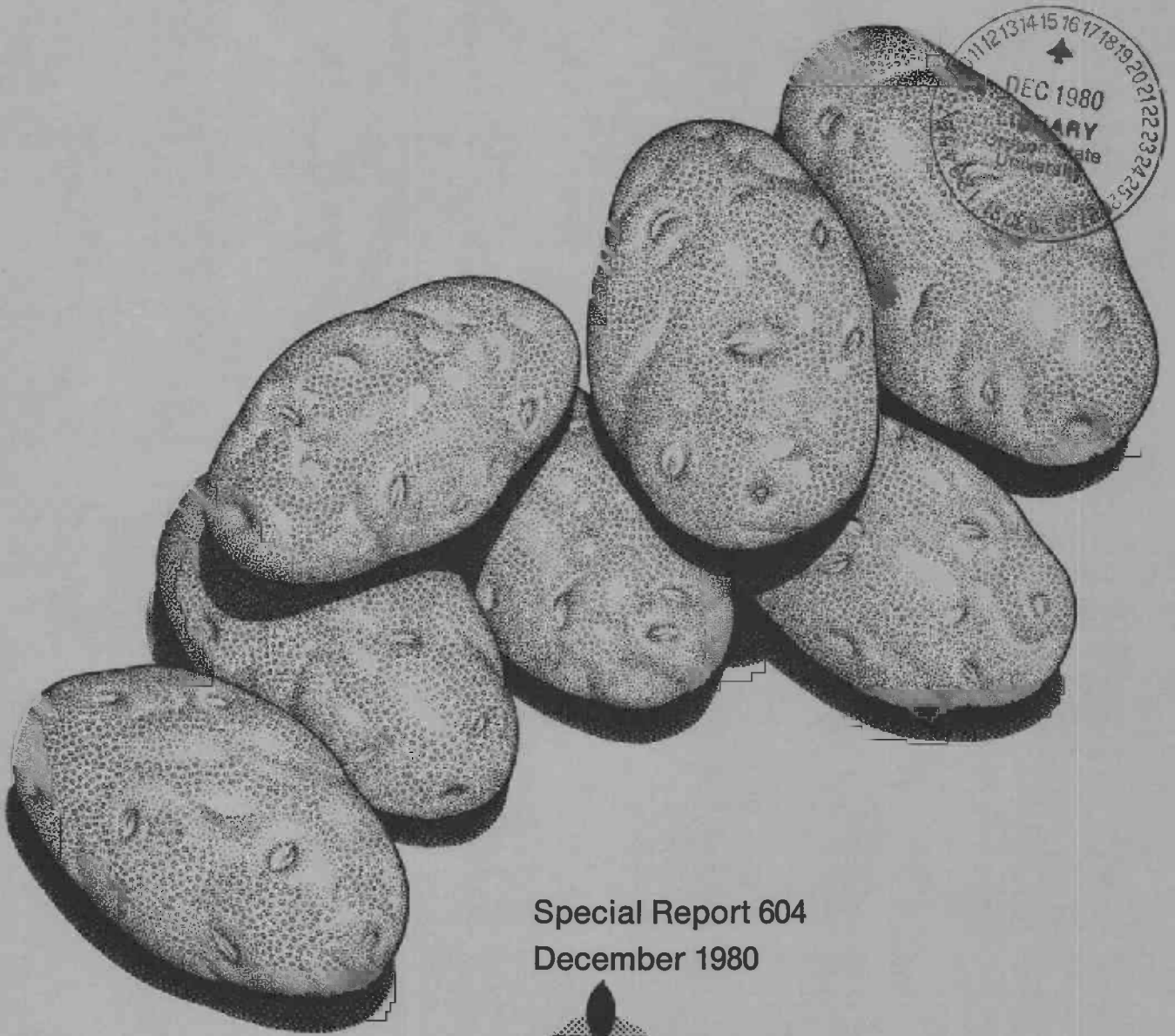


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Oregon Potato Variety Trials 1979



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AUTHORS: A. R. Mosley is associate professor, Crop Science Department; M. J. Johnson is professor of agronomy and superintendent, Central Oregon Agricultural Experiment Station, Redmond; G. E. Carter is assistant professor of agronomy and superintendent of the Klamath Agricultural Experiment Station, Klamath Falls; C. E. Stanger is associate professor of agronomy, Malheur Agricultural Experiment Station, Ontario; D. C. Hane is research assistant, unclassified, Columbia Basin Agricultural Research Center, Hermiston

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OREGON POTATO VARIETY TRIALS -- 1979

A. R. MOSLEY, M. J. JOHNSON, G. E. CARTER,
C. E. STANGER AND D. C. HANE

INTRODUCTION

OREGON POTATO VARIETY TRIALS -- 1979 summarizes work conducted by the authors at the Central Oregon, Klamath, Malheur and Columbia Basin Branch Experiment Stations; at Oregon State University; and on selected grower farms in the Columbia Basin. Selections and varieties used in these trials were obtained primarily from the USDA potato breeding program at Aberdeen, Idaho, and from: Dr. R. Voss, University of California at Davis; Dr. R. Johannsen, North Dakota State University; Dr. J. Twomey, Colorado State University; Dr. M. Martin, USDA potato breeding program at Prosser, Washington; and other colleagues in Maine and Nebraska.

Most entries were eye-indexed and increased at least one and usually two full years before testing. Increases were made at the Central Oregon Station in Redmond using typical seed production techniques such as hand cutting, tuber unit planting, skip rows and severe roguing. After harvest, the increased seed was stored at the Klamath Station and shipped to the various cooperators in time for spring planting. Yield potential and quality were observed during the increase phase. Many undesirable lots were subsequently discarded.

This controlled seed increase/storage sequence is considered crucial since it not only assures adequate amounts of seed for thorough testing, but also guarantees some degree of uniformity in seed quality among lots. Experience has shown that seed storage and handling techniques can influence yield performance markedly. Therefore, it is vitally important that seed be grown, stored and transported under identical conditions.

One hundred and nineteen (119) entries were evaluated in Oregon in 1979, representing a broad range in tuber appearance, yield and internal quality (Table 1). Several of these had shown promise in earlier tests at one or more Oregon locations.

The 1979 trials as usual were divided into five categories: (1) the Oregon Statewide Trial which compared 39 entries to Russet Burbank at Madras, Hermiston and Klamath Falls; (2) the Western Regional Trial conducted at the Hermiston Branch Station; (3) the Malheur Trials conducted at the Malheur Station (including several regional entries); (4) two on-farm trials in the Columbia Basin; and (5) the Willamette Valley Trial at Corvallis.

Plants were grown using cultural and pest control procedures common to the specific testing locations. Statistically sound, replicated planting designs were used in all cases. After harvest, tubers were weighed and evaluated using typical commercial quality standards.

Table 1. Potato Varieties and Selections Tested in Oregon in 1979

Entry	Locations tested ¹		Maturity ²
	1979	1978	
A66102-16	HO	--	L
A66107-51	HKM	K	M-L
A66122-3	HO	--	E
A6789-7	HK	K	M
A67142-1	K	HK	M
A69327-5	M	HK	M
A69657-4	K	HKO	E-M
A69868-2	K	HK	L
A70270-3	HKM	HK	M
A70319-11	HK	HK	E-M
A70365-6	HKMO	HKO	M
A70365-27	HKMO	HK	L
A70383-24	HKM	HK	E
A7203-3	K	HK	M
A7248-13	O	O	M
A7269-7	K	HKO	L
A7273-3	HKM	HK	M
A72301-1	M	--	M
A72320-11	HKM	O	M
A72320-35	O	O	L
A72322-10	K	--	M
A72329-15	HKM	--	E
A72331-10	K	O	M-L
A72331-14	O	O	M
A72331-17	O	O	E
A72421-4	HKMO	--	E
A72450-9	O	--	E
A72545-2	HKM	HK	L
A72545-3	K	HK	L
A72596-6	KM	--	E
A72601-4	H	HK	E
A72602-2	HKMO	K	M-L
A72605-2	K	HK	L
A72619-7	HKM	HK	L
A72685-2	O	O	L
A72687-11	M	--	E-M

(Continued on next page)

Table 1 (Cont.)

Entry	Locations tested ¹		Maturity ²
	1979	1978	
A7302-1	K	--	L
A7346-11	HKM	0	E
A7353-16	HKM	--	?
A7353-25	0	0	L
A7358-3	HKMO	--	L
A7393-2	HKM	0	E
A73143-4	0	0	E-M
A73175-6	HKMO	--	E
A73400-3	0	0	M-L
A73414-15	0	0	L
A74741-12	0	--	M
A7487-3	0	--	E
A7487-5	0	--	M-L
A74104-1	0	--	E
A74104-8	0	--	L
A74104-14	0	--	M-L
A74104-18	0	--	M-L
A74108-1	0	--	M
A74112-1	0	--	M
A74114-4	0	--	E-M
A74117-9	0	--	M-L
A74123-3	0	--	L
A74126-5	0	--	M-L
A74127-2	0	--	M
A74135-2	0	--	M-L
A74183-1	0	--	E-M
A74265-2	0	--	L
A74389-1	0	--	L
A74391-1	0	--	E
A74393-7	0	--	E
A74404-3	0	--	M
A74406-2	0	--	E-M
A74416-8	0	--	E
A74543-5	0	--	L
A74595-11	0	--	M-L
A74595-15	0	--	L

(Continued on next page)

Table 1 (Cont.)

