

OHIO POTATO CULTIVAR TRIALS, 1980

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The 1980 Ohio Potato Cultivar Trials were jointly sponsored by the Ohio Agricultural Research and Development Center, the Ohio Cooperative Extension Service, the Ohio Potato Growers Association and the following individual growers:

	<u>Location*</u>
Don & Ed Becker, Beach City	1
Celeryville Muck Crops Branch, Celeryville	7
Chase Farms, Defiance	5
Logan Farms, Mt. Gilead	4
Galen Moomaw, Smithville	3
Harold Thompson, Hanoverton	2
Ernst & Perry Tritten, Lisbon	6
OARDC, Wooster	8

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* See map, back cover

INTRODUCTION

Over 55 potato varieties and advanced selections were evaluated in trials across Ohio in 1980 (See Appendix Table A1). These trials included: 1) a State-wide Trial of 9 entries located on 6 commercial farms, 2) an Observational Trial of many newer entries located on two of the 6 commercial farms, 3) a trial of 10 entries at the OARDC Muck Crops Branch at Celeryville, 4) an evaluation of 17 entries in the North Central Regional Potato Trials located at the OARDC campus at Wooster, and 5) an evaluation of 13 entries in the Northeastern Regional Potato Variety Trials located at the OARDC campus at Wooster.

STATEWIDE TRIAL

Introduction

Nine entries were evaluated at 6 commercial farms located across the state. Seven of the entries (Crystal, Neb. A129.69-1, W 718, CA02-7, Denali, Michibonne, and Michimac) were included because they have looked promising in previous years, and the other two entries (Norchip and Katahdin) were included as standards. Katahdin was included for comparison as a standard midseason variety, and Norchip was included as a standard for comparison of chipping potential.

Procedure

All plots on the 6 commercial farms were subjected to standard cultural and pest control practices used on those farms (Appendix Table A2). Plots consisted of double rows approximately 40 feet long (80 seedpieces) and entries were replicated four times. Stand, vigor, ozone damage, and disease were evaluated at certain farms during the growing season.

At harvest tubers were dug by machine, left on the soil surface to dry for approximately 30 minutes, and were picked up by hand and weighed for total yield. A 50 pound sample was randomly selected from each plot for grading. A sample of graded tubers from each plot was weighed and counted to determine average tuber weight. Ten of the largest tubers from each plot were cut and evaluated for hollow heart and internal necrosis. A 15-pound subsample of U.S. No. 1 potatoes was collected from every plot and transported to the Horticulture Pilot Plant at Ohio State University for determination of specific gravity and chipping potential both from the field and from storage.

A soil sample was also taken after harvest from the plots.

Results

Rainfall was adequate throughout the growing season with no prolonged dry periods; and was at times excessive. Average grades were the lowest in all the years of these Ohio potato variety trials. The average percent U.S. No. 1 was 77.5%. Hollow heart was also extremely bad in 1980.

Each entry will be discussed as to yield, tuber grade and defects, and any other pertinent information. (Refer to Tables 1-7.)

Neb. A129.69-1 led in average yield with 320 cwt/A of U.S. No. 1 potatoes for the six farms. Neb. A129.69-1 ranked second highest in yield in the observation trials of 1978 and fourth in 1979. It had 79.7% U.S. No. 1 and small tubers

averaging 4.3 ounces. Neb. Al29.69-1 had a very low percentage of hollow heart compared to the other cultivars.

Denali ranked second in average yield with 316 cwt/A of U.S. No. 1 potatoes for the six farms. Denali has yielded very well in the statewide and observation trials for the past four years. Denali had the highest percentage of hollow heart (25.4%) of all cultivars in the trial. It had 82.5% U.S. No. 1 and tubers averaged 4.9 ounces. This cultivar has had very high specific gravity compared to other cultivars in past trials.

W 718 ranked third in average yield with 296 cwt/A of U.S. No. 1 potatoes for the six farms. This cultivar has had above average yields compared to the standard varieties in past trials. It was third highest in hollow heart (20.4%) and this has been a concern in past trials. W 718 had 81.5% U.S. No. 1 and tubers averaging 4.7 ounces.

Michibonne ranked fourth in average yield with 291 cwt/A of U.S. No. 1 potatoes. This variety has performed well in past trials. It had 80.4% U.S. No. 1 and the largest tuber size (5.9 ounces) compared to the other varieties--a characteristic noted in past trials. This variety is being phased out of production in seed growing areas.

Michimac ranked fifth in average yield with 278 cwt/A of U.S. No. 1 potatoes. It had 80.9% U.S. No. 1, tubers averaging 4.9 ounces, and 18.4% hollow heart.

Crystal (ND8891-3) ranked sixth in average yield with 273 cwt/A of U.S. No. 1 potatoes. This variety led in yield in the statewide trials in 1978 and 1979. This variety has a poor grade as noted in past trials, but this year averaged only 69.3% U.S. No.1, primarily due to second growth and growth cracks. It had 12.9% hollow heart and tubers averaging 4.8 ounces.

Katahdin ranked seventh in average yield with 267 cwt/A of U.S. No. 1 potatoes. It had 78.8% U.S. No. 1 and tubers averaging 4.8 ounces. It had 15.3% hollow heart.

CA02-7 ranked eighth in average yield with 223 cwt/A of U.S. No. 1 potatoes. It has performed well in past observation trials. It had 76.3% U.S. No. 1, tubers averaging 4.6 ounces, and the second highest percentage of hollow heart, 22.5%.

Norchip ranked ninth in average yield with 201 cwt/A of U.S. No. 1 potatoes. It had 68.3% U.S. No. 1. Tubers were the smallest of any variety averaging 3.6 ounces, but had the lowest amount of hollow heart, 1.7%.

