



2009 Annual Progress Report to the California Potato Research Advisory Board

Potato Variety Development in Tulelake

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In 2009 the Intermountain Research & Extension Center (IREC) conducted three potato variety trials: a Russet Trial with 27 entries, a Specialty Trial with 41 entries, and a Chipper Trial with 12 entries. The trials included clones from the Western Regional and Southwest Regional Trials plus varieties of local interest. Potato seed was obtained from University and USDA potato breeders and seed producers from Colorado, Idaho, Oregon, and Texas.

Each trial was planted in a randomized complete block design with four replications. Seed pieces were planted with a custom-built two row potato planter on 36" wide raised beds. Planting dates, harvest dates, seed spacing, and fertilization for each trial are listed below.

Trial	Planting Date	Harvest Date	Seed Spacing (inches)	Fertilization (lb/A)
Russet Trial	5/13/09	10/6/09	10.0"	165-211-28-88
Specialty Trial	5/13/09	10/7/09	9.0"	128-211-28-88
Chipper Trial	5/12/09	10/5/09	9.0"	165-211-28-88

Trials were irrigated with solid-set sprinklers. Pest management practices followed university recommended guidelines. At maturity, a total of 320 plots were harvested for tuber yield and graded for size, internal, and external qualities. The Klamath Basin experienced an unseasonably cool and wet spring in 2009 with over three inches of rain between May and June and a frost on June 22. Early die symptoms were visible in all trials, and the incidence of stem end necrosis was high at IREC this season.

Results

Russet Variety Trial

See Tables 1-4 for yield and quality results. In 2009, several varieties/clones out-yielded Russet Burbank (319 cwt/A) and Russet Norkotah (325 cwt/A, SWR trial) with regard to total U.S. No. 1's. The highest yielding entry was A98345-1 in regard to both total yield (596 cwt/A) and total U.S. No. 1's (502 cwt/A). A98345-1 produced a blocky type tuber with a high number in the 8-12 oz size class. PA00N14-2, a long tuber, was the third highest yielding in total U.S. No. 1's at 455 cwt/A, and it ranked 1st in the 4-8oz tuber size category. Another high-yielding clone was A96814-65LB which ranked 4th in both total yield (522 cwt/A) and total U.S. No. 1's (446 cwt/A). A96814-65LB tubers had a desirable appearance, few internal defects, and a specific gravity of 1.113. The highest yielding entry with regard to U.S. No. 1's from the Southwest trial was ATX9332-12RU at 409 cwt/A. The tubers had a desirable appearance, dark russet, and uniform shape. Tubers from the newly released varieties Alpine, Clearwater, and Classic had desirable appearance and collected little mud when harvested. Alpine, Clearwater, and Classic also produced high yields with total U.S. No. 1's yields of 469, 421, and 388 cwt/A respectively.

High yielding clones in the Russet trial that had high yields in both 2008 and 2009 included PA99N2-1, PA99N82-4, and AC99375-1RU. Total yield for PA99N2-1 was 548 cwt/A and 557 cwt/A in 2009 and 2008 respectively. Total yield for PA99N82-4 was 530 cwt/A and 516 cwt/A in 2009 and 2008 respectively. AC99375-1RU had the highest total yield in 2008 at 593 cwt/A and a total yield of 470 cwt/A in 2009.

Specialty Trial

The Specialty Trial included entries with multiple combinations of skin color and or flesh color. Combinations included 11 red skin/ white flesh entries, 9 red or purple skin/yellow fleshed entries, 3 red skin/red flesh entries, 2 purple skin/purple flesh entries, and 16 white or russet skin/ yellow flesh entries. See Table 5 for a complete list of entries.

Yield and quality results are presented in Tables 6-9. In regard to red skin/white flesh varieties, Dark Red Norland and Red LaSoda out yielded all experimental entries with total U.S. No. 1's of 496 cwt/A and 441 cwt/A respectively. The top yielding experimental entry in this category was BTX2332-1R with 395 cwt/A in total U.S. No. 1's (similar results in 2008). Tubers from this entry had a nice shape and appearance, although they did skin easily. In the Southwest Regional trial, NDTX5003-2R a dark red skinned tuber was the highest yielding experimental entry with 339 cwt/A of total U.S. No. 1's.

In the red or purple skin/yellow flesh category three entries looked promising with regard to yield and tuber quality. A99326-1PY, a purple skin/medium yellow flesh, yielded 428 cwt/A in total U.S. No. 1's. This entry produced the most 6-10oz size tubers and tended to have a flattened tuber shape. POR03PG80-2 produced an attractive tuber with an oblong shape and a high number of large sized tubers in the 10-14oz size class. Its total U.S. No. 1's yield was 421 cwt/A. ATTX98518-5PU/Y was the highest yielding Southwest Regional Trial entry with a total U.S. No. 1's yield of 387 cwt/A. This entry had good appearance and the majority of tubers were in the 4-6oz and 6-10oz size classes.

In the white or russet skin/yellow flesh category, several experimental entries out-yielded Yukon Gold (347 cwt/A in total U.S. No. 1's). A00286-3Y and A00293-2Y had a total U.S. No. 1's yield of 523 and 436 cwt/A respectively. A00286-3Y had the highest tuber yield in the 10-14oz and 6-10oz size category, and A00293-2Y had the highest tuber yield in the 4-6oz size category. Both entries had a high plant vigor rating. The Southwest Regional entries TXYG055, TXYG057, TXYG079, and TXYG098 performed well and had total U.S. No. 1's yields between 399 and 414 cwt/A (similar results in 2008).