Entry	Locations tested ¹		Maturity ²
	1979	1978	
A74595-17	O	--	E
A74596-7	O	--	L
AC67560-1	HO	HO	E
ALR 4-1	HKO	--	L
ALR 22-2	O	O	E
Atlantic	HKMOW	HK	M
B7024-81	HO	HO	E
BA9309-1	O	--	M-L
Belchip	W	--	M
Bison	HKMW	HK	E
Butte	HKMOW	HO	M-L
Centennial	HK	HK	E
Chieftain	HKM	HK	E
Dakchip	HW	--	M
Dark R. Norland	W	--	E
Denali	HW	W	M
Haig	W	--	E
Kennebec	HW	W	M
Lemhi	HKMOW	HKO	M-L
Monona	W	--	E-M
Nampa	HK	HK	L
ND8891-3 (Crystal)	HW	W	M
NDA8694-3	HKMOW	O	E
NDA9249-3	HKMOW	--	M
New Haig	W	--	E
New Superior	W	--	E
Norland	W	--	E
Nooksack	HKMW	HKO	L
Norchip	HW	W	E-M
Norgold	HKMO	OW	E
Pioneer	O	HO	E
R. Burbank	HKMOW	HKOW	M-L
Red LaSoda	W	--	M
R. LaSoda #5	W	--	M
R. LaSoda #10	W	--	M
Superior	W	--	E

(Continued on next page)

Table 1 (Cont.)

Entry	Locations tested ¹		Maturity ²
	1979	1978	
TA17-1	O	--	L
TA83-1	O	--	M-L
Targhee	HKM	HK	M-L
WC521-12	HO	--	L
WC612-13	HO	--	L
WN667-10	KM	--	E-M
WN670-3	H	--	L
WN701-14	HKM	--	L
WN708-5	H	--	E
WN720-2	KM	--	M
WN730-2	M	--	L

¹H = Hermiston; K = Klamath Falls; M = Madras; O = Ontario; W = Willamette Valley at Corvallis.

²E = early; M = midseason; L = late.

OREGON STATEWIDE TRIAL

Three similar plantings were made at the Klamath (Klamath Falls), Central Oregon (Madras) and Columbia Basin (Hermiston) Branch Stations in 1979. Each testing site included at least 40 entries. Not all of these were tested in common at all locations, however, with the result that 58 entries were included in this comprehensive test. Each entry was replicated at least four times wherever tested. Plots were generally single rows ranging from 25 to 30 feet long.

Yield and quality data are summarized in Tables 2-6. Entries are ranked alphabetically and numerically. Total yields can be compared between entries by using the "% of R. Bur." columns.

HERMISTON

The Hermiston area is characterized by sandy soils and an extremely long, hot growing season. Yields, therefore, tend to be relatively high. New fields frequently produce up to 35 tons per acre of Russet Burbank potatoes. The Columbia Basin Agricultural Research Center at Hermiston (CBARC) has been frequently cropped to potatoes, however, with the result that both yield and quality have decreased because of a higher incidence of soil-borne diseases, greater soil compaction and perhaps to nutrient imbalances. The CBARC is becoming more typical of Columbia Basin commercial potato fields as new land becomes more limiting and growers are forced to shorter rotations causing yield declines.

Forty varieties and selections were planted in Loamy Fine Sand at Hermiston on April 18 in a randomized block design with four replicates. Plots were single rows 25 feet long. Fertilizer was banded to the side and below seedpieces at planting at the rate of 100 lbs. per acre of nitrogen, 210 lbs. of P_2O_5 , 200 lbs. of K_2O , 76 lbs. of S and 6 lbs. of Zn. Additional nitrogen was broadcast on May 31 (75 lbs./A), June 26 (70 lbs.) and on July 17 (70 lbs.).

Weeds were controlled by Dalapon (5 lbs./A) applied on April 7 and by cultivation on May 21 and 31. Various insecticides were used during the season including Dyfonate at planting for wireworm control. Approximately 27 inches of water were applied through overhead sprinklers during the growing season. Vines were sprayed with Dinitro on September 13 and the plots were harvested on September 25.

Results -- Several entries produced considerably higher total yields than Russet Burbank (Table 2). Notable among these were Kennebec (143% of R. Burbank), ND8891-3 or Crystal (134%), A6789-7 (136%), A7273-3 (133%), A72545-2 (124%), Chieftain (124%), Lemhi (119%), A66107-51 (119%) and Butte (117%). Only A7273-3, A72545-2, Butte and Lemhi were oblong russets, however, and A72545-2 tended to be considerably lighter-skinned than Russet Burbank and also slightly more susceptible to scab.

Most entries produced higher U. S. No. 1 yields than Russet Burbank and A7273-3 produced excellent No. 1 yields with 523 cwt/A. as did A72545-2 with 503. Both of these were somewhat low in specific gravity, however. Based on yield and overall quality including grade-out and specific gravity, the following long russet types appeared to be promising at Hermiston -- A7273-3, A72545-2, ALR 4-1, Butte and Lemhi. Preliminary processing tests showed A72545-2, ALR 4-1 and Lemhi to produce light-colored french fries. A7273-3 and Lemhi appeared to be considerably earlier than R. Burbank.

Whites and round-whites producing well were Kennebec, ND8891-3 (Crystal), ND8888-2 (Dakchip), Norchip and Denali. The latter four were released primarily for chipping and have generally been unfit for other uses. Kennebec has been an excellent all-purpose potato but is not widely grown in the western states because of its thin skin and susceptibility to storage problems. The long white A6789-7 yielded well but showed a high incidence of purple blotching and sugar

Table 2. Yield and Quality Characteristics of Forty Potato Selections, OREGON STATEWIDE TRIAL, Hermiston

Selection	Yield, cwt/A		% of R. Bur.		Specific Gravity		Fry ¹ Color	Maturity ²	Comments
	Total No. 1	No. 1	Total No. 1	No. 1	Gravity	Color			
A 66107-51	527	329	119	204	1.074	1.2	M	Knobby	
A 6789-7	602	492	136	305	1.071	0.8	M	Lg. wh. purple flecks, sugar end	
A 70270-3	376	323	85	201	1.077	0.0	E	Good rus. type	
A 70319-11	363	298	82	185	1.072	0.1	E	Rgh. skin. Cracks. Poor	
A 70365-6	417	349	94	217	1.077	0.0	M	Lge. rus. HH.	
A 70365-27	351	257	79	160	1.083	0.9	L	Heavy rus. HH. Sugar end.	
A 70383-24	443	366	100	227	1.069	0.1	E	Fair rus. HH.	
A 7273-3	588	523	133	325	1.080	0.3	M	Good skin.	
A 72320-11	393	238	89	148	1.080	0.8	E	Fair. HH? Sugar end.	
A 72329-15	328	257	74	160	1.070	0.1	E	Rough; cracks.	
A 72421-4	302	243	81	151	1.079	0.1	E	Fair, semi-rus.	
A 72545-2	551	503	124	312	1.079	0.0	L	Smooth. Good skin.	
A 72601-4	379	312	85	194	1.076	0.1	E	Rgh. skin. HH!	
A 72602-2	418	354	94	220	1.086	0.1	L	Rus. Rgh. skin.	
A 72619-7	361	274	81	170	1.083	0.0	E	Light rus. Good.	
A 7346-11	397	343	90	213	1.075	0.0	E	Light rus. Virus. OK.	
A 7353-16	234	197	53	122	1.082	0.1	?	Smooth. Semi-rus.	
A 7358-3	403	280	91	174	1.089	0.1	L	Small. Light rus.	
A 7393-2	308	243	69	151	1.075	0.0	E	Smooth. Early?	
A 73175-6	347	321	78	199	1.074	0.1	E	Lt. rus. Large.	
ALR 4-1	487	427	110	265	1.093	0.0	L	Semi-rus. Oblong.	
Bison	404	371	91	230	1.069	0.0	E	Smooth. Red. Small.	
R. BUR., VT-SC	443	161	100	100	1.075	0.1	L	Typical but rough.	
R. BURBANK	421	234	95	145	1.082	0.0	L	Typical.	
Butte	518	397	117	246	1.085	0.2	M	--	

Table 2. (continued)