Summary

Neb. Al29.69-1 led in yield and had a low incidence of hollow heart. It yielded well in the observation trials of 1978 and 1979. Denali continues to look promising. It has high yields and high specific gravity. Although hollow heart was severe this year, we don't think this will be a major problem in its production. W 718, year-after-year continues to have above-average yields. The percentage of hollow heart this variety has had in several years of trials should be taken into account if planted commercially. W 718 would be a fresh market potato only. Michibonne has yielded well in Ohio, but certain problems with this variety will cause it to be phased out of seed production. Michimac has yielded well in past trials and may increase in production in Ohio. Crystal (ND8891-3) yielded very poorly in 1980 compared to its record in 1978 and 1979. CA02-7 had poor yields in 1980 after

good performance in 1978 and 1979.

TABLE 1. Average U.S. No. 1 yields, grades and stands -- Main Trials, 1980. (Listed in order of average yield of the six farms).

Entry	Avg. Yields cwt/A	Average Percent			Tuber Wt. (oz)	Avg. Percent stand
		U.S. No.1	B-Size	Culls		
Neb. A 129.69-1	320	79.7	6.4	14.0	4.3	92.1
Denali	316	82.5	6.1	11.5	4.9	91.2
W 718	296	81.5	4.7	13.5	4.7	85.8
Michibonne	291	80.4	2.6	17.0	5.9	91.3
Michimac	278	80.9	4.6	14.7	4.9	89.9
Crystal	273	69.3	4.7	26.0	4.8	90.7
Katahdin	267	78.8	5.6	15.5	4.8	89.1
CA 02-7	223	76.3	7.3	16.4	4.6	85.7
Norchip	201	68.3	16.5	21.4	3.6	92.3
Average	274	77.5	5.8	16.7	4.7	89.8

TABLE 2. Yield U.S. No. 1 tubers in cwt/A for each farm. Statewide Trials. (Rank of yield on each farm in parenthesis)

Farm Entry	1 B	2 TH	3 L	4 C	5 M	6 Tr	Average
Neb. A129.69-1	508(1)	303(2)	307(3)	466(1)	158(5)	178(5)	320(2.8)
Denali	498(2)	338(1)	274(5)	407(3)	193(1)	186(3)	316(2.5)
W 718	401(5)	272(4)	315(2)	439(2)	150(6)	197(2)	296(3.5)
Michibonne	460(4)	263(5)	326(1)	353(7)	185(2)	161(7)	291(4.3)
Michimac	363(8)	252(7)	271(6)	398(4)	184(3)	202(1)	278(4.8)
Crystal	475(3)	282(3)	199(9)	350(6)	170(4)	152(8)	273(5.5)
Katahdin	372(7)	258(6)	283(4)	377(5)	140(7)	173(6)	267(5.8)
CA02-7	377(6)	218(8)	20.(7)	322(8)	104(8)	114(9)	223(7.7)
Norchip	262(9)	176(9)	200(8)	305(9)	78(9)	184(4)	201(8.0)
Average	413	262	264	380	151	172	274

TABLE 3. Percent U.S. No. 1 for each farm. Statewide Trial.

Farm Entry	1 B	2 TH	3 L	4 C	5 M	6 TR	Average
Neb. A129.69-1	90.0	85.5	77.4	84.5	59.9	80.7	79.7
Denali	90.5	88.1	73.8	84.6	77.5	80.3	82.5
W718	92.6	86.3	79.8	89.2	65.5	75.8	81.5
Michibonne	92.2	86.9	76.0	80.2	73.8	73.5	80.4
Michimac	86.4	83.0	73.6	90.9	73.3	78.9	81.0
Crystal	78.7	77.3	62.0	78.0	59.2	60.3	69.3
Katahdin	91.4	83.5	77.2	87.3	60.6	72.9	78.8
CA02-7	92.8	83.6	69.4	82.6	59.9	69.2	76.3
Norchip	77.8	77.2	69.1	70.4	44.3	70.9	68.3
Average	88.0	83.5	73.1	83.1	63.8	73.6	77.5

TABLE 4. Percent B size tubers for each farm. Statewide Trial.

Farm Entry	1 B	2 TH	3 L	4 C	5 M	6 TR	Average
Neb. A129.69-1	5.0	9.2	6.2	3.6	6.4	7.8	6.4
Denali	2.9	5.4	4.8	4.7	8.0	10.6	6.1
W718	2.9	5.6	3.6	3.7	5.7	6.8	4.7
Michibonne	1.8	3.4	2.0	2.0	2.0	4.2	2.6
Michimac	6.5	6.8	4.0	2.2	3.2	4.8	4.6
Crystal	3.7	5.2	1.6	4.4	4.7	8.4	4.7
Katahdin	5.1	9.4	2.8	5.4	4.4	6.4	5.6
CA02-7	3.8	8.0	4.2	4.2	8.8	14.6	7.3
Norchip	13.0	15.2	7.7	9.2	10.4	7.6	10.5
Average	5.0	7.6	4.1	4.4	6.0	7.9	5.8

TABLE 5. Percent culls for each farm. Statewide Trial.

