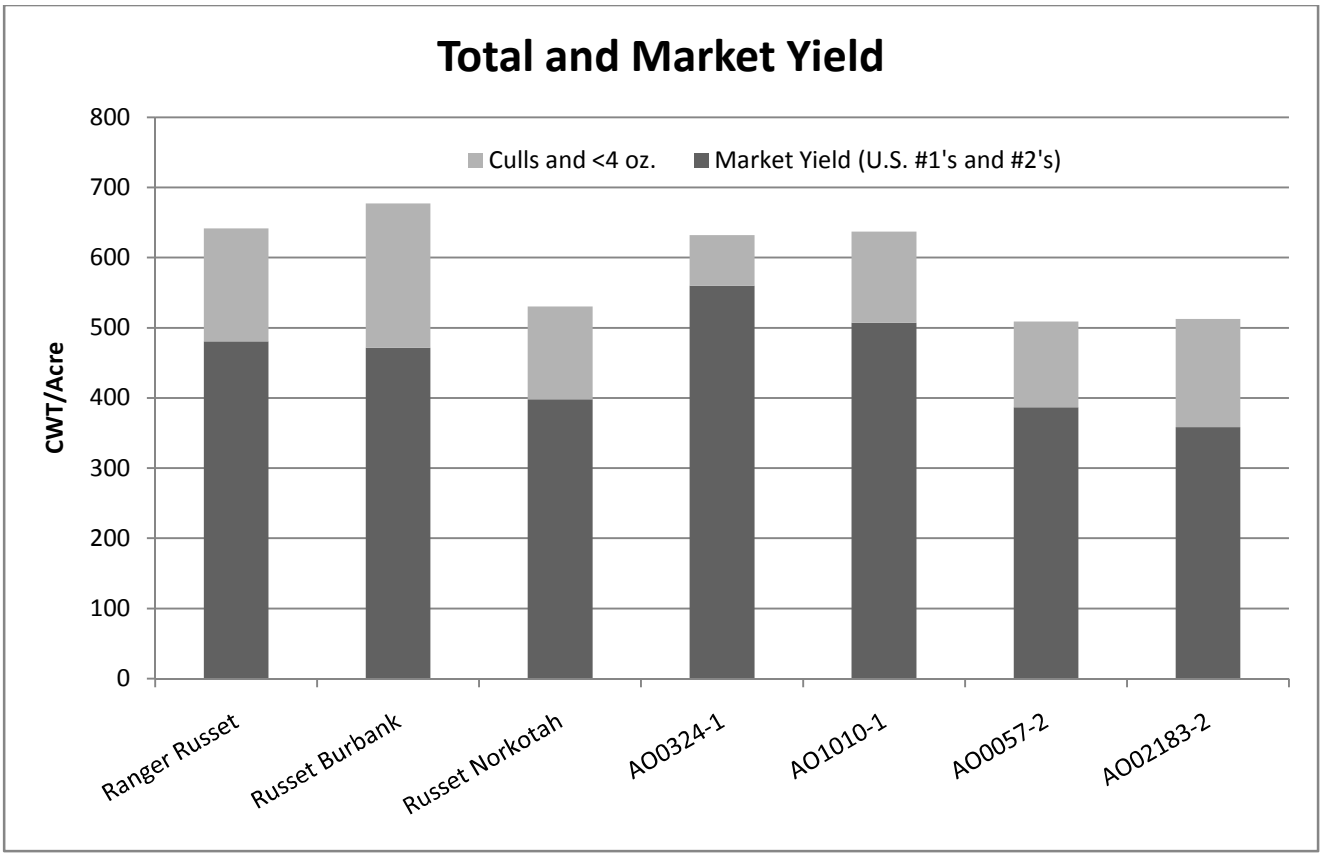
Entry	Total Yield		US # 1s* > 4 oz.	US # 2s* > 4 oz.	Culls* & <4 oz.	Carton Yield 100-50 count (US 1's 8-20 oz)	
	(cwt/A)	STATS**	% of Total Yield			% of Total Yield	(cwt/A)
Ranger Russet	642	A	59	16	25	38	241
Russet Burbank	677	A	57	12	30	32	216
R. Norkotah	530	B	69	6	25	44	233
A00324-1	632	A	71	18	11	53	336
A01010-1	637	A	71	8	20	42	270
AO00057-2	509	B	69	7	24	40	206
AO02183-2	513	B	62	8	30	37	192

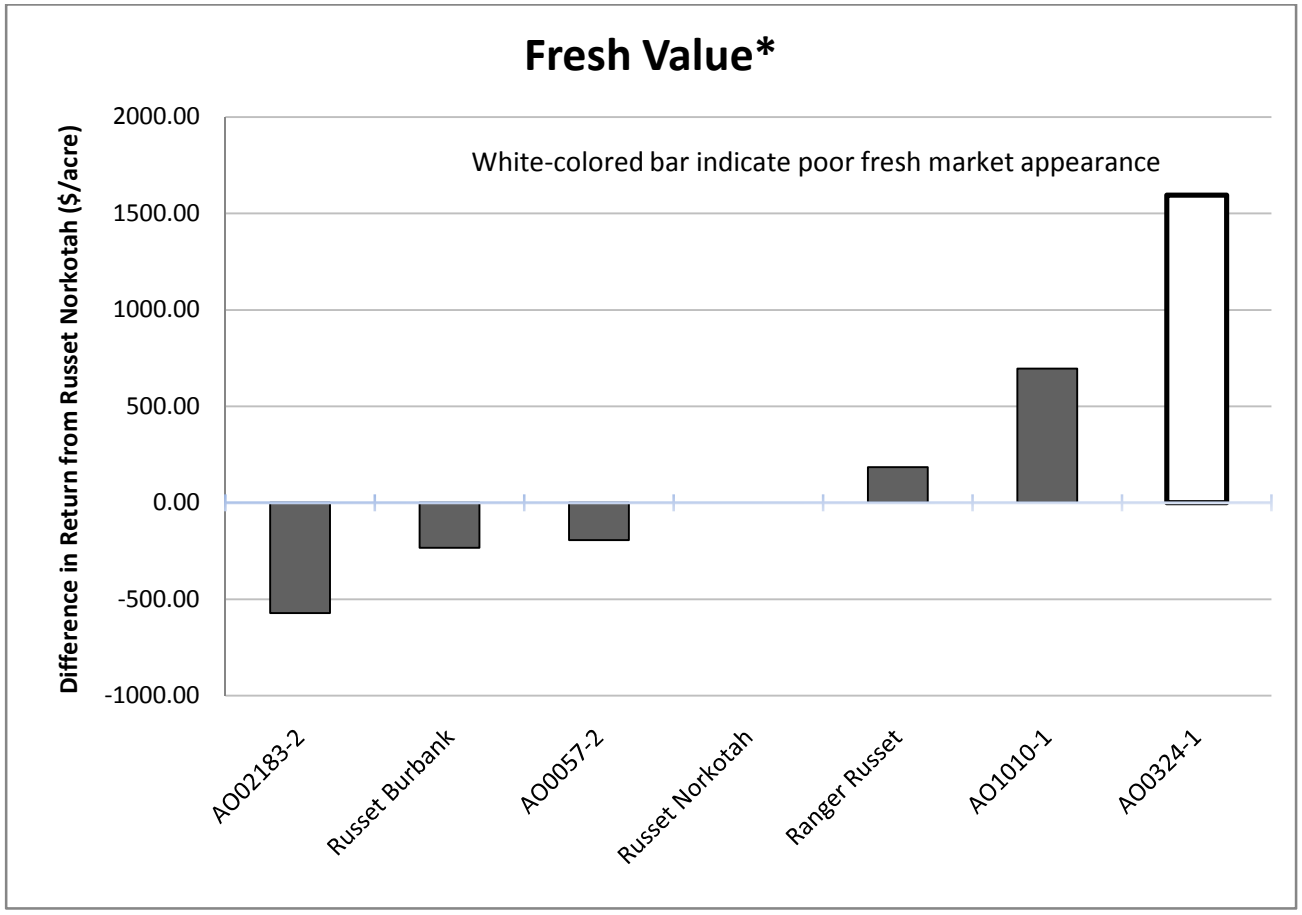
*Percent values may not total 100% due to rounding
**Entries showing the same letter are not significantly different at the 5% level

Entry	US # 1 Yield					8-12 oz Specific Gravity	Internal Defects (%) 8-12 oz. tubers***			
	>4 oz. (cwt/A)	STATS**	%* 4-8 oz.	8-12 oz.	>12 oz.		HH	IBS	BS	CRS
Ranger Russet	376	BC	36	39	26	1.096	0.0	0.0	17.5	22.5
Russet Burbank	389	ABC	44	45	11	1.094	0.0	0.0	12.5	37.5
R. Norkotah	366	C	36	44	20	1.076	5.0	2.5	0.0	0.0
A00324-1	448	AB	25	37	38	1.088	5.0	2.5	2.5	17.5
A01010-1	455	A	41	42	17	1.093	0.0	0.0	0.0	0.0
AO00057-2	351	C	41	40	19	1.094	0.0	0.0	7.5	42.5
AO02183-2	320	C	40	45	15	1.095	0.0	0.0	2.5	10.0

*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, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

Entry	Stand %	Average Tuber		Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Skin Color (1-5 dark)	Russeting (1-5 hvy)	Shape (1-5 long)	Uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant							
Ranger Russet	100	7.5	7.1	3.3	4.3	3.5	3.5	5.0	2.8	2.4
R. Burbank	100	6.1	9.2	3.6	3.1	3.9	4.0	4.0	3.1	3.6
R. Norkotah	100	5.8	7.6	3.1	2.8	4.1	4.0	4.0	3.8	3.8
A00324-1	100	9.1	5.7	3.9	4.0	4.9	5.0	4.1	4.0	4.4
A01010-1	99	6.5	8.2	4.0	3.6	3.9	4.9	4.0	4.1	3.9
AO00057-2	99	6.1	7.0	3.4	4.0	3.8	4.0	4.0	3.6	4.4
AO02183-2	100	6.0	7.1	3.8	3.6	3.9	4.4	4.8	3.5	4.0





*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 white-colored bars may not appeal to fresh market consumers due to the undesirable shape or appearance. Refer to page 8 for parameters used to collect gross return to growers.

Entry	2009 KBREC- Tri-State Russet Comment	Entry	2009 KBREC- Tri-State Russet Comment
Ranger Russet		A01010-1	
	long, lumpy, deep eye, banana		uniform, heavy skin, good shape, nice
R. Burbank		AO00057-2	
	growth cracks, irregular, fair		nice color, irregular, fair
R. Norkotah		AO02183-2	
	uniform, nice		long, many eyes, fair
A00324-1			
	very large, heavy russet, not fresh		

2009 Western Regional Russet Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 6
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days to Vine kill: 116
In-Row Spacing: 9 inch

Regional Trials are evaluated at multiple locations in Oregon, Washington, Idaho, Colorado, Texas, and California. Entries graduating from Tri-state and Southwestern (CO, TX, CA) trials are included in this trial. Entry disposition is determined by the Western Regional Technical Committee. Entries are typically evaluated for three years (if applicable) before graduating. Upon graduation, sponsoring states (state making initial selection) determine if the selection will be eligible for commercial release and assume the lead role in acquiring Plant Variety Protection (PVP). This trial included three standard varieties and 16 new clones at the KBREC location. In most circumstances, a period of 12 to 15 years is required to release a variety following the actual breeding cross and advancement through the Regional Trial. Despite a warm growing season and heavier than normal nematode pressure, potato plots at the KBREC site performed above average for total yield. The following is a summary of the Klamath Falls field results.

Stand Counts

- **30 Day**
  Slow emergence: CO97087-2RU (44%), CO99053-4RU (51%), and AC99375-1RU (52%).
- **50 Day**
  Low emergence: AC99375-1RU (73%), CO97087-2RU (74%), and CO99053-4RU (77%).
  Full emergence: All other entries were above or near 90% emergence.

