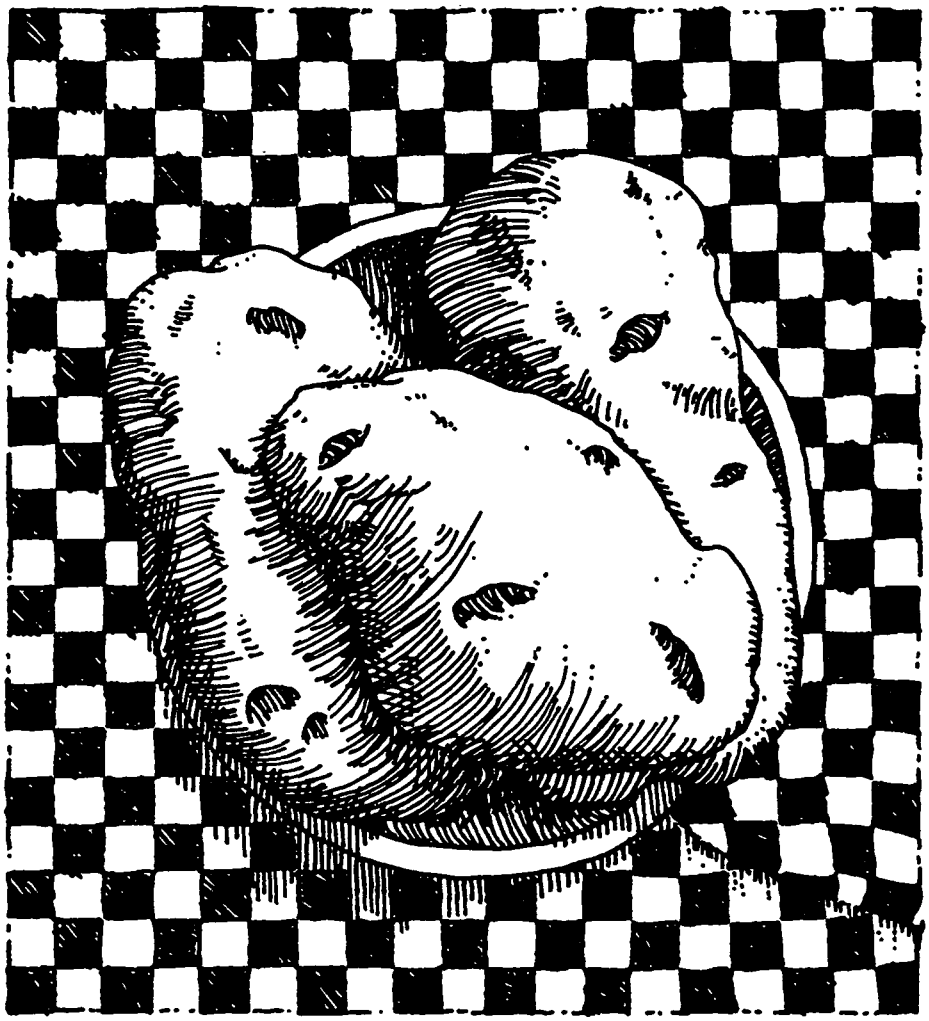
Oregon Potato Variety Trials 1978



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OREGON POTATO VARIETY TRIALS -- 1978

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G. E. Carter, and C. E. Stanger

INTRODUCTION

The 1978 Oregon Potato Variety Trials were sponsored jointly by the Central Oregon, Klamath, Malheur, and Columbia Basin Agricultural Experiment Stations and Oregon State University. All the sponsoring units were responsible for success of the trials, and efforts by the Redmond and Klamath Falls Stations were particularly important since most of the seed was produced at Redmond and stored and eye-indexed by the Klamath Falls Station.

In 1978, 111 varieties and selections were evaluated for yield and quality (Table 1). More than 100 additional lots were increased in nurseries at Redmond for future trials. Yield trials were divided into four categories: the Oregon Statewide Trial, Western Regional Trial, Willamette Valley Trial, and a comparison of 67 entries in four testing categories at the Malheur Station in Ontario.

Plants were grown using cultural and pest control methods common to the testing areas. Entries were replicated three to five times. The single-row plots ranged from 15 to 25 feet long depending on the location and stage of testing. After harvest, all tubers were subject to standard yield, quality, and size measurements.

Additional trials will be initiated in future years. Some will be in grower fields to test a range in cultural practices and disease pressures. Tests also will be conducted in Verticillium wilt-infested fields in the Columbia Basin to select lines resistant to this important disease.

TABLE 1. Potato Varieties and Selections Evaluated in Oregon in 1978

Entry	Hermiston	K. Falls	Ontario	W. Valley	Season of maturity 1/
A 6371-2 (Butte)		X			L
A 66107-12			X		EM
A 66107-51		X			?
A 6789-7		X			?
A 67142-1	X	X			EM
A 67315-7			X		ML
A 67508-13 Red	X	X			M
A 68113-4		X			?
A 68588-16			X		EM
A 68678-1	X	X	X		M
A 68710-5			X		EM
A 69173-2	X	X			EM
A 69325-7			X		ML
A 69327-5	X	X			M
A 69657-4	X	X	X		L
A 69868-2	X	X			E
A 7079-3			X		E
A 70238-2			X		ML
A 70270-3	X	X			M
A 70319-11	X	X			EM
A 70365-6	X	X	X		M
A 70365-27	X	X			L
A 70383-24	X	X			E
A 70758-3			X		ML
A 7203-3	X	X			ML
A 7248-13			X		E
A 7261-1			X		ML
A 7267-10			X		E
A 7269-7	X	X	X		ML
A 7273-3	X	X			M
A 72105-1			X		ML
A 72121-3			X		E
A 72134-1	X	X			ML
A 72282-26			X		E
A 72320-11			X		ML

1/ Maturity classifications, approximate. E=early; M=midseason, L=late maturing

TABLE 1. (Cont.)