Farm Entry	1 B	2 TH	3 L	4 C	5 M	6 TR	Average
Neb. A129.69-1	5.0	5.3	16.4	11.9	33.6	11.6	14.0
Denali	6.7	6.4	21.4	10.6	14.6	9.2	11.5
W 718	4.5	8.2	16.6	5.2	28.8	17.4	13.5
Michibonne	6.0	9.7	22.0	17.6	24.3	22.2	17.0
Michimac	7.1	10.3	22.8	7.0	24.5	16.6	14.7
Crystal	17.6	17.4	36.4	17.6	36.0	31.2	26.0
Katahdin	3.5	7.8	20.0	7.2	35.0	20.6	15.7
CA 02-7	3.2	8.4	26.4	13.2	31.2	16.2	16.4
Norchip	9.7	8.0	23.2	20.6	45.4	21.4	21.4
Average	7.0	9.1	22.8	12.3	30.4	18.5	16.7

TABLE 6. Tuber weight (oz.) for each farm. Statewide Trials

Farm Entry	1 B	2 TH	3 L	4 C	5 M	6 TR	Average
Neb. A129.69-1	-	4.3	4.5	5.1	3.9	3.8	4.3
Denali	-	5.1	5.5	5.1	4.4	4.2	4.9
W718	-	5.0	5.4	5.3	4.9	4.0	4.7
Michibonne	-	5.0	6.3	7.6	6.4	4.1	5.9
Michimac	-	4.2	4.9	5.3	5.9	4.1	4.9
Crystal	-	4.4	5.0	4.9	5.3	4.3	4.8
Katahdin	-	4.0	5.3	5.4	4.9	4.2	4.8
CA02-7	-	4.0	4.9	5.1	5.0	3.9	4.6
Norchip	-	3.0	3.8	3.8	3.5	3.9	3.6
Average	-	4.3	5.1	5.3	4.9	4.1	4.7

TABLE 7. Percentage of total tubers cut showing hollow heart and internal necrosis. Statewide Trials.

Entry	H.H.	NEC	Entry	H.H.	NEC
Crystal (ND 8891-3)	12.9	2.1	Katahdin	15.3	2.1
W718	20.4	5.4	Denali	25.4	2.1
Norchip	1.7	9.5	CA02-7	22.5	.8
Michimac	18.4	1.7	Neb. A129.69-1	6.6	.3
Michibonne	11.3	.44			

OBSERVATION TRIAL

Introduction

Over 25 entries were evaluated in the observation plots. Most entries are new breeding lines or varieties released by potato breeders recently.

Procedure

The procedure was approximately the same as for the main plots. The observation plots were on two of the six farms that had the main plots. Plot size consisted of double rows approximately 25 feet long (50 seedpieces). Stand, vigor, ozone damage, and disease were evaluated during the growing season. Harvest procedures were the same as for the main plots. Only the most promising entries were saved for storage and chipping tests.

Results

The three highest yielding varieties were Atlantic, NY59, and Dakchip. Atlantic had 35% hollow heart and the highest percentage of internal necrosis (5%) in the tuber samples cut at the two farms. Even though Atlantic yields well and has high specific gravity, we do not recommend planting this variety because the problems have also occurred in past trials. NY59 had the largest tuber size of all varieties in the observation trial, 5.1 ounces. However, it had 28% hollow heart in the cut tubers. It had no internal necrosis but led in 1978. Dakchip had 6.5% hollow heart and tubers averaging 4.5 ounces. It has had above-average yields and no major problems in past trials.

Several other entries that yielded well in these trials will be tested again next year. Many observation entries will be dropped because of low yield ability and/or a high degree of external or internal defects.

TABLE 8. Yield, grade, and tuber size of Observation Entries.

Entry	Yield (cwt/A)	% U.S. No. 1	Tuber weight (oz)
Atlantic	247	85.6	4.5
N.Y. 59	234	82.6	5.1
Dakchip	222	76.2	4.5
Superior	197	81.8	3.9
W 738	195	79.2	4.1
Neb. 51-3	195	76.3	4.2
Lemhi Russet	193	69.4	4.8
Kennebec	192	69.8	4.5
MS 402-1	192	83.6	4.3
MS 108-5	191	86.9	3.5
B7583-6 (Russette)	190	72.0	4.8
Neb. 63.71-1	188	75.0	4.9
B6987-184	173	79.0	4.0
Croatan	171	76.6	3.9
AF 41-2	166	78.3	4.2
MS 403-2	161	86.9	4.3
Allegash	160	74.8	4.2
Oceania	150	85.0	4.1
A70758-3	129	43.8	4.4

TABLE 9. Summary of percent hollow heart and internal necrosis of tubers cut - Observation Trial.

Hollow Heart

<u>Severe (Over 15%)</u>	<u>Moderate (9 to 15%)</u>	<u>Slight (8% and under)</u>
Atlantic	MS 403-2	AF 41-2
Oceania	W 738	AF 205-9
Jemseg	BelRus	Kennebec B
Allegash		Dakchip
N.Y. 59		Croatan
Neb. 63.71-1		
Lemhi Russet		
B 6987-184		
AK 28		
B 7583-6		

Necrosis

<u>Severe (Over 3.5%)</u>	<u>Moderate (Over 3.5%)</u>	<u>Slight (1.5%)</u>
Atlantic	B 7583-6	Kennebec B
		A70758-3
		MS 108-5
		MS 402-1
		MS 403-2
		B 6987-184

CELERYVILLE MUCK TRIAL

Introduction

Ten entries were evaluated at the OARDC Muck Crops Branch at Celeryville in 1980. These included Superior and Katahdin. Superior is a standard early muck variety due to its scab resistance. Katahdin is a mid-season standard.

Procedure

Plots were planted on May 15. The spacing in the plots was a double row 32 inches apart, skip 40 inches to the next double row, and seedpieces were spaced 11 inches apart in the row. Plots were a double row 25 feet long. Fertilizer was broadcast before planting at a rate of 850 lbs/A of 6-24-12. Temik was the systemic insecticide used at planting.