Chipper Trial

Over the years chip potato acreage has increased in the Klamath Basin, and there is local interest in new public chip varieties. Yield and quality results are presented in Tables 10-13. Entry 9781 had the highest total yield with 507 cwt/A and a total U.S. No. 1's yield of 408 cwt/A. This entry produced high yields in 2008, and most of the tubers in both years were in the 6-10oz size category. Entry 8402 had the second highest total U.S. No. 1's at 358 cwt/A. Atlantic and Chipeta (check varieties) also produced high total yields at 453 cwt/A and 459 cwt/A respectively. With regard to Western Regional Trial experimental lines, CO00270-7W had the highest U.S. No. 1's yield at 303 cwt/A (similar trend in 2008). This entry had light russeting and shallow eyes. Dakota Diamond had the fourth highest total yield in the trial at 451 cwt/A, but it had the smallest percentage of U.S. No. 1's and tended to produce tubers in the 4-6oz and <4oz size category. Dakota Diamond tubers had a desirable appearance and an almost perfectly round shape. Different management of seed spacing, fertilization, and/or harvest timing may improve the tuber size of this variety. During this year's harvest it was noted that Pike and Dakota Diamond had a tendency to set tubers deeper in the soil compared to other varieties.

Tuber samples from every entry were sent to a local commercial packing shed for fry tests 5, 62, and 105 days after harvest. Samples were stored at 50°F. See Table 14 for results. After chips were cooked, entries chip color was ranked using the Snack Food Association (SFA) rating of 1-3, with 1 being the best. Five entries rated a 1 by the final test date on 2/2/2010. Dakota Pearl rated a 1 for all three chip fry tests. Atlantic had a large percentage of defects for all three test dates.

Storage

Entries from all three trials are stored in a controlled environment for assessment of dormancy and storability. The Russet and Specialty entries are stored for 180 days after harvest (DAH) at 40°F each, with evaluations at 60 DAH, 120 DAH, and 180 DAH. The Chipper varieties are stored for 120 DAH at 50°F. Sprout inhibitor is not applied during any time of the storage duration. Results from each storage evaluation will be reported separately upon completion of the storage period. The 2008 storage trial report is now available.

Table 1. Tuber Yield & Size Grade of Experimental & Standard Russet Skinned Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Tuber Yield (cwt/A)										
		U.S. No. 1's (cwt)					<4oz	>16oz	2's	Culls	Total	%1's
		Total 1's	12-16oz	8-12oz	4-8oz							
Ranger Russet	WR	405	54	157	194	63	16	20	2	505	80	
Russet Burbank	WR	319	18	87	213	72	0	66	0	456	70	
Russet Norkotah	WR	302	13	71	218	90	1	1	1	394	77	
A96814-65LB	WR	446	78	173	194	46	25	3	2	522	85	
A97066-42LB	WR	344	100	133	112	28	68	12	21	472	73	
A98345-1	WR	502	76	177	249	64	22	7	2	596	84	
A0008-1TE	WR	380	28	151	201	35	6	16	1	437	87	
AC99375-1RU	WR	363	43	116	204	69	19	17	2	470	77	
AO96305-3	WR	370	4	100	266	66	1	2	1	440	84	
AO96365-2	WR	413	28	135	249	82	10	3	2	509	81	
CO97087-2RU	WR	306	57	106	144	47	26	12	3	394	78	
CO98067-7RU	WR	231	16	60	155	90	4	7	1	333	69	
CO98368-2RU	WR	239	7	52	180	78	3	9	1	330	72	
CO99053-3RU	WR	352	83	134	135	38	39	4	1	435	81	
CO99053-4RU	WR	261	15	79	168	57	6	3	1	326	80	
CO99100-1RU	WR	234	59	90	85	19	51	28	1	334	70	
PA00N14-2	WR	455	6	113	336	56	0	2	1	514	88	
PA99N2-1	WR	414	91	157	166	42	58	29	5	548	76	
PA99N82-4	WR	412	85	166	161	37	45	34	2	530	78	
Russet Norkotah	SWR	325	14	80	231	82	5	1	2	415	78	
AOTX95265-1RU	SWR	306	24	84	198	87	1	2	0	396	77	
AOTX96265-2RU	SWR	381	57	140	185	31	30	5	1	448	85	
ATX9332-12RU	SWR	409	60	168	181	30	26	8	3	476	86	
ATX97232-1RU	SWR	255	16	78	161	70	9	8	2	343	75	
A9305-10 (Alpine)	IREC	469	60	162	248	51	22	2	4	548	86	
A95109-1 (Classic)	IREC	388	93	172	123	18	49	10	1	465	83	
AOA95154-1 (Clearwater)	IREC	421	50	157	214	48	11	10	3	494	85	
Mean		359	46	122	192	55	20	12	2	449	79	
LSD {0.05}		39.9	19.3	26.1	30.3	14.0	14.7	9.0	4.6	41.8	4.0	

Table 2. External Tuber Characteristics of Experimental & Standard Russet Skinned Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Appearance ¹	Russeting ²	Eye Depth ³	Tuber Shape ⁴	Shape Uniformity ⁵	Length/Width Ratio ⁶
Ranger Russet	WR	3.2	3.3	3.3	4.6	3.2	1.8
Russet Burbank	WR	2.2	4.2	3.4	4.4	3.3	1.9
Russet Norkotah	WR	3.7	4.2	3.2	4.8	3.6	1.9
A96814-65LB	WR	3.5	3.0	3.9	3.8	3.8	1.6
A97066-42LB	WR	3.5	2.3	3.9	3.9	3.6	1.6
A98345-1	WR	2.8	2.7	3.1	3.6	3.1	1.5
A0008-1TE	WR	3.3	4.1	4.0	4.1	3.4	1.7
AC99375-1RU	WR	2.7	3.8	3.7	4.0	3.4	1.7
AO96305-3	WR	2.5	3.5	3.5	4.4	3.9	1.8
AO96365-2	WR	3.3	4.2	3.8	3.8	3.4	1.5
CO97087-2RU	WR	2.2	4.4	4.2	4.2	3.3	1.8
CO98067-7RU	WR	3.3	4.3	3.6	4.0	3.4	1.7
CO98368-2RU	WR	2.5	3.7	4.5	4.4	3.8	1.8
CO99053-3RU	WR	3.5	4.1	3.9	4.1	3.9	1.7
CO99053-4RU	WR	2.0	3.5	4.2	4.3	3.4	1.9
CO99100-1RU	WR	2.7	4.5	3.8	4.2	3.5	1.8
PA00N14-2	WR	3.2	3.3	3.7	4.9	3.9	2.0
PA99N2-1	WR	3.3	3.9	4.4	3.7	3.1	1.6
PA99N82-4	WR	3.0	4.6	3.8	3.3	3.1	1.4
Russet Norkotah	SWR	3.5	4.2	3.4	4.3	3.6	1.8
AOTX95265-1RU	SWR	3.2	4.3	3.2	4.9	3.7	2.0
AOTX96265-2RU	SWR	3.3	3.7	3.3	3.7	4.1	1.5
ATX9332-12RU	SWR	3.5	4.0	3.4	4.2	3.8	2.0
ATX97232-1RU	SWR	2.8	3.9	3.7	4.2	3.5	1.7
A9305-10 (Alpine)	IREC	3.3	3.8	3.6	4.1	3.4	1.6
A95109-1 (Classic)	IREC	3.5	4.2	3.8	4.0	3.9	1.8
AOA95154-1 (Clearwater)	IREC	3.5	4.2	3.9	4.4	4.4	1.8
Mean		3.1	3.9	3.7	4.2	3.6	1.7
LSD {0.05}		1.0	0.5	0.7	0.5	0.6	0.2