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: AC99375-1RU (11.8), Russet Burbank (9.2), and CO99053-4RU (9.2)
  Least: CO99100-1RU, and A0008-1TE (6.6)

- **Average Tuber Size (oz.)**
  Largest: A98345-1 (7.7) and CO99100-1RU (7.6)
  Smallest: AO96305-3 (5.5) and AC99375-1RU (5.7)

- **Undersized Tubers (<4 oz.) cwt/Acre**
  Most: PA00N14-2 (194) and AC99375-1RU (169)
  Least: CO99100-1RU (63) and A98345-1 (74)

Yield and Economic Data

- **Total Yield (cwt/Acre)**
  Highest: A98345-1 (681) and Russet Burbank (677)
  Lowest: CO99053-4RU (473) and CO99100-1RU (504)

- **US No. 1 Yield (cwt/Acre)**
  Highest: A98435-1 (496) and AO96365-2 (476)
  Lowest: A97066-42LB (247) and CO99053-4RU (266)

- **Carton Yield (8-20 oz.) cwt/Acre**
  Highest: A98345-1 (344) and CO99053-4RU (248)
  Lowest: AC99375-1RU (141)

- **Gross Return ($/acre)**
  Fresh Market Highest: A98345-1, AO96365-2, and PA99N2-1
  Fresh Market Lowest: AC99375-1RU, PA00N14-2, and A97066-42LB

Tuber Defect Incidence (40 tuber sample of 8-12 oz. tubers)

- **Hollow Heart**
  Notable Defects: CO99100-1RU (27.5%), PA99N82-4 (27.5%), and A0008-1TE (17.5%)

- **Blackspot Bruise**
  Notable Defects: PA99N2-1 (17.5%), AO96365-2 (17.5%), Ranger Russet (17.5%)

- **Corky Ringspot**
  Notable Defects: A98345-1 (45%), Russet Burbank (37.5%), and CO99053-4RU (35%)

Entry	Total Yield		US # 1s* > 4 oz.	US # 2s* > 4 oz.	Culls* & <4 oz.	Carton Yield 100-50 count (US 1's 8-20 oz)	
	(cwt/A)	STATS**	% of Total Yield			% of Total Yield	(cwt/A)
Ranger Russet	642	ABC	59	16	25	38	241
R. Burbank	677	AB	57	12	30	32	216
R. Norkotah	530	EFGH	69	6	25	44	233
A96814-65LB	612	ABCD	66	8	27	39	241
A97066-42LB	520	FGH	47	19	34	29	150
A98345-1	681	A	73	12	15	51	344
A0008-1TE	525	EFGH	70	6	24	45	234
AC99375-1RU	595	CDE	49	14	37	24	141
AO96305-3	534	EFGH	67	5	27	34	183
AO96365-2	651	ABC	73	7	20	42	272
CO97087-2RU	501	GH	61	14	25	41	206
CO98067-7RU	652	ABC	64	11	25	35	228
CO98368-2RU	518	GH	61	7	32	29	148
CO99053-3RU	590	CDEF	68	11	21	39	233
CO99053-4RU	473	H	56	12	32	35	167
CO99100-1RU	504	GH	70	13	17	49	248
PA00N14-2	546	DEFG	57	5	38	28	150

PA99N2-1	607	BCD	68	11	20	40	245
PA99N82-4	562	DEFG	71	9	21	36	200

*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					8-12 oz Specific Gravity	Internal Defects (%) 8-12 oz. tubers***			
	>4 oz. (cwt/A)	STATS**	%* 4-8 oz.	8-12 oz.	>12 oz.		HH	IBS	BS	CRS
Ranger Russet	376	CD	36	39	26	1.096	0.0	0.0	17.5	22.5
R. Burbank	389	C	44	45	11	1.094	0.0	0.0	12.5	37.5
R. Norkotah	366	CD	36	44	20	1.076	5.0	2.5	0.0	0.0
A96814-65LB	404	C	40	43	17	1.106	15.0	0.0	15.0	0.0
A97066-42LB	247	F	39	39	22	1.103	0.0	0.0	2.5	40.0
A98345-1	496	A	31	39	30	1.097	0.0	0.0	15.0	45.0
A0008-1TE	370	CD	37	49	14	1.088	17.5	0.0	12.5	10.0
AC99375-1RU	292	EF	52	35	14	1.103	15.0	0.0	2.5	7.5
AO96305-3	359	CDE	49	46	4	1.095	0.0	0.0	5.0	25.0
AO96365-2	476	AB	43	39	18	1.092	0.0	5.0	17.5	17.5
CO97087-2RU	306	DEF	33	40	27	1.097	7.5	0.0	5.0	0.0
CO98067-7RU	415	BC	45	40	15	1.076	2.5	0.0	2.5	0.0
CO98368-2RU	314	DEF	53	42	6	1.080	0.0	0.0	0.0	2.5
CO99053-3RU	399	C	42	41	17	1.088	2.5	0.0	2.5	27.5
CO99053-4RU	266	F	37	52	11	1.087	0.0	0.0	2.5	35.0
CO99100-1RU	351	CDE	29	46	25	1.088	27.5	0.0	7.5	5.0
PA00N14-2	311	DEF	52	45	4	1.091	0.0	0.0	5.0	0.0
PA99N2-1	415	BC	41	37	22	1.091	5.0	0.0	17.5	0.0
PA99N82-4	398	C	50	38	12	1.087	27.5	2.5	10.0	0.0

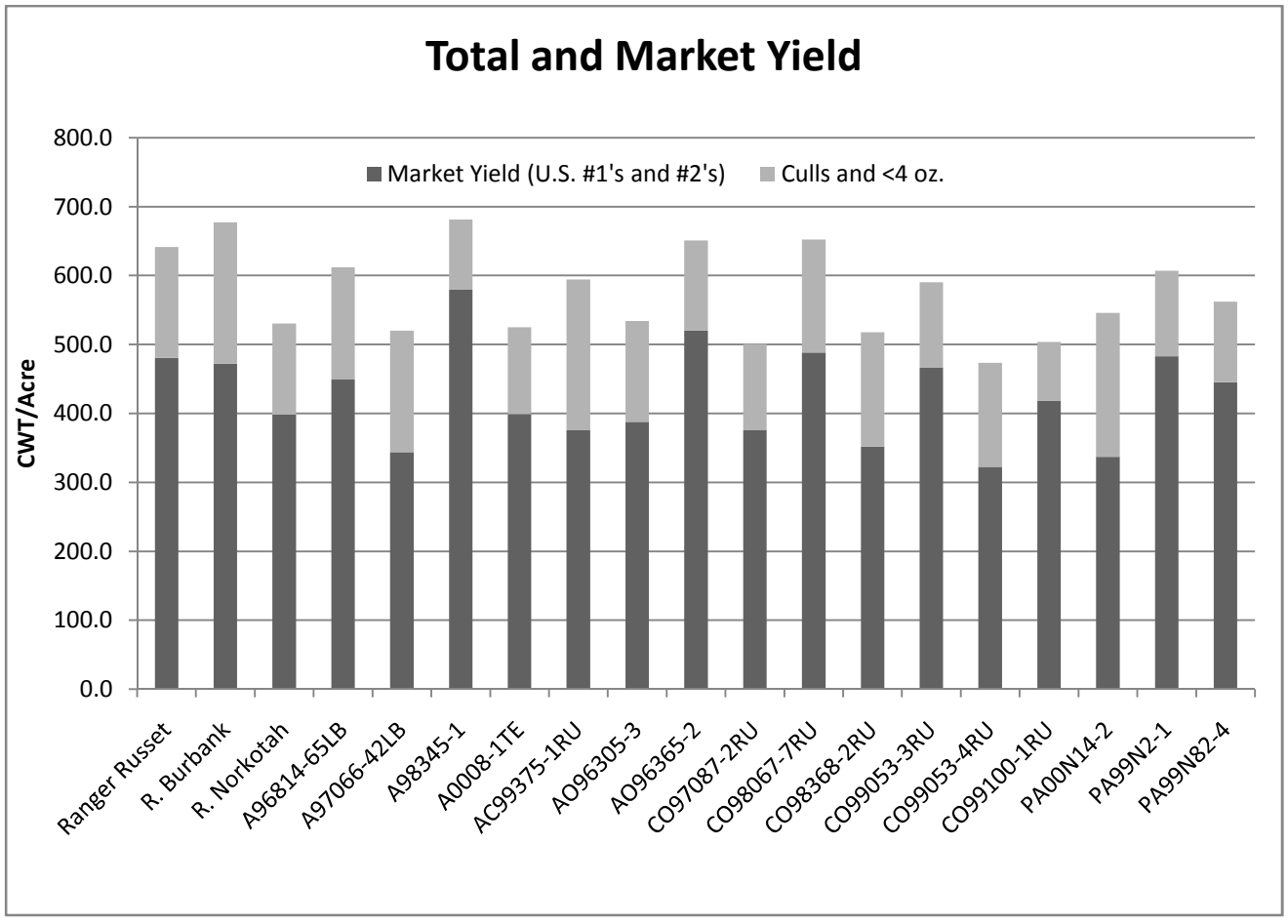
*Percent values may not total 100% due to rounding

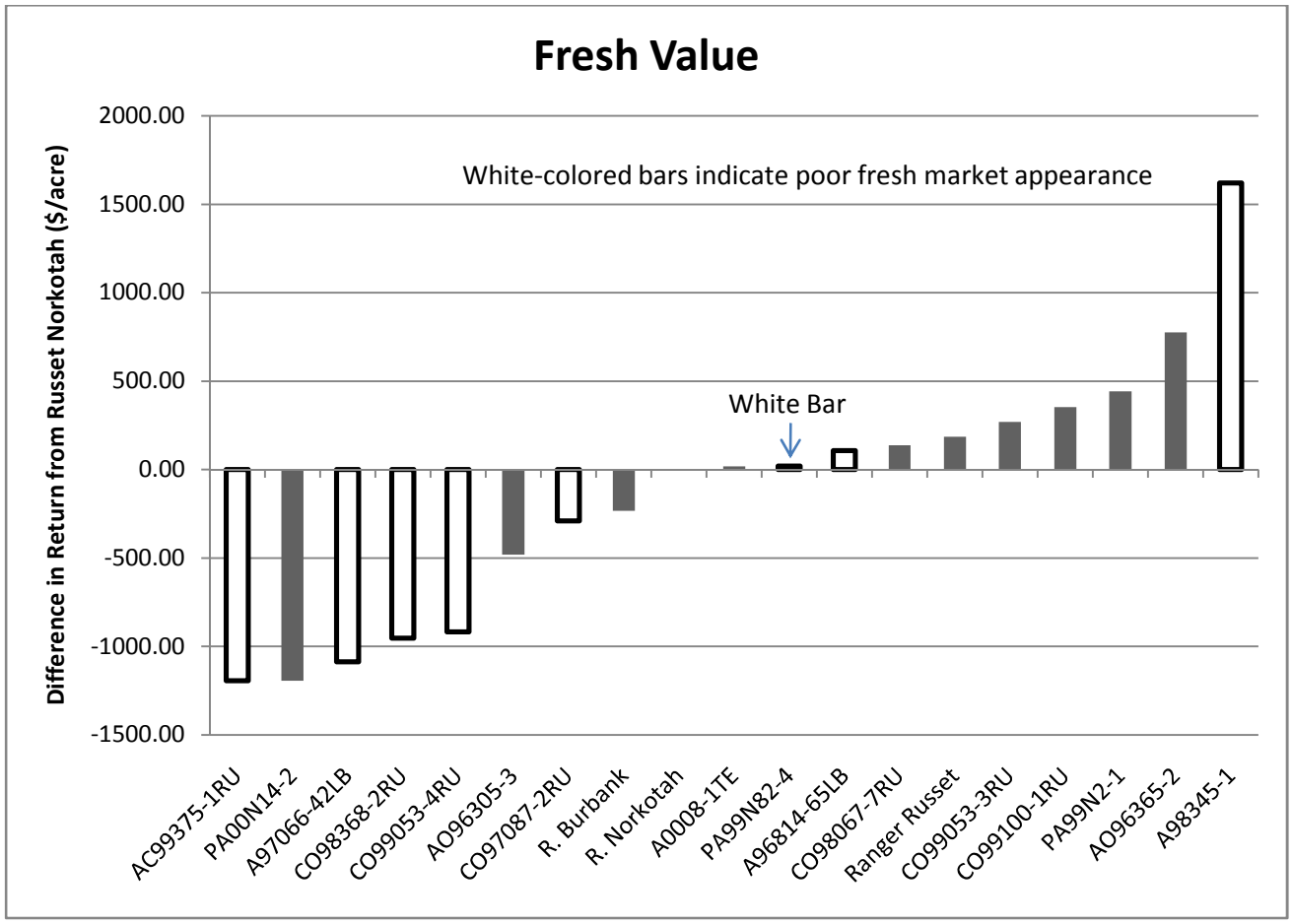
**Entries showing the same letter are not significantly different at the 5% level