Selection	Yield, cwt/A		% No. 1	% of R. Bur.		Specific Gravity	Fry ¹ Color	Maturity ²	Comments
	Total	No. 1		Total	No. 1				
Centennial	333	300	90	75	186	1.073	0.1	E	Pitted rus. skin. HH.
Chieftain	548	513	94	124	319	1.069	0.2	E	Red. Lge, rgh.
Denali	420	389	93	95	242	1.088	0.3	M	Round wh. Sugar end.
Kennebec	635	532	84	143	330	1.078	0.0	M	Typical.
Lemhi	529	447	84	119	278	1.088	0.0	M	Smooth.
Nampa	373	240	64	84	149	1.081	-	L	Long. Large eyes.
ND 8888-2	467	435	93	105	270	1.076	0.0	E	Round white.
ND 8891-3	593	544	92	134	338	1.076	0.1	E	Round white.
Nooksack	363	338	93	82	210	1.088	0.1	L	Large!
Norchip	466	420	90	105	261	1.080	0.0	E	Typical.
Norgold	400	367	92	90	228	1.074	1.1	E	Typical.
Targhee	396	344	87	89	214	1.083	1.1	L	Pitted rus. skin.
WN 670-3	382	306	80	86	190	1.085	0.3	L	Smooth. Oval. HH, GC.
WN 701-14	379	292	77	85	181	1.091	0.3	M	Lge. Dark rus. HH.
WN 708-5	324	240	74	73	149	1.089	0.1	E	Smooth. White. Round.
Average	413	335	-	-	-	1.079	-	-	-
LSD .05	114	89	-	-	-	0.003	-	-	-

¹Samples fried on October 1 by Lamb-Weston, Hermiston. 0 = light color, 4 = dark.

²Maturity ratings based on time of flowering. E = early-maturing, M = midseason, L = late.

ends when processed. Kennebec, Dakchip, Crystal and Norchip produced relatively light-colored fries in preliminary tests.

KLAMATH FALLS

Forty-eight varieties and selections were compared at the Klamath Experiment Station. Some 35 or 40 of these were also grown at Hermiston and Madras. Standard cultural, pest control and statistical procedures were used in planting, growing and evaluating performance.

Results -- Several entries performing well at Hermiston also did well at Klamath Falls (Table 3). A72545-2, for example, produced significantly higher yields than R. Burbank and showed slightly less hollow heart, but gravity also appeared to be slightly lower. A7273-3 yields were relatively low compared to Hermiston. Lemhi likewise produced relatively low yields and showed excessive hollow heart (48%) and Butte yields were unacceptably low. Several high yielding selections including A66107-51, A6789-7, A69657-4, and NDA9249-3 should be tested further. Most of these have had one or more undesirable characteristics such as excessive knobiness (A66107-51), purple flecking (A6987-7), and hollow heart (NDA9249-3) at one or more locations in past tests.

MADRAS

Forty varieties and selections were planted in Madras loam on May 9 using a randomized block design with 4 replications. Individual plots were single rows 15 feet long. Fertilizer (16-16-16) was banded at planting at 1,000 lbs. per acre. Seed pieces were spaced 9 inches apart in 36-inch rows.

The planting was sprinkler-irrigated 17 times with a total of approximately 20 inches of water. Insects were controlled by Temik at 3 lbs. per acre side-dressed on June 6 and by an aerial application of Monitor on June 29. Vines were killed by propane burning on September 20 and tubers were harvested on

Table 3. Performance of 48 Potato Breeding Lines and Varieties.
STATEWIDE TRIAL, Klamath Falls

Entry	Yield, cwt/A		%	% of R. Bur.		Specific Gravity	% Hollow
	Total	No. 1	No. 1	Total	No. 1		
A 66107-51	580	528	91	137	159	1.085	6
A 6789-7	688	662	96	163	200	1.077	0
A 67142-1	423	364	86	100	110	1.086	13
A 69657-4	592	505	85	140	153	1.088	16
A 69868-2	255	204	80	60	62	1.086	0
A 70270-3	423	362	86	100	110	1.083	21
A 70319-11	360	316	88	85	95	1.078	5
A 70365-6	368	338	92	87	102	1.081	11
A 70365-27	382	346	91	90	104	1.088	72
A 70383-24	217	144	66	51	43	1.073	36
A 7203-3	516	416	81	122	126	1.091	31
A 7269-7	502	412	82	119	124	1.092	4
A 7273-3	478	400	84	113	121	1.087	0
A 72320-11	272	186	68	64	56	1.079	78
A 72322-10	327	242	74	77	73	1.074	14
A 72329-15	411	291	71	97	88	1.078	5
A 72331-10	520	407	78	123	123	1.090	46
A 72421-4	301	180	60	71	54	1.085	0
A 72545-2	603	532	88	143	161	1.087	9
A 72545-3	337	266	79	80	80	1.077	55
A 72596-6	366	325	89	87	98	1.084	0
A 72602-2	480	439	92	114	133	1.096	20
A 72605-2	372	319	86	88	96	1.084	9
A 72619-7	465	321	69	110	97	1.090	0
A 7302-1	431	300	70	102	91	1.075	0
A 7346-11	412	340	83	97	103	1.081	3
A 7353-16	94	65	69	22	20	-	?
A 7358-3	373	294	79	88	89	1.100	52
A 7393-2	307	289	94	73	87	1.093	0
A 73175-6	270	244	90	64	74	1.084	0
ALR4-1	488	413	85	115	125	1.092	2
NDA 8694-3	448	358	80	106	108	1.079	0
NDA 9249-3	528	467	88	125	141	1.078	48
WN 667-10	355	244	69	84	74	1.083	5
WN 701-14	403	340	84	95	103	1.101	5
WN 720-2	348	318	91	82	96	1.097	0
Atlantic	470	402	86	111	121	1.099	9
Bison	307	272	89	73	82	1.073	0
Butte	421	299	71	100	90	1.087	0
Centennial	320	250	78	76	75	1.084	18
Chieftan	457	399	87	83	120	1.075	10
Lemhi	498	447	90	118	135	1.088	48
Nampa	416	342	82	98	103	1.085	24
Nooksack	463	433	94	109	131	1.092	16
Norgold	408	321	79	96	97	1.081	14

Table 3. (continued)

Entry	Yield, cwt/A		% No. 1	% of R. Bur.		Specific Gravity	% Hollow
	Total	No. 1		Total	No. 1		
R. BUR, VT-SC	423	331	78	100	100	1.092	14
R. BURBANK	591	418	71	140	126	1.089	11
Targhee	408	321	79	96	123	1.081	10
Avg	414	342	-	-	-	1.085	16
LSD .05	94	86	14.7	-	-	0.006	-

October 9. Tuber specific gravities were determined by the weight in water, weight in air method. Samples for fry tests were stored at 55-60° F for 15 days, followed by 45-50° for 7 days, 40° for 30 days and 45° F for 7 days. Four 3/8-inch fries from the centers of four different tubers were fried at 375° F for 3.5 minutes in soybean oil and scored individually using the USDA French Fry Standard Color Chart. Scores shown in Table 4 are averages for 48 individual fries. The resulting colors were somewhat darker than would be expected had storage conditions been less rigorous.

Results -- Several entries produced higher yields than Russet Burbank (Table 4). A72545-2 was particularly impressive. Not only did it produce high yields, but fry color was also good and no hollow heart was detected. Specific gravity of A72545-2 appeared to be similar to that of Russet Burbank. ALR 4-1 also performed well at Madras producing high yields of tubers of extremely high specific gravity; fry color was similar to Burbank. Lemhi was not particularly impressive, producing only moderate yields and approximately 20% hollow heart. Butte was also mediocre and french fry color was relatively poor.

CONCLUSIONS

Highest yielding entries averaged across all locations included A72545-2, A66107-51, A7273-3, ALR 4-1, Lemhi and Butte (Table 5). A72545-2 graded out well, fried satisfactorily and was relatively resistant to hollow heart; specific gravity was somewhat low, however, and tubers were somewhat lighter-skinned than desirable and sometimes scabby. A66107-51 was prone to knobiness and dark-colored french fries under conditions used in these tests. A7273-3 was physically more attractive than A66107-51, being smoother shaped and skinned, but also more prone to dark fry color. ALR 4-1, on the other hand, was usually

Table 4. Yield and Quality Characteristics of Potato Lines and Varieties, STATEWIDE TRIAL, Madras