Rating Scales

¹ 1=Worst, 5=Best

⁴ 1=Round, 5=Oblong

² 1=Light, 5=Heavy

⁵ 1=No Uniformity, 5=Very Uniform

³ 1=Deep, 5=Shallow

⁶ Ratio of 8 tubers measured from each rep evaluated

Table 3. Internal Characteristics, & External Defects of Experimental & Standard Russet Skinned Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Stem					
		Hollow Heart ¹ (%)	Vascular Discoloration ¹ (%)	End Necrosis ¹ (%)	Irregular Shaped ²	Growth Cracks ²	Knobs ²
Ranger Russet	WR	0	15	20	8.0	0.0	0.3
Russet Burbank	WR	8	10	20	2.0	23.8	3.5
Russet Norkotah	WR	3	10	13	0.8	0.0	0.0
A96814-65LB	WR	8	8	18	1.3	0.0	0.5
A97066-42LB	WR	5	13	40	1.8	0.0	1.8
A98345-1	WR	3	10	28	2.3	0.3	0.3
A0008-1TE	WR	0	5	28	4.8	2.8	0.0
AC99375-1RU	WR	0	13	13	8.5	0.0	0.0
AO96305-3	WR	0	5	23	0.8	0.0	0.0
AO96365-2	WR	0	8	28	1.3	0.0	0.5
CO97087-2RU	WR	20	3	5	4.5	1.5	0.0
CO98067-7RU	WR	0	13	20	2.5	1.0	0.8
CO98368-2RU	WR	0	5	15	4.5	0.0	0.3
CO99053-3RU	WR	8	10	23	1.0	0.5	0.0
CO99053-4RU	WR	0	10	17	1.3	0.3	0.0
CO99100-1RU	WR	35	5	15	3.5	5.8	2.0
PA00N14-2	WR	0	0	23	1.3	0.0	0.0
PA99N2-1	WR	20	0	10	3.3	8.0	0.0
PA99N82-4	WR	13	10	8	2.3	8.8	0.3
Russet Norkotah	SWR	0	10	18	1.0	0.0	0.0
AOTX95265-1RU	SWR	3	10	20	1.0	0.0	0.3
AOTX96265-2RU	SWR	5	8	63	2.5	0.0	0.0
ATX9332-12RU	SWR	0	5	15	3.8	0.0	0.8
ATX97232-1RU	SWR	5	8	20	3.5	0.3	0.0
A9305-10 (Alpine)	IREC	0	13	48	1.0	0.0	0.3
A95109-1 (Classic)	IREC	0	30	30	1.5	1.5	0.5
AOA95154-1 (Clearwater)	IREC	0	3	23	4.0	0.0	0.3
Mean		5	9	22	2.7	2.0	0.4
LSD {0.05}		10	12	16	2.6	2.3	1.3

¹ 10 tubers evaluated from each plot in the 12-16oz and/or 8-12oz tubers

² Number of tubers pulled from each plot with defects

Table 4. Performance, Average Tuber Size & Specific Gravity of Experimental & Standard Russet Skinned Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Vigor Rating¹	Stand Count²	Tubers/Plant	Plants/Acre	% Stand	Avg Tuber Size (oz)	Specific Gravity
Ranger Russet	WR	3.3	43.5	7.7	16406	99	6.2	1.102
Russet Burbank	WR	2.0	43.8	7.9	16500	99	4.8	1.090
Russet Norkotah	WR	1.0	42.8	7.9	16123	97	4.9	1.090
A96814-65LB	WR	3.5	40.5	7.9	15274	92	6.9	1.113
A97066-42LB	WR	4.8	42.3	5.9	15934	96	7.9	1.107
A98345-1	WR	3.5	43.3	9.0	16311	98	6.5	1.104
A0008-1TE	WR	2.0	41.8	6.8	15746	95	6.3	1.090
AC99375-1RU	WR	4.8	31.8	10.5	11974	72	5.8	1.112
AO96305-3	WR	3.0	42.8	8.0	16123	97	5.5	1.105
AO96365-2	WR	3.0	43.8	8.7	16500	99	5.6	1.098
CO97087-2RU	WR	3.0	28.8	9.0	10843	65	6.3	1.092
CO98067-7RU	WR	2.5	36.3	8.3	13671	82	4.6	1.083
CO98368-2RU	WR	1.8	35.8	8.0	13483	81	4.8	1.088
CO99053-3RU	WR	4.8	37.0	6.8	13954	84	7.3	1.102
CO99053-4RU	WR	1.0	38.0	6.8	14331	86	5.3	1.089
CO99100-1RU	WR	3.0	23.0	7.6	8674	52	7.6	1.093
PA00N14-2	WR	2.5	42.8	9.0	16123	97	5.7	1.098
PA99N2-1	WR	4.0	43.0	7.2	16217	98	7.1	1.097
PA99N82-4	WR	4.3	39.8	7.3	14991	90	7.3	1.097
Russet Norkotah	SWR	1.0	43.5	7.8	16406	99	5.1	1.088
AOTX95265-1RU	SWR	1.8	39.8	8.3	14991	90	5.1	1.088
AOTX96265-2RU	SWR	3.3	36.0	7.4	13577	82	7.0	1.100
ATX9332-12RU	SWR	3.0	40.0	7.1	15086	91	7.1	1.107
ATX97232-1RU	SWR	3.0	32.5	8.6	12257	74	5.2	1.096
A9305-10 (Alpine)	IREC	3.5	41.0	8.7	15463	93	6.5	1.101
A95109-1 (Classic)	IREC	3.0	41.5	5.6	15651	94	8.3	1.097
AOA95154-1 (Clearwater)	IREC	3.0	42.5	7.7	16029	97	6.3	1.100
Mean		2.9	39.1	7.8	14764	89	6.2	1.097
LSD {0.05}		0.5	3.3	0.8	1233	7	0.4	0.006