***Internal Defects: HH=hollow heart, BC=brown center, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

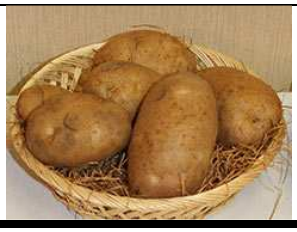
Entry	Stand %	Average Tuber Wt. (oz.)	Average Tuber Number tubers/plant	Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Skin Color (1-5 dark)	Russeting (1-5 hvy)	Shape (1-5 long)	Uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
Ranger Russet	100	7.5	7.1	3.3	4.3	3.5	3.5	5.0	2.8	2.4
R. Burbank	100	6.1	9.2	3.6	3.1	3.9	4.0	4.0	3.1	3.6
R. Norkotah	100	5.8	7.6	3.1	2.8	4.1	4.0	4.0	3.8	3.8
A96814-65LB	93	6.3	8.6	3.5	3.6	2.1	2.3	3.5	3.3	4.4

A97066-42LB	100	6.2	7.0	3.6	4.1	1.9	1.6	3.9	1.9	4.4
A98345-1	99	7.7	7.4	4.5	3.9	1.9	2.0	3.8	3.3	3.6
A0008-1TE	97	6.8	6.6	3.1	2.9	3.0	3.9	4.0	4.1	4.5
AC99375-1RU	73	5.7	11.8	4.9	4.3	3.9	4.5	3.4	2.7	4.3
AO96305-3	93	5.5	8.7	3.8	3.3	3.1	3.3	4.5	4.3	3.8
AO96365-2	99	6.3	8.6	3.4	4.0	3.8	4.4	3.1	3.7	4.3
CO97087-2RU	74	6.6	8.5	3.8	3.5	3.6	4.5	4.0	2.8	4.4
CO98067-7RU	95	6.3	9.0	3.8	3.0	3.5	4.1	3.4	3.2	4.4
CO98368-2RU	89	5.7	8.4	2.5	2.6	3.5	3.5	4.0	3.9	4.8
CO99053-3RU	98	6.6	7.5	3.6	3.9	3.0	4.5	4.0	3.8	4.5
CO99053-4RU	77	5.6	9.2	2.9	2.9	3.0	3.9	4.0	2.1	4.4
CO99100-1RU	89	7.6	6.2	2.8	2.9	3.8	4.6	4.0	4.1	4.5
PA00N14-2	98	5.2	9.1	3.5	2.6	2.5	3.0	4.5	3.8	4.5
PA99N2-1	98	7.0	7.3	3.6	3.5	3.5	4.6	2.6	3.6	4.5
PA99N82-4	98	6.6	7.2	3.3	3.3	4.5	5.0	1.6	3.9	4.4





*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 white-colored bars may not appeal to fresh market consumers due to the undesirable shape or appearance. Refer to page 8 for parameters used to collect gross return to growers.

Entry	2009 KBREC- Regional Russet Comment	Entry	2009 KBREC- Regional Russet Comment
Ranger Russet		CO97087-2RU	
	long, lumpy, deep eye, banana		flat, irregular, lumpy
R. Burbank		CO98067-7RU	
	growth cracks, irregular, fair		pear shape, round-oblong, fair
R. Norkotah		CO98368-2RU	
	uniform, nice		flat, skinning, fair
A96814-65LB		CO99053-3RU	
	light color, irregular, not fresh		nice, uniform, keep
A97066-42LB		CO99053-4RU	
	ugly, knobby, white		lenticel scar, irregular, bottle shape
A98345-1		CO99100-1RU	
	white, pointy, irregular shape, pear		heavy russet, uniform, fair

Entry	2009 KBREC- Regional Russet Comment	Entry	2009 KBREC- Regional Russet Comment
A0008-1TE		PA00N14-2	
	very nice, uniform, good color, keep		small, banana, light color
AC99375-1RU		PA99N2-1	
	lumpy, irregular, heavy skin		Large, roundish, plump, fresh?
AO96305-3		PA99N82-4	
	long, uniform, skinning, nice		round, heavy skin, not fresh
AO96365-2			
	heavy skin, round, plump		

2009 Preliminary Yield (PYT-2) Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19 Vine Kill Date: September 11
Harvest Date: September 28 Days Grown: 116
Fertility: 170-75-100-205S In-Row Spacing: 9 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 18 new entries. The Oregon Potato Variety Development Team chose to advance 5 selections to the Statewide Specialty Trial in 2010 and discarded the remaining selections due to poor performance. **Only retained selections are listed in the following tables.**

Entry	Skin Color	Primary skin color rating (1-5 dark)	Flesh Color	Primary flesh color rating (1-5 dark)	Total yield (cwt/A)	US # 1's > 0 oz.	Culls > 0 oz.	Specific Gravity
						% of Total Yield		
Yukon Gold	Yellow	2.8	Yellow	2.3	576	92	8	1.087
All Blue	Purple	4.5	Purple	4.0	630	87	13	1.089
AO03545-2	Red	3.0	Yellow	2.5	635	93	7	1.079
OR04198-1	Yellow	5.0	Yellow	5.0	456	93	7	1.077
POR07PG3-1	Yellow	2.0	Yellow	2.0	765	92	8	1.081
POR07PG20-2	Yellow	1.0	Yellow	4.5	472	91	9	1.067
POR07PG21-1	Yellow	2.5	Yellow	2.5	670	97	3	1.095

Entry	US # 1 Yield							KBREC Comments
	(cwt/A)	%						
		C size	B size	4-6 oz.	6-10 oz.	10-14 oz.	>14 oz.	
Yukon Gold	528	3	10	14	30	31	13	smooth, large, nice
All Blue	546	21	32	23	21	4	0	deep eye, irregular, ugly
AO03545-2	591	28	28	34	9	0	0	round, small, nice
OR04198-1	425	43	31	26	0	0	0	smooth, yellow-orange, sprout, nice
POR07PG3-1	703	14	27	33	22	4	0	yellow chip, round, smooth, sprouting
POR07PG20-2	429	29	29	30	12	0	0	sprout, smooth, orange color, nice
POR07PG21-1	651	31	31	28	10	0	0	little yellow eggs, smooth, very nice

2009 Statewide Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: September 28
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days to Vine kill: 116
In-Row Spacing: 9 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.

Stand Counts

- **30 Day**
  Slow emergence: POR06PG24-2 (78%), all other entries above 90%.

- **50 Day**
  Full emergence: All entries had above 98% emergence except POR06PG24-2 (86%)

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: POR02PG12-1 (28.6) and POR06PG24-2 (23.1)
  Least: Yukon Gold (6.5) and POR06PG57-2 (8.8)

- **Average Tuber Size (oz.)**
  Largest: Yukon Gold (7.1) and POR06PG57-2 (5.7)
  Smallest: POR02PG12-1 (1.3) and POR06PG24-2 (1.5)

- **C Size Tubers (≤ 1.875 inch diameter and <4 oz.) cwt/Acre**
  Most: POR02PG12-2 (362) and POR06PG24-2 (322)
  Least: Yukon Gold (22) and POR06PG57-2 (31.2)

- **B Size Tubers (1.875-2.25 inch diameter and <4 oz.) cwt/Acre**
  Most: POR05PG26-11 (187) and POR05PG56-1 (178)
  Least: POR06PG24-2 (0) and Yukon Gold (37)

Yield Data

- **Total Yield (cwt/Acre)**
  Highest: OR05045-1 (682) and OR04036-5 (651)
  Lowest: POR06PG24-2 (353) and POR02PG12-1 (458)

- **US No. 1 Yield (cwt/Acre)**
  Highest: OR05045-1 (645) and OR04036-5 (598)
  Lowest: POR06PG24-2 (331) and POR02PG12-1 (436)

- **% U.S. #1s**
  Highest: All entries had more than 90% 1s.

Tuber Defect Incidence (40 tuber sample)

- **External Defects**
  Yukon Gold had a high degree of tuber greening probably due to excess size and shallow tuber set. All entries showed a low incidence for growth cracks and knobs.

- **Internal Defects**
  Most entries had low incidence of internal defects. Some varieties showed a high percent of corky ringspot with POR02PG12-1 (22.5%) and OR05045-1 (17.5%) showing the most.

Entry	Skin Color	Primary skin color rating (1-5 dark)	Flesh Color	Primary flesh color rating (1-5 dark)	Total Yield		US # 1's > 0 oz.	Culls > 0 oz.	External Defects (1-5 none)		
					(cwt/A)	STATS**	% of Total Yield*		Green	Growth crack	Knobs
Yukon Gold	Yellow	2.6	Yellow	3.0	532	DE	94	6	4.3	5.0	4.8
All Blue	Purple	4.6	Purple	4.1	621	ABC	93	7	4.6	5.0	5.0
OR04036-5* **	Yellow	3.9	Yellow	3.0	651	AB	92	8	4.5	5.0	5.0
OR04131-2* **	Red	4.1	White	1.5	490	EF	93	7	4.9	5.0	5.0
POR02PG12-1* **	White	1.5	White	2.3	458	F	95	5	4.8	5.0	5.0
POR04PG11-2	Red	4.0	Purple	2.8	574	CD	92	8	4.4	5.0	5.0
PORO5PG26-11* **	Yellow	3.1	Yellow	3.0	583	BCD	95	5	4.4	5.0	5.0
PORO5PG56-1* **	Purple	3.9	Purple	3.3	597	BCD	94	6	4.6	4.8	5.0
OR05020-1* **	Red	3.4	White	1.5	614	ABC	93	7	4.8	4.9	5.0
OR05045-1	White	1.4	White	1.4	682	A	95	5	4.5	5.0	5.0
OR05112-1* **	Yellow	3.3	Yellow	3.0	580	BCD	92	8	4.5	5.0	4.8
POR06PG24-2* **	Yellow	2.9	Yellow	3.5	353	G	94	6	4.6	5.0	5.0
POR06PG57-2	Purple	4.2	Purple	3.5	600	BCD	92	8	4.5	4.8	4.8

Entry	US # 1 Yield								Specific Gravity	Internal Defects (%)****			
			%*										
	(cwt/A)	STATS**	C size	B size	4-6 oz.	6-10 oz.	10-14 oz.	>14 oz.		HH	IBS	BS	CRS
Yukon Gold	502	CD	4	7	21	29	20	18	1.090	2.5	0.0	2.5	12.5
All Blue	580	AB	18	28	22	23	7	1	1.091	0.0	7.5	2.5	0.0
OR04036-5* **	598	AB	8	19	32	32	9	0	1.071	0.0	0.0	0.0	15.0
OR04131-2* **	455	D	19	30	36	13	3	0	1.076	0.0	5.0	5.0	2.5
POR02PG12-1* **	436	D	83	14	2	0	0	0	1.083	0.0	7.5	0.0	22.5
POR04PG11-2	530	BC	23	26	25	20	5	0	1.096	2.5	0.0	0.0	0.0
PORO5PG26-11* **	552	BC	29	34	24	12	1	0	1.088	0.0	2.5	2.5	5.0
PORO5PG56-1* **	560	BC	24	32	22	18	3	1	1.082	0.0	0.0	0.0	0.0
OR05020-1* **	573	B	9	15	35	23	11	7	1.070	0.0	0.0	5.0	7.5
OR05045-1	645	A	15	24	42	16	1	1	1.068	0.0	0.0	5.0	17.5
OR05112-1* **	531	BC	41	7	33	18	1	0	1.072	0.0	0.0	0.0	7.5
POR06PG24-2* **	331	E	97	0	3	0	0	0	1.088	0.0	0.0	0.0	0.0
POR06PG57-2	553	BC	6	14	30	34	14	3	1.090	0.0	0.0	0.0	0.0