Entry	Hermiston	K. Falls	Ontario	W. Valley	Season of maturity 1/
A 72320-15			X		ML
A 72320-35			X		ML
A 72322-3			X		ML
A 72322-9			X		ML
A 72331-10			X		ML
A 72331-14			X		E
A 72331-15			X		E
A 72331-17			X		E
A 72360-5			X		E
A 72408-7			X		E
A 72449-7			X		ML
A 72455-2	X	X			E
A 72545-2	X	X			L
A 72545-3	X	X			EM
A 72545-7			X		ML
A 72601-4	X	X			EM
A 72602-2		X			EM
A 72602-5	X	X			M
A 72605-2	X	X			ML
A 72619-7	X	X			ML
A 72636-7	X	X			L
A 72685-2			X		ML
A 72687-9	X	X			E
A 72687-11			X		E
A 72707-3	X	X			E
A 72713-4	X	X			E
A 7319-14			X		ML
A 7321-5			X		E
A 7346-11			X		E
A 7353-3			X		ML
A 7353-25			X		ML
A 7393-2			X		E
A 73107-4			X		ML
A 73126-9			X		ML
A 73143-2			X		ML
A 73143-4			X		ML
A 73145-5			X		E
A 73147-1			X		ML
A 73183-5			X		E
A 73361-2			X		ML

Table 1. (Cont.)

Entry	Hermiston	K. Falls	Ontario	W. Valley	Season of maturity 1/
A 73361-3			X		E
A 73373-2			X		ML
A 73373-6			X		E
A 73400-3			X		ML
A 73414-1			X		E
A 73414-15			X		ML
A 73457-2			X		ML
AC 67560-1	X		X		?
ALR 22-2			X		E
Atlantic	X	X			M
B 7024-81	X		X		EM
BC 8370-24	X		X		M
BR 7093-24	X		X		M
Bison	X	X			E
Butte	X		X		ML
Centennial	X	X			E
Chieftain (Red)	X	X			E
Denali				X	M
Kennebec				X	M
Nampa	X	X			EM
ND 8891-3				X	M
NDA 8694-3			X		EM
Nooksack	X	X	X		L
Norchip				X	M
Norgold			X	X	E
Pioneer (Red)	X		X		EM
Pontiac (Red)				X	M
R. Burbank	X	X	X	X	ML
R. Burbank, Gen. 1	X	X			ML
Snowchip				X	M
Targhee	X	X			ML
WC 316-1	X				E
WC 415-12		X			?
WC 435-3	X	X			?
WN 330-1		X			?

OREGON STATEWIDE TRIAL

Seed potatoes for the Statewide Trial were produced by the Redmond and Klamath Falls Experiment Stations using a three-year scheme. Four tubers each of approximately 85 promising lines were selected from the Idaho breeding program and elsewhere during the fall of 1975, or year 1. The tubers were stored through the winter of 1975-76 at Klamath Falls and eye-indexed for viruses by winter greenhouse testing at OSU, Corvallis. All tubers showing virus symptoms were discarded immediately.

The remaining healthy tubers (minus apical eyes) of each lot were tuber-unit planted by machine at Redmond in May 1976. Detectable virus-infected plants were eliminated by summer roguing during this seed increase phase. After harvest, all tubers were stored at Klamath Falls.

The remaining lines were increased during 1977 by growing-out and roguing at the Redmond Station after the second winter storage. Yield from the second Redmond planting was then stored during the winter at Klamath Falls for planting comprehensive yield trials at several locations during the fourth year, 1978. Approximately 75 percent of the original selections were eliminated because of disease or other faults during the first three years.

Approximately 80 new selections are brought into the Redmond seed increase program annually. By using the methods described, sufficient healthy seed of 35 to 50 entries are available for yield trials each year. In future years, seed used in the Western Regional Trial also will be increased at Redmond.

The Oregon Statewide Trial included three locations in 1978: Klamath Falls, Madras, and Hermiston. A similar planting was conducted at the Malheur Station. Not all entries were evaluated at all sites. A higher degree of uniformity in this regard will be established in future years, and the Statewide Trial will be expanded to include Ontario as a fourth location.

HERMISTON

Thirty-eight entries representing a wide range in adaptability and season of maturity were evaluated at the Columbia Basin Agricultural Research Center at Hermiston in 1978. Russet Burbank was included for purposes of comparison with midseason-to-late entries. In subsequent tests, Norgold will be included for comparison with early-maturing entries.

Procedure

The loamy fine sand was fertilized before planting by broadcasting and incorporating 80 pounds of nitrogen, 170 pounds of phosphorus (P_2O_5), 160 pounds of potassium (K_2O), and 67 pounds of sulfur per acre. Seed pieces were planted nine inches apart in 34-inch rows by assisted-feed planter on May 3. Individual plots were single rows 25 feet long. Each entry was replicated five times in a randomized block design.

Satisfactory weed control was achieved by one cultivation on June 9 and an application of Sencor at 0.5 pound active ingredient per acre on June 20. Di-Syston, Dyfonate, Guthion, and Monitor were used as needed to control insects. On July 11, Nitrogen was side-dressed at 190 pounds per acre. Vines were sprayed on September 20 with Dinoseb at 1 pint per acre in 30 gallons of water and five gallons of oil. All plots were harvested on October 5.