Entry	Yield, cwt/A		% of R. Bur.	oz/ Tuber	Specific Gravity	% ¹ H.H.	Fry ² Color	Average ³ Maturity		
	Total	No. T							No. T	Total
A 66107-51	521	326	63	162	164	10.2	1.075	0.0	3.6	L
A 67142-1	248	140	56	77	70	9.1	1.072	51.4	3.6	M
A 69327-5	385	289	75	119	145	8.2	1.091	0.0	2.2	M
A 70270-3	360	293	82	112	147	7.5	1.078	11.1	1.7	M
A 70319-11	420	293	70	130	147	7.9	1.073	3.6	3.9	E-M
A 70365-6	435	326	75	135	164	11.1	1.071	2.7	3.8	M
A 70365-27	424	331	78	132	166	7.1	1.089	12.3	2.0	L
A 70383-24	447	310	69	139	156	9.9	1.073	9.7	2.3	E
A 7273-3	442	327	74	137	164	8.9	1.082	1.3	4.0	M
A 72301-1	324	254	78	101	128	6.4	1.067	0.0	3.3	M
A 72320-11	357	292	82	111	147	7.3	1.091	56.0	1.6	M
A 72329-15	200	149	75	62	75	5.6	1.070	0.0	3.1	E
A 72421-4	302	236	78	94	118	6.7	1.078	15.0	3.6	E-M
A 72545-2	493	431	87	153	216	8.7	1.082	0.0	1.2	L
A 72596-6	261	214	82	81	107	6.9	1.080	3.6	3.9	E
A 72602-2	386	308	80	120	155	8.1	1.090	9.8	1.6	E-M
A 72619-7	313	246	79	97	124	7.2	1.082	5.2	1.9	M-L
A 7346-11	356	296	83	110	149	9.0	1.077	1.4	1.5	E-M
A 7353-16	245	192	78	76	96	6.1	1.077	14.4	2.3	M
A 7358-3	353	230	76	111	115	8.1	1.096	51.1	1.6	L
A 7393-2	323	229	71	100	115	7.3	1.079	6.9	2.2	E-M
A 73175-6	341	302	88	106	152	11.7	1.073	2.1	2.9	E-M
ALR 4-1	463	403	87	144	202	9.5	1.099	5.2	2.4	L
Atlantic	332	272	82	103	137	7.6	1.087	9.4	1.3	M-L
Bison	291	237	81	90	119	8.5	1.068	0.0	1.5	E

Table 4. (continued)

Entry	Yield, cwt/A		No. 1	% of Total	No. 1	No. 1	Bur.	No. 1	oz/ Tuber	Specific Gravity	% ¹ H.H.	Fry ² Color	Average ³ Maturity
	Total	No. 1											
Butte	423	325	77	131	163	6.8	1.090	5.2	3.6	L			
Chieftain	462	366	79	143	184	11.0	1.068	0.0	3.7	E			
Lemhi	408	315	78	127	158	9.3	1.080	19.6	2.0	M			
NDA 8694-3	323	278	87	100	140	9.1	1.071	0.0	3.0	E			
NDA 9249-3	239	173	73	74	87	9.0	1.073	31.5	3.4	M			
Nooksack	317	259	82	98	130	10.8	1.081	6.1	3.2	L			
Norgold	299	245	82	93	123	8.1	1.069	5.1	3.7	E			
Norgold	259	153	73	80	77	6.4	1.067	20.2	3.6	E			
R. Burbank (M)	469	322	69	146	162	8.4	1.082	5.3	3.3	M-L			
R. Burbank (M)	425	314	74	132	158	8.4	1.087	3.6	2.4	M-L			
R. BURBANK (Gen 1)	322	199	62	100	100	7.1	1.083	14.1	2.8	M-L			
Targhee	325	245	76	101	123	7.8	1.085	8.9	2.7	M-L			
WN 667-10	473	310	66	147	156	7.1	1.084	6.5	3.5	E-M			
WN 701-14	281	220	78	87	110	7.1	1.097	14.1	3.3	L			
WN 720-2	302	229	76	94	115	6.9	1.093	1.3	3.0	L			
Average	359	272	76	-	-	8.2	1.080	10.3	2.7	-			
LSD .05	118	112	-	-	-	2.0	0.005	14.5	0.7	-			

¹Hollowheart sample = approximately 10 pounds of 6-10 oz tubers.

²USDA color standards for frozen French fried potatoes: 0 = light, 4 = dark. Samples fried on December 10 after 7 days at 45°F preceded by 30 days at 40°F.

³Maturity estimates based primarily on vine condition: E = early, M = midseason, L = late.

Table 5. Performance of Fifty-Eight Potato Breeding Lines and Varieties at Three Locations, STATE-WIDE TRIAL

Entry	Total cwt/A			No. / cwt/A			% of Burbank			% No. /			Specific Gravity					
	Herm.			K. Falls			Madras			Herm.			K. Falls			Madras		
	Herm.	K. Falls	Madras	Herm.	K. Falls	Madras	Herm.	K. Falls	Madras	Herm.	K. Falls	Madras	Herm.	K. Falls	Madras	Herm.	K. Falls	Madras
A 66107-51	527	580	521	329	528	326	125	137	162	62	91	63	1.074	1.085	1.075			
A 6789-7	602	688	-	492	662	-	143	163	-	82	96	-	1.086	1.077	-			
A 67142-1	-	423	248	-	364	140	-	100	77	-	86	56	-	1.086	1.072			
A 69327-5	-	-	385	-	-	289	-	-	119	-	-	75	-	-	1.091			
A 69657-4	-	592	-	-	505	-	-	140	-	-	85	-	-	1.088	-			
A 69868-2	-	255	-	-	204	-	-	60	-	-	80	-	-	1.086	-			
A 70270-3	376	423	360	323	362	293	89	100	112	86	86	82	1.077	1.083	1.078			
A 70319-11	363	360	420	298	316	293	86	85	130	82	88	70	1.072	1.078	1.073			
A 70365-6	417	368	435	349	338	326	99	87	135	84	92	75	1.077	1.081	1.071			
A 70365-27	351	382	424	257	346	331	83	90	132	73	91	78	1.083	1.088	1.089			
A 70383-24	443	217	447	366	144	310	105	51	139	83	66	69	1.069	1.073	1.073			
A 7203-3	-	516	-	-	416	-	-	122	-	-	81	-	-	1.091	-			
A 7269-7	-	502	-	-	412	-	-	119	-	-	82	-	-	1.092	-			
A 7273-3	588	478	442	523	400	327	140	113	137	89	84	74	1.080	1.087	1.082			
A 72301-1	-	-	324	-	-	254	-	-	101	-	-	78	-	-	1.067			
A 72320-11	393	272	357	238	186	292	94	64	111	61	68	82	1.080	1.079	1.091			
A 72322-10	-	327	-	-	242	-	-	77	-	-	74	-	-	1.074	-			
A 72329-15	328	411	200	257	291	149	78	97	62	78	71	75	1.070	1.078	1.070			
A 72331-10	-	520	-	-	407	-	-	123	-	-	78	-	-	1.090	-			
A 72421-4	302	301	302	243	180	236	72	71	94	81	60	78	1.079	1.085	1.078			
A 72545-2	551	603	493	503	532	431	131	143	153	91	88	87	1.079	1.087	1.082			
A 72545-3	-	337	-	-	266	-	-	80	-	-	79	-	-	1.077	-			
A 72596-6	-	366	261	-	325	214	-	87	81	-	89	82	-	1.084	1.080			
A 72601-4	379	-	-	292	-	-	90	-	-	77	-	-	1.091	-	-			
A 72602-2	418	480	386	354	439	308	99	114	120	85	92	80	1.086	1.096	1.090			
A 72605-2	-	372	-	-	319	-	-	88	-	-	86	-	-	1.084	-			
A 72619-7	361	465	313	274	321	246	86	110	97	76	69	79	1.083	1.090	1.082			
A 7302-1	-	431	-	-	300	-	-	102	-	-	70	-	-	1.075	-			
A 7346-11	397	412	356	343	340	296	94	97	110	86	83	83	1.075	1.081	1.077			
A 7353-16	234	94	245	197	65	192	55	22	76	84	69	78	1.082	-	1.077			
A 7358-3	403	373	353	280	294	230	96	88	111	69	79	76	1.089	1.100	1.096			
A 7393-2	308	307	323	243	289	229	73	73	100	79	94	71	1.075	1.093	1.079			
A 73175-6	347	270	341	321	244	302	82	64	106	92	90	88	1.074	1.084	1.073			
ALR 4-1	487	488	463	427	413	403	116	115	144	88	85	87	1.093	1.092	1.099			
NDA 8694-3	-	448	323	-	358	278	-	106	100	-	80	87	-	1.079	1.071			
NDA 9249-3	-	528	239	-	467	173	-	125	74	-	88	73	-	1.078	1.073			
WN 670-3	382	-	473	306	-	310	91	-	147	80	-	66	-	1.085	-			
WN 667-10	-	355	-	-	244	-	-	84	-	-	69	-	-	1.083	1.084			
WN 701-14	379	403	281	292	340	220	90	95	87	77	84	78	1.091	1.101	1.097			
WN 708-5	324	-	-	240	-	-	77	-	-	74	-	-	-	-	-			

Table 5 (Continued)