At harvest plots were dug by machine and tubers picked up by hand. The tubers were graded for B's and culls.

Results

The overall yield of U.S. No. 1 potatoes in 1980 was 283 cwt/A. The standard varieties, Katahdin and Superior, yielded 268 cwt/A and 224 cwt/A, respectively.

W 718 led in yield of U.S. No. 1 potatoes for the fifth consecutive year. Again, there was a high percentage of hollow heart in cut tubers. Michimac ranked second in yield and has done well in past trials. CA02-7 ranked third in yield and had only 7% hollow heart. Other selections with above-average yields were Jemseg which is an early maturing variety, and Neb. A129.69-1 which led in yield in the statewide trials. Michibonne, Denali, and Oceana did not look promising for production on muck soils.

TABLE 10. Yield and grade characteristics of entries in Celeryville Muck Trial.

Entry	Cwt/A		Percent			
	Total	US No.1	US No.1	B-Size	Culls	H.H.
W 718	385	346	89.9	7.2	2.9	40
Michimac	380	342	89.9	5.7	4.4	13
CA02-7	361	311	85.9	9.7	4.4	7
Jemseg	329	302	91.6	3.4	5.0	0
NebA129.69-1	339	295	86.8	8.6	4.6	7
Katahdin	315	268	84.9	9.1	6.0	0
Michibonne	285	255	89.4	6.3	4.3	5
Denali	302	247	81.7	10.0	8.3	40
Oceana	274	239	87.3	9.7	3.0	20
Superior	272	224	82.1	10.8	7.1	0

NORTH CENTRAL REGIONAL TRIAL

Introduction

The North Central Regional Potato Variety Trial has been conducted for its 30th year. Eleven states and two Canadian provinces are now cooperating in this trial. Participating plant breeders throughout the country give seed of their most promising potato selections to cooperators, and they are evaluated in each cooperating state or province. At least 35 varieties have been named after testing in this program. This program is under the direction of Robert H. Johannsen of North Dakota State University.

Procedure

Seventeen varieties and selections were evaluated in the NCR plot at Wooster. Six breeders entered 5 red, 4 white, and 4 russet selections plus 4 standards. Plots were single rows, 30 feet long and were replicated three times in a randomized complete block design. The plot was planted on May 1 and vines were killed on September 3. The fertilizer program consisted of 1200 lbs. of 10-20-20, half of which was broadcast before planting and the other half banded at planting.

Plots were dug by machine and tubers picked up by hand and weighed. Tubers were graded for B's and culls and internal and external defects.

Results

Yields averaged 289 cwt. U.S. No. 1/A (Table 11). Neb. A129.69-1 was the highest yielding cultivar and was the top cultivar in the statewide trials. Red Pontiac was second highest in yield. LA 42-38 ranked third in yield and has done well in the NCR trials the past three years. It is a red-skinned variety. Neb. A71.72-1 yielded well but had a high instance of internal necrosis when all the rest of the entries had little. TND 14-1 Russ is a russet variety from North Dakota that yielded well and will be tested in Ohio again.

TABLE 11. Average yield, grade, and defects - North Central Regional Trial.

Entry	U.S. No. 1		G.C. ¹	2nd G. ²	G. ³	H.H. ⁴	I.N. ⁵	V.D. ⁶
	cwt/A	%						
ND 146-4R	169.0	74.6	0	2	2	0	2	25
Norland	252.2	77.2	10	12	5	0	2	43
Neb. A129.69-1	505.0	88.7	0	5	3	0	3	15
Neb. A71.72-1	345.2	77.0	0	2	0	5	22	49
Neb. A219.70-3	200.4	78.3	3	6	9	0	0	32
MN 8742	264.6	70.8	11	29	2	2	0	51
MN 8757	252.9	80.7	5	5	8	0	5	25
MN 9319	163.8	76.6	19	0	8	0	0	81
Wisc. 723	236.5	78.7	7	5	3	0	0	56
Wisc. 726	281.6	81.8	0	9	9	4	2	73
Wisc. 806R	325.4	70.9	2	10	0	0	0	57
La. 42-38	381.5	81.9	8	5	2	0	2	44
AK 34-2	336.6	83.4	0	2	8	0	0	16
TND 14-1 Russ	269.1	85.1	2	5	7	2	2	28
Red Pontiac	489.3	85.3	8	3	0	0	0	41
Russet Burbank	140.4	41.2	16	80	3	2	0	57
Norchip	302.0	86.2	4	7	7	0	0	40
Average	289.1	77.6						

1 G.C. - Growth cracks
 2 2nd G. - Second growth
 3 G - green

4 H.H. - hollow heart
 5 I.N. - internal necrosis
 6 V.D. - vascular discoloration

NORTH EASTERN REGIONAL TRIAL

Introduction

The North Eastern Regional Potato Variety Trial has been in existence for 5 years. In 1980, Ohio became a part of the trial. The trial is composed of thirteen states in the northeastern section of the United States and Canada. Potato breeders in these states enter their more promising looking selections into this trial. Co-operators may then choose the selections to test in their state.

Procedure

Thirteen varieties and selections were evaluated in the NER plot at Wooster. Plots were single rows, thirty feet long and were replicated three times in a randomized complete block design. The plot was planted on May 1, killed September 3, and harvested September 12. The fertilizer program consisted of 1200 lbs. of 10-20-20, half of which was broadcast before planting and the other half banded at planting.

Plots were dug and tubers picked up by hand and weighed. Tubers were graded for B's and culls and internal and external tuber defects.