Results

Total yields averaged 401 hundredweight per acre across all entries and ranged from 628 for A7273-3 to 227 for A72707-3 (Table 2). Most high yielding entries at Hermiston also yielded well in Klamath Falls Trials (Tables 3 and 4). A69657-4, for example, was third in total yield (first in U.S. No. 1) at Hermiston, and third and first, respectively, in the Experiment Station (Table 3) and Hill Farm (Table 4) Trials at Klamath Falls. Most of the 10 top-yielding entries also had a high grade-out except for the two Russet Burbank clones

TABLE 2. Yield and Quality Data, Hermiston

Entry	Cwt/Acre		Percent	Specific	Ounces/
	Total	U.S. No. 1	No. 1	Gravity	Tuber
A 7273-3	628	446	71	1.076	9.2
A 70365-6	591	490	83	1.075	11.6
A 69657-4	581	441	76	1.078	9.6
R. Burbank	551	325	59	1.080	8.4
Burbank, VT. SC.	506	243	48	1.073	8.6
A 72636-7	499	359	72	1.068	8.9
A 67142-1	491	383	78	1.074	9.3
A 7203-3	490	181	37	1.070	9.8
A 72545-3	485	330	68	1.072	7.3
A 7269-7	463	296	64	1.079	6.9
A 70383-24	449	269	60	1.069	8.3
Atlantic	438	363	83	1.076	7.0
A 72619-7	436	288	66	1.077	7.9
A 69327-5	431	289	67	1.082	8.8
Chieftain (Red)	420	349	83	1.067	7.1
Targhee	406	333	82	1.073	8.7
A 70319-11	406	304	75	1.064	7.6
A 72601-4	403	278	69	1.072	6.3
A 72545-2	402	322	80	1.072	8.0
A 70270-3	384	311	81	1.076	8.0
A 67568-13 (Red)	384	257	67	1.070	9.7
A 72134-1	379	246	65	1.081	5.9
Butte	365	237	72	1.085	5.5
A 72602-5	363	163	45	1.072	9.1
A 70365-27	339	190	56	1.076	8.1
Centennial	338	291	86	1.074	7.8
Nampa	329	210	64	1.069	7.1
A 68678-1	329	237	72	1.082	7.6
A 72455-2	328	256	78	1.068	7.2
A 72687-9	323	229	71	1.073	6.9
A 72602-2	317	241	76	1.076	8.0
A 69868-2	316	212	67	1.073	6.5
WC 435-3	315	186	59	1.068	6.7
A 72713-4	300	189	63	1.071	6.0
Bison (Red)	285	211	74	1.065	5.5
A 69173-2	282	220	78	1.076	7.7
A 72605-2	274	238	87	1.072	7.9
A 72707-3	227	172	76	1.065	6.2
Average	401	278	70	1.073	7.8
LSD, 5% Level	93	89	--	0.004	---

TABLE 3. Yield and Quality Data, Klamath Falls, Experiment Station

Entry	Cwt/Acre		Percent			Ounces/	Specific	Percent
	Total	No. 1	No. 1	4 oz	10 oz	tuber	gravity	hollow
A 6789-7	561	496	88	4	54	10.4	1.064	0.0
A 7203-3	514	415	81	4	47	10.3	1.069	12.3
A 69657-4	506	332	65	9	30	7.2	1.061	1.1
A 7269-7	484	383	78	16	27	5.9	1.075	2.9
A 68113-4	476	382	80	11	27	7.0	1.066	0.5
A 7273-3	430	357	82	8	30	6.4	1.061	0.6
A 72636-7	425	347	81	12	22	7.0	1.055	4.3
A 70365-6	408	371	90	4	56	10.5	1.062	2.9
A 66107-51	401	338	84	4	43	8.9	1.059	5.3
A 72619-7	399	349	87	10	23	7.6	1.074	1.8
Targhee	398	340	85	9	39	8.1	1.060	1.1
A 67142-1	398	353	86	6	34	7.6	1.065	2.7
A 72602-2	381	324	85	7	49	8.6	1.060	2.6
A 72545-2	375	274	73	16	16	6.2	1.060	0.6
A 69868-2	359	290	82	12	22	6.6	1.070	0.2
A 70365-27	356	279	77	16	27	7.1	1.064	8.5
R. Burbank, Gen. 1 '76	354	275	78	15	24	5.8	1.073	0.2
Atlantic	349	300	85	11	30	6.4	1.080	1.9
R. Burbank, X-tested, Idaho	350	257	72	18	27	6.7	1.076	0.3
R. Burbank, Fdn.	348	251	72	18	18	5.2	1.076	0.0
A 69327-5	336	251	74	13	22	7.4	1.079	1.6
A 68678-1	335	269	79	9	35	8.2	1.068	8.6
WC 435-3	331	275	83	12	25	7.0	1.056	0.8
Chieftain (Red)	330	290	88	7	41	6.6	1.061	0.6
A 72602-5	318	249	73	12	37	6.9	1.064	0.6
A 72687-9	311	208	68	20	16	6.2	1.074	0.2
A 72545-3	311	240	76	14	27	7.7	1.061	4.0
A 72134-1	311	216	68	28	7	4.6	1.081	0.5
Nampa	308	230	73	15	26	5.8	1.072	1.8
WC 415-12	305	256	84	10	34	6.9	1.063	5.0
A 70319-11	298	242	81	12	26	6.7	1.055	1.0
A 70270-3	282	225	80	9	20	7.0	1.066	1.3
A 72713-4	274	171	62	29	2	4.2	1.068	0.2
A 6371-2 (Butte)	266	205	76	17	17	5.1	1.074	0.8
A 72601-4	265	183	68	21	14	5.2	1.061	8.0
A 69173-2	264	221	84	14	25	6.6	1.071	0.2
A 72605-2	262	220	83	14	21	7.0	1.064	2.4
A 72707-3	260	185	69	23	7	5.1	1.060	2.6
Nooksack	243	193	80	8	14	7.5	1.070	1.1
Centennial	242	202	84	12	21	6.0	1.056	1.9
WN 330-1	238	172	73	22	9	5.1	1.055	0.2
A 70383-24	236	189	80	14	25	6.5	1.068	2.7
A 67508-13	229	166	71	14	18	6.8	1.060	2.4
A 72455-2	198	145	72	16	12	6.0	1.060	0.5
Bison (Red)	193	160	82	12	8	5.0	1.064	0.0
LSD, 5% Level	84	88	11	6	13	1.3	0.012	2.0