Entry	Stand %	Average Tuber		Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Russeting (1-5 hvy)	Shape (1-5 long)	Size uniformity (1-5 ex.)	Shape uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant							
Yukon Gold	98	7.1	6.5	3.6	3.0	1.0	2.0	4.1	3.9	4.5
All Blue	99	4.1	12.9	4.6	4.1	1.9	3.8	3.1	1.5	2.1
OR04036-5* **	99	5.4	10.4	2.9	2.9	1.1	2.8	4.0	3.4	4.5
OR04131-2* **	98	3.2	12.9	2.9	2.6	1.0	1.0	4.3	4.8	4.4
POR02PG12-1* **	100	1.3	28.6	3.1	2.3	1.6	1.0	5.0	4.6	4.4
POR04PG11-2	100	2.9	16.4	4.0	3.4	1.0	1.8	3.6	3.4	1.5
PORO5PG26-11* **	100	2.8	17.2	3.3	3.1	1.0	2.0	4.4	4.3	4.5
PORO5PG56-1* **	100	3.3	14.8	3.5	2.8	1.0	2.5	3.9	3.5	4.4
OR05020-1* **	99	4.7	11.0	3.0	2.5	1.0	2.0	3.8	4.0	4.4
OR05045-1	100	3.6	15.5	3.3	2.9	1.0	1.0	4.5	4.5	4.5
OR05112-1* **	100	2.9	16.6	3.4	3.5	1.5	5.0	3.9	3.4	4.5
POR06PG24-2* **	86	1.5	23.1	4.4	4.8	1.0	4.6	4.0	4.1	4.5
POR06PG57-2	100	5.7	8.8	4.3	3.7	1.0	1.7	4.2	4.0	4.2

*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 2011

****Internal Defects: HH=hollow heart, BC=brown center, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

Entry	2009 KBREC- Statewide Specialty Comment	Entry	2009 KBREC- Statewide Specialty Comment
Yukon Gold		PORO5PG26-11	
	smooth, large, nice		smooth, good color, more yellow than Yukon gold, nice
All Blue		PORO5PG56-1	
	bronzing, irregular shape, ugly		violet color, smooth, very unique color
OR04036-5		OR05020-1	
	smooth, irregular shape, nice		larger than OR04131-2, good color, smooth, nice
OR04131-2		OR05112-1	
	uniform, round, nice, keep		yellow fingerling, smooth, banana, nice
POR02PG12-1		POR06PG24-2	
	high tuber set, uniform, nice, keep		very small, pink eye fingerling, nice

2009 Tri-State Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 5
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days to Vine kill: 116
In-Row Spacing: 9 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.

Stand Counts

- **30 Day**
  Slow emergence: All entries had above 90% emergence after 30 days.

- **50 Day**
  Full emergence: All entries above 97% total emergence.

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: POR04PG11-2 (14.7) and POR05PG56-1 (14.6)
  Least: Yukon Gold (6.2) and Dark Red Norland (6.6)

- **Average Tuber Size (oz.)**
  Largest: Dark Red Norland (8.1) and Yukon Gold (7.2)
  Smallest: POR04PG11-2 (2.9) and POR05PG56-1 (3.4)

- **C Size Tubers (<1.875 inch diameter and <4 oz.) cwt/Acre**
  Most: POR04PG11-2 (122) and POR05PG56-1 (103)
  Least: Dark Red Norland (12) and Yukon Gem (14)

- **B Size Tubers (1.875-2.25 inch diameter and <4 oz.) cwt/Acre**
  Most: POR05PG56-1 (192) and A02267-5PY (139)
  Least: Dark Red Norland (34) and Yukon Gold (41)

Yield Data

- **Total Yield (cwt/Acre)**
  Highest: OR04036-5 (741) and Yukon Gem (715)
  Lowest: POR04PG11-2 (494) and Yukon Gold (522)

- **US No. 1 Yield (cwt/Acre)**
  Highest: OR04036-5 (659) and A99433-5Y (653)
  Lowest: POR04PG11-2 (443) and Yukon Gold (482)

- **% U.S. #1s**
  Highest: A99433-5Y and A02267-5PY both had 97% U.S. 1s.
  Lowest: All Blue (87%) and OR04036-5 (89%)

Tuber Defect Incidence (40 tuber sample)

- **External Defects**
  All entries had a low incidence of external defects for greening, growth cracks, and knobs.

- **Internal Defects**
  Most entries had low incidence of internal defects. Some varieties showed a high percent of corky ringspot with Yukon Gold (47.5%) and Dark Red Norland (15%) showing the most.

Entry	Skin Color	Primary skin color rating (1-5 dark)	Flesh Color	Primary flesh color rating (1-5 dark)	Total Yield		US # 1's > 0 oz.	Culls > 0 oz.	External Defects (1-5 none)		
					(cwt/A)	STATS**	% of Total Yield*		Green	Growth crack	Knobs
Dk. Red Norland	Red	2.0	White	1.6	634	BC	90	10	4.5	5.0	4.8
Yukon Gem	Yellow	2.8	Yellow	2.4	715	A	90	10	4.8	5.0	4.8
Yukon Gold	Yellow	2.5	Yellow	2.6	522	DE	92	8	4.5	4.6	5.0
A99433-5Y	White	1.5	Yellow	2.3	675	AB	97	3	4.9	5.0	4.9
A02267-1Y	Yellow	3.0	Yellow	3.1	631	BC	92	8	4.1	5.0	5.0
A02267-5PY	Purple	3.3	Yellow	2.6	525	DE	97	3	5.0	4.9	5.0
OR04036-5	Yellow	3.0	Yellow	3.4	741	A	89	11	4.1	5.0	5.0
POR04PG11-2	Red	3.9	Yellow	2.9	494	E	90	10	4.3	5.0	4.6
POR05PG56-1	Purple	3.0	Purple	3.3	590	CD	93	7	4.1	4.9	5.0
All Blue	Purple	4.4	Purple	3.6	593	CD	87	13	4.6	5.0	4.8

*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								Specific	Internal Defects (%) ***			
			%*										
	(cwt/A)	STATS**	C size	B size	4-6 oz.	6-10 oz.	10-14 oz.	>14 oz.	Gravity	HH	IBS	BS	CRS
Dk. Red Norland	570	BC	2	6	12	36	29	15	1.075	2.5	0.0	0.0	15.0
Yukon Gem	647	AB	2	9	21	43	19	7	1.083	0.0	0.0	0.0	7.5
Yukon Gold	482	DE	3	8	12	33	24	18	1.089	0.0	5.0	0.0	47.5
A99433-5Y	653	A	4	9	18	44	20	5	1.095	0.0	0.0	7.5	0.0
A02267-1Y	580	ABC	9	19	24	41	7	0	1.076	0.0	0.0	0.0	2.5
A02267-5PY	509	CDE	16	27	31	24	2	0	1.085	0.0	5.0	0.0	7.5

OR04036-5	659	A	7	16	23	40	12	1	1.065	0.0	5.0	0.0	5.0
POR04PG11-2	443	E	28	28	23	18	3	0	1.085	2.5	0.0	0.0	2.5
POR05PG56-1	547	CD	19	35	31	15	1	0	1.078	0.0	7.5	0.0	0.0
All Blue	518	CDE	18	26	25	28	2	0	1.091	0.0	0.0	2.5	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, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

Entry	Stand %	Average Tuber		Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Russeting (1-5 hvy)	Shape (1-5 long)	Size uniformity (1-5 ex.)	Shape uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant							
Dk. Red Norland	99	8.1	6.6	3.8	3.5	1.4	2.3	3.6	3.5	3.3
Yukon Gem	98	6.4	9.4	4.3	3.0	2.1	2.4	4.1	3.3	4.5
Yukon Gold	97	7.2	6.2	3.5	3.0	1.0	2.5	3.9	3.5	4.5
A99433-5Y	100	6.7	8.4	4.8	3.9	2.0	1.5	4.3	4.4	4.1
A02267-1Y	100	4.6	11.5	4.5	3.4	1.3	1.8	4.1	4.1	4.1
A02267-5PY	100	3.5	12.5	3.8	2.9	1.1	1.0	4.4	4.5	3.9
OR04036-5	98	5.3	11.8	3.1	3.3	1.1	3.3	3.8	2.9	4.5
POR04PG11-2	100	2.9	14.7	3.5	3.5	1.0	1.8	3.8	3.8	2.4
POR05PG56-1	100	3.4	14.6	3.3	2.9	1.0	2.9	4.1	3.8	4.4
All Blue	100	4.0	12.3	4.5	4.0	2.1	3.3	3.1	1.6	2.8

Entry	2009 KBREC- Tri-State Specialty Comments
Dk. Red Norland	large, lighter red, fair
Yukon Gem	ruptured lenticels, some with pink eye
Yukon Gold	large, smooth, nice
A99433-5Y	chipper shape, white, chip trial?
A02267-1Y	some skin cracking, uniform, nice
A02267-5PY	bronzing, round, uniform, nice
OR04036-5	some pear, irregular shapes, large yield
POR04PG11-2	sprouting, deep eyes, round, fair
POR05PG56-1	nice, light purple, uniform
All Blue	ugly, bronzing, skin cracking, irregular

2009 Regional Specialty Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 5
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days Grown: 116
In-Row Spacing: 9 inch

Regional Trials are evaluated at multiple locations in Oregon, Washington, Idaho, Colorado, Texas, and California. Entries graduating from Tri-state and Southwestern (CO, TX, CA) trials are included in this trial. Entry disposition is determined by the Western Regional Technical Committee. Entries are typically evaluated for three years (if applicable) before graduating. Upon graduation, sponsoring states (state making initial selection) determine if the selection will be eligible for commercial release and assume the lead role in acquiring Plant Variety Protection (PVP). This trial included four standard varieties and 9 new clones at the KBREC location. Only Tri-state entries originating in Oregon and Idaho were evaluated at KBREC due to budgetary constraints. Despite a warm growing season and heavier than normal nematode pressure, potato plots at the KBREC site performed above average for total yield. The following is a summary of the Klamath Falls field results.

Stand Counts

- **30 Day**
  Slow emergence: All entries above 90% emergence after 30 days.

- **50 Day**
  Full emergence: All entries had stands above 97%.

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: POR03PG23-1 (16.8) and PA96RR1-193 (15.3)
  Least: POR03PG80-2 (6.0) and Red LaSoda (6.1)

- **Average Tuber Size (oz.)**
  Largest: Red LaSoda (8.6) and POR03PG80-2 (8.4)
  Smallest: POR03PG23-1 (2.8) and PA96RR1-193 (3.1)

- **C Size Tubers (< 1.875 inch diameter and <4 oz.) cwt/Acre**
  Most: POR03PG23-1 (121) and Purple Majesty (103)
  Least: Red LaSoda (10) and Dark Red Norland (12)

- **B Size Tubers (1.875-2.25 inch diameter and <4 oz.) cwt/Acre**
  Most: POR03PG23-1 (181) and Purple Majesty (153)
  Least: Red LaSoda (21), Dark Red Norland (34), and POR03PG80-2 (34)

Yield Data

- **Total Yield (cwt/Acre)**
  Highest: AO0286-3Y (677) and Dark Red Norland (634)
  Lowest: AO0293-2Y (521) and Yukon Gold (522)

- **US No. 1 Yield (cwt/Acre)- no statistical significance**
  Highest: AO0286-3Y (606) and Dark Red Norland (570)
  Lowest: Yukon Gold (482) and AO0293-2Y (498)

- **% U.S. #1s**
  Highest: AO0293-2Y (96%), PA96RR1-193 (94%), and POR01PG45-5 (94%)
  Lowest: Red LaSoda (83%) and POR03PG80-2 (87%)

Tuber Defect Incidence (40 tuber sample)

- **External Defects**
  Observable external defects were minimal with the exception of Red LaSoda which exhibited problems with growth cracks.

- **Internal Defects**
  Two entries had high incidence of internal brown spot (IBS); PA96RR1-193 (10%) and POR03PG23-1 (22.5%). Red LaSoda exhibited blackspot bruise (10%). Corky ringspot was also problematic in several entries with Yukon Gold (47.5%) and Red LaSoda (17.5%) being the highest.

