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1990

OHIO POTATO CULTIVAR TRIALS

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Special credit and thanks are given to John Elliott, Department of Horticulture, and his crew, including Bruce Williams, Jeff Reidenbach, Steve Ridenbaugh and Mark Jameson, who assisted in harvesting and grading the plots at Wooster; Danny Hall, and Frank Caudill, technicians at the Muck Crops Branch, OARDC; William Beery, technician, Department of Plant Pathology, Marcy Todd and Dianne E. Shoemaker, County Extension Agent, Agriculture, Lisbon County, and James Hoorman, County Extension Agent, Agriculture Defiance and Williams Co. We appreciate the help of William M. Brooks, M.E. Cravens and David R. Miskell, professors emeritus, OSU. The help of Amy Hall and Greg McKee in collecting chip samples and specific gravity results is also appreciated.

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Floyd I. Lower died January 13, 1991, following a brief illness. He gave leadership to the over state potato variety trials for 26 years. We will miss his genuine interest in the Ohio potato industry. He received many honors for his endeavors in agriculture including Honorary Life membership in the Potato Association of America, the distinguished service award from the Ohio Vegetable and Potato Growers Association, and was inducted into the Ohio Agricultural Hall of Fame in 1987.

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STATEWIDE TRIALS - 1990

INTRODUCTION

The purpose of the statewide variety trials is to test new varieties for the benefit of Ohio growers under various farm conditions. Cultural and pest control practices in each case are those used by the cooperating grower. Stand, vigor, plant characteristics, diseases, and maturity were recorded in the fields. At harvest the tubers are evaluated, weighed, and graded, with samples taken for chipping tests.

Eleven cultivars were planted at each of five farms. These farms were selected to give different soil and climatic conditions. The cultivars were selected either because they looked promising in previous statewide trials, and in the observation trials on two cooperating farms, or were selected from the cultivar plots at the Ohio Agricultural Research and Development Center (OARDC), Wooster.

Farm Locations

The five farms referred to in the introduction are as follows:

Farm 1 (M) - Michael Farms, Urbana, Ohio, Champaign County

Farm 2 (Th) - Thompson Farms, Hanoverton, Ohio, Columbiana County

Farm 3 (Mel) - Mellinger Farms (Crystal Springs Farm), Leetonia, Ohio, Columbiana County

Farm 4 (L) - Logan Farms, Mt. Gilead, Ohio, Morrow County

Farm 5 (C) - Chase Farms, Defiance, Ohio, Defiance County

See Table 1 for summary of cultural practices followed on these cooperating farms-- planting dates, harvest dates and related information.

PROCEDURES

Eleven cultivars were planted in three replicates on each of the five farms. In addition, five cultivars were planted in triplicated plots for observation on the same farms. Eighty seed pieces were planted in each replicate.

The seed potatoes were cut and treated on May 9 to 14. Farm No. 2 was planted on May 12 but rain delayed planting on the other farms until May 21-25. All were harvested from September 26 to October 3. The growers planters were used by driving very slowly. The potatoes were harvested with flat bed diggers, then picked up and weighed. A representative 50 lb. sample was then graded with 10 tubers cut for internal defects. A sample of each cultivar was then taken to The Ohio State University pilot plant (Columbus)

for chip tests. Atlantic, Norchip, Katahdin and Superior were standard varieties used for comparison.

WEATHER AND GROWING CONDITIONS

The last four winters were unusually warm and dry. The 1988 growing season was the hottest on record and one of the driest. The 1989 season was unusually wet with almost continuous rains through May and June. The 1990 season was also wet with heavy rainfall at times that ruined crops on seemingly well drained land. Some replicates in the test plots were lost on three of the five farms. Consequently, in some cases the results may not be truly indicative of the capabilities of the cultivar. However, the figures in 1990 are far more uniform and more truly represent the characteristics of most of the entries than in 1988 and 1989.

FIELD OBSERVATIONS

The average percent stand on the two Columbiana County farms was 84% (Table 3). It was 76% on the Morrow County farm; however, this farm had the highest yields at harvest. The average stand for four farms in 1989 was 84%, one of the lowest on record. The average percent stand for the last 16 years for all farms in the trials is 88.3%.

Some bacterial stem rot was present on Farm 2 in Columbiana County. Only four entries were infected severely enough to affect yields. Twenty to twenty-seven percent of the pants were infected with a few dead hills. The four were Norchip, MS700-83 (Spartan Pearl), Steuben and MS716-15.

Some early blight and Colorado potato beetles were observed on Farm 3 (Columbiana County) but neither were severe. Mild mosaic or other yellowing was also seen on this farm, but apparently not severe enough to affect yield or quality. The entries that definitely showed mild mosaic symptoms were Norchip, MS700-83 (Spartan Pearl), MS700-70, Superior and MS716-15.

GRADES AND YIELDS

The following tables present yield information as well as grades and defects. Surface scab was a general problem in the farm trials this year, largely due to the weather conditions. Most entries in the variety trials showed at least traces of scab. A few entries had pitted scab. Due to the damp dirt on the tubers at harvest, it was impossible to make accurate records of scab infection. Hollow heart was severe in some cultivars on four of the five farms (Table 4).

The average percent U.S. No. 1 for all entries on all the farms was 86.7 for the main trials and 87 for the observation entries. Last year it was 84% for all.

SOIL ANALYSES OF STATEWIDE TRIAL PLOTS - 1990

	------Cooperating Farms--------				
Test Results	1	2	3	4	5
pH	6.8	6.1	5.3	6.8	5.8
P (lb/A)	748	418	1056	164	726
K (lb/A)	579	304	416	343	367
CA (lb/A)	3450	2010	1170	3800	1110
Mg (lb/A)	434	496	98	321	136
CEC (meq/100g)	11	10	11	11	5
Ca (% base sat.)	77	51	26	84	55
Mg (% base sat.)	16	21	4	12	11
K (% base sat.)	6.6	3.9	4.8	3.9	9.4
Zn (lb/A)	19.6	13.4	17.2	9.5	9.9
B (lb/A)	1.0	.8	.6	1.0	.5
OM (%)	2.4	2.0	2.1	3.2	1.0

1 - Michael Farms, Urbana
2 - Thompson Farms, Hanoverton
3 - Mellinger Farms, Leetonia
4 - Logan Farms, Mt. Gilead
5 - Chase Farms, Defiance

Soil analyses conducted at Research-Extension Analytical Lab, The Ohio Agricultural Research and Development Center, Wooster.