TABLE 4. Yield and Quality Data, Klamath Falls, Hill Farm

Entry	Cwt/Acre		Percent			Ounces/ tuber	Specific gravity	Percent hollow
	Total	No. 1	No. 1	<4 oz	>10 oz			
A 69657-4	412	331	80	10	29	7.4	1.075	1.7
A 68113-4	397	320	79	14	10	5.6	1.076	0.9
A 6789-7	394	318	81	11	24	9.1	1.070	0.0
A 72636-7	381	313	82	12	17	5.0	1.059	0.9
A 7203-3	367	196	53	10	7	5.9	1.067	12.0
A 67142-1	336	294	88	8	16	6.4	1.065	3.1
A 72602-5	334	287	88	7	51	9.2	1.074	9.3
A 72545-2	306	249	82	13	10	6.8	1.063	4.0
A 7269-7	283	202	71	14	7	5.4	1.075	0.4
A 7273-3	277	214	76	18	6	5.6	1.066	2.3
A 66107-51	275	216	77	9	28	8.1	1.067	1.7
A 72602-2	263	216	82	14	28	7.5	1.080	12.9
A 68678-1	261	182	70	16	14	6.3	1.066	16.0
A 70319-11	260	194	73	15	13	5.8	1.071	4.4
A 70365-6	236	132	55	19	9	7.9	1.070	6.7
WC 415-12	235	174	73	21	12	6.0	1.061	9.3
R. Burbank, Gen. 1 '76	233	148	59	26	3	4.7	1.066	7.1
A 72134-1	233	156	66	22	6	4.9	1.079	3.1
A 72619-7	232	152	66	24	11	5.7	1.070	0.4
Nooksack	223	178	79	9	27	6.7	1.081	2.3
A 69327-5	219	148	67	14	9	4.4	1.082	0.0
A 70270-3	217	158	70	20	6	5.4	1.073	6.7
R. Burbank, X-tested, Idaho	213	126	58	27	0	4.7	1.085	0.9
A 72545-3	213	177	83	11	20	7.4	1.072	9.3
A 70365-27	212	135	63	20	14	5.0	1.072	16.0
Atlantic	211	150	69	19	15	6.5	1.081	6.3
Nampa	208	136	63	20	8	5.4	1.064	6.3
Targhee	197	130	62	25	17	5.3	1.072	3.6
A 67508-13	196	144	73	24	3	5.3	1.065	7.1
A 72713-4	195	109	53	36	0	4.0	1.055	0.0
A 72605-2	194	143	73	20	3	6.1	1.073	3.1
A 6371-2 (Butte)	189	90	47	39	4	4.1	1.076	1.7
R. Burbank, Fdn.	189	91	48	36	0	3.8	1.072	0.0
A 72601-4	188	77	41	40	4	5.1	1.065	12.9
WC 435-3	187	129	68	22	4	4.7	1.066	3.1
A 72687-9	184	104	57	32	4	4.9	1.067	0.0
A 69173-2	175	126	72	20	6	5.6	1.083	0.0
WN 330-1	170	99	58	32	0	5.0	1.057	0.4
A 72707-3	167	109	60	29	3	3.8	1.055	0.4
Bison (Red)	161	135	84	14	13	5.5	1.070	0.4
Centennial	159	102	75	22	0	5.3	1.067	1.3
Chieftain (Red)	153	130	84	11	21	5.9	1.064	0.0
A 72455-2	144	103	70	22	9	5.0	1.061	0.4
A 70383-24	137	95	70	20	11	3.8	1.096	5.7
A 69868-2	132	69	51	27	2	4.7	1.067	0.0
LSD, 5% Level	67	69	16	10	14	1.8	0.013	5.7

and A7203-3 which produced only 37 percent U.S. No. 1 potatoes at Hermiston. A7203-3 also appeared to be prone to hollow heart at Hermiston as well as Klamath Falls. Butte yielded well below average. The below average performance by A68678-1 probably was caused, in large part, by virus infection of the seed. Most plants showed symptoms of mild to severe PVX and/or PVY.

Future tests at Hermiston will allow for an early-harvest phase since many of the entries were early-maturing. Two harvest dates will be utilized in 1979.

KLAMATH FALLS

Forty-five entries were evaluated at two Klamath Falls locations in 1978. The Experiment Station Trial (Table 3) was located on soil considered to have a relatively low level of Verticillium wilt. The site chosen was fumigated for nematodes with 20 gallons per acre of Telone 2 in the spring before planting. The Hill Farm Trial (Table 4), on the other hand, was situated on a soil which had been cropped to potatoes annually for the last nine years. Verticillium wilt pressure was considered to be relatively severe. Similar cultural practices were used in both trials; therefore, Verticillium wilt incidence could be considered to be a major variable between the two trials. Other factors probably differed also.

Seed pieces were planted May 30 and May 31, respectively, in fine sandy loam at the Klamath Experiment Station and Hill Farm. Plots were single rows 20 feet long spaced 32 inches apart. Seed pieces were spaced 9 inches in the row. All entries were replicated five times at each location. Because of complications, two replications were eliminated at the Hill Farm.

The soil was amended with 500 pounds per acre of 21-0-0 broadcast and plowed down before planting, and 800 pounds per acre of 16-20-0 banded at planting. Temik was banded at planting according to label directions. A foliar application of Monitor at 3 pounds per acre was used in midseason.

Weeds were controlled by use of Sencor at 0.6 pounds active ingredient per acre.

Plants were frozen on September 11 at the Hill Farm and September 20 at the Experiment Station. No additional vine killing was performed. The Experiment Station plots were harvested on October 9-11 and the Hill Farm Trial on October 19.