Entry	Skin Color	Primary skin color rating (1-5 dark)	Flesh Color	Primary flesh color rating (1-5 dark)	Total Yield		US # 1's* > 0 oz.	Culls* > 0 oz.	External Defects (1-5 none)		
					(cwt/A)	STATS**	% of Total Yield		Green	Growth crack	Knobs
Dk. Red Norland	Red	2.0	White	1.6	634	AB	90	10	4.5	5.0	4.8
Red LaSoda	Red	2.1	White	1.8	621	ABC	83	17	4.4	3.9	4.6
A99326-1PY	Purple	3.3	Yellow	3.3	622	ABC	90	10	4.8	4.6	4.9
POR01PG45-5	Purple	3.4	Yellow	2.4	568	BCD	94	6	4.8	4.9	5.0
POR03PG80-2	Purple	3.0	Yellow	2.8	611	ABC	87	13	5.0	4.3	5.0
PA96RR1-193	Red	4.0	Red	1.5	565	BCD	94	6	4.8	5.0	4.5
POR03PG23-1	Red	4.0	Red	3.0	563	BCD	92	8	4.6	5.0	4.8
Purple Majesty	Purple	5.0	Purple	4.1	544	CD	91	9	4.9	5.0	5.0
OR00068-11	Purple	4.0	Purple	3.8	539	CD	93	7	5.0	5.0	5.0
Yukon Gold	Yellow	2.5	Yellow	2.6	522	D	92	8	4.5	4.6	5.0
A00286-3Y	Yellow	1.4	Yellow	2.6	677	A	89	11	4.5	5.0	4.8
A00293-2Y	Yellow	3.4	Yellow	3.8	521	D	96	4	5.0	5.0	5.0
POR02PG37-2	Yellow	2.9	Yellow	3.3	589	BCD	90	10	4.1	5.0	4.8

*Percent values may not total 100% due to rounding
**Entries showing the same letter are not significantly different at the 5% level

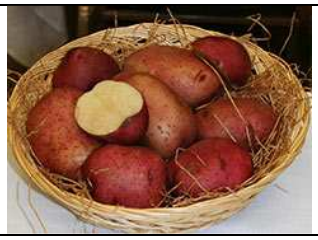
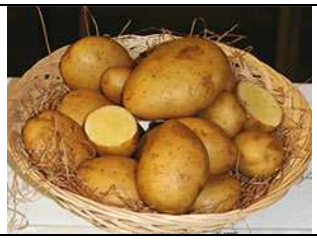
Entry	US # 1 Yield								Specific Gravity	Internal Defects (%) ***			
			%*										
	(cwt/A)	STATS**	C size	B size	4-6 oz.	6-10 oz.	10-14 oz.	>14 oz.		HH	IBS	BS	CRS
Dk Red Norland	570	*NS*	2	6	12	36	29	15	1.075	2.5	0.0	0.0	15.0
Red LaSoda	514	*NS*	2	4	9	35	31	19	1.077	0.0	0.0	10.0	17.5
A99326-1PY	562	*NS*	3	9	20	41	16	11	1.083	0.0	2.5	2.5	7.5
POR01PG45-5	533	*NS*	14	21	23	34	6	1	1.091	0.0	0.0	0.0	7.5
POR03PG80-2	531	*NS*	2	6	11	33	29	19	1.076	0.0	0.0	0.0	0.0
PA96RR1-193	531	*NS*	20	34	29	18	0	0	1.086	0.0	10.0	0.0	10.0
POR03PG23-1	520	*NS*	23	35	25	15	2	0	1.076	0.0	22.5	0.0	2.5
Purple Majesty	493	*NS*	21	31	27	20	0	0	1.089	5.0	0.0	0.0	2.5
OR00068-11	502	*NS*	15	26	28	28	2	0	1.093	0.0	2.5	0.0	0.0
Yukon Gold	482	*NS*	3	8	12	33	24	18	1.089	0.0	5.0	0.0	47.5
A00286-3Y	606	*NS*	5	12	16	33	23	11	1.086	0.0	5.0	0.0	10.0
A00293-2Y	498	*NS*	14	27	32	24	3	0	1.086	0.0	0.0	5.0	0.0
POR02PG37-2	531	*NS*	10	18	29	38	6	1	1.082	2.5	0.0	0.0	5.0

*Percent values may not total 100% due to rounding

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

***Internal Defects: HH=hollow heart, BC=brown center, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

Entry	Stand %	Average Tuber		Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Russeting (1-5 hvy)	Shape (1-5 long)	Size uniformity (1-5 ex.)	Shape uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
		Wt. (oz.)	Number tubers/plant							
Dk Red Norland	99	8.1	6.6	3.8	3.5	1.4	2.3	3.6	3.5	3.3
Red LaSoda	98	8.6	6.1	2.9	3.3	1.0	2.3	3.8	1.8	1.5
A99326-1PY	99	7.3	7.1	3.6	3.4	1.3	2.3	3.5	3.6	4.1
POR01PG45-5	100	4.4	10.7	3.6	4.0	1.3	2.9	3.5	3.8	4.4
POR03PG80-2	100	8.4	6.0	3.9	3.4	1.1	4.0	3.8	3.9	4.4
PA96RR1-193	100	3.1	15.3	3.1	2.9	1.3	1.4	4.0	4.0	4.1
POR03PG23-1	98	2.8	16.8	3.3	3.6	1.5	2.0	4.0	3.8	4.5
Purple Majesty	100	3.4	13.4	3.1	3.0	2.0	2.5	3.6	2.8	4.5
OR00068-11	98	4.0	11.7	4.4	3.4	1.5	2.0	3.9	3.8	4.0
Yukon Gold	97	7.2	6.2	3.5	3.0	1.0	2.5	3.9	3.5	4.5
A00286-3Y	99	6.1	9.3	4.5	4.5	1.0	2.8	3.8	2.4	4.5
A00293-2Y	100	3.9	11.3	3.8	3.5	1.0	2.1	3.9	4.0	4.5
POR02PG37-2	100	4.2	11.6	2.6	2.9	1.0	1.8	4.0	4.0	4.3

Entry	2009 KBREC- Regional Specialty Comment	Entry	2009 KBREC- Regional Specialty Comment
Dark Red Norland		Purple Majesty	
	irregular, large, light red, fair		very rough skin, bronzing, irregular, ugly
Red LaSoda		OR00068-11	
	lumpy, large, folded bud end, ugly		powdery scab, small, very dark, nice when skin is smooth
A99326-1PY		Yukon Gold	
	chipper shape, flat, fair		corky ring spot, large, smooth, nice
POR01PG45-5		A00286-3Y	
	some irregular shapes, light purple, nice		ugly pink eyes, irregular shapes, smooth
POR03PG80-2		A00293-2Y	
	large, blocky, baker shape		good size, uniform, smooth yellow, nice
PA96RR1-193		POR02PG37-2	
	bronzing, dark skin, ugly		smooth, Yukon Gold look alike, nice

Entry	2009 KBREC- Regional Specialty Comment	Entry	2009 KBREC- Regional Specialty Comment
POR03PG23-1			
	rough skin, bronzing, nice color inside/out, uniform		

2009 Chip Trial

Location: OSU KBREC – Klamath Falls, OR
Planting Date: May 19
Harvest Date: October 5
Fertility: 170-75-100-205S
Vine Kill Date: September 11
Days Grown: 116
In-Row Spacing: 9 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. In 2009 sixteen 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 Baley-Trotman Farms. Results for 2009 are listed below. A two-year summary of yield and grade is also provided toward the end of this publication.

Stand Counts

- **30 Day**
  Slow emergence: CO00270-7W (28%), CO00188-4W (63%), and CO00197-3W. All other entries had above 90% emergence after 30 days.

- **50 Day**
  Low emergence: CO00270-7W (67%) and CO00188-4W (83%)
  Full emergence: All other entries had a final stand greater than 96%.

Plant and Tuber Growth and Development

- **Average Tuber Number Per Plant**
  Most: MSJ461-1 (12.3) and MSJ036-A (12.2)
  Least: Chipeta (7.1) and NY140 (8.1)

- **Average Tuber Size (oz.)**
  Largest: Chipeta (8.5) and NY140 (6.8)
  Smallest: MSJ461-1 (3.8) and MSJ036-A (4.0)

- **Undersized Tubers (<4 oz.) cwt/Acre**
  Most: MSJ461-1 (141) and MSJ036-A (141)
  Least: Chipeta (35) and NY140 (50)

Yield Data

- **Total Yield (cwt/Acre)**
  Highest: Chipeta (712) and CO97043-14W (687)
  Lowest: CO00270-7W (459) and Dakota Pearl (512)

- **Marketable Yield >4 oz. (cwt/Acre)**
  Highest: Chipeta (613) and CO97043-14W (609)
  Lowest: CO00270-7W (347) and MSJ461-1 (361)

- **% Marketable Yield >4 oz.**
  Highest: CO97043-14W (89%), NY140 (88%), and Marcy (88%)
  Lowest: MSJ461-1 (66%) and CO00197-3W (70%)

Tuber Defect Incidence (40 tuber sample)

- **External Defects**
  Chipeta and MN99380-1 both exhibited a fair amount of tuber greening. CO00270-7W and Dakota Pearl showed a propensity for shatter bruise.

- **Internal Defects**
  Hollow Heart: Dakota Pearl (55%)
  Brown Center: MSJ036-A (20%)
  Corky ringspot: MSJ036-A (15%) and NY140 (15%)

Entry	Total Yield		> 4 oz.*	< 4 oz.*	Culls*	Skin color rating (1-5 dark)	Flesh color rating (1-5 dark)
	(cwt/A)	STATS**	% of Total Yield				
Atlantic	651	ABCD	78	14	8	2.1	1.5
Chipeta	712	A	86	5	9	1.9	1.4
CO00188-4W	532	FG	74	18	9	2.0	1.5
CO00197-3W	581	DEFG	70	22	8	1.5	1.3
CO00270-7W	459	H	76	15	10	1.0	1.3
MSJ461-1 (Missankee)	544	EFG	66	26	8	1.6	1.5
MSJ036-A (Kalkaska)	581	DEFG	71	24	5	1.9	1.6
MN99380-1	615	BCDE	72	19	9	2.6	2.3
CO97065-7W	611	BCDE	85	10	5	1.6	1.5
Snowden	664	ABC	81	15	4	2.6	1.5
CO97043-14W	687	AB	89	8	4	1.0	1.5
NY140	654	ABCD	88	8	5	1.4	1.4
Marcy	678	ABC	88	8	4	2.5	1.9
Dakota Diamond	625	BCD	75	21	4	1.1	1.5
Dakota Pearl	512	GH	77	16	8	1.0	1.5
Pike	600	CDEF	79	17	4	1.6	1.4

*Percent values may not total 100% due to rounding
**Numbers followed by the same letter are not significantly different at the 5% level

Entry	Yield US # 1 (>4 oz.)						External Defects (1-5 none)			
			%*							
	(cwt/A)	STATS**	4-6 oz.	6-10 oz.	10-14 oz.	>14 oz.	Green	Growth crack	Knobs	Shatter
Atlantic	509	CDE	28	49	17	7	4.1	5.0	5.0	4.6
Chipeta	613	A	9	29	31	31	3.6	5.0	4.6	4.6
CO00188-4W	393	FGH	35	44	19	3	3.9	4.8	5.0	4.9
CO00197-3W	408	FGH	39	37	22	2	4.5	5.0	5.0	5.0
CO00270-7W	347	H	23	33	30	13	4.0	4.0	4.6	3.8
MSJ461-1 (Missankee)	361	GH	36	49	14	2	4.1	5.0	5.0	4.8
MSJ036-A (Kalkaska)	413	FGH	45	43	11	1	4.4	5.0	5.0	4.9
MN99380-1	444	EFG	34	50	12	4	3.6	5.0	4.3	4.3
CO97065-7W	519	BCDE	22	47	25	5	4.3	5.0	5.0	4.4
Snowden	537	ABCD	38	43	15	4	4.5	5.0	5.0	5.0
CO97043-14W	609	A	21	45	25	9	4.3	5.0	5.0	4.9
NY140	573	ABC	16	34	36	14	4.6	4.9	5.0	4.4
Marcy	596	AB	26	41	23	10	4.6	5.0	5.0	5.0
Dakota Diamond	470	DEF	43	39	15	3	4.5	4.9	4.9	4.3
Dakota Pearl	392	FGH	36	37	22	5	4.0	4.4	4.6	3.9
Pike	472	DEF	32	47	14	6	4.6	5.0	4.9	5.0