Table 1. Cultural and pest control practices used on Ohio statewide potato trials - 1990.

	Farm 1 (M)	Farm 2 (Th)	Farm 3 (Mel)	Farm 4 (L)	Farm 5 (C)
Date planted	May 22	May 12	May 21	May 25	May 24
Date harvested	Oct. 3	Sept. 27	Sept. 26	Oct. 3-4	Oct. 2
1989 crop	Sweet corn	Wheat	Corn	Corn	Potatoes
Cover crop	Rye	Rye+60 lbs.N	Cornstalks	Cornstalks	Nothing
Fertilizer	1000 lbs.	1000 lbs.	1000 lbs.	lbs. 150-175-175	70 gal. 5-15-15
applied in row	10-26-26	8-22-29	10-20-20	+ 30# S+25#MgO	28% N
side dressed	Urea				
Herbicide Incorporated Pre-emergence	Dual + Sencor	Lorox + Dual	Lorox + Dual	Lorox + Dual	
Systemic Insecticide	Phorate	Phorate	Phorate	Phorate	Furadan
Spacing	8″ x 36″	9″ x 36″	8″ x 36″	9″ x 36″	10 1/2″ x 36″
Soil type	Silt loam	Silt loam	Silt loam	Heavy silt loam	Sandy silt loam
Soil conditions at planting	Good	Good	Slightly wet	Good	Good
Irrigation	Yes	If needed	No	No	No

Table 2. Rainfall and irrigation records for Ohio statewide potato trial plots – 1990.

	Farm 1 (M)	Farm 2 (Th)	Farm 3 (Mel)	Farm 4 (L)	Farm 5 (C)
Date planted	May 25	May 12	May 21	May 25	May 24
Date harvested	October 3	September 27	September 26	October 3–4	October 2
	Rainfall – Irrig.	Rainfall – Irrig.	Rainfall	Rainfall	Rainfall
			----inches--------		
May	6.1	6.0	2.7	2.5(2.0Est.)	2.4
June	4.0	3.0	3.37	3.82	6.4
July	6.4	9.9	10.4	8.00	4.9
August	4.5	2.6	3.6	3.15	3.3
September	6.3	6.3	4.95	1.88	2.8
Season Total	27.3	27.8	25.02	17.35	19.8
June/July/August	14.9	15.5	17.37	14.97	14.6
Avg. Yields U.S. No. 1 Main Trials Cwt/A	173	255	255	350	176

Table 3. Stand counts for Ohio statewide main trials and observational trials, 1990.

	Cooperating Farms					
	1(M)	2(Th)	3(Mel)	4(L)	5(C)	Mean
	% Emergence					
Cultivar	MAIN TRIALS					
Atlantic		88	85	71		81
Norchip		91	88	76		85
MS700-70		89	87	85		87
MS700-83 (Spartan Pearl)		94	87	80		87
LA01-38 (LaBelle)		69	80	61		70
Steuben (NY 81)		86	75	71		77
Gemchip (BR7093-24)		86	85	81		84
B7592-1 (Castile)		87	76	82		82
Katahdin		85	87	75		82
FL 657 (Norwis)		82	79	81		81
MS716-15		79	84	68		77
Farm Mean		85	83	76		81
	OBSERVATION TRIALS					
Superior		96	87	91		
Chaleur		86	84	85		
B9792-8B		97	96	96		
Coastal Chipper		92	90	91		
Saginaw Gold		82		82		
Kennebec		86		86		
Coastal Russet		92		92		
Somerset		82	80	81		
Farm Mean		89	87	88		

Table 4. Percent of B's and culls, major external and internal defects for main trial cultivars. Results are the mean values for five farms, 1990.

			--------Major Defects--------	
Cultivar	% B's	% Culls	External z	Internal (HH) y
Atlantic	5.5	6.5	Sh,Cr,2nd,Gr	17
Norchip	6.8	10.1	Sh,Cr,2nd	0.6
MS700-70	5.1	7.2	Sh,Cr,Gr,2nd	15
MS700-83 (Spartan Pearl)	6.6	8.8	Cr,Gr,Sh	10
LA01-38 (LaBelle)	3.2	8.1	Sh,Cr,Gr,2nd	5
Steuben (NY 81)	11.6	3.4	Sh,Cr,2nd	5
Gemchip (BR7093-24)	5.3	6.9	Sh,Cr,Gr	9
B7592-1 (Castile)	8.3	6.2	Sh,Cr,	7
Katahdin	7.3	5.5	Sh,Gr,Cr	8
FL657 (Norwis)	4.1	7.2	Sh,Gr,Cr	0.6
M716-15	7.4	5.8	Sh,Gr,Cr	5
Average	6.5	5.8		7.5

z Abbreviations for external defects:

Sh = misshapen
2nd = second growth
Cr = growth cracks
Gr = greening

y Abbreviations for internal defects:

HH = % Hollow Heart

Table 5. Total yield, percent U.S. No. 1 and marketable yield for main trial potato cultivars, Ohio statewide trials - 1990.

	-----Farm 1 (M)-----			-----Farm 2 (Th)-----			-----Farm 3 (Mel)-----		
Cultivar	Yield cwt/A	No. 1 %	No. 1 cwt/A	Yield cwt/A	No. 1 %	No. 1 cwt/A	Yield cwt/A	No. 1 %	No. 1 cwt/A
Atlantic	242	86	208	234	81	189	270	95	256
Norchip	226	79	179	312	79	246	278	88	245
MS700-70	172	86	148	349	83	290	273	90	246
MS700-83(Spartan Pearl)	198	78	154	234	86	201	270	88	238
LA01-38(LaBelle)	279	83	232	356	81	288	326	92	300
Steuben(N.Y.81)	179	86	154	281	84	236	296	90	266
Gemchip (BR7093-24)	219	84	184	371	84	312	315	90	283
B7592-1(Castile)	234	83	194	435	85	370	306	91	278
Katahdin	190	81	154	329	87	286	288	93	268
FL657(Norwis)	170	89	151	278	84	234	289	89	257
MS716-15	161	88	141	163	84	137	204	88	180
Mean	206	84	173	304	84	255	283	90	255