Entry	Total cwt/A		No. 1 cwt/A		% of Burbank				% No. 1		Specific Gravity				
	Herm.	K.Falls	Madras	Herm.	K.Falls	Madras	Herm.	K.Falls	Madras	Herm.	K.Falls	Madras			
WN 720-2	-	348	302	-	318	229	-	82	94	-	91	76	-	1.097	1.093
Atlantic	-	470	332	-	402	272	-	111	103	-	86	82	-	1.099	1.087
Bison	404	307	291	371	272	237	96	73	90	92	89	81	1.069	1.073	1.068
Butte	518	421	423	397	299	325	123	100	131	77	71	77	1.085	1.087	1.090
Centennial	333	320	-	300	250	-	79	76	-	90	78	-	1.073	1.084	-
Chieftain	548	457	462	513	399	366	130	83	143	94	87	79	1.069	1.075	1.068
Crystal (ND 8891-3)	593	-	-	544	-	-	141	-	-	92	-	-	1.076	-	-
Dakchip (ND 8888-2)	467	-	-	435	-	-	111	-	-	93	-	-	1.076	-	-
Denali	420	-	-	389	-	-	100	-	-	93	-	-	1.088	-	-
Kennebec	635	-	-	532	-	-	151	-	-	84	-	-	1.078	-	-
Lemhi (A 68678-1)	529	498	408	447	447	315	126	118	127	84	90	78	1.088	1.088	1.080
Nampa	373	416	-	240	342	-	88	98	-	64	82	-	1.081	1.085	-
Nooksack	363	463	317	338	433	259	86	109	98	93	94	82	1.088	1.092	1.081
Norchip	466	-	-	420	-	-	111	-	-	90	-	-	1.080	-	-
Norgold	400	408	299	367	321	245	95	96	93	92	79	82	1.074	1.081	1.069
R. BURBANK, VT-SC	443	423	322	161	331	199	105	100	100	36	78	62	1.075	1.092	1.083
R. BURBANK, FND.	421	591	425	234	418	314	100	140	132	55	71	74	1.082	1.089	1.087
Targhee	396	477	325	344	389	245	94	113	101	87	82	76	1.083	1.085	1.085
Average	413	414	359	335	342	272	-	-	-	-	-	-	1.079	1.085	1.080
LSD .05	114	94	118	89	86	112	-	-	-	-	-	-	0.003	0.006	0.005

smooth, fried light and had extremely high specific gravity. Lemhi and Butte yielded moderately well, were smooth and of average specific gravity. Lemhi fried light, but was quite susceptible to hollow heart.

Based on these preliminary results, it would appear that A72545-2 and ALR 4-1 could hold promise for the russet processing market. More testing is needed before they can be recommended, however. Lemhi was somewhat disappointing in that yields were only slightly higher than Burbank and hollow heart tended to be a serious problem at Klamath Falls and Madras.

The white-skinned entries, Dakchip, Denali, Atlantic, Crystal and Kennebec, yielded well and generally produced light-colored french fries, but are best suited for chipping and not suitable for table or processing uses. Most of these and additional round-white selections were included in the Willamette Valley Chipping Trial.

HERMISTON WESTERN REGIONAL TRIALS

Fourteen potato selections were evaluated in the Western Regional Trial in 1979 (Table 6). Six of these fourteen were also compared to Norgold clones for early fresh market potential in an "Early Regional Trial" (Table 7). Similar tests of these 14 entries were conducted cooperatively at 10 locations in six western states in 1979.

WESTERN REGIONAL TRIAL

Seed pieces were spaced nine inches apart in 34-inch rows on April 18. Each entry was replicated four times in a randomized block statistical design. The Loamy Fine Sand was amended by banding 100 lbs. of N, 210 of P₂O₅, 200 of K₂O, 76 of S and 6 lbs. of Zn per acre at planting; in addition, 75 lbs. of N per acre were broadcast on May 31 and 70 lbs. each on June 26 and July 17. Weeds were controlled by Dalapon applied at the rate of 5 lbs. per acre on April 7 and cultivations with a Lilliston rolling cultivator on May 21 and May 31. Late-season weed competition from water grass and other species was relatively severe. Dyfonate, Disyston, Monitor and Imidan were used during the season for wireworm and foliar insect control. Fungicide sprays were not needed. Vines were sprayed with Dinitro on September 13 and plots were harvested on September 25. Yields and tuber grade-out were evaluated using typical procedures.

Results -- Yield and quality differed considerably among entries (Table 6). As expected, earlier-maturing entries such as Norgold, NDA 8694-3, NDA 9249-3 and B7024-81 tended to yield less than average (375 cwt/acre U. S. No. 1). The mid-season entry Lemhi appeared to have very good yielding potential with 512 cwt. No. 1 potatoes in comparison to 246 for Russet Burbank. Not only did Lemhi grade out much better than Burbank (86 compared to 51% No. 1), it also yielded approximately 100 cwt more totally. Other high-yielding entries included

Table 6. Yield and Quality Characteristics of Entries, WESTERN REGIONAL TRIAL, Hermiston

Entry	Mat.*	Yield Total	Mat.* Total	Yield cwt./A No. 1	% No. 1	% of R. B. Total	No. 1	Specific Gravity	Avg. wt. (oz)	Fry Color ¹	Shape & Skin ²	Comments ³
A 66102-16	3.3	516	371	72	107	151	1.088	8.2	0.6	0-L, Rus	Scab	
A 66122-3	3.5	585	404	69	122	164	1.071	9.1	0.1	L, Rus	SG severe	IN
A 70265-27	3.4	411	281	68	86	114	1.085	8.1	0.7	0, Rus	SG, HH	
AC 67560-1	2.4	440	388	88	92	158	1.070	7.6	0.2	R, Red	Scab	
Atlantic	2.8	540	493	91	112	200	1.090	7.4	0.0	R, Rus	IN	
B 7024-81	2.3	379	326	86	79	132	1.092	7.2	0.1	R-0, W	Scab	
R. BURBANK	3.4	480	246	51	100	100	1.081	7.6	0.1	L, Rus	SG!	
Butte	3.1	412	278	67	86	113	1.086	7.2	0.5	L, Rus	--	
Lemhi	3.0	582	512	88	121	208	1.087	9.9	0.0	L, Rus	IN, minor	
NDA 8694-3	2.2	356	317	89	74	129	1.075	7.4	0.0	0, Rus	Minor scab	
NDA 9249-3	2.4	421	364	86	88	148	1.079	9.3	0.3	0, Rus	--	
NORGOLD	2.0	348	306	88	72	124	1.075	9.6	0.7	R-0, Rus	--	
WC 521-12	3.3	535	496	93	111	202	1.098	9.3	0.0	R, Rus	HH	
WC 612-13	3.4	516	469	91	107	191	1.083	8.5	0.1	R-0, Rus	Scab, minor	
Average		465	375				1.083					
LSD .05		85	87				0.004					

¹Tests performed by Lamb-Weston, Hermiston: 0 = light, 4 = dark.

²Shape: L = long, 0 = oblong, R = round. Skin: W = white, Rus = Russet.

³SG = second growth; IN = internal necrosis or browning; HH = hollow heart.

*Maturity: 1 = early; 5 = late.

WC 521-12 (496 cwt.), Atlantic (493), and WC 612-13 (469 cwt./acre).

Based on yield and overall quality, Lemhi appeared to have excellent potential; both yield and specific gravity were high, tubers were moderately large and fry color was excellent. Tubers were oblong and very smooth and uniform. Skins were excellent, being thick and heavily russeted. Hollow heart was not evident in 1979 but has been troublesome in past years. Some internal brown flecking was observed.

Atlantic also appeared to have excellent potential for some uses. Tubers of Atlantic were characteristically round, however, and were, therefore, not ideal for french frying. Further, Atlantic skins were not heavily russeted, but were still somewhat thick. High yields and specific gravity and good fry color suggest excellent potential for the potato chip market. Atlantic has found good acceptance in most states for chipping. It probably would be excellent for most other types of processing where long tuber shape is not necessary. Atlantic did show some internal necrosis or brown flecking.

The Washington selections WC 521-12 and WC 612-13 both appeared to have potential. WC 521-12 tubers were highest in specific gravity among all entries; yields were also good but tubers were too round for french fry processing. WC 521-12 could be an excellent candidate for chipping provided hollow heart can be controlled. WC 612-13 appeared to have less yielding potential than WC 521-12 but tuber shape was longer and, therefore, more acceptable for fresh market and processing. Specific gravity of WC 612-13 was similar to that of R. Burbank.

The red selection AC 67560-1 performed well in past years, but yields were only average in 1979 and tubers were scabby. Tubers of AC 67560-1 have stored extremely well and remained firm throughout the storage period in past tests. Color tended to fade considerably in storage, however, and was only mediocre at harvest.

Based on these results, future regional tests should probably include Lemhi, WC 521-12, WC 612-13, Atlantic, Russet Burbank and Norgold. Other entries in the 1979 trial are questionable.