Results

A wide range in yield and quality was observed among entries at both locations (Tables 3 and 4). The highest total yield at the Hill Farm (Verticillium wilt-infested) was 412 hundredweight per acre compared to 561 at the Klamath Experiment Station. Verticillium wilt probably accounted in part for these yield differences, but other factors doubtlessly also contributed. For example, the Hill Farm plants were frozen down some nine days earlier than those at the Experiment Station, possibly accounting for some yield reduction.

Relative yield ranking among the various entries appeared to be similar at the two locations. For example, four of the top five varieties at the Experiment Station also were among the five highest yielding entries at the Hill Farm. Russet Burbank (Generation 1) was 17th in the total yield at both locations. Interestingly, Russet Burbank Foundation entries were 19th and 20th in total yield, respectively, at the Experiment Station, but 23rd and 31st at the Hill Farm. This possibly indicated a Verticillium wilt effect since Burbank is known to be susceptible to this disease. A68678-1 produced average yields at the Experiment Station and only slightly better at the Hill Farm. As noted earlier, it also did poorly in the Hermiston Trial. Excessive levels of PVX and/or PVY, no doubt, accounted in part for these low yields. Centennial, Bison, Chieftain, A72707-3, A70383-24, A72455-2, and others yielded poorly at both sites and probably will be dropped from further testing.

Specific gravities were low and highly variable both within and among varieties. Gravities ranged from 1.066 to 1.085 among the three Russet Burbank seed sources, for example. Hollow heart could be a limiting factor for some entries. A68678-1 was relatively susceptible at both locations. The high-yielding A7203-3 exceeded 12 percent hollow at both locations. A70365-27 also was susceptible to hollowness.

WESTERN REGIONAL TRIAL

The Western Regional Trial was conducted for the first time in 1978. Thirteen entries were evaluated in six states: Oregon, Idaho, Washington, California, Colorado, and Wyoming. Results of the Oregon test will be reported here. Only one Oregon testing site, the Columbia Basin Agricultural Research Center at Hermiston, was used in 1978. Henceforth, the Malheur Experiment Station at Ontario also will be utilized.

Seed was planted on May 3 in a loamy fine sand by assisted-feed planter. The soil had been amended prior to planting by broadcasting and incorporating 80 pounds of nitrogen, 170 pounds of phosphorus (P_2O_5), 160 pounds of potassium (K_2O), and 67 pounds of sulfur per acre. An additional 190 pounds of nitrogen was side-dressed on July 11. Seed pieces were spaced nine inches apart in 34-inch wide rows. Plots were single rows 25 feet long, replicated five times.

Adequate weed control was achieved by one cultivation on June 9 and one application of Sencor at 0.5 pounds active ingredient per acre on June 20. Insects were controlled by using Di-Syston, Dyfonate, Guthion, and Monitor as needed. Vines were sprayed on September 20 with Dinoseb at 1 pint per acre in 30 gallons of water and five gallons of oil. Plots were harvested on October 5.

Results

Both yield and quality were adversely affected by excess virus in some entries (Table 5). A68678-1, for example, appeared to be 100 percent infected with PVX as was BR7093-24 and Pioneer. Minor virus infection was evident in A69327-5, BC8370-24, and B7024-81. A70365-6 showed about five percent leaf roll.

Yields were average or below for the Hermiston area. A70365-6 produced highest total yields with 624 hundredweight per acre, but ranked second in U.S. No. 1 yield after Pioneer with 422, compared to 426 hundredweight. Russet Burbank and A68678-1 were second and third in total yield, respectively,

TABLE 5. Yield and Quality Information, WESTERN REGIONAL Potato Variety Trial, Hermiston

Selection	Average Maturity 1/	Cwt/Acre Total	Cwt/Acre U.S. No. 1	Percent No. 1	Ounces/ tuber	Specific gravity	Fry color 4/	Percent hollow 5/	Remarks
A 70365-6	4.0	624	422	66.3	14.5	1.071	0.8	7	5% L. roll. Long, light russet, 90% >10 oz. Deep eyes.
R. Burbank	4.0	597	271	40.7	10.8	1.077	0.5	0	Typical rough shape, etc.
A 68678-1	3.5	546	414	76.3	12.2	1.085	0.5	13	100% PVX?
Pioneer	3.0	535	426	78.6	10.8	1.073	0.6	0	Excess Mosaic, red.
Butte	3.0	534	332	62.8	10.2	1.085	1.0	7	Fair shape, long russet. Deep eyes.
A 69327-5 2/	4.5	485	277	56.8	11.1	1.077	0.8	6	Minor PVX, PVY. Sugar end? Long. Deep eyes.
BR 7093-24	3.0	479	422	87.4	9.3	1.068	0.5	0	100% mild PVX. White. Folded bud end.
BC 8370-24	3.0	461	384	82.7	9.4	1.086	0.8	9	PVX? Yellowish flesh. Long Smooth. Dark.
AC 67560-1 3/	2.0	449	386	85.5	9.4	1.066	0.6	1	Sugar end? Bright purplish red.
B 7024-81	2.0	352	275	78.3	10.5	1.091	---	2	20% Mosaic. Long, flat, white, smooth.
Nooksack	4.0	308	263	83.0	10.8	1.081	0.5	0	Thumbnail crack. Round.
WC 316-1	2.5	279	229	81.9	9.4	1.070	0.5	5	Thumbnail crack. Var. shape, dark.
LSD, 5% Level	---	134	117	9.4	1.5	0.004	---	--	----------

1/ Maturity -- 1-very early; 2-early; 3-medium; 4-late; 5-very late.
2/ 2 reps only.
3/ 3 reps only.
4/ French fries -- USDA std. 0.5 (light) to 4.0 (dark). Fried on 10/11/78.
5/ Several tubers showed net-necrosis-type strands in fries. Had 5% leafroll in field.

but Burbank grade-out was quite poor at 40.7 percent No. 1. BR7093-24 appeared to be 100 percent infected with PVX and produced only moderate total yield, but second highest No. 1 yield.

