

Horticulture and Crop Science Series No. 791

January 2012

# 2011 OHIO POTATO GERMPLASM EVALUATION REPORT

Matthew D. Kleinhenz, Jennifer B. Moyseenko, Michelle Young,  
Sonia D. Walker and Bruce Williams

Department of Horticulture and Crop Science  
The Ohio State University

**IN COOPERATION WITH  
NORTHEAST (NE-1031)  
REGIONAL PROJECT**

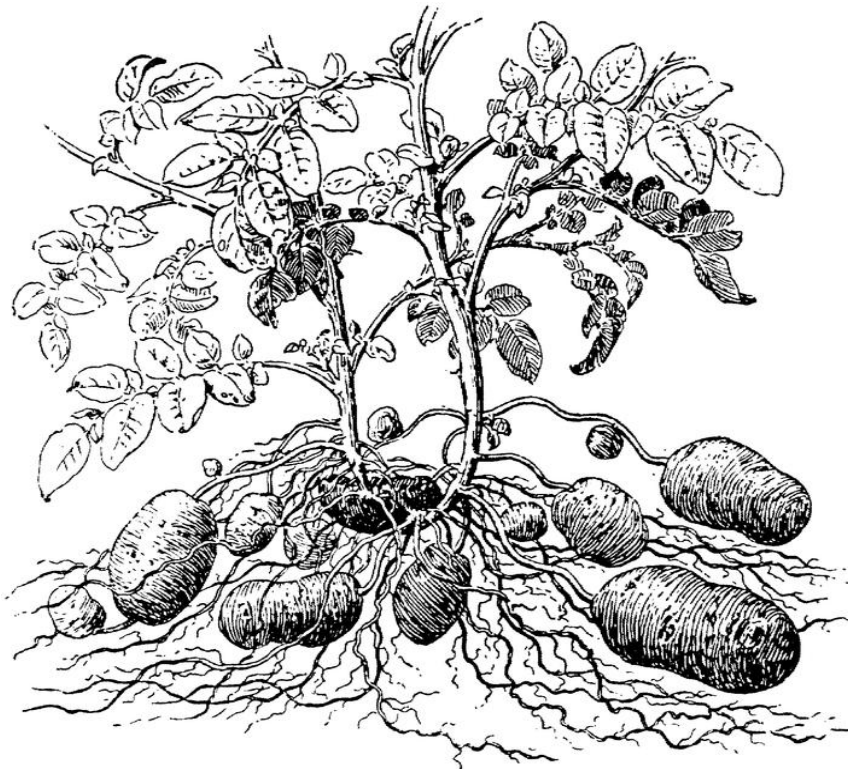


## ACKNOWLEDGMENTS

This project was funded by a grant from the USDA Cooperative State Research, Education, and Extension Service (CSREES) and by the OARDC, OSU Extension and the Department of Horticulture and Crop Science.

Special thanks to Bayer Corporation, Cerexagri, Inc., Dow AgroSciences LLC, Gowan, Gustafson, and Shearer's Foods, Inc., and Syngenta Crop Protection, Inc. for support.

The technical assistance of Bruce Williams, Terry Miller, Alex Musselman, Jordan Welsh, Charlene Zimmerman, Nikita Amstutz, Brittany Aukerman, Natalie Bumgarner, Kevin Fletcher, Paige Houser, Torri Leach, Matt McCarty, Sarah McNulty, and Dane Wolfe is gratefully acknowledged.



---

All programs of the Ohio Agricultural Research and Development Center are available to clientele without regard to race, color, creed, religion, sexual orientation, national origin, gender, age, disability or Vietnam-era status.