	-----Farm 4 (L)-----			-----Farm 5 (C)----			-- Mean of Farms 1-5--		
Cultivar	Yield cwt/A	No. 1 %	No. 1 cwt/A	Yield cwt/A	No. 1 %	No. 1 cwt/A	Yield cwt/A	No. 1 %	No. 1 cwt/A
Atlantic	495	89	441	234	90	211	295	88	260
Norchip	388	88	341	211	82	173	283	83	235
MS700-70	333	95	316	181	85	156	262	88	230
MS700-83(Spartan Pearl)	384	90	346	286	80	229	274	84	231
LA01-38(LaBelle)	354	95	336	214	93	199	306	89	272
Steuben(N.Y.81)	382	93	355	178	72	128	263	85	224
Gemchip(BR7093-24)	431	93	401	234	87	204	314	85	268
B7592-1(Castile)	428	89	381	191	79	151	319	88	280
Katahdin	380	96	365	208	84	175	279	88	246
FL657(Norwis)	329	93	306	220	89	196	257	89	228
MS716-15	285	92	262	145	82	119	192	87	167
Mean	381	92	350	209	84	176	277	87	240

Table 6. Total yield, percent U.S. No. 1 and marketable yield for observational potato cultivars, Ohio statewide trials, 1990.

	Farm 1 (M)			Farm 4 (L)				MEANS		
Cultivar	Yield Cwt/A	No. 1 %	No. 1 Cwt/A	Yield Cwt/A	No. 1 %	No. 1 Cwt/A	n	Yield Cwt/A	No. 1 %	No.1 Cwt/A
Superior	161	89	143	347	88	305				
Chaleur	148	85	126	293	93	272				
B9792-8B	191	85	162	364	80	291				
B9792-157	231	80	185	327	84	275				
MS002-1717Y				250	91	227				
Kennebec				349	86	300				
AF236-1(Somerset)	136	79	107	333	85	283				
Mean	173	84	145	323	87	279				
	Farm 3 (Mel)			Farm 5 (C)						
Superior	236	91	217	197	84	165	4	235	88	207
Chaleur	138	92	127	199	93	185	4	195	91	177
B9792-8B	353	87	307	238	83	198	4	287	84	240
B9792-157	280	93	260	262	87	228	4	275	86	237
MS002-1717Y				249	73	182	2	250	82	205
Kennebec							1	349	86	300
AF236-1(Somerset)	156	84	131	203	82	166	4	207	82	171
Mean	233	89	208	225	84	187				

Table 7. Mean U.S. No. 1 yields in cwt per acre for major entries in the Ohio statewide potato trials of all farms each year grown in the last ten years and grown more than one year.

Cultivar	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Early & Med Early										
Jemseg	294	161								
Superior								131		207
Conestoga		141	230	266	321	225				
Rus. Norkotah						272	105			
Early Midseason										
Crystal	254									
Langlade	311	388						184	188	
Norchip	231	337	184	208	228	301	236	160	161	173
Midseason										
LA01-38(LaBelle)					359	413	330	235	211	199
Katahdin	292	374	238	315	335	363	276	187	178	175
Late										
Denali	269	300	206							
Elba (NY59)	324	373	245			393				
Neb. A129-69-1	336	341	207	278						
WNC521-12					325	344				
MS700-70							241	233	187	156

Some of the cultivars grown in Ohio for which the characteristics are well known after several years of testing have been omitted in later years. Some cultivars listed were included in the trials prior to the last ten years. Among these are Shurchip, Monona, Kennebec, Atlantic, Crystal, Sebago, Red Pontiac, Red LaSoda, etc. Katahdin, Norchip and Superior are well known and used as standards for comparison.

Table 8. Specific gravity, chip color, percent blister, and Agtron E-5F readings of potato cultivars grown at five farms in statewide trials, 1990.

	Farm 1(M)				Farm 2 (Th)				Farm 3 (Mel)			
Cultivar	Specific Gravity	Chip Color y	% Blister z	Agtron	Specific Gravity	Chip Color	% Blister	Agtron	Specific Gravity	Chip Color	% Blister	Agtron
Atlantic	1.083	2	30	51.1	1.078	2	20	50.9	1.073	2	10	48.5
Norchip	1.071	2	20	45.4	1.079	2	30	48.8	1.075	2	40	53.3
MS700-70	1.077	2	20	49.4	1.094	2	0	48.8	1.079	2	10	49.3
MS700-83	1.070	3	20	42.6	1.080	3	40	47.1	1.073	2	40	44.4
LA01-38	1.067	2	10	52.4	1.071	2	20	47.8	1.073	2	10	49.3
Steuben(NY 81)	1.067	2	20	50.6	1.067	2	0	51.3	1.066	2	10	44.5
Gemchip (BR7093-24	1.061	2	10	43.3	1.072	3	30	40.3	1.075	3	30	37.9
B7592-1	1.074	2	20	57.7	1.074	3	20	39.0	1.072	3	40	42.7
Katahdin	1.068	3	20	45.0	1.069	3	20	37.3	1.067	2	10	46.7
FL657	1.063	2	10	50.3	1.066	2	10	48.0	1.067	2	10	45.5
MS716-15	1.079	4	40	34.4	1.078	1	10	47.4	1.077	3	20	40.7
Farm Mean	1.071	2.4	20	47.5	1.077	2.3	18.2	46.1	1.072	2.3	20.9	45.7

	Farm 4 (L)				Farm 5 (C)			
Cultivar	Specific Gravity	Chip Color	% Blister	Agtron	Specific Gravity	Chip Color	% Blister	Agtron
Atlantic	1.069	3	30	40.4	1.082	2	30	45.4
Norchip	1.089	3	30	46.3	1.067	3	40	36.1
MS700-70	1.084	3	10	31.7	1.060	2	40	42.4
MS700-83	1.078	3	30	47.8	1.072	3	20	38.7
LA01-38	1.075	3	10	50.5	1.071	3	40	51.5
Steuben(NY 81)	1.074	2	10	55.4	1.063	2	20	43.8
Gemchip (BR7093-24	1.061	3	20	37.5	1.072	2	40	52.2
B7592-1	1.076	3	30	48.3	1.070	2	40	38.2
Katahdin	1.075	3	20	40.2	1.071	3	30	41.8
FL657	1.072	3	10	42.4	1.061	2	30	42.3
MS716-15	1.081	3	30	39.1	1.065	2	10	45.7
Farm Mean	1.076	2.9	20.9	43.6	1.069	2.4	30.9	43.5

y PC/SFA Standards; 1=light (high Agtron index readings), 5=dark (low Agtron index readings).

z Percentage of chips that develop blisters > 20 mm in diameter during the frying process.