B7024-81, Nooksack, and WC316-1 did not appear to have sufficient yield potential for the Columbia Basin. A70365-6, A68678-1, and Butte, on the other hand, showed considerable promise. All three had some tendency toward hollow heart and should be examined carefully in that regard.

All entries fried satisfactorily on October 11. None had been exposed to realistically cool storage temperatures at that time. It is likely that some would have fried darker from 45°F storage in mid-winter. Future tests will include a mid-winter frying.

Yield and quality differences between entries may have been caused, in large part, by differences in seed quality from virus infection and handling practices. Seed variability should be reduced in subsequent trials since all seed will be produced in Central Oregon and stored under uniform conditions at the Klamath Falls Experiment Station.

ONTARIO TRIALS

Sixty-seven entries were evaluated in four tests at the Malheur Experiment Station in 1978. Thirty varieties and selections were compared in early harvest trials and some 30 in late-harvest trials. Cultural practices were similar for all tests and were comparable to methods used by local commercial growers. However, vines were mechanically shredded on August 1 in the early trials and October 2 in the late trials. Tubers were harvested seven days after rotobeating in each instance.

The silt loam soil (1.3 percent organic matter, pH 7.2) was fertilized with 100 pounds per acre of phosphorus (P_2O_5) plowed down in the fall of 1977. The area had been cropped to barley. Nitrogen was applied at 200 pounds per acre and disked in prior to planting on May 2 and 3. Vernam was also pre-plant incorporated at 4 pounds active per acre for weed control. The systemic insecticide Di-Syston was incorporated before planting at the rate of 4 pounds active per acre.

Seed pieces were spaced nine inches apart in rows 36 inches apart. All plots were one row wide and either 15 or 35 hills long for the preliminary and advanced trials, respectively. Each entry was replicated four times in the advanced trial and three times in the preliminary tests.

Results

NDA8694-3 appeared to be excellent among the early entries. It ranked first in yield in the Preliminary Early Harvest Trial (Table 6) and second in the Advanced Early Harvest Trial (Table 7). A72687-11, which performed well in the Advanced Early Trial, also may be worthy of further testing. Based on these results, it appeared that A68678-1 was too late for early cropping in the Ontario area. Norgold, the standard early variety in Oregon, ranked last in yield in both early trials. Excess virus in the Norgold seed may have accounted for this poor performance.

TABLE 6. Yield and Quality of Potato Lines Evaluated in the Preliminary Early Harvest Trial. Malheur Experiment Station.

Entry	Cwt/Acre		Percent	
	Total	U.S. No. 1	U.S. No. 1	6-10 oz.
NDA 8694-3	484	402	83.0	30
A 72282-26	452	290	64.1	26
Pioneer	437	320	73.2	29
A 7248-13	418	284	67.9	33
A 7267-10	378	294	77.8	39
A 72408-7	378	268	70.9	22
A 72331-14	371	299	80.6	37
A 7346-11	371	292	78.7	25
A 72331-17	365	293	80.3	39
A 73373-6	364	260	71.4	31
A 73145-5	364	249	68.4	34
A 72121-3	364	246	67.6	27
A 7393-2	362	236	65.2	31
A 72331-15	358	246	68.7	15
A 7321-5	340	252	74.1	32
A 73361-3	325	233	71.7	37
A 73414-4	321	251	78.2	42
A 73183-5	302	263	87.1	53
Norgold	250	194	77.6	28
LSD, 5% Level	75	---	----	60

Most of the highest yielding entries in the Preliminary Late Harvest Trial were undesirable because of poor appearance and/or grade-out (Table 8). A7353-25 appeared to have some promise. Most others will be discarded.

Several entries in the Advanced Late Harvest Trial seemed to have potential (Table 9). A68678-1, in particular, appeared to be promising with 477 hundredweight per acre of U.S. No. 1 potatoes. Based on yields, the A68678-1 seed used in these tests probably was much superior, i.e., less virus, than that used in the statewide tests at Hermiston and Klamath Falls. Based on these tests, Nooksack did not appear to hold any promise for the Ontario area. Nooksack is known to be slow to emerge, however, and warming the seed for two to three weeks before planting may promote yield.

TABLE 7. Yield and Quality of Potato Lines Evaluated in the Advanced Early Harvest Trial, Malheur Experiment Station.

	Cwt/Acre		Percent		
Entry	Total	U.S. No. 1	U.S. No. 1	6-10 oz.	Remarks
A 72687-11	488	372	83.0	39	--
NDA 8694-3	422	328	77.7	31	Good commercial
A 68710-5	403	248	61.5	25	--
ALR 22-2	402	303	75.3	29	1% hollow heart
Pioneer	384	296	77.1	26	Redskin
A 68588-16	349	262	75.0	28	--
A 7079-3	340	265	77.9	29	Hollow heart
A 66107-12	339	247	72.9	34	--
A 72360-5	331	250	75.5	33	--
A 68678-1	307	226	73.6	30	All good quality
Norgold	233	156	66.9	21	Disease, 16% hollow
LSD, 5% Level	91	---	----	44	--

TABLE 8. Yield and Quality of Potato Lines Evaluated in the Preliminary Late Harvest Trial, Malheur Experiment Station