## TABLE of CONTENTS

Section	Page
<b>Ohio Potato Germplasm Evaluation</b>	
<u>Summary</u> .....	1
<u>Procedures</u>	
Planting, Stand Establishment, and Cultural Practices .....	1
Crop Yield and Quality .....	1
Chipping Quality Evaluation .....	2
Results .....	2
Table 1. List of participating breeding programs .....	4
Table 2. List of entries evaluated .....	5
Table 3. Marketable yield for standard varieties 2001-2011 .....	6
Table 4. Cultural, nutrient, and pest management practices in 2011 .....	6
Table 5. Seasonal and historical climatic data for the study site .....	7
<u>Results</u>	
Table 6. Percent stand, yield, and chip quality for NE-1031 .....	8
Table 7. Tuber characteristics for NE-1031 .....	9
Table 8. Percent stand, yield and chip quality for Observation Studies .....	10
Table 9. Tuber characteristics for Observation Studies .....	13
<u>Reference</u>	
Conversion Table for Specific Gravity .....	16
Tuber Rating System .....	17

# OHIO POTATO GERMPLASM EVALUATIONS - 2011

## Summary

Ohio cooperates with private and public breeders in the U.S. and elsewhere in evaluating varieties and experimental lines of fresh and processing potatoes. A total of eighty-eight distinct varieties and experimental lines developed in three breeding programs were evaluated in 2011 (Table 1). Entries were placed into one of four experiments completed at the Ohio Agricultural Research and Development Center (OARDC) in Wooster, OH; Northeast Regional Project 1031 (NE-1031), Triple Observation (OBT), Double Observation (OBD) and Single Observation (OBS). Named varieties were included in at least one study, numbered entries in one or more studies. Entries were contributed by breeding programs in Maine (ME), New York (NY), and USDA (in Beltsville, MD). Entries are listed in Table 2 and include a total of sixty-one varieties contributed by ME, four by NY, twelve by the USDA, and eleven varieties included as standards.

The studies were established to evaluate the growth and market traits of each entry when grown under non-irrigated conditions in Ohio. The fact that the trials at the OARDC are not irrigated tends to affect the performance of individual entries. Marketable yield of five varieties and seasonal rainfall for 2001-2011 at the OARDC are shown in Table 3.

## Procedures

### Planting, Stand Establishment and Cultural Practices

Seed potatoes were cut on May 3, 4, and 5, 2011 and allowed to cure under recommended temperature and humidity conditions. Plots were established on May 12, 2011. All entries in the NE-1031 experiment were replicated three times. Entries in the Observation studies were replicated once, twice or three times depending on the study. Percent stand was recorded 5 weeks after planting.

Tables 3, 4 and 5 contain plot, climatic and historical yield data for the study site, located on a well-drained Wooster silt loam. Pest, weed and disease pressure were minimized using procedures and materials consistent with local commercial practice, including weekly pesticide applications. Plants were vine-killed on September 12, 2011.

### Crop Yield and Quality

Whole plots in the NE-1031 and Observation trials were harvested on October 6, 2011. Tubers were placed in a barn under ambient conditions, and then transferred to humidified refrigerated (37° F) storage on October 17, 2011.

On November 2, 2011, tubers were removed for grading. At grading, the total weight of tubers produced by each genotype (across multiple plots, if present) was recorded. Approximately 50% of this total weight -- comprised of a sub-sample of tubers from all plots of the genotype -- was retained and graded. The weight of tubers in the A-size marketable external appearance, B-size, and cull categories was recorded. These weights were also expressed as percentages of the weight of the graded potatoes. The same percentages were then applied to the total weight of the potatoes produced by the genotype in

order to calculate its marketable yield (cwt/A). Total yield (cwt/A) was calculated for each plot and the average for each genotype was found.

After grading, tubers were retained for internal and external quality ratings and chipping quality evaluations. Tubers set aside for internal and external quality ratings were placed in refrigerated (48-50° F) storage. Tubers set aside for chipping were placed in humidified refrigerated storage (37° F).

Tubers were rated for internal and external quality on November 4, 7, 9, and 10, 2011. Up to ten randomly selected, A-size, marketable tubers collected at grading were scored for tuber shape, color, surface texture, eye depth, general appearance, and the presence or absence of hollow heart, brown center, internal necrosis, and vascular discoloration using accepted protocols. (See Tuber Data Rating System on p.17).

### **Chipping Quality Evaluation**

Tubers were held in refrigerated humidified storage (37° F). They were removed from storage on November 8, 2011 and held under ambient conditions (approx. 70° F) until being processed on November 9, 2011.