¹ 1=Bad, 5=Good

² Number of plants counted in two rows 19.5ft long

Table 5. Skin & Flesh Colors of Experimental & Standard Specialty Entries. Tulelake 2009.

Clone/Variety	Trial	Skin Color	Flesh Color
Dk Red Norland	WR/SWR	Red	White
Red LaSoda	WR/SWR	Red	White
ATTX98453-6R	WR	Red	White
BTX2332-1R	WR	Red	White
COTX94216-1R	WR	Red	White
COTX94218-1R	WR	Red	White
NDTX4784-7R	WR	Red	White
ATTX98453-11BR	SWR	Red	White
ATTX01178-1R	SWR	Red	White
COTX00104-7R	SWR	Red	White
NDTX5003-2R	SWR	Red	White
A99326-1PY	WR	Purple	Yellow
AC99329-7PW/Y	WR	Purple/White	Yellow
AC99330-1P/Y	WR	Purple	Yellow
POR01PG45-5	WR	Purple	Yellow
POR03PG80-2	WR	Purple	Yellow
ATTX98493-1R/Y	SWR	Red	Yellow
ATTX98518-5PU/Y	SWR	Purple	Yellow
BTX2103-1R/Y	SWR	Red	Yellow
CO01399-10P/Y	SWR	Purple	Yellow
PA96RR1-193	WR	Red	Red
POR03PG23-1	WR	Red/White	Red/White
PORTX03PG25-2R/R	SWR	Red	Red
Purple Majesty	WR/SWR	Purple	Purple
OR00068-11	WR	Purple	Purple
Yukon Gold	WR/SWR	White	Yellow
A00286-3Y	WR	Yellow	Yellow
A00293-2Y	WR	Yellow	Yellow
CO00412-5W/Y	WR	White	Yellow
CO99045-1W/Y	WR	White	Yellow
POR02PG37-2	WR	Yellow	Yellow
Sierra Gold	SWR	Russet	Yellow
ATX9132-2Y	SWR	Yellow	Yellow
Sierra Gold-2	SWR	Russet	Yellow
Sierra Gold-3	SWR	Russet	Yellow
TXYG055	SWR	White	Yellow
TXYG057	SWR	White	Yellow
TXYG079	SWR	White	Yellow
TXYG098	SWR	White	Yellow
TXYG105	SWR	White	Yellow
TXYG107	SWR	White	Yellow

Table 6. Tuber Yield & Size Grade of Experimental & Standard Specialty Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Tuber Yield (cwt/A)							Culls	Total	%1's
		U.S. No. 1's (cwt)									
		Total 1's	10-14oz	6-10oz	4-6oz	<4oz	>14oz				
Red/White Flesh											
Dk Red Norland	WR/SWR	496	102	288	105	53	40	7	5	601	82
Red LaSoda	WR/SWR	441	109	249	82	42	39	28	2	552	80
ATTX98453-6R	WR	321	111	144	67	48	71	24	5	469	69
BTX2332-1R	WR	395	131	186	78	53	85	8	4	546	72
COTX94216-1R	WR	339	68	169	102	89	21	29	3	481	70
COTX94218-1R	WR	330	34	163	133	91	9	21	3	455	73
NDTX4784-7R	WR	355	101	169	85	55	52	14	12	490	73
ATTX98453-11BR	SWR	239	35	95	109	123	4	20	2	389	61
ATTX01178-1R	SWR	378	118	187	74	47	109	29	6	569	66
COTX00104-7R	SWR	278	94	136	48	34	154	41	7	515	54
NDTX5003-2R	SWR	339	77	170	92	57	48	38	6	489	69
Red-Purple/Yellow Flesh											
A99326-1PY	WR	428	128	199	101	62	70	19	1	580	74
AC99329-7PW/Y	WR	328	78	154	97	79	26	7	7	447	73
AC99330-1P/Y	WR	154	1	41	111	248	1	2	2	406	37
POR01PG45-5	WR	370	29	170	171	158	14	9	3	554	67
POR03PG80-2	WR	421	162	193	67	26	81	19	2	549	77
ATTX98493-1R/Y	SWR	265	75	128	62	53	50	28	22	417	63
ATTX98518-5PU/Y	SWR	387	89	195	104	53	53	12	2	506	77
BTX2103-1R/Y	SWR	344	39	167	138	128	7	21	3	503	68
CO01399-10P/Y	SWR	315	91	135	89	82	67	36	3	503	63
Red/Red Flesh											
PA96RR1-193	WR	192	0	36	155	283	0	5	1	480	40
POR03PG23-1	WR	121	1	14	105	278	0	10	1	411	29
PORTX03PG25-2R/R	SWR	139	1	45	94	213	0	18	6	376	37
Purple/Purple Flesh											
Purple Majesty	WR/SWR	320	14	110	196	232	2	10	3	567	56
OR00068-11	WR	310	4	112	194	207	0	3	2	522	59

Table 6 Continued on pg 10.