Entry	Cwt/Acre		Percent		Remarks
	Total	U.S. No. 1	U.S. No. 1	6-10 oz.	
A 73400-3	571	459	80	29	Round, deep eyes. Rough, cracks. Discard
A 7261-1	568	425	75	35	Round, white. Rough skin. Discard. Small
A 72322-9	561	431	77	31	Long. Deep, prominent eyes. Discard
A 72331-10	542	412	76	26	Blocky, coarse net. Shatter bruise. Discard?
A 7353-25	530	455	86	25	Light skin. Smooth. Flecks. Continue
A 72105-1	528	423	80	23	Large, smooth, light. Pointed but recessed ends
A 72320-35	527	447	85	30	Large. Some flat. Some pointed ends
A 73143-4	495	389	79	24	Large, flattened. Rough skin, deep eyes. Discard
A 73147-1	495	359	72	33	Bulgy eyes. Cracks. Discard
A 7353-3	494	187	38	8	Small. Sprouting. Discard
R. Burbank	494	382	77	34	Long. Shatter bruise. Good Burbanks
A 72320-15	488	285	58	19	Shatter bruise. Long, spindly. Discard?
A 73361-2	468	374	80	38	Long, light skin. Cracks, pointed. Discard?
A 72320-11	439	318	72	30	Blocky. Fair net. Smooth. Not bad
A 72322-3	439	284	65	23	Alligator hide. Small. Deep eyes. Discard
A 73107-4	436	247	57	19	Small. Coarse net. Discard
A 73238-4	406	312	77	34	Rgh. skin. Growth cracks. Shatter. Discard
A 73373-2	402	292	73	29	Scabby. Round, flattened. Discard
A 73414-15	369	252	68	19	Large, long, flat. Rough skin. Discard
A 73126-9	357	208	58	26	End cracks. Small, bulgy eyes. Discard
A 7319-14	354	283	80	35	Smooth. Good net. Attractive
A 73143-2	340	230	68	31	End cracks. Knobs, bulgy eyes. Discard

TABLE 9. Yield and Quality of Potato Lines Evaluated in the Advanced Late Harvest Trial, Malheur Experiment Station

Entry	Cwt/Acre		Percent				Remarks
	Total	U.S. No. 1	U.S. No. 1	6-10 oz	Total solids	Reducing sugars	
R. Burbank	607	417	69	24	23.4	0.29	Long, slender. Some cracks, knobs
A 72685-2	578	491	85	22	25.2	0.29	Promising. Blocky but long. Some off shape
A 68678-1	575	477	83	25	25.3	0.16	Smooth, good color. No hollow. Promising
A 7269-7	525	394	75	30	23.6	0.30	Better than Burbank. Some undersized
A 72545-7	517	414	80	27	23.2	0.29	Poor shape. Knobs & bulgy eyes
A 69657-4	515	376	73	27	23.5	0.18	Rgh. shape. Deep eyes. Greens. Poor color
Butte	512	385	75	27	24.6	0.25	Irreg. shape. Broad, flat. Some deep eyes
A 70238-2	511	383	75	28	23.9	0.17	Light skin. Deep bud
A 70365-6	511	419	82	21	20.5	0.14	Smooth, blocky. Large eyebrows. Fair color
Pioneer (Red)	501	373	74	26	21.7	0.13	Longer, rougher than normal. Green
A 67560	499	421	84	31	20.2	0.12	Dark red. Large, smooth. Promising
A 70758-3	496	367	74	18	----	----	Poor. Discard
A 67315-7	467	388	83	21	22.9	0.23	Flat, blocky. Mediocre
A 73457-2	455	287	63	23	----	----	Poor. Discard
BC 8370-4	441	367	83	28	24.4	0.26	Attractive. Smooth. Good length, color
A 69327-5	438	278	63	28	22.7	0.24	Poor. Discard
BR 7093-24	435	396	91	20	----	----	Round. Deep bud end. Not for processing
WC 316-1	407	334	82	26	23.4	0.23	Promising. Long, smooth, fair russeting
A 72449-7	406	288	71	18	----	----	Poor. Discard
B 7024-81	377	335	89	27	----	----	Irreg. shape. Buff color. Not good
Nooksack	343	307	89	18	26.0	0.31	Ex. shape, color, quality. Low yield
LSD, 5% Level	61	---	--	--	----	----	----------

WILLAMETTE VALLEY TRIAL

A small but significant number of Oregon growers are engaged in supplying potatoes to the chip and specialty markets. Although the chipping industry is most active in the Willamette Valley, some chipping potatoes also are produced in the Columbia Basin, Klamath Basin, Malheur County, and in other areas of Oregon. Many chipping potato growers also produce red and white potatoes for local markets. To satisfy the needs of this group, a variety trial was established at Corvallis. This trial will be expanded and refined in subsequent years.

Procedure

Twelve selections were planted in moderately well-drained silt loam near Corvallis on May 12. The soil was cold and slightly wet at planting, and remained so for three weeks afterward. Although seed pieces were treated with Captan, severe loss of stand and reduced plant vigor resulted. Four of the 12 entries (Monona, Norland, White Rose, and A68678-1) were discarded because of lack of stand. Observed differences in stand and vigor also were possibly caused by variations in seed quality, i.e., virus infection.

The soil was amended before planting by broadcasting and incorporating 168 pounds each of nitrogen, phosphorus (P_2O_5), and potassium (K_2O) as 14-14-14. Plots were then hand planted to exact stand by spacing seed pieces nine inches apart in 36-inch rows of 25 seed pieces per plot. Plots were replicated five times.

Weeds were controlled by the use of Sencor at 0.5 pounds active per acre and cultivation. Insecticides and fungicides were applied every 7 to 10 days as needed. Vines were sprayed with Dinoseb on September 7 at the rate of 0.5 gallons per acre in 25 gallons of water. Tubers were dug using a level-bed digger on September 26.