Chipping quality evaluation began with measurements of specific gravity. Eight pounds of potatoes were placed in a hydrometer and specific gravity was recorded. A subset of three potatoes was selected and peeled using a Rotato Express electric potato peeler. These potatoes were sliced to an approximate thickness of 0.051 inches using a DeBuyer Kobra mandolin slicer. Slices were rinsed in cold water and then fried in a Commercial Pro Model CPF32 electric fryer containing cottonseed oil donated by Shearer's Foods, Inc. at 171-173°C (340-345°F) for approximately 2 minutes and 15 seconds. After frying, a representative sample was visually evaluated for color using color standards in the Potato Chip Color Reference Chart published by the Snack Food Association. Chips that are very light in color are scored "1" and very dark chips are scored "6". The percentage of chips with blister(s) greater than 1 cm (0.39 in) in diameter was recorded.

### **Results**

Yield, tuber traits, and chipping quality data are presented in Tables 8-9. Total yield and US #1 yield (cwt/A) averaged 109 and 70 (cwt/A) across all studies respectively, with a range of 0-326 (total) and 0-203 (US #1). Average total yield averaged 150 cwt/A among varieties and 133 cwt/A among the selections (a study range of 55-215 cwt/A) in the NE-1031 study. Of the 88 entries evaluated overall tuber appearance was rated poor-fair (scale rating of 1-3), fair-good (scale rating of 4-6), and good-excellent (scale rating of 7-9) in 0, 48, and 39 entries, respectively.

1. Entries having an overall appearance rating of  $\geq 7$  (good-excellent) at grading.
  - NE-1031: AF 2866-3, AF 4047-2, Atlantic, B 1992-106, B 2152-17, Dark Red Norland, Katahdin, Kennebec, Modoc, NY 143, NY 144, NY 145, Red Sunset, Yukon Gem
  - Triple Observation: AF 4013-3, AF 4047-2, AF 4125-1, AF 4157-6, AF 4205-1, AF 4227-2, AF 4360-5, AF 4363-2, B 1816-5, B 2152-17, B 2676-2, B 2751-1, B-2756-7, B 2818-1, B 2818-8
  - Double Observation: AF 4540-2, AF 4540-3, AF 4543-3, AF 4550-2, AF 4594-1, AF 4709-2

- Single Observation: AF 4551-1, AF 4573-2, AF 4441-14, AF 4441-9
2. Entries having an external tuber rating of  $\geq 7$  (good-excellent) at grading and marketable yield  $\geq$  the study average.
    - NE-1031: AF 4047-2, Atlantic, B 1992-106, Dark Red Norland, Modoc, Yukon Gem
    - Triple Observation: AF 4013-3, AF 4047-2, AF 4157-6, AF 4227-2, AF 4363-2, B 1816-5, B 2751-1, B 2756-7
    - Double Observation: AF 4540-3, AF 4543-3, AF 4550-2, AF 4594-2, AF 4709-2
    - Single Observation: AF 4441-9, AF 4441-14
  3. Entries having a chip score of  $\leq 3$ .
    - Double Observation: AF 4565-1, AF 4565-2, AF 4593-1

Table 1. List of programs participating in the 2011 Ohio Potato Germplasm Evaluations.

Number	Program	Genotype Codes	----- 2011 experiment -----			Total
			NE-1031	Triple Observation	Double Observation	
1	Univ. Maine	AF	3	13	9	61
2	Cornell Univ.	NY	3			3
		NYE	1			1
3	USDA	B	2	8		10
		BCO		1		1
		BNC		1		1
4	Various	named	11			11
Total			20	23	9	88

<sup>1</sup> Refers to number of single row replicates. All other experiments contained two (Double Observation) or three (NE-1031, Triple Observation) replicates.

Table 2. List of varieties and experimental lines planted in the potato germplasm evaluations at the Ohio Agricultural Research and Developmental Center (OARDC) in Wooster, OH in 2011.