Results

Katahdin was the highest yielding variety in this trail (Table 12). BR7093-23 and CA02-7 are two round whites that yielded well. CD106-16 was a russet that had rough tubers. B7583-6 (Russette) is a russet that has been in previous Ohio trials. It has a round to oblong tuber and a tendency to hollow heart. Allegash Russet was the lowest yielding variety in the trial.

TABLE 12. Average yield, grade, and defects - Northeastern Regional Trial.

Entry	Cwt/A		US No.1	B's	Culls	HH	Int.Nec.
	Total	US No. 1					
Katahdin	468.03	393.15	84%	3	12	0	27
BR7093-23	460.91	382.56	83	4	13	0	23
CA02-7	410.29	336.44	82	6	14	10	0
CD106-16	489.18	317.97	65	3	31	7	10
BR5991-WV16	505.44	308.32	61	5	35	3	57
B7583-6	372.34	290.43	78	4	18	20	0
BR708848	377.86	287.17	76	4	20	0	30
Norchip	363.15	272.36	75	6	18	0	23
C7358-26A	408.98	245.39	60	4	35	0	0
W564-3A	420.93	243.62	58	5	37	0	27
AF92-3	296.84	207.79	70	8	22	0	7
F69016	390.73	175.83	45	7	47	0	0
Allegash Russet	201.83	135.23	67	6	27	3	7

VERTICILLIUM SUSCEPTIBILITY TRIALS

Introduction

A number of Ohio growers have expressed interest in knowing the relative susceptibility of potato cultivars to Verticillium. Once established in the soil, this fungus causes premature decline of some cultivars and is a major factor in the "early dying" disease complex. It is also a major cause of vascular discoloration in tubers.

Procedure

A plot was established on Wooster silt loam at the OARDC, Wooster, in a location that had been cropped to Kennebec for three previous years. The continuous cropping of Kennebec had resulted in high levels of Verticillium in the soil. Certified seed potatoes of 21 cultivars and selections were cut by hand and planted on May 12 in 30-foot, single rows spaced 3 feet apart. All plots were treated with an in-furrow application of the insecticide Temik at 3 lbs a.i./A and maintained throughout the season under standard commercial fertility and disease control programs. On August 6 (86 days after planting) vines were visually rated for maturity on a scale of 0 (all vines green) to 3 (vines nearly dead). After rating, ten stems were cut at the soil line at random along each row, and the basal 3" removed and placed in plastic bags. Stems were washed, surface sterilized for 3-60 sec in 0.5% NaOCl (10% chlorox), aseptically sectioned and placed on the surface of an ethanol-antibiotic agar medium selective for Verticillium. After 10-14 days incubation, sections were examined for the presence of Verticillium and each stem was rated from 0 (no Verticillium recovered) to 8 (all plated tissues completely infected). On September 15, after nearly all cultivars had matured, ten tubers were dug at random from each row. Tubers were washed and a slice was removed just under the stem end. Slices were surface sterilized as above and small sections of discolored vascular tissue were removed, plated and evaluated as above.

Results

The data shown on the table indicate that most potato cultivars presently available are moderately to highly susceptible to Verticillium. It is interesting to note that the recovery rate of Verticillium is always higher from stems than from tubers and, in a few cases, cultivars with high levels of stem infection have only moderate or low levels of tuber infection. Only three cultivars, BelRus (russet skinned), Oceana (white skinned) and Norland (red skinned) showed any amount of Verticillium tolerance in these tests. Since none of these are promising cultivars for wide-scale use in Ohio, further work is needed to find acceptable cultivars tolerant to Verticillium.

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Verticillium Susceptibility Trials

Cultivar	Vine maturity ¹ (86 days)	Verticillium Index ²	
		Stems	Tubers
W-718	0	7.8a ³	2.0abc
Oneida	1	7.7a	3.4ab
Kennebec	0	7.6a	3.0abc
Monona	1	7.1ab	2.0abc
Michibonne	0	7.0ab	3.6ab
Jemseg	3	6.7ab	2.2abc
Norchip	1	6.6ab	1.8 bc
Michimac	0	6.4abc	2.6abc
Denali	0	6.3abc	1.4 bc
Atlantic	1	6.2abc	4.8a
Dakchip	2	6.2abc	2.4abc
Croatan	1	6.0abc	3.8ab
Ca-027	0	6.0abc	1.2 bc
Neb. 129.69-1	0	5.6abc	2.6abc
Shurchip	2	5.4abc	3.0abc
Superior	2	5.3abc	3.4ab
Katahdin	0	5.3abc	0.2 c
Crystal	1	5.0 bc	4.0ab
Belrus	3	3.9 c	1.0 bc
Oceana	2	1.4 d	1.0 bc
Norland	3	0.8 d	1.0 bc

1. Maturity at time of stem sampling (Aug. 6) rated on a scale of 0 (vines completely green) to 3 (vines nearly dead).
2. Each figure is the average rating of ten basal stems or tubers sectioned and planted on a Verticillium selective agar medium. Values range from 0 (no Verticillium recovered) to 8 (all tissues completely infected).
3. Means within a column followed by the same letter do not differ at the 5% level of significance according to Duncan's new multiple range test.