Table 9. Mean specific gravity, chip color, percent blister and Agtron E-5F readings based on statewide main potato cultivar trials from five farms - 1990.

Cultivar	Specific Gravity	Chip Color y	% Blister z	Agtron
Atlantic	1.077	2.2	24	47.3
Norchip	1.075	2.4	32	46.0
MS700-70	1.079	2.2	18	44.3
MS700-83 (Spartan Pearl)	1.075	2.2	30	44.1
LA01-38 (LaBelle)	1.071	2.4	18	50.3
Steuben (NY81)	1.067	2.0	12	49.1
Gemchip (BR7093 24)	1.068	2.6	26	42.2
B7592-1 (Castile)	1.073	2.6	30	45.2
Katahdin	1.070	2.8	20	42.2
FL657 (Norwis)	1.066	2.4	14	45.7
MS716-15	1.076	2.6	22	41.5
Mean	1.073	2.5	22.2	45.3

y PC/SFA standards; 1=light, 5=dark (low Agtron index readings).

z Percentage of chips that develop blisters > 20 mm in diameter during the frying process

Observation Trials (Wooster) Table 1. Total yields, U.S. No. 1 yields and grade distribution for observation entries, 1990

Cultivar	Yield Cwt/A	Total No. 1 Cwt/A	U.S. No. 1	U.S. B size	Culls
			---------	---%---	--------
Somerset	295	245	83	5	12
Red Gold	339	292	86	9	5
Chaleur	232	204	88	1	11
WF31-4	247	222	90	3	7
Chieftan	319	271	85	4	11
Green Mountain	329	250	76	3	21
Caribe	440	392	89	2	9
Sangre	513	462	90	3	7
Rosa	339	295	87	6	7
W100	242	215	89	4	7
CS7635-4	227	195	86	2	12
CS7697-24	276	232	84	4	12
S-3	411	378	92	1	7
S-2	184	178	97	0	3
WS440	261	232	89	4	7
C082142-4	218	181	83	8	9
AC75430-1	232	181	78	6	15
B0178-14	344	296	86	10	4
B0255-9	310	248	80	6	15
MN13035	382	321	84	7	9
B0325-5	256	212	83	15	2
B0312-10	334	291	87	10	3
B0306-6	237	194	82	7	11
B0311-2	252	169	67	13	20

Observation Trials (Wooster) Table 2. Tuber data and internal disorders for observation entries, 1990.

	Tuber Data[z]					Internal Disorders[y]			
Cultivar	Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear.	Internal Necrosis	Hollow Heart	Vascular Discoloration	Defect Free
Somerset	7	7	5	8	7	0	0	0	10
Red Gold	3	6	2	6	7	0	0	0	10
Chaleur	7	7	5	7	5	0	0	0	10
WF 31-4	5	4	3	6	6	0	2	0	8
Chieftain	2	6	7	7	7	0	0	0	10
Green Mountain	6	7	5	4	4	0	0	1	9
Caribe	1	7	6	6	6	0	0	0	10
Sangre	2	6	4	5	5	0	0	0	10
Rosa	7	8	2	8	8	0	1	0	9
W 1000	6	5	3	7	6	0	0	0	10
CS 7635-4	7	7	2	7	8	0	0	0	10
CS 7697-24	7	9	3	6	7	0	0	0	10
S-3	7	8	3	7	5	0	0	0	10
S-2	7	7	6	5	5	0	0	0	10
WS 440	6	7	6	6	4	0	0	0	10
CO82142-4	4	3	7	8	8	0	3	0	7
AC 75430-1	5	3	7	8	6	0	4	0	6
BO 178-14	7	4	2	7	7	0	2	0	8
BO 255-9	6	4	3	5	5	0	2	0	8
MN 13035	2	6	6	5	7	0	0	0	10
BO 325-5	4	3	7	8	8	0	2	0	8
BO 312-10	5	3	7	8	6	0	3	0	7
BO 306-6	5	3	7	8	7	0	1	0	9
BO 311-2	4	3	8	8	8	0	0	0	10

y Hollow heart and internal necrosis ratings indicate the number of affected tubers found per 10 tubers sampled

z Tuber Data Rating System

Tuber Color: 1) purple 2) red 3) pink 4) dark brown 5) brown 6) tan 7) buff 8) white 9) cream

Skin Texture: 1) part. russet 2)heavy russet 3)mod. russet 4)light russet 5)netted 6)slight net. 7) mod smooth 8) very smooth

Tuber Shape: 1) round 2) mostly round 3) round to oblong 4) mostly oblong 5) oblong 6) oblong to long 7) mostly long 8) long 9) cylindrical

Eye Depth: 1) very deep 2) -- 3) deep 4) -- 5) intermediate 6) -- 7) shallow 8) -- 9) very shallow

Appearance: 1) very poor 2) -- 3) poor 4) -- 5) fair 6) -- 7) good 8) -- 9) excellent

Advanced Observation Trials (Wooster) Table 1. Total yields, U.S. No. 1 yields, grade distribution, specific gravity, chip color, percent blister and Agtron readings for advanced observation entries, 1990.

Cultivar	Total Yield cwt/A	U.S. No. 1 cwt/A	----------%---------- U.S. No. 1	B. size	culls	Scab Area Type z	Specific Gravity	Chip Color y	% Blister x	Agtron E-5F
NEA 22.75-1	300	243	81	2	17	0	1.063	5	50	19.1
AC 81198-11	279	204	73	6	21	T-1	1.069	5	40	14.8
CS 7232-4	247	200	81	4	15	0	1.074	2	10	46.5

x Percentage fo chips that develop blisters > 20 mm in diameter during the frying process

y PC/SFA standards, 1=light, 5=dark (low Agtron index readings).

z Area - T-less than 1%; 1-10-20%; 3-41-60%; 4-61-80%; 5-81-100%.
Type - 1. Small, superficial; 2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes

Advanced Observation Trials (Wooster) Table 2. External defects and internal disorders for advanced observation entries, 1990.