----- Experiment -----			
<u>NE-1031</u>	<u>Triple Observation</u>	<u>Double Observation</u>	<u>Single Observation</u>
1. AF 0338-17	21. AF 2291-10	45. AF 4540-2	54. AF 4545-1
2. AF 2866-3	22. AF 4013-3	46. AF 4540-3	55. AF 4547-1
3. AF 4047-2	23. AF 4047-2	47. AF 4543-3	56. AF 4551-1
4. Atlantic	24. AF 4125-1	48. AF 4550-2	57. AF 4552-4
5. B 1992-106	25. AF 4130-7	49. AF 4565-1	58. AF 4552-5
6. B 2152-17	26. AF 4145-1	50. AF 4565-2	59. AF 4566-4
7. Chieftan	27. AF 4157-6	51. AF 4593-1	60. AF 4573-2
8. Dark Red Norland	28. AF 4205-1	52. AF 4594-1	61. AF 4587-2
9. Katahdin	29. AF 4227-2	53. AF 4709-2	62. AF 4592-1
10. Kennebec	30. AF 4236-1		63. AF 4430-2
11. Modoc	31. AF 4245-2		64. AF 4640-1
12. NY 143	32. AF 4360-5		65. AF 4648-2
13. NY 144	33. AF 4363-2		66. AF 4441-14
14. NY 145	34. B 1816-5		67. AF 4441-8
15. NYE 106-4	35. B 2152-17		68. AF 4441-9
16. Red Sunset	36. B 2676-2		69. AF 4442-1
17. Snowden	37. B 2751-1		70. AF 4442-4
18. Superior	38. B 2756-7		71. AF 4447-2
19. Yukon Gem	39. B 2810-2		72. AF 4458-2
20. Yukon Gold	40. B 2810-3		73. AF 4463-7
	41. B 2818-1		74. AF 4463-8
	42. B 2818-8		75. AF 4477-4
	43. BCO 01044-2		76. AF 4518-1
	45. BNC 193-1		77. AF 4521-1
			78. AF 4526-2
			79. AF 4543-2
			80. AF 4139-1
			81. AF 4386-16
			82. AF 4387-8
			83. AF 4408-3
			84. AF 4408-5
			85. AF 4421-2
			86. AF 4421-4
			87. AF 4423-5
			88. AF 4430-1
			89. AF 4437-1
			90. AF 4437-5



Table 3. Yield (cwt/A) of marketable, A-size tubers of six varieties grown at the OARDC in Wooster, OH 2001-2011.

Variety	Year and Mkt. Yield (cwt/A)											row average
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Atlantic	213	125	240	*	211	327	225	277	276	197	153	224
Katahdin	61	103	223	204	211	241	232	256	280	79	70	178
Kennebec	184	116	225	151	164	199	226	203	290	101	59	174
Russet Burbank	41	19	151	*	*	*	*	*	*	*	*	70
Superior	66	100	218	146	140	149	141	226	224	104	110	148
Yukon Gold	165	103	135	164	155	222	223	255	267	113	91	172
Rainfall (inches, July-Aug)	6.20	2.83	10.91	8.50	7.10	7.74	10.57	5.70	8.77	7.20	6.59	7.46

Table 4. Cultural, nutrient, and pest management practices for the potato germplasm evaluations completed at the OARDC in Wooster, OH in 2011.

Date planted	12-May
Date vine-killed	12-Sep
Date harvested	6-Oct
2010 main crop	Fallow with winter cover
Fertilizer	10-20-20 400lb/A
Herbicide	Dual-Magnum (2pt/A), Sencor DF (1lb/A)
Spacing (ft.) within, between row	1 x 3
Plot width, length (ft.)	3 x 30
Soil conditions at planting	Dry
Irrigation (inches)	None
Sprays applied	17-Jun Baythroid (2.5 oz/A), Manzate (2 lb/A), Kocide (1 lb/A)
	21-Jun Baythroid (3 oz/A), Bravo (1 pt/A)
	25-Jun Tanos (8 oz/A), Kocide (1 lb/A), (Manzate 2 lb/A), Provado (3 oz/A)
	30-Jun Bravo (2 pt/A), Asana (9 oz/A)
	7-Jul Tanos (8 oz/A), Kocide (1 lb/A), (Manzate 2 lb/A), Baythroid 2.8 oz/A)
	14-Jul Bravo (1.5 pt), Tanos (8 oz/A), Baythroid (2.8 oz)
	19-Jul Provado (3.8 oz/A)
	21-Jul Quadris (6 oz/A)
	28-Jul Bravo (1.5 pt/A), Tanos (1 lb/A), Baythroid (2.8 oz/A)
	4-Aug Tanos (8 oz/A), Manzate (1.5 lb/A), Kocide (2 lb/A), Baythroid (2 oz/A)
	11-Aug Bravo (1.5 pt/A), Kocide (2 pt/A), Asana (8 oz/A)
	18-Aug Quadris (5 oz/A), Asana (8 oz/A)
	26-Aug Tanos (8 oz/A), Kocide (2 lb/A), Asana (8 oz/A)
	1-Sep Bravo (1.5 pt/A), Asana (9 oz/A)
	12-Sep Desiccate II (1.5 qt/A), Ammonium Sulfate (4 lb/A), Sticker (1 pt/A)