Results

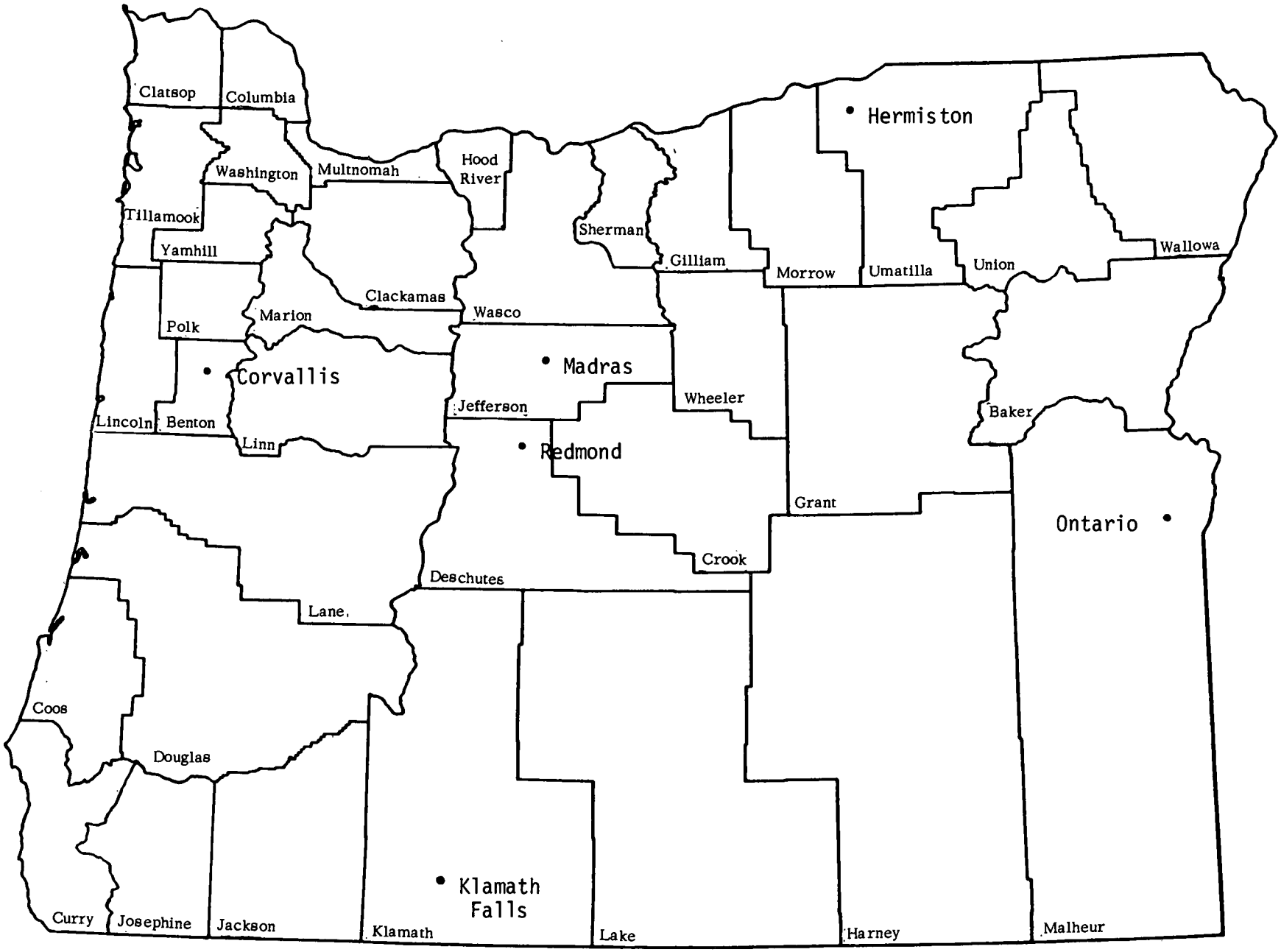
Yields were relatively low, averaging 339 and 165 hundredweight per acre, respectively, for total and U.S. No. 1. Grade-out was poor as indicated by an average of 52.4 percent U.S. No. 1 across all varieties. Low grade-out was caused in part by uneven stands which varied tuber size and shape. Greening also was serious for some entries. Low yields were expected for Denali and Norchip based on visual virus symptoms. Both varieties were stunted and Denali, in particular, showed excessive mottling of the foliage caused by what appeared to be PVX and possibly mild PVY. A clean source of Denali, being increased under certification standards in Central Oregon, will be used in 1979 tests.

ND8891-3 has performed well in the north central states and California. Tuber appearance has been average to good in most cases and chipping quality has been satisfactory. ND8891-3 tubers in this trial resembled Norchip to some extent, but were more uniform with shallower eyes. Denali likewise has performed well and often has appeared more promising than ND8891-3 for chipping. Tubers of Denali typically have been smooth and shallow-eyed. In this trial, virus present in the seed pieces nullified any advantages of Denali.

Specific gravity did not vary greatly among entries. Pontiac was lowest at 1.069 as expected. Chipping tests are not complete. Results will be reported separately.

TABLE 10. Yield and Quality Information, Willamette Valley Trial

Entry	Cwt/Acre		Percent U.S. No. 1	Specific gravity	Percent <1 7/8"	Remarks
	Total	U.S. No. 1				
Red Pontiac	503	348	68	1.069	7.9	Deep eyes. Rough
R. Burbank	429	112	35	1.077	13.2	Deep eyes. Rough
ND 8891-3	417	240	59	1.075	4.6	----
Kennebec	381	47	14	1.075	7.0	Rough. Greening. Mosaic
Snowchip	305	165	64	1.074	7.5	5% Rugose mosaic
Norgold	232	156	67	1.073	14.2	----
Denali	231	138	60	1.075	8.3	100% PVX?
Norchip	211	115	52	1.075	7.7	Stunted, 25% mosaic
Average	339	165	52	1.074	8.8	----
LSD, 5% Level	83	80	22	0.008	4.1	----



TESTING SITES FOR 1978 OREGON POTATO VARIETY TRIALS