Table 6 Continued. Tuber Yield & Size Grade of Experimental & Standard Specialty Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Tuber Yield (cwt/A)									
		U.S. No. 1's (cwt)						2's	Culls	Total	%1's
		Total 1's	10-14oz	6-10oz	4-6oz	<4oz	>14oz				
Yellow Flesh											
Yukon Gold	WR/SWR	347	95	173	79	54	65	15	2	484	72
A00286-3Y	WR	523	120	281	121	56	35	14	10	637	82
A00293-2Y	WR	436	32	205	199	128	6	5	4	579	75
CO00412-5W/Y	WR	343	33	168	143	126	12	6	5	492	70
CO99045-1W/Y	WR	426	80	213	133	94	41	10	9	580	74
POR02PG37-2	WR	267	10	109	148	190	1	13	3	474	56
Sierra Gold	SWR	395	94	196	105	60	18	3	4	480	82
ATX9132-2Y	SWR	105	0	25	79	225	12	2	6	348	30
Sierra Gold-2	SWR	352	73	170	110	83	21	1	2	458	77
Sierra Gold-3	SWR	320	77	163	80	50	45	6	3	425	75
TXYG055	SWR	409	93	211	105	72	30	14	1	526	78
TXYG057	SWR	399	91	207	101	69	40	14	3	525	76
TXYG079	SWR	414	100	216	98	58	26	10	1	509	81
TXYG098	SWR	403	77	206	120	85	21	8	2	519	78
TXYG105	SWR	356	46	190	120	89	2	11	1	460	77
TXYG107	SWR	370	95	183	91	54	49	13	3	488	76
Mean		338	69	160	110	104	35	15	4	497	67
LSD {0.05}		44.4	23.2	29.9	19.3	18.6	26.4	11.9	4.6	50.1	5.9

Table 7. External Tuber Characteristics of Experimental & Standard Specialty Entries. Tulelake 2009.

Clone/Variety	Trial	Appearance¹	Skin Color Rating²	Eye Depth³	Tuber Shape⁴	Shape Uniformity⁵	Length/Width Ratio⁶
Red/White Flesh							
Dk Red Norland	WR/SWR	3.3	1.9	2.9	2.5	2.9	1.2
Red LaSoda	WR/SWR	2.5	2.3	1.0	2.2	3.4	1.1
ATTX98453-6R	WR	3.3	2.8	2.8	2.4	3.6	1.1
BTX2332-1R	WR	3.5	3.5	3.1	2.6	3.0	1.2
COTX94216-1R	WR	3.0	3.7	2.7	2.2	2.9	1.1
COTX94218-1R	WR	3.0	3.0	3.1	2.1	3.8	1.1
NDTX4784-7R	WR	3.3	3.7	3.1	2.1	3.3	1.1
ATTX98453-11BR	SWR	2.3	2.9	2.3	2.3	2.9	1.1
ATTX01178-1R	SWR	2.5	2.7	2.3	1.8	3.8	1.1
COTX00104-7R	SWR	3.4	3.4	3.7	3.1	3.2	1.3
NDTX5003-2R	SWR	2.5	4.2	2.9	1.8	3.6	1.1
Red-Purple/Yellow Flesh							
A99326-1PY	WR	3.0	3.5	3.6	2.7	3.3	1.2
AC99329-7PW/Y	WR	3.2	3.3	4.0	2.5	3.3	1.1
AC99330-1P/Y	WR	4.0	4.2	2.5	1.6	3.4	1.1
POR01PG45-5	WR	3.5	3.3	3.6	4.0	2.9	1.6
POR03PG80-2	WR	4.0	3.1	3.5	4.1	2.8	1.6
ATTX98493-1R/Y	SWR	2.2	2.3	3.8	3.5	2.4	1.4
ATTX98518-5PU/Y	SWR	3.5	3.5	3.9	3.9	3.3	1.6
BTX2103-1R/Y	SWR	2.5	3.2	2.9	2.6	2.5	1.1
CO01399-10P/Y	SWR	3.3	4.0	3.3	2.6	3.5	1.1
Red/Red Flesh							
PA96RR1-193	WR	3.4	4.3	2.5	1.9	4.0	1.0
POR03PG23-1	WR	3.0	3.0	4.0	3.1	3.1	1.3
PORTX03PG25-2R/R	SWR	3.2	2.7	3.2	5.0	3.6	2.3
Purple/Purple Flesh							
Purple Majesty	WR/SWR	2.0	4.8	3.2	4.7	2.5	1.7
OR00068-11	WR	3.8	5.0	3.0	3.3	3.2	1.2

Table 7 Continued on pg 12.

Table 7 Continued. External Tuber Characteristics of Experimental & Standard Specialty Entries. Tulelake 2009.

Clone/Variety	Trial	Appearance ¹	Skin Color Rating ²	Eye Depth ³	Tuber Shape ⁴	Shape Uniformity ⁵	Length/Width Ratio ⁶
Yellow Flesh							
Yukon Gold	WR/SWR	3.6	1.0	3.8	2.7	3.2	1.2
A00286-3Y	WR	3.5	1.3	3.8	3.2	2.4	1.4
A00293-2Y	WR	3.5	1.0	3.8	3.5	2.9	1.4
CO00412-5W/Y	WR	3.4	2.0	3.6	3.3	2.8	1.3
CO99045-1W/Y	WR	3.0	1.8	3.6	4.0	3.4	1.5
POR02PG37-2	WR	2.8	1.0	3.5	3.5	3.1	1.3
Sierra Gold	SWR	3.8	2.2	3.7	3.3	3.1	1.3
ATX9132-2Y	SWR	1.7	2.3	1.5	1.3	3.5	1.1
Sierra Gold-2	SWR	3.7	1.8	3.9	3.1	2.8	1.3
Sierra Gold-3	SWR	4.2	2.0	3.8	3.0	3.3	1.4
TXYG055	SWR	4.0	1.0	4.0	2.8	3.1	1.2
TXYG057	SWR	3.8	1.0	3.9	2.8	2.6	1.3
TXYG079	SWR	3.7	1.0	4.0	3.1	3.4	1.3
TXYG098	SWR	4.0	1.0	3.8	2.8	2.8	1.1
TXYG105	SWR	3.8	1.0	4.0	3.2	2.6	1.3
TXYG107	SWR	3.3	1.0	3.7	2.6	3.1	1.3
Mean		3.2	2.6	3.3	2.9	3.1	1.3
LSD {0.05}		0.8	0.6	0.5	0.7	0.7	0.1