APPENDIX

TABLE A1--Origin and Characteristics from Entries

Entry	Origin	Tuber Evaluation at Harvest		Notes from Prior Years	Years Tested in Ohio(2)
		Field Comments	Grade Notes		
Crystal (ND8891-3)	1980 N.D.	Mostly oblong. Wide range in size. Cream or buff skin. Shallow eyes. Some rough. Trace 2nd growth and cracks.	Av. 26% culls-shape, green, cracks. Av. 9 main entries 12% HH high at farms 4, 5, & 6, but below av. of 9 entries.	High yields and high Sp.Gr. Av. grades. May be rough. has been good most years.	6
W 718	Wisc.	Round to oblong. cream skin. Shallow eyes. Slightly indented bud end. Size varies.	Av. 20% H.H. Good grade. Culls green and shape.	Midseason. High yields. Large attractive. Low sp.gr. Chips blister Some hollow heart.	8
Norchip	1968 N.D.	Small, round tubers. Trace second growth & cracks. Slightly indented eyes.	Av. 21% culls, 10% B size. 9% necrosis. Small tubers.	Sets heavy. Tubers tend to be small Good chipper. Sometimes rough.	13
Michimac	1977 MI	Round or blocky to oblong. Size varied small to large. Buff skin. Shallow eyes. Shallow indented bud end.	Greening and rot. Growth cracks. Av. 18% HH. Above av. grade.	Good yields and grades. Low Sp.Gr. in 1978. Chips may blister. Good grades. Stem rot common.	6
Michibonne	1977 MI	Round to oblong. Netted cream color skin. Shallow eyes. Trace of 2nd growth.	High % culls-shape and green. Largest tubers (5.9 oz). Lowest % B-size.	Late midseason. High yields but variable. Good grades. Attractive Large tubers. Low sp. gr.	10
Katahdin	1935, USDA	Round to oblong. Cream color skin. Trace 2nd growth. Shallow eyes.	Avg. % culls-green and shape. 15% HH	Widely adapted. Standard all-purpose variety.	18

APPENDIX

TABLE A1--Origin and Characteristics from Entries(cont.)

Entry	Origin	Tuber Evaluation at Harvest			Years Tested in Ohio(2)
		Field Comments	Grade Notes	Notes from Prior Years	
Denali	1978,Alaska	Round to oblong. Smooth cream color skin. Shallow eyes. Sl. indented bud end. Trace of 2nd growth.	Av. 25% HH. Best % US #1. Lowest % culls-shape, green & cracks.	High yields. Good grades. May be too late. High sp. gr.	4
Ca02-7	Ca. Inst.	Round to oblong. Wide range in size. Buff skin slightly russetted. Shallow eyes and butts. Trace 2nd growth & cracks.	Low grades at farms 3, 5, & 6 - shape, rot, cracks, greening. Good at farm 1 2, & 4. Av. same as W718. Av. 22.5% HH.	Scab resistant. Fair chipper. Good in 1978. Second high yield in 1979. Good grade both years.	3
Neb. A129.69-1	Neb.	Round tubers. Cream color, heavy netted skin. Trace of 2nd growth. Attractive.	Low % HH and necr. Small tubers. Av.% B size & culls shape.	Late. High yields & grades. Size varies.	3
<u>OBSERVATION ENTRIES</u>					
Superior	1961, Wisc.	Round. Slightly netted, light cream color skin. Shallow eyes. Sl. indented bud end.	Av.% culls-shape. Low % HH and Necr.	Early. High grades. Standard early variety. Usually smooth and uniform.	18
AF 41-2	ME	Round to oblong. Shallow eyes. Trace 2nd growth.	Culls mainly shape, some growth cracks.		1
Oceana (B6969-2)	1980,USDA	Round to oblong, small tubers. Cream color skin. Shallow eyes, sl. indented bud end.	Culls mainly green. 16% HH.	Med. early. Very low grade in 1977.	3

APPENDIX

TABLE A1--Origin and Characteristics from Entries(cont.)

Entry	Origin	Tuber Evaluation at Harvest		Notes from Prior Years	Years Tested in Ohio(2)
		Field Comments	Grade Notes		
Jemseg (F67072)	1978, N.B.	Round to oblong. Tend to be large. Slight russet. Shallow eyes and butt fairly shallow. Second growth, cracks, enlarge lenticels. Att. at farms 4 and 5.	Rot, cracks, green- ing, rough skin at Tritten's, and extra enlarge lenticels. Very low grades at farms 4 and 6.	Chips but may blister. May tend to growth cracks. Low Sp.Gr.	3
Atlantic	1975,USDA	Round. Cream, heavy- netted skin. Shallow eyes. Sl. indented bud end.	35% HH. Highest amt. necrosis (5%). Ex- cellent grade.	Attractive. High yields. Early midseason. High sp.gr. Susc. to necrosis and HH.	11
BelRus	1978,USDA	Oblong to long. Dark, heavy russet skin. Trace of second growth.	High % B size. Culls mainly shape.	Well shaped heavy russet. Very low yields. Med. early. Long tubers.	3
Russette (B7583-6)		Round to oblong tubers. Nice russet skin. Trace of second growth.	Second highest nec- rosis (3.5%). 19% culls-shape, cracks, & scab.	Dark russet. Midseason. Growth cracks and green in 1979. Below avg. grades.	4
Allegash Russet	1979, ME	Oblong tubers. Russet skin. Trace of growth cracks. Shallow eyes Shallow bud end.	Low yields, cracks & grade. High % B size and culls-shape and cracks. 24% HH.		1
Kennebec	1948, USDA	Round to oblong. Smooth cream color skin. Sl. indented eyes. Trace of growth cracks.	High % culls-shape, green, and cracks.	High yields. Low grades. Good size.	15
Dakchip (ND8888-2)	1979, ND	Round to oblong. Light creamy skin. Eyes and Bud end mod. indented. 2nd growth, cracks, en- large lenticels.	Above av. grade at Thompson's, below at Tritten's. Culls green and misshapen. Very little HH.	Good chipper. Low Sp.Gr. Yields av. or above. Grades av. or below. Simi- lar to Norchip.	3

APPENDIX

TABLE A1--Origin and Characteristics from Entries(cont.)