EARLY REGIONAL TRIAL

Seventeen selections and clones were planted in Loamy Fine Sand at the Hermiston Station on March 23 for an early yield trial. Entries had been selected for earliness and overall potential. Eight Norgold clones and one Lemhi clone were obtained from Nebraska for comparison with Oregon-produced Lemhi and Norgold. Plots were single 25-foot rows and were replicated four times in a randomized block design.

The crop was grown using commercially acceptable practices as outlined above for the Western Regional Trial. Tubers were harvested on August 7 approximately one week after vine kill. Typical yield and quality data were collected.

Results -- U. S. No. 1 yields ranged from 280 to 420 cwt. per acre with an average of 356 (Table 7). Lemhi, AC67560-1 and two Norgold clones from Nebraska (clones 35 and H) yielded significantly more than the Oregon Norgold check. The red-skinned AC67560-1 showed relatively poor color compared to Bison and most other reds in commercial production. AC 67560-1, therefore, may be of doubtful use despite high yielding ability and excellent storage characteristics as mentioned previously.

Lemhi (formerly A 68678-1) has traditionally been considered a mid-season-to-late variety but yielded well in this early harvest trial with more than 390 cwt./acre. Skins appeared to be fairly well set and tuber size and specific gravity were acceptable. Lemhi will be tested further for early harvest potential in 1980. The attractive tuber shape and russet skin should make Lemhi highly competitive to Norgold for early fresh market if indeed Lemhi matures sufficiently early. Hollow heart was not evident although Lemhi has been prone to this disorder in past years.

Table 7. Yield and Quality Characteristics of Entries, EARLY REGIONAL TRIAL, HERMISTON

Entry	Yield, cwt/A		Percent ¹			% of Norgold		Specific Gravity	Fry ² Color
	Total	No. 1	No. 1	<2 in	H.H.	Total	No. 1		
A 70383-24	403	324	80	4	17	115	100	1.069	0.3
AC 67560-1	456	402	88	4	0	131	124	1.074	0.1
B 7024-81	363	287	79	9	0	104	88	1.090	0.0
Bison	428	363	85	5	0	123	112	1.075	-
Lemhi	459	393	85	3	0	131	121	1.084	0.1
Lemhi (Neb.)	439	391	89	4	2	126	121	1.085	0.1
NDA 8694-3	401	361	90	3	0	115	111	1.078	0.1
NDA 9249-3	334	280	84	4	5	96	86	1.081	0.9
Norgold (Ore.)	349	324	93	3	2	100	100	1.077	-
Norgold (Neb.)	405	356	88	4	0	116	110	1.079	0.7
Norgold 7	383	335	88	4	2	110	103	1.075	2.0
Norgold 10	355	311	88	4	0	102	96	1.079	1.5
Norgold 19	421	378	90	2	0	121	117	1.074	0.9
Norgold 35	480	420	88	2	2	137	130	1.075	1.0
Norgold H	431	396	92	2	2	123	122	1.075	1.1
Norgold L	439	359	82	4	2	126	111	1.073	1.1
Norgold M	407	368	91	2	0	117	113	1.075	0.5
Average	409	356	87	3	-	111	110	1.077	0.7
LSD .05	73	66	-	-	-	-	-	0.003	-

¹<2 in = percent of tubers less than 2 in. diameter; HH = percent hollow tubers.

²French fry color: 0 = light, 4 = dark. Tests by Lamb-Weston, Hermiston.

A70383-24, B7024-81, Bison and the two North Dakota lines, NDA 8694-3 and NDA 9249-3, were of questionable worth in the Columbia Basin based on results of this trial. A70383-24 was too susceptible to hollow heart with 17% of the tubers affected. Deficiencies shown by the other four undesirable entries included: red skin color (Bison), low yields (B7024-81 and NDA 9249-3) and unattractive tuber appearance (NDA 8694-3).

Yields varied considerably among the Norgold clones, ranging from 420 cwt./acre U.S. No. 1 for Norgold 35 to 311 cwt for Norgold 10. Despite high yields, Norgold 35 may be less desirable than indicated since tuber skins appeared to be less well set and more easily damaged at harvest than skins of the other Norgold clones or of Lemhi. This skin maturity aspect will be further tested in 1980. Norgold H also yielded well and seemed to be earlier maturing than Norgold 35 whereas Norgold strains 7, 10, 19, L and M did not yield significantly more than the Oregon Norgold check. Norgold clonal comparisons will be continued in 1980 in an attempt to determine whether clones do differ consistently and, if so, to select clones best suited to Oregon.

MALHEUR TRIALS

Seventy-one selections were evaluated in one or more of our separate trials at the Malheur Experiment Station in 1979. Entries were selected primarily from the Aberdeen, Idaho, breeding program and, to a lesser extent, from other participants in the Western Regional Cooperative Potato Variety Trial. Newly obtained lines were evaluated in a preliminary trial with early and late harvest dates while previously tested and promising lines were compared in an advanced test with early and late harvest dates. All lines obtained through the Western Regional Trial were tested in the advanced late- (A66102-16, A66122-3, A70365-27, AC67560-1, B7024-81, WC 521-12, WC 612-13, Butte, Lemhi and Russet Burbank) or advanced early- (NDA 8694-3, NDA 9249-3, Atlantic and Norgold) harvested trials.

Seed pieces of the various entries were planted in silt loam soil of pH 7.3 and 1.3 percent organic matter on April 20 and 21. The soil had been amended before planting with 100 lbs of P_2O_5 and 60 lbs of N per acre plowed down the preceding fall. An additional 140 lbs of N per acre were side-dressed when plants were about six inches tall. The land had been cropped to barley twice before fall plowing and bedding in 1978.

Seed pieces were planted in 36-inch rows and individual plots were single rows of either 25 hills (preliminary trials) or 35 hills (advanced trials). Preliminary trials were replicated three times and advanced trials, 4 times.

Insects were controlled by side-dressing Dasanit (4 lbs. ai/a) preplant in the spring and side-dressing aldicarb (3 lbs. ai/a) when plants were about six inches tall. Weed control was achieved by the use of vernolate (5 lbs. ai/a) disc-incorporated prior to fall bedding. The plantings were irrigated as needed by furrow. Vines were shredded about one week before harvest. Early trials were harvested the second week of August and late trials the second week of October. After harvest, tubers were sized and graded and

samples were subjected to various quality tests including sugar and specific gravity determinations.

Results

Advanced Trials -- Thirteen varieties and selections were compared to Norgold in the Advanced Early Harvest Trial. Yield and quality varied tremendously (Table 8). Several entries outyielded Norgold at 294 cwt./acre of U. S. No. 1 potatoes. Those yielding less than Norgold will be dropped from further testing. Entries worthy of further testing include ALR 22-2, Pioneer, Lemhi, Atlantic and NDA 8694-3. Pioneer and Atlantic will probably find only limited acceptance in the Ontario area since the former is red-skinned and Atlantic tubers are round rather than oblong. Lemhi, on the other hand, may be fairly well accepted since it yields well for either early or late harvest and grades out extremely well for fresh market as well as processing.

Average U. S. No. 1 yields were some 30 cwt. per acre higher in the Advanced Late Harvest Trial than the early (Table 9). Lemhi yields increased from 395 cwt./acre to 466, considerably higher than the Russet Burbank check; specific gravity was also higher for Lemhi than for R. Burbank. Several entries appeared to have promise including A72685-2, Lemhi, WC 521-12 and WC 612-13. A72685-2 produced extremely high yields of tubers with high specific gravity; vines matured late and this selection may be well suited to long-season areas such as the Columbia Basin. Additional observations of tuber type and processing potential must be made before the selection can be fully evaluated, however. Butte yielded below average and was not impressive.

Preliminary Trials -- Eighteen varieties and selections were compared to the Norgold standard in the Preliminary Early Harvest Trial (Table 10). Of these, only Pioneer, a red-skinned variety, significantly outyielded Norgold with 416

cwt./acre of U. S. No. 1 potatoes compared to 304 for Norgold. A74117-9 also yielded well but appeared to mature considerably later than Norgold based on vine senescence. Entries yielding less than 300 cwt./acre U. S. No. 1 in this trial are of questionable value in the Malheur area.

Eighteen lines and varieties were compared to Russet Burbank in the Preliminary Late Harvest Trial (Table 11). Only TA 17-1 significantly outyielded Burbank with 496 compared to 390 cwt. of U. S. No. 1 potatoes. A74543-5 also yielded very well as did A74104-8, A74389-1 and A74595-17. Only those entries yielding more than Russet Burbank will be tested further for yield and quality traits.