	--% External Defects--				-Internal Disorders-		
Cultivar	Growth Cracks	2nd Growth	Sun Grn	%defect Free	HH [z]	Int. Nec.	Defect Free
NEA22.75-1	2	3	2	93	5	0	25
AC81198-11	7	8	0	85	2	0	28
CS7232-4	0	0	3	97	0	0	30

z HH (Hollow heart) and internal necrosis ratings indicate the number of affected tubers found per 30 tubers sampled

1990 NORTH CENTRAL REGIONAL POTATO TRIALS

Location Wooster, OH

Soil Type Wooster silt loam

Fertilizer Treatment 1200 lbs. 10-20-20

Date Planted May 24, 1990

Date Harvested September 13, 1990

Size of Plots Single rows - 30 feet

Spacing - Between Hills 12 inches

Spacing - Between Rows 36 inches

Replications 30 hills per rep

Number of Replications 3

Environmental Factors (rainfall, temperature, irrigations, etc.):

	Rainfall (in.)		Air Temperature (°F)	
	1990	80 yr. mean	Ave. Min.	Ave. Max.
May(24-31)	1.6	1.1	45	67
June	2.5	4.0	56	78
July	6.5	4.2	60	81
August	4.3	3.7	58	80
September (1-13)	2.0	1.4	53	74

Sprays Applied:

6/20 Bravo 720 (1 qt/100 gal)
6/22 Imidan 50W (2 lbs)
7/10 Vydate (4 pts) + Mancozeb (2 lbs)
7/18 Penncap M (2 pts) + Mancozeb (2 lbs)
8/8 Vydate (4 pts) + Mancozeb (2 lbs)
8/17 Imidan 50W (2 lbs) + Bravo 720 (1 qt)
8/24 Imidan 50W (2 lbs) + Bravo 720 (1 qt)

Other Data (vine killing, specific gravity determinations, etc.):

Herbicide: Dual 1 (1 pt) + Sencor 75W (10 oz.) applied 5/25
Vine Killing: Diquat (1 pt) + spreader (August 31)
Previous Crop: Plow down alfalfa

Specific gravity determined using weight in air-weight in water method, and solids determined by tabular conversion.

Objective chip color measurements were made with the Agtron E-5F.

Maturity and early blight evaluations were not made due to lack of personnel.

SUMMARY SHEET

Selection Number or Variety	Aver. (1) Maturity	Most (2) Representative Scab Area-Type (A-T)	CWT/A Aver. Yield	CWT/A Yield US #1	Average Percent US #1	Aver. (3) % Total Solids	Gen (4) Merit Rating	Chip (5) Color	Early (6) Blight Reading	Comments and General Notes
EARLY TO MEDIUM MATURITY Norland		0-0	235	207	88	16.84				
Norchip		0-0	300	249	83	19.68		3		
Norgold Russet		0-0	274	205	75	17.05		4		Shallow eyes; Lenticles may be problem
ND1196-2R		0-0	310	263	85	16.63	3			Excellent, holds red color, uniform size
ND2008-2		1-3	345	286	83	18.53		3		
MEDIUM LATE TO LATE MATURITY MN 12966		0-0	295	271	92	18.32	2			Smooth, shallow eyes, promising
MN 13540		0-0	347	257	74	18.53		2		Shape is problem
MN 13740		0-0	352	313	89	18.74		3		Trace surface scab
Mich. 41-1		T-1	374	337	90	19.79		2		Promising, uniform excellent. HH high
Mich. 402-8		T-1	69	50	73					
ND 1538-1Russ		0-0	352	246	70	17.89	4	3		Promising, shallow eyes
LA 12-59		0-0	408	359	88	18.53	1			Holds red color well; eyes Med.
Wisc. 856		0-0	284	219	77	20.21		3		Bud end major defect
Wisc. 870		0-0	356	285	80	23.17		2		Shape could be problem
Wisc. 877		0-0	192	171	89	23.17		3		Large tubers have bud end defect
Red Pontiac		0-0	375	315	84	16.21	5			
Russet Burbank		0-0	366	271	74	20.64		4		
AVERAGE			308.9	253.2	82	18.05		2.9		

1) 1-Very Early - Norland maturity; 2-Early - Irish Cobbler maturity; 3-Medium - Red Pontiac maturity; 4-Late - Katahdin maturity; 5-Very Late - Kennebec or Russet Burbank maturity.

2) **AREA:** T-less than 1%; 1 - 10-20%; 2 - 21-40%; 3 - 41-60%; 4 - 61-80%; 5 - 81-100%. **TYPE:** 1. Small, superficial; 2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes.

3) Percent total solids, not total solids/acre.

4) Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third, fourth, fifth (in order) for overall worth as a variety).

5) Chip Color - PCII Color Chart or Agtron. Indicate what Agtron you are using.

6) Early blight: 1 - susceptible; 5 - highly resistant.

(L:wp51/data/johansen.dir/regtrial.ltr)

SUMMARY OF GRADE DEFECTS

Selection Number or Variety	Percent External Defects (1)					Total (3) Tubers Free of External Defects	Percent Internal Defects (1)			
	Scab (2)	Growth Cracks	Off Shape and Second Growth	Sun Green	Tuber Rot		Hollow Heart	Internal Necrosis	Vascular Discolor-ation	Normal Tubers (4)
EARLY TO MEDIUM MATURITY										
Norland	0	5	15	0	0	80	3	0	0	97
Norchip	0	8	22	5	0	65	0	0	0	100
Norgold Russet	0	0	20	0	0	80	13	0	0	87
ND1196-2R	0	3	13	0	0	84	3	0	0	97
ND2008-2	3	3	12	10	0	72	7	0	0	93
MEDIUM LATE TO LATE MATURITY										
MN 12966	0	13	5	0	0	82	0	0	0	100
MN 13540	0	2	23	5	2	68	7	0	0	93
MN 13740	2	0	27	0	0	71	0	0	0	100
Mich. 401-1 XXX	3	0	3	2	2	90	27	0	0	73
Mich. 402-8	10	0	10	15	0	65	0	0	0	100
ND 1538-1Russ	0	13	30	0	0	57	0	0	0	100
LA 12-59	2	10	3	0	0	85	3	0	0	97
Wisc. 856	0	3	18	0	0	79	0	0	0	100
Wisc. 870	0	0	15	0	0	85	17	0	0	83
Wisc. 877	0	0	8	0	0	92	13	7	0	80
Red Pontiac	2	0	13	0	0	85	3	0	0	97
Russet Burbank	0	7	32	2	0	59	3	0	0	97
AVERAGE	1.0	3.9	15.8	2.3	.2	74	5.8	.4	0	94

1) Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

2) Includes <u>all</u> tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area. <u>Be sure</u> to count tubers with any amount of scab in this category.

3) This total - tubers free from any external defect of any sort.

4) Percentage normal tubers are those showing no internal defects. Some individual tubers will have more than one type of internal defect.

(L:wp51/data/johansen.dir/regtrial.1

OHIO

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Introduction: Thirty-seven varieties and clones were tested in 1990 at the Ohio Agricultural Research and Development Center, Wooster, as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast).

Methods: Plots were planted on May 24, 1990, with 30 hills spaced twelve inches apart, in rows 36 inches apart. A randomized complete block design with 3 replications was used. The experimental area had a good stand of alfalfa killed in the fall of 1989. Soil type was a Wooster silt loam (fine-loamy, mixed, mesic Typic Fragiudalf) with a pH of 6.0 and an organic matter of 3.0%. Fertilization consisted of 1200 lbs/A 10-20-20, one half applied at plow-down, and the remainder banded at planting. Herbicides used were Dual/Lexone. Pesticides included Bravo 720, Thiodan, Pydrin and Penncap. Plots were vinekilled on August 30, which was 98 days after planting. All plots were mechanically harvested on September 13, 1990. Chip samples were stored at 52°F and chipped 63 days after harvest. Chip color was evaluated using the standards established by the Potato Chip/Snack Food Association (PC/SFA). Objective color measurements were made with the Agtron E-5F. Specific gravity was determined using the potato hydrometer method. Hollow heart and internal necrosis ratings (Ohio Table 2) indicate the number of affected tubers found per 30 tubers examined.

Results: The 1990 growing season at Wooster was nearly ideal for potato growth and development. Top yielding entries included AF1060-2, Allegany, Coastal Chip, Steuben, B0257-3, E55-35, B9792-8B, E57-13, Russet Norkotah, and Superior. These ten varieties/clones produced U.S. No. 1 yields of over 300 cwt/A, and percent U.S. No. 1 ranged from 80-92%. Allegany, AF1060-2, B0257-3, B9792-8B, and Russet Norkotah received overall tuber appearance ratings of good to very good. Potential for hollow heart was noted for five of the ten top yielding entries (B9792-8B, Coastal Chip, E57-13, Steuben, and Russet Norkotah) with a range of 8 to 1 affected tubers/30 tubers sampled, respectively (Ohio Table 2). Allegany had a high incidence of very large tubers, while B0257-3 would benefit from strategies to increase tuber size.

Promising russet entries (in addition to Russet Norkotah) included A74114-4 (Frontier Russet) and Coastal Russet. Total yields ranged from 305-336 cwt/A, with 78-84% U.S. No. 1. A74114-4 showed potential for hollow heart, however, under 1990 Ohio growing conditions.

Ohio Table 1. Yield, marketable yield, percent of yield by grade size distribution and specific gravity for varieties grown at Wooster, Ohio - 1990

Variety	Total Yield Cwt/A	Marketable Yield Cwt/A	Marketable Yield % of STD	Size Distribution by Class(% of total yield) U.S. No.1 (> 1-7/8")	B size	Culls	Specific Gravity
AF1060-2	462	383	184	83	5	12	1.069
Allegany	394	362	174	92	2	6	1.073
Coastal Chip	394	315	151	80	6	14	1.084
Steuben	381	324	156	85	1	14	1.078
B0257-3	379	322	155	85	9	6	1.093
E55-35	374	325	156	87	7	6	1.075
B9792-8B	373	313	150	84	4	12	1.085
Norchip	370	285	137	77	4	19	1.085
F82026	361	289	139	80	9	11	1.076
E57-13	361	318	153	88	8	4	1.079
Russet Norkotah	360	328	158	91	5	4	1.093
Kennebec	342	287	138	84	4	12	1.068
Superior	337	307	147	91	2	7	1.073
A74114-4 (Frontier Russet)	336	262	126	78	7	15	1.081
B0241-8	329	299	144	91	7	5	1.074
B0242-3	326	274	132	84	5	11	1.078
E55-27	319	284	137	89	5	6	1.086
Atlantic	319	278	134	87	6	7	1.079
Monona	307	243	117	79	5	16	1.068
AF828-5	306	282	136	92	1	7	1.065
Coastal Russet	305	256	123	84	13	3	1.076
Saginaw Gold	292	234	112	80	4	16	1.079
N.Y. 85	289	237	114	82	6	13	1.094
E40-10	286	260	125	91	3	6	1.062
Norland	285	245	118	86	3	11	1.066

Ohio Table 1. (continued)

Variety	Total Yield Cwt/A	Marketable Yield Cwt/A	% of STD	Size Distribution by Class(% of total yield) U.S. No. 1 (>1-7/8")	B size	Culls	Specific Gravity
LA01-38 (LaBelle)	279	226	109	81	4	15	1.073
N.Y 84	274	236	113	86	5	9	1.064
CS7639-1	273	205	99	75	5	20	1.071
WNC672-2	266	235	111	87	3	10	1.077
B0175-20	261	175	84	67	1	32	1.084
F77087	252	227	109	90	4	6	1.073
E55-44	250	227	109	91	3	6	1.078
B0220-14	250	217	104	87	4	9	1.074
Katahdin (std)	242	208	100	86	2	12	1.064
AF875-16	237	199	96	84	2	14	1.091
N.Y. 78	210	178	86	85	4	11	1.066
B9792-158	198	164	79	83	1	16	1.076
W.D. LSD (K=100,5% level)	76						

Ohio Table 2. Tuber shape and appearance, hollow heart ratings, internal necrosis ratings and chip color for varieties grown at Wooster, Ohio - 1990.