Entry	Origin	Tuber Evaluation at Harvest		Notes from Prior Years	Years Tested in Ohio(2)
		Field Comments	Grade Notes		
NY 59	NY	Round. Creamy skin. Shallow eyes. Bud end some indented. Attractive. Size varied widely.	28% HH. Av. good grades. Well above av. Some rot and cracks at Tritten's.	High yields. Led each year. Good grades.	4
Neb.63.71-1	Neb.	Oblong tubers. Light color russet. Shallow eyes. Some misshapen tubers.	41% HH. High % culls-shape.	Russet. Late. Av. yields & grades. Tends to HH.	2
Croatan	1977, NC.	Round tubers. Indented eyes. Deep bud end. Growth cracks. Rough.	Low grades and cracks, rough.	Midseason. Low sp.gr. Below av. yield in 1978.	2
Neb. 51-3	Neb.	Round to oblong. Creamy skin. Shallow eyes with pink or red tint.	Misshapen, cracks, greening and rot in culls. Av. grades.		1
Lemhi Russet (A67678-1)	1980, ID & USDA	Oblong tubers. Light russet skin. Sl. indented end. Trace of 2nd growth & cracks.	Misshapen. Rough. 38.5% HH. High % culls-shape and cracks.	Low yields & grades. Rough.	2
A70758-3	ID	Oblong tubers. Light russet skin. 2nd growth & growth cracks.	Misshapen. Rough. Very low yields.		1
MS 108-5	MI.	Round. Small with wide range in size. Eyes mod. shallow. Bud slightly indented. Enlarged lenticels.	High % B size. Few culls. Misshapen and greening. Grade av. and sl. above av.		1
MS 402-1	MI	Round to oblong. Wide range in size. Shallow eyes and bud ends. Poor app. Enlarged lenticels. Cracks, some deep scab.	Yellow flesh. Grades above average. Yields av. or above. Culls mostly green and misshapen.		1

APPENDIX

TABLE A1--Origin and Characteristics from Entries (cont.)

Entry	Origin	Tuber Evaluation at Harvest Field Comments	Grade Notes	Notes from Prior Years	Years Tested in Ohio(2)
MS 403-2	MI	Round to slightly ob- long. Wide range in size. Buff skin. Slightly in- dented eyes and bud end. Poor app. Red tint in eyes.	Deep scab at Thompson's Enlarged lenticels at Tritten's. Grades above av. Av. yield. 30% HH at Tritten's.		1
W 738	Wisc.	Round or blocky to slightly oblong. Wide range in size. Buff or creamy skin. Slightly indented eyes and bud end.	Yields and grades above av. Culls mis- shapen, green, cracks, and rot, 20% HH at Tritten's only.	Low grades and below av. yields in 1978.	2
B6987-184	USDA	Oblong. Buff skin. Shallow eyes and bud end. Some deep scab. En- larged lenticels.	Av. grade or above. Av. yield at Thomp- son's, low at Trit- ten's. Culls misshapen, green, cracks, and scab. 70% HH at Tritten's.	High Sp.Gr. Yields below Superior Late midseason.	2

APPENDIX

TABLE A2.--Cultural and pest control methods - Ohio Potato Variety Trials - 1980

	Farm No.1(B)	Farm No.2(TH)	Farm No.3(L)	Farm No.4(C)	Farm No.5(M)	Farm No.6(TR)
Date planted	April 26	April 29	May 7	May 23	May 24	May 31
Date killing chemical applied	Sept. 8	Sept. 6 (Rotobeat-no chemical)	Sept. 13	Sept. 16	Sept. 15	Sept. 8 & 15
State of maturity when killed	Mostly green (?)	Main entries 75% dead	Some green some nearly dead	Some fairly green; some fairly mature	Mostly green	Mostly green except early entries
Date harvested	Sept. 18	Sept. 25	Oct. 1	Oct. 2	Oct. 13	Oct. 14
No. days planting to killing	135	130	132	116	114	117
No. days planting to harvest	145	149	146	132	142	136
1979 crop	Cantaloupe	Wheat	Soybeans	Wheat	Wheat	Wheat
Cover crop plowed down	None	Clover and Timothy	None	Rye	Clover	Timothy
Fertilizer lbs/acre plowed down	200 lbs. 12-24-24	40 lbs. nitrogen	40 lbs. nitrogen	None	None	None
disced in broadcast	400 lbs. 12-24-24					
in-row at planting	400 lbs. 12-24-24	1,000 lbs. 11-20-20	2,000 lbs. 6-9-9	700 lbs. 10-26-26	1,100 lbs. 15-15-15	1,000 lbs. 10-20-26
sidedress				60 lbs./nitrogen		
Herbicide	Sencor	Eptam plus Lorox later	Eptam and Lorox or Sencor later	Sencor or Lasso Sencor	Sencor later	50 lbs. Eptam

APPENDIX

TABLE A2.--Cultural and pest control methods - Ohio Potato Variety Trials - 1980 (cont.)