*Percent values may not total 100% due to rounding

**Numbers followed by the same letter are not significantly different at the 5% level

Entry	Stand %	Average Tuber		Internal Defects (%)*						
		Wt. (oz.)	Number tubers/plant	HH	BC	IBS	SEB	VD	HB	CRS
Atlantic	99	5.6	9.7	8	0	0	3	3	3	0
Chipeta	98	8.5	7.1	5	0	3	0	0	5	3
CO00188-4W	83	4.7	11.4	3	8	3	8	0	5	5
CO00197-3W	90	4.5	12.0	0	3	3	3	5	10	3
CO00270-7W	67	5.4	10.5	0	0	0	0	3	0	0
MSJ461-1 (Missankee)	97	3.8	12.3	0	0	3	3	0	5	0
MSJ036-A (Kalkaska)	98	4.0	12.2	3	20	0	0	3	0	15
MN99380-1	98	4.6	11.2	0	8	0	0	5	0	8
CO97065-7W	100	5.7	8.9	0	0	0	0	0	5	0
Snowden	100	5.0	11.1	0	0	0	0	0	10	8
CO97043-14W	98	6.2	9.4	3	0	3	0	0	8	8
NY140	98	6.8	8.1	0	0	0	10	3	5	15
Marcy	98	6.0	9.5	8	0	0	0	0	0	5
Dakota Diamond	98	4.6	11.4	5	5	0	3	0	8	3
Dakota Pearl	98	4.5	9.7	55	18	0	0	0	0	8
Pike	100	4.8	10.3	0	0	0	0	0	10	13

*Internal Defects: HH=hollow heart, BC=brown center, IBS=internal brown spot, SEB=stem end browning, VD=vascular discoloration, HB=hard bite, CRS=corky ring-spot

Entry	Vine Vigor (1-5 large)	Vine Maturity (1-5 late)	Russeting (1-5 hvy)	Shape (1-5 long)	Size uniformity (1-5 ex.)	Shape uniformity (1-5 ex.)	Eye Depth (1-5 shal.)
Atlantic	3.8	3.8	3.0	1.8	4.0	4.0	3.9
Chipeta	5.0	4.0	1.9	2.3	4.1	3.4	3.1
CO00188-4W	3.5	3.3	2.0	1.9	3.8	4.0	4.0
CO00197-3W	3.5	3.1	1.5	2.0	4.3	3.8	4.5
CO00270-7W	3.4	3.1	1.0	1.6	2.9	3.5	4.6
MSJ461-1 (Missankee)	3.8	3.3	1.8	1.4	4.0	4.4	4.1
MSJ036-A (Kalkaska)	3.9	4.0	1.8	1.6	3.8	3.9	4.1
MN99380-1	3.1	2.8	1.6	1.5	4.0	2.6	3.8
CO97065-7W	3.8	3.8	2.1	1.4	4.4	4.5	3.6
Snowden	4.3	3.4	3.3	1.3	4.6	4.8	3.9
CO97043-14W	3.5	3.6	1.1	1.5	4.5	4.5	4.1
NY140	4.4	3.9	1.5	2.0	3.6	3.4	4.0
Marcy	4.3	3.6	2.9	2.0	4.6	3.9	4.1
Dakota Diamond	3.3	2.8	1.5	1.4	3.8	4.3	4.5
Dakota Pearl	3.3	3.1	1.0	1.4	4.0	3.9	4.4
Pike	3.8	4.3	2.0	2.0	3.9	3.9	4.0

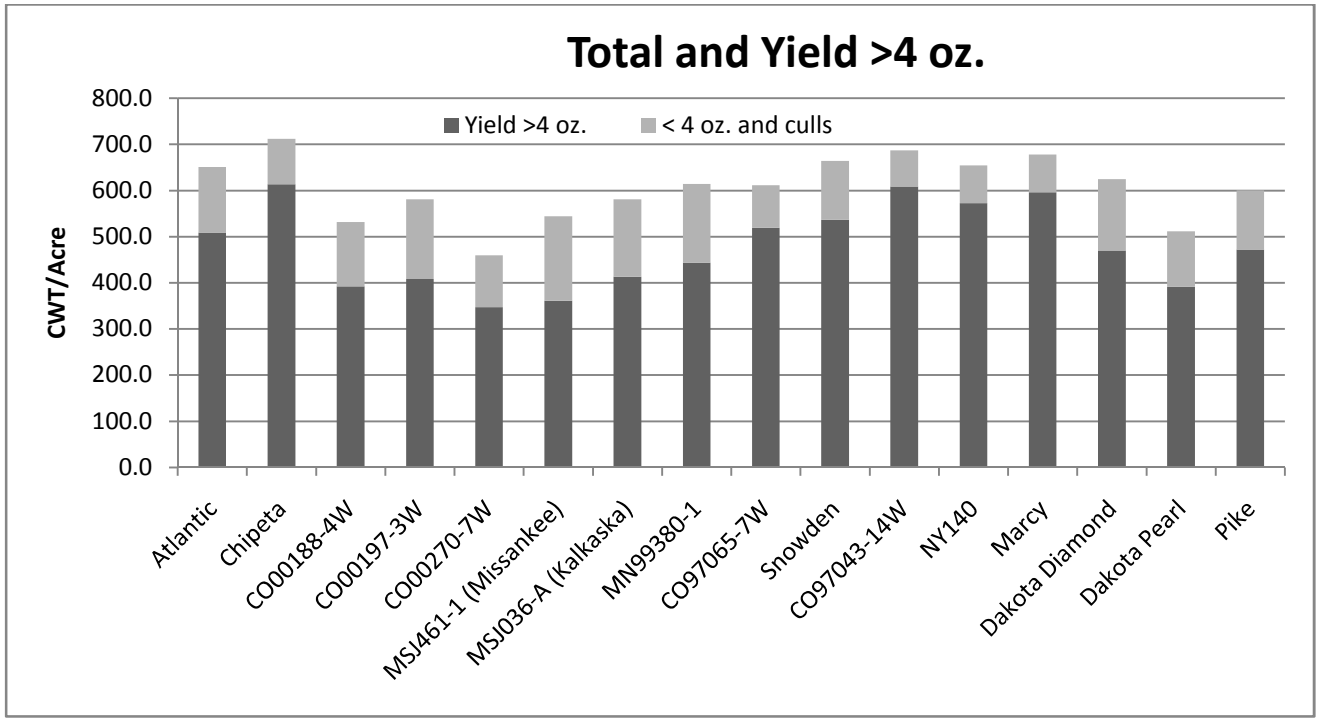
Entry	2009 KBREC- Chip Trial Comments
Atlantic	flaky skin, uniform, fair-nice
Chipeta	thin skin, irregular shape, large
CO00188-4W	irregular shape, some with light russet, fair
CO00197-3W	root knot nematode, some irregular shape, fair
CO00270-7W	smooth, irregular, low yield and emergence
MSJ461-1 (Missankee)	small, good shape, uniform, nice
MSJ036-A (Kalkaska)	small, root knot nematode, fair
MN99380-1	pointy stem end, pear, sprouting
CO97065-7W	folded bud end on large ones, uniform, nice
Snowden	russet skin, uniform, nice
CO97043-14W	folded bud end, uniform, smooth, nice
NY140	folded bud end on large ones, some irregular shape
Marcy	good size, uniform, nice
Dakota Diamond	uniform, good size, irregular skin, nice
Dakota Pearl	smooth, corky ring-spot, some air checking, fair-nice
Pike	little irregular, slightly russeted skin, fair

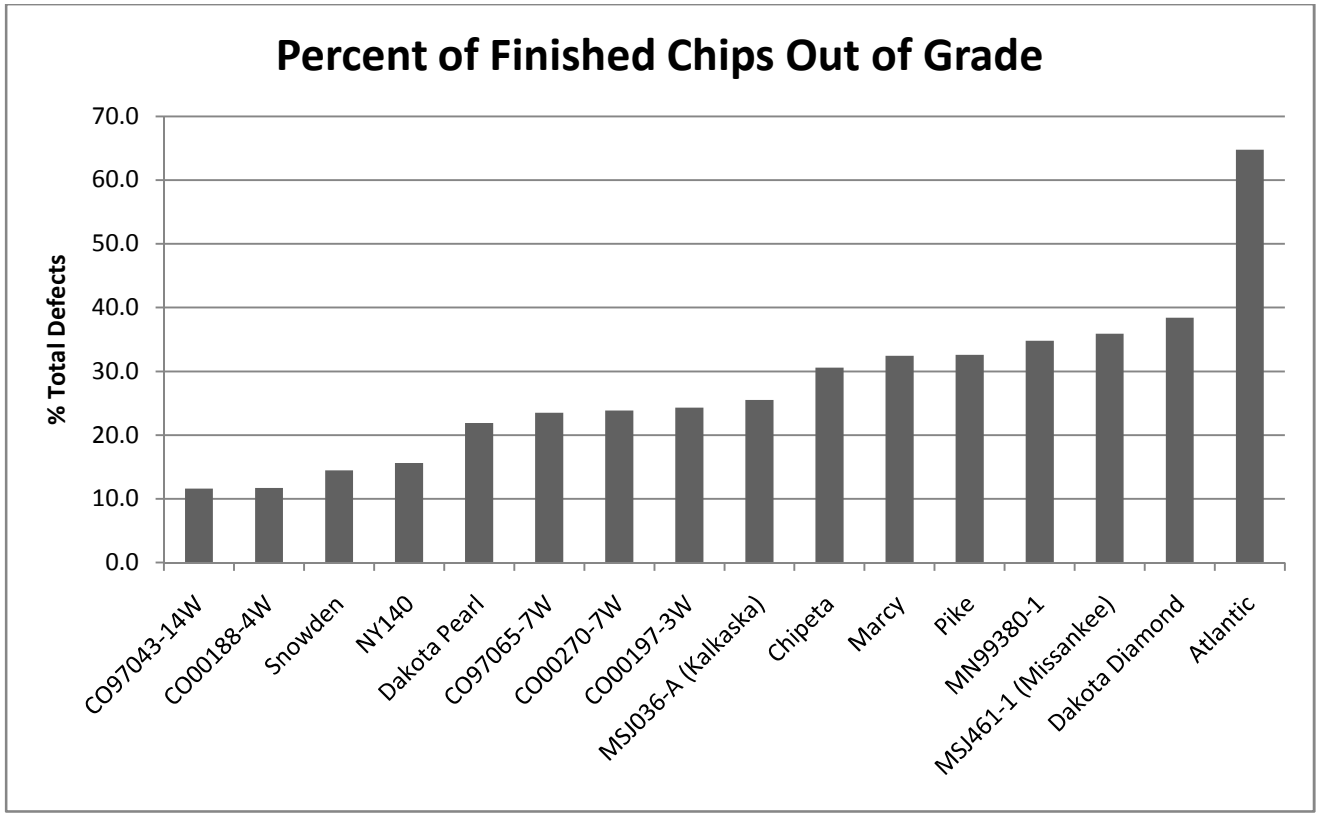
Entry	Specific Gravity[1]		TDF %[2]	Sugars[3]	
	Field	Short-term Storage		dextrose	sucrose
Atlantic	1.092	1.090	64.8	0.272	0.405
Chipeta	1.084	1.084	30.6	0.090	0.317
CO00188-4W	1.086	1.085	11.7	0.025	0.572
CO00197-3W	1.088	1.088	24.3	0.035	0.815
CO00270-7W	1.080	1.082	23.9	0.047	0.891
MSJ461-1 (Missankee)	1.092	1.085	35.9	0.117	0.767
MSJ036-A (Kalkaska)	1.092	1.090	25.5	0.112	0.933
MN99380-1	1.076	1.081	34.8	0.140	0.431
CO97065-7W	1.091	1.089	23.5	0.080	0.420
Snowden	1.093	1.082	14.4	0.010	0.248
CO97043-14W	1.084	1.083	11.6	0.026	0.289
NY140	1.087	1.085	15.6	0.011	0.825
Marcy	1.086	1.085	32.4	0.201	0.599
Dakota Diamond	1.090	1.092	38.4	0.072	0.536
Dakota Pearl	1.084	1.087	21.9	0.069	0.543
Pike	1.096	1.096	32.6	0.037	0.272
Mean	1.088	1.086	27.6	0.084	0.554
CV (%)	0.3	0.6	41	146	52
LSD (0.05)	0.005	*NS*	16.1	*NS*	0.410