Table 5. Seasonal and historical climatic data for the potato germplasm evaluations completed at the OARDC in Wooster, OH in 2011.

	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>
Avg. High Temp. (2011) (F)	71.6	79.3	87.3	81.5	73.0	61.6
Avg. Low Temp. (2011) (F)	52.5	58.7	64.9	59.9	55.8	42.5
Avg. Temp. (2011) (F)	61.3	69.0	75.7	70.4	63.6	51.4
Normal Avg. Temp. (Historical) (F)	58.5	67.6	71.5	69.9	63.4	52.1
Total Precip. (2011) (in.)	7.3	3.1	2.9	3.7	3.9	3.7
Normal Avg. Precip. (Historical) (in.)	3.9	3.9	4.1	3.6	3.1	2.3
Precip. deficit/surplus (2011) (in.)						
period	3.4	-0.8	-1.2	0.1	0.8	1.4
cumulative	3.4	2.6	1.4	1.5	2.3	3.7

Table 6. Percent stand, yield and chip quality for entries grown in the Ohio NE-1031 Regional Project experiment in 2011.

Entry #	Entry Name	Stand %	Total cwt/A	US # 1 cwt/A	US # 1 %	B-Size %	Cull %	Specific Gravity <sup>1</sup>	Specific Gravity <sup>2</sup>	Chip Color <sup>3</sup>	Blister <sup>4</sup> %
1	AF 0338-17	77	155	111	71	5	23	1.064	1.061	6	0
2	AF 2866-3	81	139	91	66	12	22	<1.060	1.057	6	0
3	AF 4047-2	79	174	144	83	4	13	<1.060	1.057	5	30
4	Atlantic	86	215	153	71	5	24	1.069	1.066	5	0
5	B 1992-106	74	175	126	72	7	20	<1.060	1.057	5	5
6	B 2152-17	71	99	77	78	14	8	1.066	1.063	6	10
7	Chieftain	81	188	91	49	9	43	<1.060	1.057	5	45
8	Dark Red Norland	97	160	133	83	5	12	<1.060	1.057	5	0
9	Katahdin	81	99	70	71	7	22	<1.060	1.057	5	60
10	Kennebec	87	127	59	46	10	43	<1.060	1.057	5	0
11	Modoc	88	160	129	80	9	10	<1.060	1.057	6	5
12	NY 143	92	139	110	79	4	16	<1.060	1.057	4	20
13	NY 144	90	55	23	42	32	25	<1.060	1.057	6	25
14	NY 145	91	138	99	72	17	12	1.069	1.066	4	20
15	NYE 106-4	76	122	97	80	5	15	1.067	1.064	4	5
16	Red Sunset	63	91	73	80	7	13	<1.060	1.057	5	10
17	Snowden	87	169	120	71	4	25	<1.060	1.057	6	15
18	Superior	87	159	110	69	3	28	<1.060	1.057	6	10
19	Yukon Gem	78	152	93	62	13	26	<1.060	1.057	4	5
20	Yukon Gold	74	127	91	72	3	26	<1.060	1.057	5	10
	Average	82	142	100	70	9	21	1.067	1.058	5	14

<sup>1</sup> Specific gravity recorded at chipping.

<sup>2</sup> Specific gravity with correction factor based on SFA chart. See reference table on page 16 for starch and dry matter conversions.

<sup>3</sup> SFA Standard (1=light, 6 =dark).