Table 8. Malheur Advanced Early Harvest Trial

Entry	Yield, cwt/A		% of Norgold		Tuber Size, % ¹			Specific Gravity	Maturity ²	
	Total	No. 1	Total	No. 1	4-6 oz	6-10 oz	≥10 oz			
A 70365-6	415	340	119	81	116	12	21	68	1.078	2.0
A 72331-14	430	356	123	83	121	18	37	44	1.084	2.0
A 72331-17	260	214	75	83	73	14	29	57	1.077	3.6
A 72421-4	300	252	86	84	86	16	44	39	1.082	4.0
A 72602-2	300	247	86	83	84	14	32	54	1.095	1.0
A 72687-11	377	339	108	90	115	12	32	56	1.079	2.0
A 73175-6	343	323	98	94	110	9	23	68	1.080	3.0
ALR 22-2	488	435	140	88	148	8	33	60	1.083	2.6
Atlantic	400	357	115	89	121	17	43	39	1.098	2.0
Lemhi	431	395	124	92	134	10	29	60	1.089	1.0
NDA 8694-3	496	441	142	89	150	7	26	67	1.078	2.0
NDA 9249-3	402	352	115	87	120	8	24	68	1.081	2.5
NORGOLD	348	294	100	84	100	19	37	44	1.070	2.5
Pioneer	456	409	131	90	139	12	35	54	1.083	3.0
Average	389	339	-	87	-	-	-	-	1.083	2.4
LSD .05	56	56	-	4.3	-	-	-	-	-	-

¹Based on U.S. No. 1 potatoes

²Vine maturity at harvest: 1 = foliage green, 5 = foliage dead

Table 9. Malheur Advanced Late Harvest Trial

Entry	Yield, cwt/A		% of R. Bur.		Tuber Size, % ¹			Specific Gravity	Maturity ²	
	Total No. 1	No. 1	Total	No. 1	4-6 oz	6-10 oz	≥10 oz			
A 66102-16	493	372	75	96	92	17	30	53	1.094	1.7
A 66122-3	408	294	71	80	73	15	33	52	1.077	4.2
A 69327-5	491	404	82	96	100	18	32	50	1.090	2.5
A 70365-6	438	361	83	85	89	11	27	62	1.089	2.5
A 70365-27	421	358	84	82	89	12	24	63	1.096	1.5
A 72320-35	402	259	62	78	64	12	28	59	1.081	1.2
A 72685-2	606	553	91	118	137	8	19	73	1.101	1.0
A 7353-25	352	282	80	69	70	16	27	57	1.100	1.4
A 7358-3	475	350	74	93	87	24	45	30	1.104	1.5
A 73143-4	402	336	83	78	83	14	34	51	1.086	3.0
A 73400-3	483	304	63	94	75	24	39	37	1.102	2.0
A 73414-15	284	216	75	55	53	21	30	48	1.088	1.5
AC 67560-1	395	334	84	77	83	24	36	40	1.071	5.0
B 7024-81	434	381	88	85	94	17	30	49	1.102	3.7
Butte	441	345	78	86	85	19	25	56	1.102	1.5
Lemhi	528	466	87	103	115	14	22	63	1.095	2.5
R. BURBANK	512	404	79	100	100	20	36	43	1.082	2.7
WC 521-12	553	496	90	108	123	8	16	73	1.104	1.0
WC 612-13	526	486	92	103	120	9	26	65	1.096	1.5
Average	455	368	80	-	-	-	-	-	1.093	-
LSD .05	95	93	9	-	-	-	-	-	-	-

¹Based on U.S. No. 1 potatoes

²Vine maturity rating at harvest: 1 = foliage green, 5 = foliage dead

Table 10. Malheur Preliminary Early Harvest Trial

Entry	Yield, cwt/A		% of Norgold		Tuber Size, % ¹			Specific Gravity	Maturity ²
	Total	No. 1	Total	No. 1	4-6 oz	6-10 oz	≥10 oz		
A 7248-13	261	203	77	67	23	42	34	1.086	1.5
A 72320-35	315	247	78	81	15	30	55	1.084	1.0
A 72450-9	327	286	88	94	10	42	47	1.079	3.0
A 7474-12	362	309	85	102	11	32	57	1.083	1.0
A 7487-3	372	315	85	104	14	29	57	1.086	2.5
A 7487-5	263	213	81	70	28	52	21	1.091	1.0
A 74104-14	283	252	88	83	15	29	55	1.084	1.0
A 74104-18	329	281	85	92	15	24	60	1.078	1.0
A 74108-1	424	324	76	106	7	22	72	1.075	1.3
A 74112-1	276	247	89	81	9	34	56	1.090	1.3
A 74114-4	340	273	80	90	16	29	56	1.086	2.3
A 74117-9	446	371	83	122	17	36	48	1.085	1.0
A 74126-5	235	187	80	61	18	50	32	1.079	1.0
A 74183-1	303	242	80	80	22	40	38	1.085	2.0
A 74404-3	357	252	70	83	27	44	28	1.090	1.3
A 74406-2	410	321	78	105	16	34	50	1.095	2.0
NORGOLD	359	304	85	100	20	40	40	1.072	4.0
Pioneer	465	416	89	137	11	26	63	1.084	2.6
R. Burbank	415	307	73	101	27	52	21	1.082	1.0
Average	344	281	81	-	-	-	-	1.084	1.7
LSD .05	88	88	9	-	-	-	-	-	-

¹Based on U.S. No. 1 potatoes

²Vine maturity at harvest: 1 = foliage green, 5 = foliage dead

Table 11. Malheur Preliminary Late Harvest Trial

Entry	Yield, cwt/A		% of R. Bur.		Tuber Size, % ¹			Specific Gravity	Maturity ²	
	Total	No. 1	Total	No. 1	4-6 oz	6-10 oz	≥10 oz			
A 74104-1	374	241	63	72	62	11	22	68	1.085	4.0
A 74104-8'	585	430	74	113	110	6	14	79	1.090	1.0
A 74123-3	376	237	63	73	61	21	40	39	1.089	1.5
A 74127-2	434	345	79	84	88	9	21	70	1.095	2.0
A 74135-2	360	275	78	70	70	9	26	64	1.090	1.5
A 74265-2	386	339	88	75	87	14	28	58	1.087	1.0
A 74389-1	525	430	81	101	110	7	18	75	1.096	1.0
A 74391-1	345	274	79	67	70	11	23	65	1.097	4.0
A 74393-7	243	177	72	47	45	26	41	32	1.095	5.0
A 74416-8	328	281	86	63	72	7	26	67	1.078	3.0
A 74543-5	549	481	87	106	123	2	10	88	1.086	1.0
A 74595-11	471	405	86	91	104	12	32	55	1.096	2.0
A 74595-15	554	394	71	107	101	6	14	80	1.090	1.0
A 74595-17	525	435	83	101	111	7	26	66	1.090	3.0
A 74596-7	379	323	85	73	83	19	36	45	1.095	1.0
BA 9309-1	401	228	56	77	58	15	34	51	1.090	2.0
R. BURBANK	517	390	76	100	100	17	37	46	1.090	2.5
TA 17-1	587	496	85	113	127	8	21	71	1.088	1.0
TA 83-1	258	187	73	50	48	21	36	43	1.090	2.0
Average	431	335	77	-	-	-	-	-	1.089	-
LSD .01	112	106	11	-	-	-	-	-	N.S.	-

¹Based on U.S. No. 1 potatoes

²Vine maturity rating at harvest: 1 = foliage green, 5 = foliage dead

HERMISTON ON-FARM TRIALS

Potato varieties and selections were tested on two commercial potato farms in the Columbia Basin in 1979. Both trials were situated directly in commercial potato fields irrigated by center-pivot systems. Soils at both sites were relatively sandy, particularly the Boardman location. Both plantings were subjected to all cultural and pest control practices used on the remainder of the field. Generally speaking, irrigation and fertility, particularly nitrogen, were relatively high compared to other production areas in Oregon. The Boardman planting was situated on Eastern Oregon Farms and the Hermiston plots on Royal Farm.

Seed pieces were spaced approximately nine inches apart using an Iron Age assisted-feed planter on April 5 at both locations. Plots were single rows 25 feet long and were replicated three times in a randomized block design. Tubers were harvested on October 9 approximately 10 days after vine kill.

Eastern Oregon Farms

Seven varieties and selections were compared to Russet Burbank and Norgold on Field No. 10 at Eastern Oregon Farms.

Results -- Only Atlantic and Targhee significantly outyielded the checks Russet Burbank and Norgold (Table 12). Neither of these is apt to replace either check variety, however. Atlantic appears to be an excellent round potato with somewhat russeted skin. Although it produces light-colored french fries and has high specific gravity, tubers are considered too short for efficient french fry production. Atlantic will probably become a widely-accepted chipping variety in Oregon if hollow heart can be controlled. Brown flecking of the flesh has been noted in Atlantic in other states but has not yet been severe in Oregon.