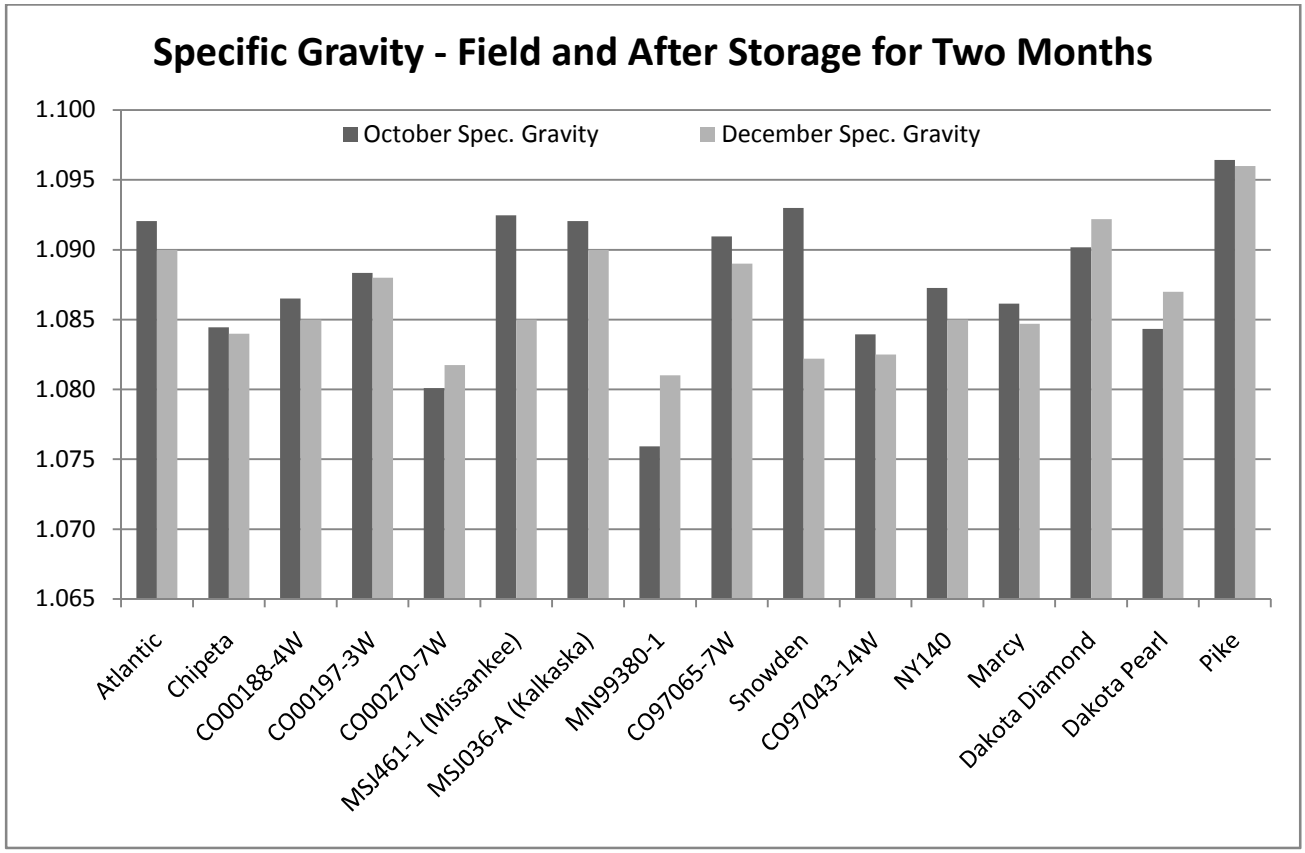
[1]Specific gravity measured out of field and after storage for 2 months at 50^0 F.

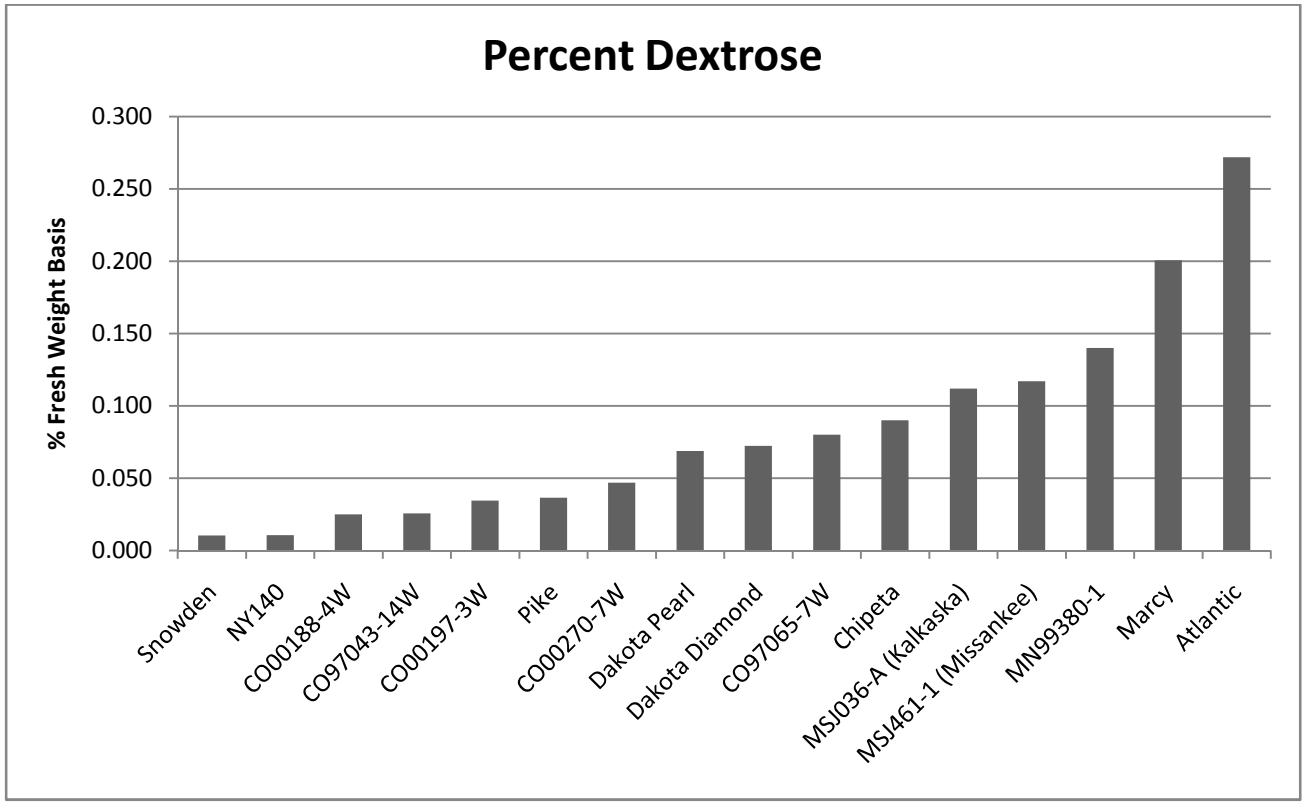
[2] % Total Defects = % of finished chips out of grade; includes internal & external defects (e.g. HH, Green, Dark Color, etc.)

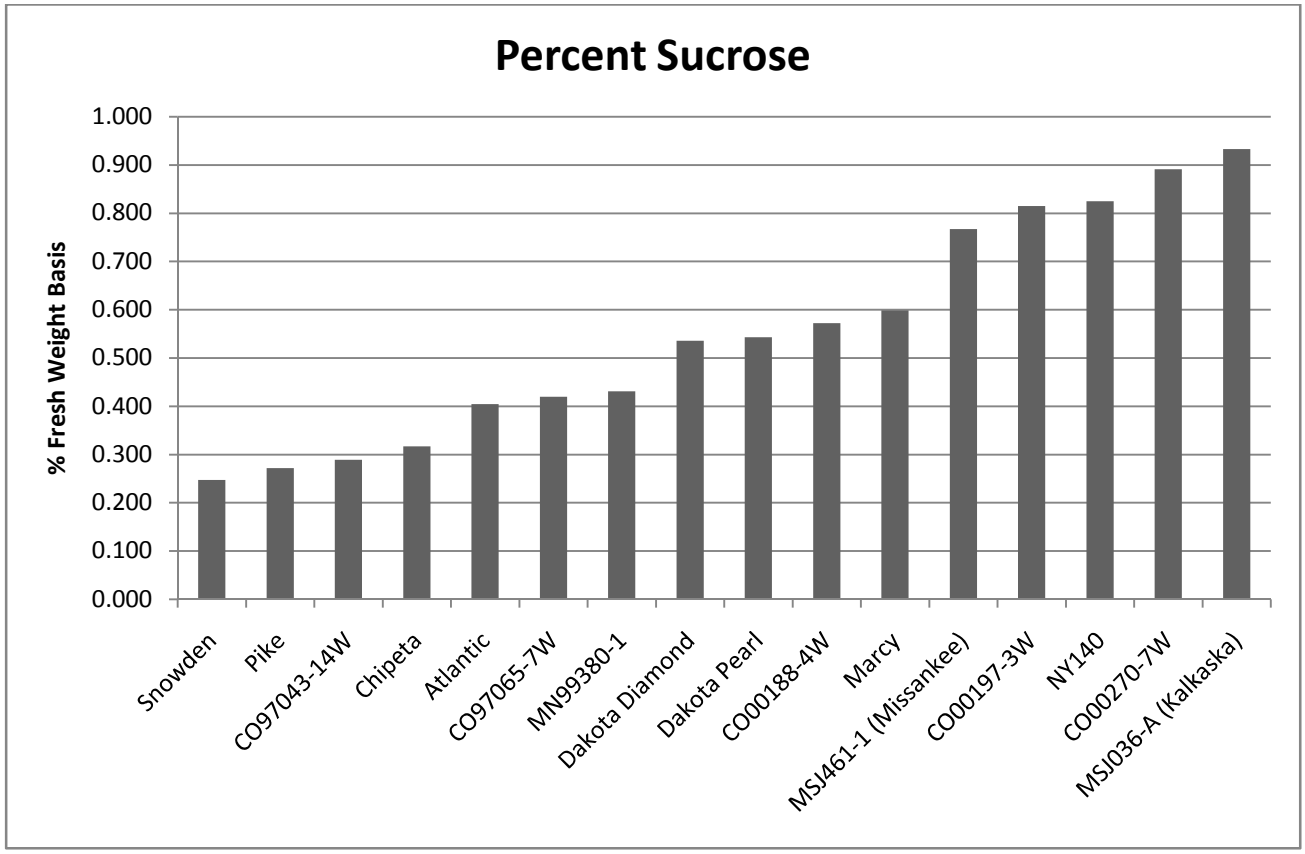
[3]Percent fresh weight basis measured after storage for 2 months at 50^0 F.