<sup>4</sup> Percentage of chips that developed blisters greater than 1 cm in diameter during the frying process.

Table 7. Tuber Characteristics for entries grown in the Ohio NE-1031 Regional Project experiment in 2011.

Entry #	Entry Name	----- External <sup>1</sup> -----				----- Internal <sup>2</sup> -----				Vsclr Dsclrtn	% Defected Tubers
		Skin Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear.	Hollow Heart	Brown Center	Necrosis		
1	AF 0338-17	7	6	2	7	6	0	0	1	8	80
2	AF 2866-3	7	8	3	7	7	0	0	0	7	70
3	AF 4047-2	7	6	2	5	7	0	0	0	3	30
4	Atlantic	6	5	2	6	7	0	2	0	4	60
5	B 1992-106	5	5	3	7	7	0	1	0	8	80
6	B 2152-17	2	7	2	7	7	0	0	0	3	30
7	Chieftain	2	8	3	5	6	0	0	2	4	50
8	Dark Red Norland	2	6	3	7	7	0	0	0	3	30
9	Katahdin	7	8	2	8	8	0	0	0	4	40
10	Kennebec	7	7	3	7	8	0	0	0	8	80
11	Modoc	2	6	2	6	7	0	0	0	4	40
12	NY 143	7	7	3	7	8	0	0	0	2	20
13	NY 144	2	8	2	6	7	0	0	0	1	50
14	NY 145	7	6	2	8	7	0	0	0	3	30
15	NYE 106-4	6	3	2	7	6	0	0	0	2	20
16	Red Sunset	2	8	2	7	8	0	0	0	5	50
17	Snowden	6	3	2	5	5	0	0	3	10	100
18	Superior	7	5	2	6	6	0	0	0	4	40
19	Yukon Gem	7	7	2	9	8	0	0	0	1	10
20	Yukon Gold	7	4	2	5	6	0	0	1	5	60

<sup>1</sup> See reference table for rating system on page 17.

<sup>2</sup> Number of tubers out of 10 that contain the defect (for some samples, fewer than 10 tubers were rated).

Table 8. Percent stand, yield and chip quality for entries grown in the Ohio Triple Observation Trial in 2011.

Study	Entry #	Entry Name	Stand %	Total cwt/A	US # 1 cwt/A	US # 1 %	B-Size %	Cull %	Specific Gravity <sup>1</sup>	Specific Gravity <sup>2</sup>	Chip Color <sup>3</sup>	Blister <sup>4</sup> %
OBT	21	AF 2291-10	72	169	89	53	10	37	1.062	1.059	5	5
OBT	22	AF 4013-3	59	156	92	59	18	24	1.062	1.059	4	0
OBT	23	AF 4047-2	56	134	87	65	8	27	<1.060	1.057	4	5
OBT	24	AF 4125-1	76	80	58	72	8	20	<1.060	1.057	5	15
OBT	25	AF 4130-7	56	83	64	77	4	18	1.074	1.071	4	0
OBT	26	AF 4145-1	52	124	75	60	4	36	<1.060	1.057	5	5
OBT	27	AF 4157-6	53	124	83	67	5	28	1.069	1.066	4	0
OBT	28	AF 4205-1	42	70	40	57	21	22	1.064	1.061	5	25
OBT	29	AF 4227-2	56	121	81	67	8	25	<1.060	1.057	6	0
OBT	30	AF 4236-1	66	112	69	62	17	21	<1.060	1.057	5	0
OBT	31	AF 4245-2	36	96	60	63	11	26	1.066	1.063	5	10
OBT	32	AF 4360-5	46	62	35	57	7	37	<1.060	1.057	5	0
OBT	33	AF 4363-2	57	95	62	66	13	21	1.060	1.057	5	40
OBT	34	B 1816-5	59	102	65	64	11	25	<1.060	1.057	6	45
OBT	35	B 2152-17	53	89	68	77	10	12	1.064	1.061	6	20
OBT	36	B 2676-2	46	72	50	70	10	20	1.071	1.068	6	40
OBT	37	B 2751-1	70	116	78	68	12	20	1.067	1.064	6	15
OBT	38	B 2756-7	60	95	61	64	14	22	<1.060	1.057	5	25
OBT	39	B 2810-2	58	74	53	72	15	13	1.062	1.059	6	0
OBT	40	B 2810-3	48	88	44	50	18	32	<1.060	1.057	6	5
OBT	41	B 2818-1	50	49	30	62	19	19	1.065	1.062	6	15
OBT	42	B 2818-8	39	68	47	69	10	21	<1.060	1.057	5	55
OBT	43	BCO 01044-2	48	43	25	58	9	33	<1.060	1.057	6	5
OBT	44	BNC 193-1	41	38	23	59	19	22	<1.060	1.057	5	5
		Average	54	94	60	64	12	24	1.066	1.059	5	14