Variety	Vine Data ---at vinekill--- Plant Size	Maturity	--Tuber Data[y]--- Shape	Appear-ance	Hollow Heart %	Internal Necrosis %	Chip Color[z]
AF1060-2	8.3	7.0	2	7	0	0	3
Allegany	7.3	6.0	3	8	0	0	3
Coastal Chip	8.3	7.7	2	4	17	0	2
Steuben	8.3	7.7	3	6	10	0	3
B0257-3	7.0	7.0	2	7	0	0	2
E55-35	9.0	8.3	2	5	0	0	5
B9792-8B	7.0	7.0	7	7	27	0	3
Norchip	6.3	6.0	4	5	0	0	2
F82026	8.3	7.3	4	5	7	0	3
E57-13	8.3	6.7	2	5	13	0	4
Russet Norkotah	8.0	5.0	7	7	3	0	2
Kennebec	6.7	6.0	7	4	0	0	4
Superior	7.7	6.3	5	5	0	0	2
A74114-4	7.7	5.7	6	6	10	0	2
B0241-8	8.0	7.0	2	7	40	0	3
B0242-3	8.3	8.3	3	4	3	0	2
E55-27	9.0	7.3	2	7	0	0	2
Atlantic	8.3	6.7	3	6	27	0	3
Monona	5.7	6.0	3	3	7	0	2
AF828-5	9.0	7.7	3	7	7	0	3
Coastal Russet	8.0	6.7	7	7	0	3	5
Saginaw Gold	6.0	6.3	3	4	0	0	3
N.Y. 85	8.0	6.3	3	6	10	0	2
E40-10	7.3	5.0	2	5	0	0	4
Norland	8.3	6.3	3	5	0	0	4
LA01-38	8.7	6.7	5	6	0	0	3
N.Y. 84	7.0	6.3	3	5	0	0	5
CS7639-1	7.3	7.0	6	6	3	0	5
WNC672-2	8.3	8.0	3	5	0	0	3
B0175-20	8.7	7.3	7	5	10	3	2
F77087	7.3	5.7	5	5	43	0	4
E55-44	8.7	7.3	3	8	7	0	2
B0220-14	8.7	7.3	6	7	60	0	2
Katahdin (std)	8.7	7.3	3	7	13	0	3
AF875-16	7.3	5.3	3	6	50	0	2
N.Y. 78	8.3	7.0	3	7	0	0	2
B9792-158	8.3	7.7	7	5	23	0	2

y See standard NE 107 rating system - pg. 28.

z PC/SFA standards; 1=light, 5=dark (Low Agtron index readings)

Ohio Table 3. Plant stand, plant type, air pollution, percent blister, Agtron readings, and additional tuber data for varieties grown at Wooster, Ohio - 1990

Variety	% Plant Stand	Plant Type	Air Pollu-tion	% [y] Blister	Agtron E-5F	Plant Appear-ance	----Tuber Data---- [z] Skin Texture	Eye Depth	Skin Color
AF1060-2	87	8.7	6.7	20	42.3	7.0	7	7	7
Allegany	92	7.3	6.0	20	31.8	6.0	6	7	7
Coastal Chip	91	8.0	7.7	10	42.0	8.0	6	4	6
Steuben	71	8.0	6.0	30	31.8	7.7	5	7	6
B0257-3	93	8.0	7.3	10	40.0	6.7	7	7	6
E55-35	88	9.0	8.0	10	19.9	8.0	6	5	5
B9792-8B	88	7.7	8.7	20	41.5	7.0	7	6	6
Norchip	88	6.0	5.0	20	44.4	6.3	7	6	6
F82026	79	8.7	7.0	50	39.9	7.3	7	6	7
E57-13	81	8.3	7.3	20	27.0	7.7	6	7	6
Russet Norkotah	85	8.7	4.3	10	47.6	6.7	4	8	5
Kennebec	78	7.7	6.0	10	31.3	6.0	7	5	7
Superior	85	8.7	7.7	10	46.7	7.3	6	5	7
A74114-4	85	8.7	5.7	10	47.4	6.7	4	6	5
B0241-8	79	8.0	5.7	10	36.4	7.0	7	6	7
B0242-3	88	9.0	8.0	10	53.7	8.0	6	5	6
E55-27	64	9.0	6.7	10	48.3	8.0	6	7	6
Atlantic	85	7.7	7.0	10	46.7	6.7	5	5	6
Monona	87	5.7	6.2	10	44.8	6.3	7	5	7
AF828-5	73	9.0	6.7	10	37.4	8.3	7	6	6
Coastal Russet	79	9.0	7.0	30	14.4	7.3	4	5	5
Saginaw Gold	75	8.3	7.3	20	43.5	7.3	7	7	6
N.Y.85	84	8.7	6.0	20	37.9	6.7	6	7	6
E40-10	72	7.7	4.0	0	18.9	6.3	4	7	7
Norland	89	8.0	7.0	50	29.3	6.0	7	6	2

Ohio Table 3. (continued)

Variety	% Plant Stand	Plant Type	Air Pollu-tion	% Blister	Agtron E-5F	Plant Appear-ance	Tuber Data---- Skin Texture	Eye Depth	Skin Color
LA01-38	52	8.7	4.0	60	36.1	7.3	7	6	5
N.Y.84	61	7.0	7.0	30	24.3	6.6	7	5	6
CS7639-1	56	9.0	6.3	10	17.1	7.0	7	7	6
WNC672-2	82	9.0	7.3	20	30.6	8.0	5	7	6
B0175-20	81	8.7	8.0	10	51.3	7.7	8	6	7
F77087	81	8.0	5.0	30	35.0	6.3	7	6	7
E55-44	61	8.7	6.7	30	47.6	7.7	6	8	7
B0220-14	70	8.0	6.0	10	44.1	7.3	3	7	5
Katahdin (std)	71	7.7	6.7	20	30.7	7.0	8	6	7
AF875-16	75	7.0	6.3	10	52.9	6.0	7	7	7
N.Y.78	75	8.3	6.7	20	39.6	7.3	7	8	7
B9792-158	73	8.7	7.3	10	52.3	7.3	7	5	6

y Percentage of chips that develop blisters greater than 20 mm in diameter during the frying process

z See standard NE 107 rating system - pg. 28.