Rating Scales

¹ 1=Worst, 5=Best

⁴ 1=Round, 5=Oblong

² 1=Light (White/Red), 5=Dark (Red/Purple)

⁵ 1=No Uniformity, 5=Very Uniform

³ 1=Deep, 5=Shallow

⁶ Ratio of 8 tubers measured from each rep evaluated

Table 8. Internal Characteristics, & External Defects of Experimental & Standard Specialty Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Hollow Heart ¹ (%)	Vascular Discoloration ¹ (%)	Stem End Necrosis ¹ (%)	Internal Color Rating ²	Irregular Shaped ³	Growth Cracks ³	Knobs ³
Red/White Flesh								
Dk Red Norland	WR/SWR	0	0	20	1.0	2.3	0.3	0.3
Red LaSoda	WR/SWR	7	0	13	1.0	9.0	1.0	0.3
ATTX98453-6R	WR	0	0	13	1.0	5.5	1.0	0.5
BTX2332-1R	WR	0	0	15	2.0	2.7	0.7	0.0
COTX94216-1R	WR	0	0	23	1.0	15.5	1.0	1.3
COTX94218-1R	WR	0	0	27	1.3	1.8	18.8	0.0
NDTX4784-7R	WR	7	0	20	1.7	1.5	2.3	3.3
ATTX98453-11BR	SWR	0	0	13	1.0	6.8	4.8	1.3
ATTX01178-1R	SWR	3	0	13	1.3	8.0	0.8	0.5
COTX00104-7R	SWR	0	0	13	1.0	4.7	7.0	1.0
NDTX5003-2R	SWR	0	0	20	1.3	14.8	1.8	0.3
Red-Purple/Yellow Flesh								
A99326-1PY	WR	0	10	27	2.7	5.0	1.0	0.5
AC99329-7PW/Y	WR	0	0	23	2.7	2.5	0.0	3.3
AC99330-1P/Y	WR	0	17	37	3.7	1.8	0.0	0.3
POR01PG45-5	WR	0	10	17	2.3	5.8	0.3	1.3
POR03PG80-2	WR	0	3	40	2.7	5.8	0.3	1.3
ATTX98493-1R/Y	SWR	0	13	27	2.3	8.3	0.0	4.8
ATTX98518-5PU/Y	SWR	0	15	30	2.0	5.3	0.3	0.3
BTX2103-1R/Y	SWR	0	0	20	2.8	7.8	2.8	1.8
CO01399-10P/Y	SWR	10	0	17	2.7	5.5	7.8	2.3
Red/Red Flesh								
PA96RR1-193	WR	0	0	27	2.0	2.3	0.5	2.8
POR03PG23-1	WR	3	0	7	3.7	7.3	0.0	3.7
PORTX03PG25-2R/R	SWR	0	13	30	4.3	36.3	0.0	0.0
Purple/Purple Flesh								
Purple Majesty	WR/SWR	7	0	13	5.0	6.3	0.3	1.0
OR00068-11	WR	0	0	23	3.7	2.0	0.0	0.8

Table 8 Continued on pg 14.

Table 8 Continued. Internal Characteristics, & External Defects of Experimental & Standard Specialty Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Hollow Heart¹ (%)	Vascular Discoloration¹ (%)	Stem End Necrosis¹ (%)	Internal Color Rating²	Irregular Shaped³	Growth Cracks³	Knobs³
Yellow Flesh								
Yukon Gold	WR/SWR	0	0	40	2.0	5.8	0.5	2.5
A00286-3Y	WR	0	7	23	2.7	5.5	1.0	1.8
A00293-2Y	WR	0	3	27	3.3	3.3	0.0	0.0
CO00412-5W/Y	WR	0	0	30	3.7	3.5	0.3	0.3
CO99045-1W/Y	WR	0	0	30	2.7	4.8	0.0	1.8
POR02PG37-2	WR	0	0	20	3.7	7.8	0.0	1.3
Sierra Gold	SWR	0	7	27	2.0	1.3	0.0	0.8
ATX9132-2Y	SWR	0	3	3	5.0	1.3	0.0	0.3
Sierra Gold-2	SWR	0	0	37	2.3	1.0	0.0	0.3
Sierra Gold-3	SWR	0	7	17	2.0	2.0	0.8	0.5
TXYG055	SWR	0	0	33	2.3	4.3	0.0	2.0
TXYG057	SWR	3	3	27	2.7	4.0	0.0	5.0
TXYG079	SWR	0	3	33	2.0	1.8	0.0	3.0
TXYG098	SWR	0	7	37	2.0	3.5	0.0	0.5
TXYG105	SWR	0	0	23	2.0	5.0	0.0	1.3
TXYG107	SWR	0	0	17	2.0	2.8	0.3	2.5
Mean		1	3	23	2.4	5.6	1.3	1.4
LSD {0.05}		5	1	NS	0.9	5.9	2.9	1.7