<sup>1</sup> Specific gravity recorded at chipping.

<sup>2</sup> Specific gravity with correction factor based on SFA chart. See reference table on page 16 for starch and dry matter conversions.

<sup>3</sup> SFA Standard (1=light, 6 =dark).

<sup>4</sup> Percentage of chips that developed blisters greater than 1 cm in diameter during the frying process.

Table 8(cont.). Percent stand, yield and chip quality for entries grown in the Ohio Double Observation Trial in 2011.

Study	Entry #	Entry Name	Stand %	Total cwt/A	US # 1 cwt/A	US # 1 %	B-Size %	Cull %	Specific Gravity <sup>1</sup>	Specific Gravity <sup>2</sup>	Chip Color <sup>3</sup>	Blister <sup>4</sup> %
OBD	45	AF 4540-2	37	69	38	55	7	14	1.065	1.057	4	2
OBD	46	AF 4540-3	38	46	27	59	9	26	1.069	nd	4	1
OBD	47	AF 4543-3	45	81	49	61	22	16	< 1.060	1.057	5	1
OBD	48	AF 4550-2	63	113	78	69	12	13	1.066	1.059	4	0
OBD	49	AF 4565-1	53	69	36	53	18	11	1.064	1.057	3	1
OBD	50	AF 4565-2	35	66	27	42	9	19	1.074	nd	3	0
OBD	51	AF 4593-1	45	81	36	44	13	19	1.070	1.057	3	0
OBD	52	AF 4594-1	48	41	26	62	7	19	1.072	1.057	4	0
OBD	53	AF 4709-2	38	114	85	75	12	17	1.071	1.062	4	1
		Average	45	76	45	58	12	17	1.069	1.058	4	1

<sup>1</sup> Specific gravity recorded at chipping.

<sup>2</sup> Specific gravity with correction factor based on SFA chart. See reference table on page 16 for starch and dry matter conversions.

<sup>3</sup> SFA Standard (1=light, 6 =dark).

<sup>4</sup> Percentage of chips that developed blisters greater than 1 cm in diameter during the frying process.

Table 8(cont.). Percent stand, yield and chip quality for entries grown in the Ohio Single Observation Trial in 2011.