Total and Yield >4 oz.
CWT/Acre
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Yield >4 oz.
< 4 oz. and culls
Atlantic
Chipeta
CO00188-4W
CO00197-3W
CO00270-7W
MSJ461-1 (Missankee)
MSJ036-A (Kalkaska)
MN99380-1
CO97065-7W
Snowden
CO97043-14W
NY140
Marcy
Dakota Diamond
Dakota Pearl
Pike


Percent of Finished Chips Out of Grade
% Total Defects
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
CO97043-14W
CO00188-4W
Snowden
NY140
Dakota Pearl
CO97065-7W
CO00270-7W
CO00197-3W
MSJ036-A (Kalkaska)
Chipeta
Marcy
Pike
MN99380-1
MSJ461-1 (Missankee)
Dakota Diamond
Atlantic


Specific Gravity - Field and After Storage for Two Months
October Spec. Gravity
December Spec. Gravity
1.100
1.095
1.090
1.085
1.080
1.075
1.070
1.065
Atlantic
Chipeta
CO00188-4W
CO00197-3W
CO00270-7W
MSJ461-1 (Missankee)
MSJ036-A (Kalkaska)
MN99380-1
CO97065-7W
Snowden
CO97043-14W
NY140
Marcy
Dakota Diamond
Dakota Pearl
Pike


Percent Dextrose
% Fresh Weight Basis
0.300
0.250
0.200
0.150
0.100
0.050
0.000
Snowden
NY140
CO00188-4W
CO97043-14W
CO00197-3W
Pike
CO00270-7W
Dakota Pearl
Dakota Diamond
CO97065-7W
Chipeta
MSJ036-A (Kalkaska)
MSJ461-1 (Missankee)
MN99380-1
Marcy
Atlantic


Percent Sucrose
% Fresh Weight Basis
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Snowden
Pike
CO97043-14W
Chipeta
Atlantic
CO97065-7W
MN99380-1
Dakota Diamond
Dakota Pearl
CO00188-4W
Marcy
MSJ461-1 (Missankee)
CO00197-3W
NY140
CO00270-7W
MSJ036-A (Kalkaska)

Two-Year Chip Variety Analysis

Trials were conducted 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. In 2008, we identified 11 entries to be further evaluated in 2009 (along with 6 new entries). Dakota Crisp seed was not available in 2009. As such, 10 entries were evaluated in 2008 and 2009. The following yield and grade table is a statistical analysis of how these varieties performed over years. Processing information was not replicated during the 2008 season; therefore, a statistical comparison over years was not conducted. A two-year statistical analysis for processing quality will be performed next year comparing 2009 and 2010 data. All field data was collected at the KBREC site and analyzed as a split-plot in time.

Plant and Tuber Growth and Development

- **Undersized Tubers (<4 oz.) cwt/Acre**
  Most: Kalkaska (125) and Snowden (109)
  Least: Chipeta (41) and NY140 (55)

Yield Data

- **Total Yield (cwt/Acre)- no statistical significance**
  Highest: Chipeta (602) and Marcy (598)
  Lowest: Dakota Pearl (484) and CO97065-7W (491)

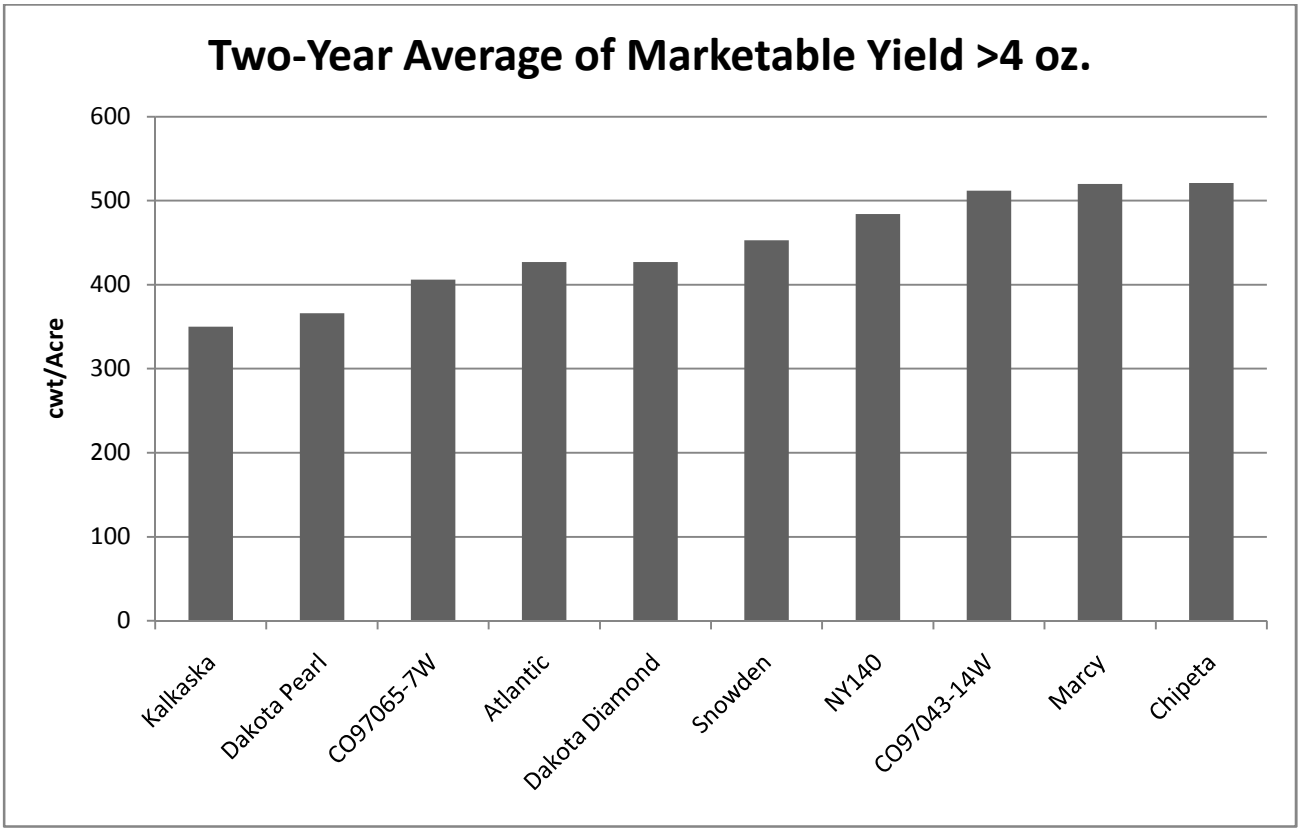
- **Marketable Yield >4 oz. (cwt/Acre)**
  Highest: Chipeta (521) and Marcy (520)
  Lowest: Kalkaska (350) and Dakota Pearl (366)

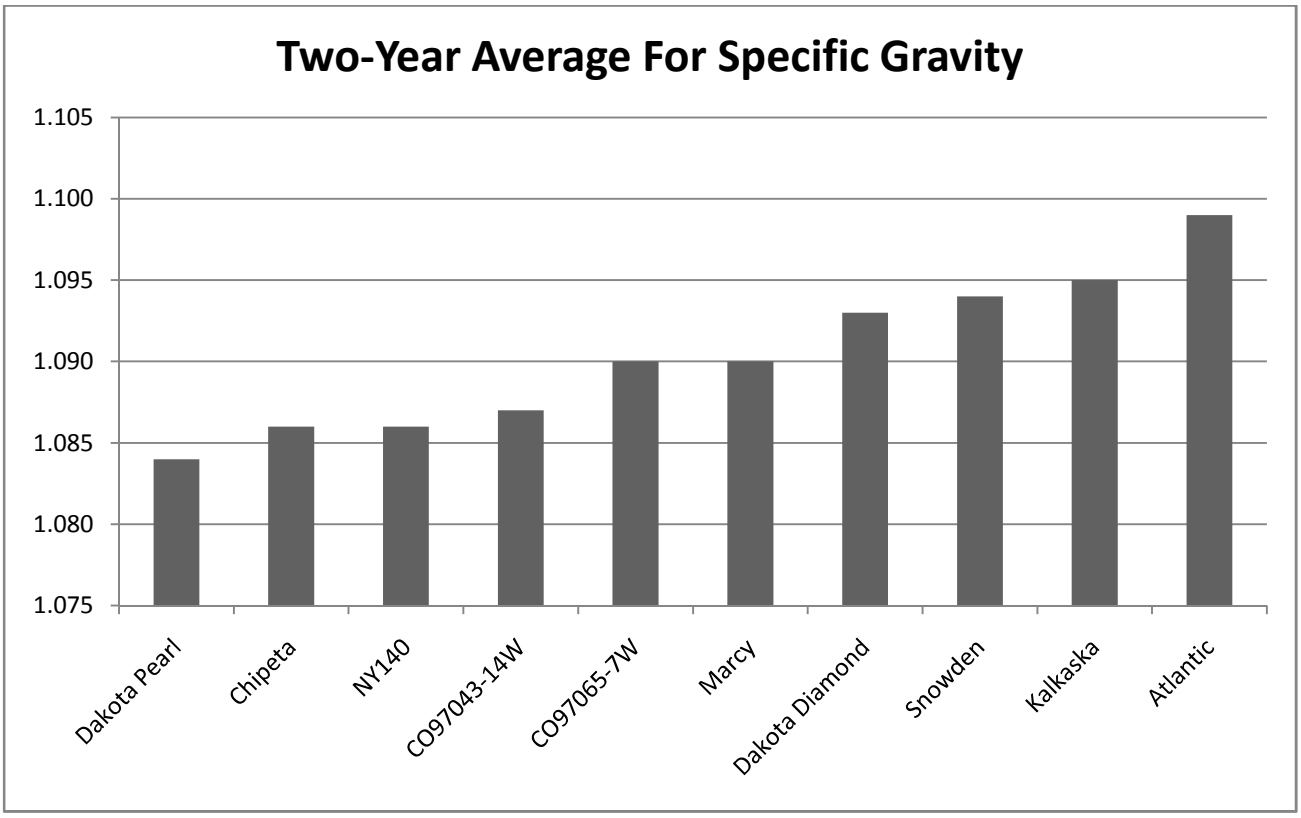
- **% Marketable Yield >4 oz.**
  Highest: Marcy (87%) and Chipeta (87%)
  Lowest: Kalkaska (70%) and Dakota Pearl (76%)

Processing Information

- **Specific Gravity**
  Highest: Atlantic (1.099) and Kalkaska (1.095)
  Lowest: Dakota Pearl (1.084) and NY140 (1.086)

Variety	Year	Yield U.S. No. 1s				Yield			Specific Gravity
		4-6 oz	6-10 oz	> 10 oz	Total	< 4 oz	culls	Total	
		cwt/acre							
Atlantic	1	128	148	69	345	76	23	444	1.106
	2	144	248	117	509	90	51	651	1.092
Chipeta	1	108	230	90	429	48	16	493	1.088
	2	55	179	379	613	35	64	712	1.084
Kalkaska	1	141	126	19	286	110	18	414	1.097
	2	185	179	50	413	141	27	581	1.092
CO97065-7W	1	124	127	42	293	69	9	371	1.090
	2	115	246	159	519	60	32	611	1.091
Snowden	1	174	162	33	368	121	7	497	1.094
	2	205	228	103	537	98	30	664	1.093
CO97043-14W	1	105	188	123	416	63	26	505	1.089
	2	125	274	209	609	53	26	687	1.084
NY140	1	114	202	78	395	61	13	469	1.085
	2	91	197	286	573	50	31	654	1.087
Marcy	1	151	234	58	443	63	12	518	1.094
	2	154	243	199	596	57	25	678	1.086
Dakota Diamond	1	161	173	49	383	73	35	491	1.095
	2	201	185	84	470	130	25	625	1.090
Dakota Pearl	1	152	155	33	341	92	24	457	1.084
	2	141	146	105	392	81	39	512	1.084
Variety Main Effect:									
Atlantic		136	198	93	427	83	37	547	1.099
Chipeta		82	205	235	521	41	40	602	1.086
Kalkaska		163	153	34	350	125	22	497	1.095
CO97065-7W		119	186	100	406	64	21	491	1.090
Snowden		190	195	68	453	109	19	581	1.094
CO97043-14W		115	231	166	512	58	26	596	1.087
NY140		103	199	182	484	55	22	562	1.086
Marcy		153	239	129	520	60	19	598	1.090
Dakota Diamond		181	179	67	427	101	30	558	1.093
Dakota Pearl		146	151	69	366	87	31	484	1.084
CV (%)		19	36	38	23	26	36	18	0.41
LSD (0.05)		26.8	NS	43.6	101.0	20.6	9.7	NS	0.005
Year Main Effect:									
1		136	175	59	370	78	18	466	1.092
2		142	213	169	523	79	35	637	1.088
CV (%)		8	10	28	7	13	14	5	0.07
LSD (0.05)		NS	NS	71.6	73.6	NS	8.6	67.1	0.002


Two-Year Average of Marketable Yield >4 oz.
cwt/Acre
600
500
400
300
200
100
0
Kalkaska
Dakota Pearl
CO97065-7W
Atlantic
Dakota Diamond
Snowden
NY140
CO97043-14W
Marcy
Chipeta


Two-Year Average For Specific Gravity
1.105
1.100
1.095
1.090
1.085
1.080
1.075
Dakota Pearl
Chipeta
NY140
CO97043-14W
CO97065-7W
Marcy
Dakota Diamond
Snowden
Kalkaska
Atlantic

Klamath Basin Research and Extension Center

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