Table 1. (Fremont) Plant stand, total yields, U.S. No. 1 yields, grade distribution, specific gravity and internal disorders for Fremont entries, 1990.

Cultivar	% Plant Stand	Total Yield Cwt/A	U.S. No. 1 Cwt/A	U.S. No. 1	B Size	Culls	Specific Gravity	Internal Disorders z Hollow Heart	Internal Necrosis
				----------	----%----	-------			
Steuben (NY 81)	88	302	222	74	24	2	1.067	1	0
Saginaw Gold	96	266	215	80	16	4	1.079	0	0
W1059 Russ	85	211	99	47	36	17	1.070	0	0
ND 15381 Russ	95	186	93	48	47	5	1.067	.5	0
W 1005 Russ	93	325	174	54	33	13	1.074	3	0
ND 1113-10	93	183	125	56	40	4	1.065	.5	0
Snowden (W855)	84	262	194	73	24	3	1.080	1	0
Russet Norkotah	95	279	205	74	18	8	1.066	.7	0

All data based on 4 reps except for:
Saginaw Gold = 6reps
W1509 Russ = 3 reps
ND 15381 Russ = 2 reps

z Hollow heart and internal necrosis ratings indicate the number of affected tubers found per 10 tubers sampled.

PLANTED: May 11, 1990
FERTILIZER: 100 lbs. N Broadcast
75 lbs. N at planting
50 lbs. N sidedress 6 wks. after planting
50 lbs. N sidedress 9 wks. after planting

HARVEST DATE: Oct. 18, 1990
PLANT SPACING: Row length 30'; 36 in. between rows, 12 in. spacing within rows
PEST MANAGEMENT: Furadan 1 1/2 lbs/1000' row; May 11, 1990

Table 2. (Fremont) Specific gravity, % blister, chip color and Agtron readings for Fremont entries, 1990.

Cultivar	Specific Gravity	% Blister z	Chip Color y	Agtron E -5F
Steuben (NY 81)	1.067	18	2	39.8
Saginaw Gold	1.079	23	3	36.3
W1059 Russ	1.070	43	3	24.4
ND 15381 Russ	1.067	15	4	25.4
W 1005 Russ	1.074	23	3	31.5
ND 1113-10	1.065	10	4	19.0
Snowden (W855)	1.080	20	2	41.4
Russet Norkotah	1.066	23	4	23.2

y PC/SFA Standards; 1=light, 5=dark (low Agtron index readings).

z Percentage of chips that develop blisters > 20 mm in diameter during the frying process.

TUBER DATA RATING SYSTEM
for
POTATO VARIETY TRIALS–NE 107

Tuber Skin Color
1. Purple
2. Red
3. Pink
4. Dark Brown
5. Brown
6. Tan
7. Buff
8. White
9. Cream

Skin Texture
1. Part. russet
2. Heavy russet
3. Mod. russet
4. Light russet
5. Netted
6. Slight net.
7. Mod. smooth
8. Smooth
9. Very smooth

Tuber Shape
1. Round
2. Mostly round
3. Rd. to obl.
4. Mostly obl.
5. Oblong
6. Obl. to long
7. Mostly long
8. Long
9. Cylindrical

Eye Depth
1. VD
2. --
3. D
4. --
5. Intermediate
6. --
7. S
8. --
9. VS

Appearance
1. Very poor
2. --
3. Poor
4. --
5. Fair
6. --
7. Good
8. --
9. Excellent

PLANT DATA RATING SYSTEM

Plant Type
1. decumbent–poor canopy
2. decumbent–fair canopy
3. decumbent–good canopy
4. spreading–poor canopy
5. spreading–fair canopy
6. spreading–good canopy
7. upright–poor canopy
8. upright–fair canopy
9. upright–good canopy

Air Pollution
0. dead
1. decreasing plant appearance
2. with varying degrees
3. of defoliation
4.
5. most leaves have symptoms, but generally appearance is still good
6. good plant condition with decreasing
7. percent of foliar symptoms
8.
9. no symptoms

Plant Size
1. very small
2. +
3. small
4. +
5. medium
6. +
7. large
8. +
9. very large

Plant Maturity
1. very early
2. early
3. +
4. medium early
5. medium
6. medium late
7. +
8. late
9. very late

Plant Appearance
1. v. poor
2. poor
3. +
4. --
5. fair
6. +
7. --
8. good
9. excellent

LOCATIONS OF 1990 OHIO POTATO VARIETY TRIALS

1. Michael Farms, Urbana
2. Harold Thompson Farm, Hanoverton
3. Mellinger Farms, Leetonia
4. Logan Farms, Mt. Gilead
5. Chase Farms, Defiance
6. Ohio Agricultural Research and Development Center, Wooster

Appendix A. Summary of reported general merit ratings for varieties in the 1990 North Central Regional Potato Trials.

Variety	IA	IN*	KY	LA*	Manitoba	MI	MN	MO*	ND	NE	OH	SD	WI*	---Total--- n	pts.	Ave. Rating
EARLY TO MEDIUM MATURITY																
Norland					5				5					2	10	5
Norchip			3		3									2	6	3
Norgold Russet			5				5							2	10	5
ND 1196-2R									3	5	3	4		4	15	3.8
ND 2008-2					2									1	2	2
MEDIUM LATE TO LATE MATURITY																
MN 12966	4										2			2	6	3
MN 13540							3		4					2	7	3.5
MN 13740	2		4											2	6	3
Mich. 401-1										4				1	4	4
Mich. 402-8	1													1	1	1
ND 1538-1Russ			1			4	1		2		4			5	12	2.4
LA 12-59	3		2		4	1			1	3	1	3		8	18	2.3
Wisc. 856						2	2					1		3	5	1.7
Wisc. 870	5					3	4			1		2		5	15	3
Wisc. 877						5						5		2	10	5
Red Pontiac					1					2	5			3	8	2.7
Russet Burbank																

*Ratings not received

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