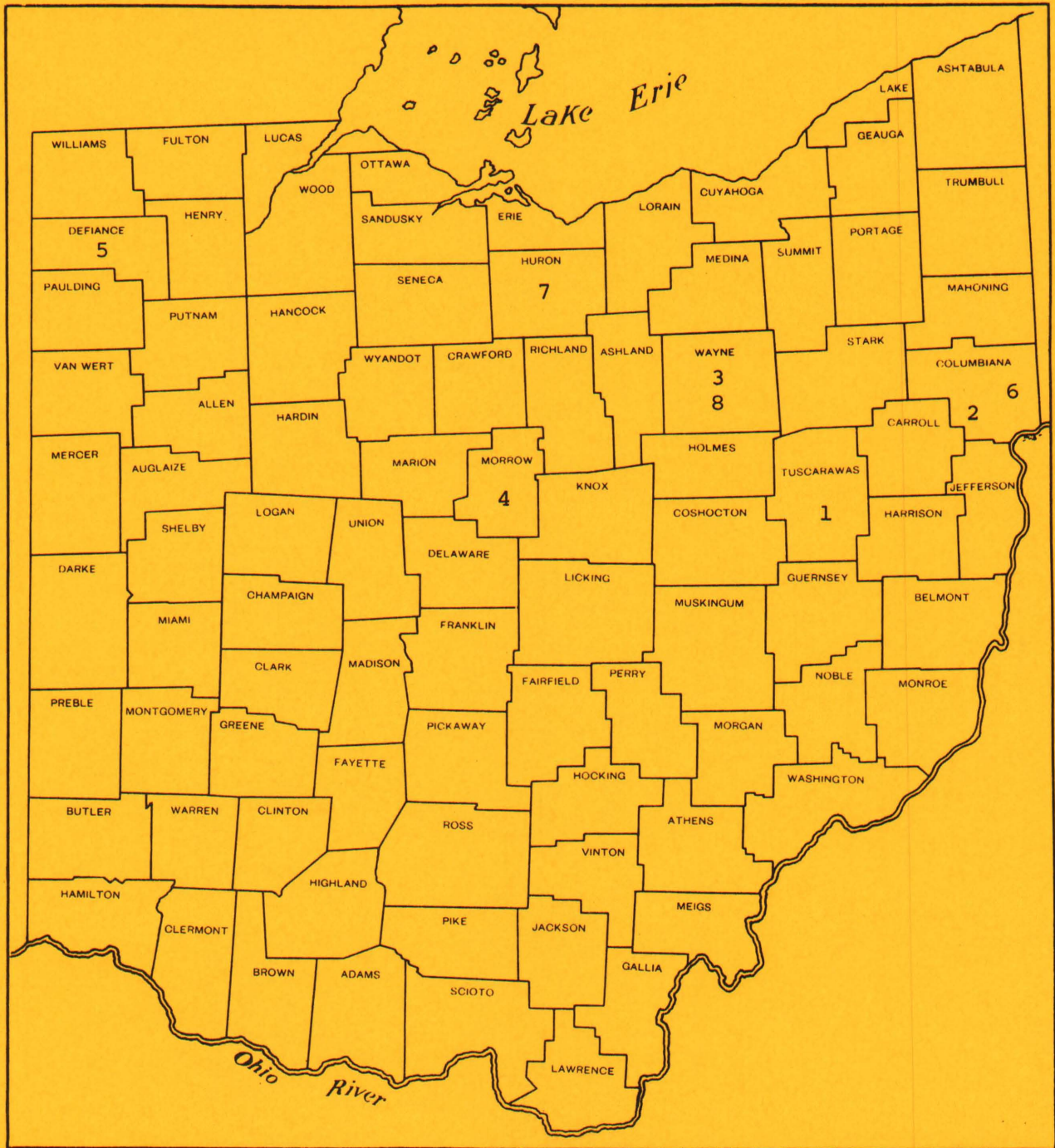
	Farm No.1(B)	Farm No.2(TH)	Farm No.3(L)	Farm No.4(C)	Farm No.5(M)	Farm No.6(TR)
Systemic Insecticide	Furidan	Furidan	18 lbs. Temik	Furidan	Furidan	30 lbs. Furidan
Spacing	9 1/2 x 34	8 1/2 x 36	10 x 34	10 1/2 x 36	10 x 32	11 x 34
Soil type	Sandy silt loam	Silt loam	Silty Clay loam	Sandy silt loam	Silt loam	Silt loam
Total Rain (inches)		29.0	19.8	16.8	21.4	24.0

APPENDIX

TABLE A3.--U.S. No. 1 yields in cwt/acre for major entries in the Ohio State Wide Trials in 1980 or more than one year in the last 10 years.

Entry	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Early & Med. Early</u>										
Haig	310	296	----	----	----	----	----	----	----	----
Superior	275	228	287	266	273	342	248	256	----	----
<u>Early Midseason</u>										
ND 8891-3 (Crystal)	----	----	----	----	----	----	256	348	425	273
Atlantic	----	----	----	----	----	----	374	309	414	----
<u>Midseason & Late</u>										
W 718	----	----	----	----	371	385	360	299	386	296
Shurchip	335	304	310	305	327	----	----	----	----	----
Norchip	294	284	292	297	272	273	262	252	309	201
Hudson	347	352	342	396	348	----	----	----	----	----
Katahdin	285	277	283	301	336	319	320	255	346	267
6 CX 6	----	----	----	----	307	307	----	----	----	----
Penn 71	----	----	268	293	----	----	----	----	----	----
Snowchip	----	----	----	----	----	402	329	288	----	----
Abnaki	319	297	291	260	----	----	----	----	----	----
Kennebec	----	285	280	362	321	343	----	----	----	----
Michimac	----	----	----	----	----	----	----	----	384	278
Michibonne	----	----	----	----	----	----	----	----	391	291
Neb. A129.69-1	----	----	----	----	----	----	----	----	----	320
Denali	----	----	----	----	----	----	----	----	----	316
Ca 02-7	----	----	----	----	----	----	----	----	----	223
Average	300	290	294	310	319	316	306	293	379	274

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LOCATIONS OF 1980 OHIO POTATO VARIETY TRIALS

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