Table 12. Performance of Nine Potato Varieties on Eastern Oregon Farms. Hermiston, 1979

Entry	Yield, cwt/A		% No. 1	% of R. Bur.		Specific Gravity
	Total	No. 1		Total	No. 1	
AC 67560	282	256	91	37	64	1.066
Atlantic	844	767	91	112	191	1.093
Kennebec	565	357	63	75	89	1.069
Lemhi	597	457	77	79	114	1.087
NDA 8694-3	267	209	78	35	52	1.064
Nooksack	308	230	75	41	57	1.082
Norgold	493	441	89	65	110	1.067
R. BURBANK	755	402	53	100	100	1.081
Targhee	753	640	85	97	159	1.081
LSD .05	198	178	-	-	-	0.007

Targhee, like Atlantic, has been named for a few years. It is not widely grown in Oregon and is generally limited to fresh market uses. It has produced well in some instances, but not consistently. Lemhi did not perform noticeably well in this trial, possibly because of excess virus noted in the foliage during the growing season. Lemhi has been extremely susceptible to mosaics and good seed has not been readily available.

Of all the entries in this trial, Lemhi probably has the greatest all-around potential but more testing under commercial conditions is needed before Lemhi can be fully recommended. The yield data indicate that AC 67560-1, NDA 8694-3 and Nooksack probably should be eliminated from further testing.

Royal Farm

Seven lines and varieties were evaluated at Royal Farm near Hermiston. Russet Burbank and Norgold were included for comparison.

Results -- Only Kennebec and Targhee significantly outyielded Russet Burbank at Royal Farm (Table 13). Lemhi performed moderately but not exceptionally well with 471 cwt./acre of U. S. No. 1 potatoes compared to 412 for Russet Burbank. Nooksack did relatively better at Hermiston than at Boardman. Targhee, despite high yield, grade-out and specific gravity has not been a good processor, but has found limited success in the Hermiston area for fresh pack.

Table 13. Performance of Seven Potato Varieties on Royal Farm, Hermiston, Oregon, 1979

Entry	Yield, cwt/A		% No. 1	% of R. Bur.		Specific Gravity
	Total	No. 1		Total	No. 1	
Butte	296	209	71	45	51	1.086
Kennebec	738	627	85	112	152	1.073
Lemhi	563	471	84	86	114	1.084
Nooksack	464	416	90	71	101	1.091
Norgold	340	299	88	52	73	1.073
R. BURBANK	656	412	63	100	100	1.081
Targhee	610	551	90	93	134	1.092
LSD .05	114	128	-	-	-	0.003

WILLAMETTE VALLEY TRIAL

Twenty-four varieties and selections were evaluated on sandy loam soil at Corvallis in 1979. Entries were selected primarily for chipping and fresh market uses. Seed was obtained from numerous sources and, therefore, was less uniform than desired from a dormancy/vigor standpoint. Multiple clones of the various varieties were obtained from Mr. Warren Trank of the Potato Certification Association of Nebraska.

Seed pieces were planted 9 inches apart in pre-formed furrows by hand on May 11. Plots were single rows, 20 feet long on 36-inch centers. Each entry was replicated four times in a randomized block design. Metribuzin was applied pre-emergence for weed control according to label directions. Fertilizer was side-dressed at the rate of 800 lbs. of 8-24-8 per acre June 18 when the plants were 2 to 3 inches tall. Aldicarb (Temik) was used at 3 lbs. ai/acre on that date.

The planting was cultivated and hilled once during the season. Sprinkler irrigation was used to supply approximately 1.5 inches of water per week as needed. Growth was relatively normal for the Willamette Valley. Vines were sprayed with dinitro @ 3 pints per acre with 5 gallons of diesel oil and 75 gallons of water on September 11. One pint of X-77 surfactant was added to the mix to improve activity. Plots were harvested on September 24 and tubers were evaluated for yield and quality. Samples were saved for chipping tests on February 9-11.

Results -- U. S. No. 1 yields ranged from 134 cwt./acre for Bison to 375 for New Superior and averaged 250 (Table 14). The standard varieties Kennebec, Norchip and Russet Burbank produced slightly below average yields for the Willamette Valley. Lack of available nitrogen early may have contributed to low yields.

Table 14. Yield, Grade and Quality Characteristics of Twenty-Four Potato Varieties, Corvallis

Entry	Yield, cwt/A		% <4 oz		% of R. Bur.		Specific Gravity	Comments
	Total	No. T	No. T	%	Total	No. T		
Atlantic	319	266	83	3	74	96	1.085	Smooth, round.
Belchipp	348	216	61	4	81	78	1.089	Flat, sev. rots.
Bison	186	134	68	14	43	48	1.070	Red, early.
Butte	306	222	74	8	71	80	1.087	Viruses.
Crystal	442	327	74	6	102	118	1.080	Lge, round white.
Dakchip	291	253	76	5	67	91	1.081	Rots.
Denali	330	265	80	4	76	96	1.095	Thick, dark skin.
Haig	325	268	82	12	75	97	1.074	Very round.
Haig (new)	349	301	87	4	81	109	1.077	Very round.
Kennebec	426	297	71	3	99	107	1.082	Lge, rough. Rots.
Lemhi	407	322	79	4	94	116	1.075	Long rus.
Monona	327	283	87	5	76	102	1.072	Deep eyes. Rots.
Nooksack	259	179	66	5	60	65	1.089	Small, cracks.
Norchipp	284	239	84	10	66	86	1.082	Typical.
Norland	185	159	83	6	43	57	1.067	Red.
Norland (dark red)	200	167	83	11	46	60	1.072	-
NDA 9249-3	327	259	78	6	76	93	1.080	Oblong rus.
Red LaSoda	359	267	78	3	83	96	1.073	Rots! Red.
Red LaSoda #5	269	230	83	4	62	83	1.072	Rots!
Red LaSoda #10	377	335	89	2	87	121	1.072	Lge, deep eyes.
R. Burbank (early)	431	277	64	4	100	100	1.086	Firm. Typical.
R. Burbank (late)	376	205	54	3	87	74	1.083	-
Superior	197	158	78	6	46	57	1.076	Netted. Round.
Superior (new)	437	375	86	4	101	135	1.081	Lge, rough. Netted.
Average	323	250	77	6	75	90	1.079	-
LSD .05	105	92	14	3	-	-	0.004	-

Entries chosen strictly for chipping potential included Atlantic, Belchip, Crystal, Dakchip, Denali, Haig, Kennebec, Monona and Norchip. All these tended to be round and white-skinned except for Atlantic which was slightly russeted and thicker-skinned than most other entries. Superior has been used somewhat successfully for early chipping in eastern states but normally has had a short dormancy period and has not stored well.

Several entries appeared to chip as well or better than Norchip on February 11 after a rigorous storage (Table 15). Belchip produced particularly light-colored chips but centers were dark and oily. Based on overall chip quality, Atlantic, Denali and Monona appeared to be excellent with Norchip being only slightly less desirable. Yields and grade-out also were high for those entries.

Belchip, Dakchip, Kennebec, Monona and Red LaSoda were relatively susceptible to rots. The former two did not appear to be worth further testing in the Willamette Valley. Superior, Red LaSoda, Norland, Nooksack, Haig, Crystal and Bison will also be dropped from further testing based on these preliminary findings.

Lemhi produced good yields of attractive oblong-to-long, dark, russeted tubers. It appeared to have excellent potential for fresh market production in the Valley. Tuber appearance was considerably better than that of Russet Burbank. Lemhi yields were significantly higher than Butte which also produced oblong russet but relatively small tubers.

Based on results of these trials, it appears that Atlantic, Denali, Monona and Norchip should be evaluated further for chipping and Lemhi, Russet Burbank and Butte for fresh market.

Table 15. Chipping Characteristics of 16 Potato Varieties, Corvallis

Variety	Average ¹ Color	Color ²		Taste, %		Comments
		Inside	Outside	Good	Bitter	
Atlantic	3.3	5.3	3.7	100	0	--
Belchip	2.7	4.3	2.7	100	0	Dark, oily center
Bison	3.7	6.0	2.7	66	34	Red
Butte	4.3	8.0	3.0	50	50	Dark centers oily
Crystal	5.3	9.3	4.5	50	50	0
Dakchip	6.0	7.8	4.5	50	50	Dark, oily center
Denali	3.3	5.0	2.8	100	0	--
Haig	4.3	7.3	3.8	25	75	Dark, oily center
Haig (new)	4.5	7.0	3.3	75	25	--
Kennebec	3.3	4.5	3.0	75	25	1 oily center
Lemhi	3.8	6.0	3.5	50	25	25
Monona	3.0	-	-	100	0	--
Nooksack	4.3	6.0	3.0	25	75	--
Norchip	4.3	5.3	3.3	34	66	Dark, oily center
Superior	5.5	8.5	3.3	50	50	--
Superior (new)	5.0	7.3	3.3	100	0	--
Average	4.2	6.5	3.4	-	-	--

¹1 = light, 10 = dark. Samples fried February 11-15 after two weeks at room temperature preceded by approximately 90 days at 40-45°F. Fried 2.5 minutes at 375°F.

²Inside = inside the vascular ring; outside = outside the vascular ring.