¹ 10 tubers evaluated from each plot in the 12-16oz and/or 8-12oz tubers

² 1=White/Pink, 5=Dark

³ Number of tubers pulled from each plot with defects

Table 9. Performance, Average Tuber Size & Specific Gravity of Experimental & Standard Specialty Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Vigor Rating¹	Stand Count²	Tubers/Plant	Plants/Acre	% Stand	Avg Tuber Size (oz)	Specific Gravity
Red/White Flesh								
Dk Red Norland	WR/SWR	1.3	47.0	8.4	17061	98	6.7	1.075
Red LaSoda	WR/SWR	2.5	45.8	7.5	16607	95	7.1	1.086
ATTX98453-6R	WR	3.3	31.0	9.2	11253	65	7.3	1.084
BTX2332-1R	WR	2.7	35.7	7.3	13250	76	7.0	1.079
COTX94216-1R	WR	3.8	33.8	11.4	12251	70	5.5	1.082
COTX94218-1R	WR	3.8	40.3	10.8	14611	84	4.9	1.092
NDTX4784-7R	WR	3.3	29.0	11.3	10527	60	6.6	1.096
ATTX98453-11BR	SWR	2.8	35.0	11.3	12705	73	4.4	1.099
ATTX01178-1R	SWR	4.3	35.3	9.3	12796	73	7.7	1.090
COTX00104-7R	SWR	4.3	27.7	9.8	10043	58	8.4	1.077
NDTX5003-2R	SWR	3.5	35.3	10.1	12796	73	6.6	1.090
Red-Purple/Yellow Flesh								
A99326-1PY	WR	3.3	46.8	7.9	16970	97	6.9	1.081
AC99329-7PW/Y	WR	4.5	36.5	9.8	13250	76	5.7	1.096
AC99330-1P/Y	WR	2.8	40.8	13.7	14792	85	3.2	1.082
POR01PG45-5	WR	3.5	45.0	11.5	16335	94	4.2	1.097
POR03PG80-2	WR	3.3	43.0	7.1	15609	90	8.1	1.079
ATTX98493-1R/Y	SWR	3.0	25.5	13.9	9257	53	6.3	1.075
ATTX98518-5PU/Y	SWR	2.0	34.7	10.2	12584	72	6.6	1.075
BTX2103-1R/Y	SWR	3.3	32.8	14.1	11888	68	4.8	1.086
CO01399-10P/Y	SWR	4.8	36.0	10.6	13068	75	6.1	1.080
Red/Red Flesh								
PA96RR1-193	WR	1.5	45.0	13.9	16335	94	3.4	1.092
POR03PG23-1	WR	1.3	44.3	13.2	16093	92	3.1	1.085
PORTX03PG25-2R/R	SWR	3.3	40.5	13.3	14702	84	3.1	1.080
Purple/Purple Flesh								
Purple Majesty	WR/SWR	2.5	46.5	13.6	16880	97	4.0	1.083
OR00068-11	WR	1.8	46.3	12.9	16789	96	3.9	1.094

Table 9 Continued on pg 16.

Table 9 Continued. Performance, Average Tuber Size & Specific Gravity of Experimental & Standard Specialty Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Vigor Rating¹	Stand Count²	Tubers/ Plant	Plants/ Acre	% Stand	Avg Tuber Size (oz)	Specific Gravity
Yellow Flesh								
Yukon Gold	WR/SWR	2.5	43.3	7.3	15700	90	6.9	1.089
A00286-3Y	WR	4.3	41.0	11.1	14883	85	6.4	1.093
A00293-2Y	WR	4.5	45.5	11.2	16517	95	5.0	1.086
CO00412-5W/Y	WR	3.5	41.3	11.1	14974	86	4.7	1.096
CO99045-1W/Y	WR	3.5	40.8	11.1	14792	85	5.7	1.089
POR02PG37-2	WR	2.3	43.5	13.8	15791	91	3.9	1.089
Sierra Gold	SWR	1.5	39.3	9.1	14248	82	6.2	1.086
ATX9132-2Y	SWR	3.0	45.3	11.3	16426	94	3.0	1.094
Sierra Gold-2	SWR	2.5	42.8	8.4	15518	89	5.6	1.082
Sierra Gold-3	SWR	2.5	39.8	7.4	14429	83	6.5	1.086
TXYG055	SWR	2.0	44.0	8.5	15972	92	6.2	1.093
TXYG057	SWR	3.0	41.8	9.6	15155	87	6.2	1.090
TXYG079	SWR	2.3	45.8	7.8	16607	95	6.3	1.081
TXYG098	SWR	2.3	41.8	9.8	15155	87	5.7	1.090
TXYG105	SWR	1.5	44.8	8.4	16244	93	5.4	1.093
TXYG107	SWR	2.3	42.8	7.7	15518	89	6.6	1.088
Mean		2.9	40.1	10.4	14546	83	5.7	1.087
LSD {0.05}		1.0	6.8	2.7	2458	14	0.4	0.011

¹ 1=Bad, 5=Good

² Number of plants counted in two rows 20ft long

Table 10. Tuber Yield & Size Grade of Experimental & Standard Chipping Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Tuber Yield (cwt/A)							Total	%1's
		U.S. No. 1's (cwt)					Culls			
		Total 1's	10-14oz	6-10oz	4-6oz	<4oz		>14 oz		
Atlantic	WR	356	33	177	146	82	7	9	453	79
Chipeta	WR	327	107	157	63	32	80	20	459	71
CO00188-4W	WR	263	29	127	107	85	4	4	356	74
CO00197-3W	WR	277	26	121	130	114	3	13	407	68
CO00270-7W	WR	303	69	158	76	51	25	9	387	78
9781	IREC	408	59	213	136	80	13	6	507	81
Dakotah Pearl	IREC	274	19	128	127	93	2	4	373	73
8402	IREC	358	71	181	106	64	19	5	446	80
7681	IREC	347	20	161	167	94	0	5	446	78
3502	IREC	322	15	152	155	94	3	11	430	75
Pike	IREC	306	22	164	120	73	0	4	383	80
Dakotah Diamond	IREC	262	4	86	172	183	0	6	451	58
Mean		317	39	152	125	87	13	8	425	75
LSD (0.05)		36.5	15.5	27.0	23.6	22.1	12.5	6.4	32.1	6.0

Table 11. External Tuber Characteristics of Experimental & Standard Chipping Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Appearance ¹	Russeting ²	Eye Depth ³	Tuber Shape ⁴	Shape Uniformity ⁵	Length/Width Ratio ⁶
Atlantic	WR	3.8	2.2	2.9	1.2	4.0	1.1
Chipeta	WR	3.6	1.5	3.1	1.2	3.9	1.1
CO00188-4W	WR	3.1	1.3	3.0	1.2	3.6	1.1
CO00197-3W	WR	3.1	1.1	3.8	1.2	2.8	1.2
CO00270-7W	WR	3.1	1.0	3.8	1.3	3.5	1.2
9781	IREC	2.8	1.1	3.1	1.3	3.2	1.2
Dakotah Pearl	IREC	3.4	1.2	2.8	1.4	3.6	1.2
8402	IREC	2.3	1.0	3.1	1.3	3.3	1.1
7681	IREC	3.3	1.5	3.4	1.1	3.9	1.1
3502	IREC	2.8	1.8	3.4	1.7	2.9	1.2
Pike	IREC	3.5	1.3	3.3	1.1	3.9	1.0
Dakotah Diamond	IREC	4.6	1.1	3.1	1.0	3.9	1.1
Mean		3.3	1.3	3.2	1.2	3.5	1.1
LSD (0.05)		0.8	0.4	0.5	NS	0.6	0.7

Rating Scales

¹ 1=Worst, 5=Best

² 1=Light, 5=Heavy

³ 1=Deep, 5=Shallow

⁴ 1=Round, 5=Oblong

⁵ 1=No Uniformity, 5=Very Uniform

⁶ Ratio of 10 tubers measured from each rep evaluated

Table 12. Performance, Average Tuber Size & Specific Gravity of Experimental & Standard Chipping Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Vigor Rating ¹	Stand Count ²	Tubers/ Plant	Plants/ Acre	% Stand	Average Tuber Size (oz)	Specific Gravity
Atlantic	WR	3.3	46.7	8.5	16940	97	5.1	1.112
Chipeta	WR	5.0	38.5	7.0	13976	80	7.5	1.108
CO00188-4W	WR	2.0	30.3	10.6	10981	63	5.0	1.090
CO00197-3W	WR	3.0	40.0	9.9	14520	83	4.6	1.093
CO00270-7W	WR	3.0	37.0	7.5	13431	77	6.1	1.094
9781	IREC	3.5	47.0	8.6	17061	98	5.5	1.102
Dakotah Pearl	IREC	1.5	44.3	7.9	16063	92	4.7	1.100
8402	IREC	3.3	43.7	7.6	15851	91	5.9	1.099
7681	IREC	2.5	44.0	9.1	15972	92	4.9	1.110
3502	IREC	2.0	46.5	8.4	16880	97	4.8	1.114
Pike	IREC	3.0	45.8	7.1	16607	95	5.2	1.109
Dakotah Diamond	IREC	4.3	45.8	11.2	16607	95	3.9	1.107
Mean		3.0	42.4	8.6	15407	88	5.3	1.103
LSD (0.05)		0.7	2.8	0.9	1021	6	0.4	0.010

¹ 1=Bad, 5=Good

² Number of plants counted in two rows 20ft long

Table 13. External Defects of Experimental and Standard Chipping Potato Entries. Tulelake 2009

Clone/Variety	Trial	Irregular Shaped ¹	Growth Cracks ¹	Knobs ¹
Atlantic	WR	1.7	0.0	0.7
Chipeta	WR	1.5	0.0	0.8
CO00188-4W	WR	0.5	0.3	0.0
CO00197-3W	WR	3.0	0.0	1.5
CO00270-7W	WR	2.8	0.0	0.0
9781	IREC	0.5	0.0	1.0
Dakotah Pearl	IREC	1.3	0.5	0.0
8402	IREC	0.7	0.7	0.0
7681	IREC	2.3	0.0	0.0
3502	IREC	2.0	0.0	1.5
Pike	IREC	0.8	0.0	0.0
Dakotah Diamond	IREC	0.8	0.0	0.3
Mean		1.5	0.1	0.5
LSD (0.05)		NS	0.4	NS

¹ Number of tubers pulled from each plot with defects

Table 14. Chip Fry Quality & Snack Food Association (SFA) Rating at Harvest, 62 Days, and 105 Days Storage at 50°F of Experimental & Standard Chipping Potato Entries. Tulelake 2009.

Clone/Variety	Trial	Total Defects Found ¹			Total Defects Found %			Total Defects Found %		
		Specific Gravity ¹ 10/23/09	% 10/23/09	SFA Rating ² 11/2/09	Specific Gravity 12/20/09	% 12/20/09	SFA Rating 1/6/10	Specific Gravity 1/29/10	% 1/29/10	SFA Rating 2/2/10
Atlantic	WR	1.106	62.2	1	1.107	69.8	2	1.110	35.6	1
Chipeta	WR	1.102	26.3	2	1.105	33.5	1	1.102	10.7	1
CO00188-4W	WR	1.093	11.3	2	1.086	12.7	1	1.102	6.8	1
CO00197-3W	WR	1.092	26.6	1	1.092	24.7	2	1.108	24.3	1
CO00270-7W	WR	1.091	0.6	1	1.093	12.0	2	1.089	8.1	2
9781	IREC	1.099	6.2	1	1.101	9.1	1	1.103	3.2	2
Dakotah Pearl	IREC	1.089	1.6	1	1.087	12.9	1	1.088	0.0	1
8402	IREC	1.097	2.8	1	1.097	14.3	1	1.089	5.2	2
7681	IREC	1.111	7.8	2		18.8	2	1.110	9.6	2
3502	IREC	1.108	16.7	1	1.105	3.8	1	1.108	17.0	2
Pike	IREC	1.099	26.5	1		40.0	2	1.110	14.7	2
Dakotah Diamond	IREC	1.108	11.3	1	1.111	56.0	1	1.105	8.5	2

¹Data collected from local commercial packing shed, Total Defects Found = % of potato found to have undesirable coloring, external, and/or internal defects

² Snack Food Association Rating of 1-3 (1=best or most desired, 3= worst or dark yellow to brown in color)

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