Study	Entry #	Entry Name	StaND %	Total cwt/A	US # 1 cwt/A	US # 1 %	B-Size %	Cull %	Specific Gravity <sup>1</sup>	Specific Gravity <sup>2</sup>	Chip Color <sup>3</sup>	Blister <sup>4</sup> %
OBS	54	AF 4545-1	3	5	5	96	0	4	ND <sup>5</sup>	ND	ND	ND
OBS	55	AF 4547-1	50	104	48	46	16	38	ND	ND	4	15
OBS	56	AF 4551-1	3	11	0	0	2	98	ND	ND	ND	ND
OBS	57	AF 4552-4	50	137	80	58	1	41	<1.060	1.058	5	25
OBS	58	AF 4552-5	60	117	57	49	5	46	1.062	1.060	6	25
OBS	59	AF 4566-4	20	5	0	0	76	24	ND	ND	5	5
OBS	60	AF 4573-2	40	78	29	37	9	54	ND	ND	4	45
OBS	61	AF 4587-2	10	23	5	23	8	69	ND	ND	ND	ND
OBS	62	AF 4592-1	40	162	73	45	10	45	<1.060	1.058	5	0
OBS	63	AF 4430-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OBS	64	AF 4640-1	0	0	0	0	100	0	ND	ND	ND	ND
OBS	65	AF 4648-2	7	0	ND	ND	ND	ND	ND	ND	ND	ND
OBS	66	AF 4441-14	63	176	103	58	5	37	1.069	1.067	5	45
OBS	67	AF 4441-8	53	123	70	57	5	38	1.069	1.067	5	5
OBS	68	AF 4441-9	77	239	169	71	5	24	1.060	1.058	6	0
OBS	69	AF 4442-1	73	174	99	57	13	31	1.068	1.066	4	50
OBS	70	AF 4442-4	77	208	168	81	6	14	1.065	1.063	5	10
OBS	71	AF 4447-2	90	207	72	35	7	59	<1.060	1.058	6	20
OBS	72	AF 4458-2	60	136	116	86	1	13	1.060	1.058	2	20
OBS	73	AF 4463-7	73	106	57	53	6	40	1.062	1.060	6	50
OBS	74	AF 4463-8	70	177	88	50	10	40	<1.060	1.058	5	5
OBS	75	AF 4477-4	90	164	111	68	13	20	1.063	1.061	6	30
OBS	76	AF 4518-1	37	97	45	46	18	36	ND	ND	4	25
OBS	77	AF 4521-1	47	85	41	49	4	47	ND	ND	4	35
OBS	78	AF 4526-2	40	106	50	47	6	46	<1.060	1.058	5	20
OBS	79	AF 4543-2	0	0	0	0	0	0	ND	ND	ND	ND
OBS	80	AF 4139-1	63	186	118	64	13	23	<1.060	1.057	5	5
OBS	81	AF 4386-16	53	148	102	69	6	25	1.060	1.057	6	15
OBS	82	AF 4387-8	87	95	65	68	11	21	1.063	1.060	5	45
OBS	83	AF 4408-3	77	143	112	78	4	18	1.063	1.060	4	5
OBS	84	AF 4408-5	83	326	203	62	5	32	<1.060	1.057	6	5
OBS	85	AF 4421-2	90	231	135	58	6	36	<1.060	1.057	6	0
OBS	86	AF 4421-4	67	129	90	70	9	21	1.071	1.068	5	5
OBS	87	AF 4423-5	47	136	72	53	12	35	<1.060	1.057	6	30
OBS	88	AF 4430-1	33	91	65	71	9	20	1.061	1.058	5	5
OBS	89	AF 4437-1	0	193	115	60	8	32	1.060	1.058	5	10
OBS	90	AF 4437-5	63	57	27	47	9	43	ND	ND	4	15
		Average	50	122	74	52	12	33	1.064	1.059	5	19

<sup>1</sup> Specific gravity recorded at chipping.<sup>2</sup> Specific gravity with correction factor based on SFA chart. See reference table on page 16 for starch and dry matter conversions.<sup>3</sup> SFA Standard (1=light, 6 =dark).<sup>4</sup> Percentage of chips that developed blisters greater than 1 cm in diameter during the frying process.<sup>5</sup> ND = No data due to low yield or insufficient tubers for analysis.

Table 9. Tuber Characteristics for entries grown in the Ohio Triple Observation Trial in 2011.

Study	Entry #	Entry Name	----- External <sup>1</sup> -----					----- Internal <sup>2</sup> -----				Vscrlr Dscrltn	% Defected Tubers
			Skin Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear.	Hollow Heart	Brown Center	Necrosis			
OBT	21	AF 2291-10	7	6	3	7	5	0	0	0	30	30	
OBT	22	AF 4013-3	7	7	3	8	7	0	0	0	60	60	
OBT	23	AF 4047-2	6	4	2	6	7	0	0	1	20	30	
OBT	24	AF 4125-1	6	4	2	7	7	0	0	0	50	50	
OBT	25	AF 4130-7	5	3	2	6	6	0	0	0	20	20	
OBT	26	AF 4145-1	6	4	2	6	6	0	0	0	30	30	
OBT	27	AF 4157-6	7	6	2	7	7	0	0	0	60	60	
OBT	28	AF 4205-1	7	7	1	8	8	0	0	0	10	10	
OBT	29	AF 4227-2	7	6	2	8	7	0	0	0	30	30	
OBT	30	AF 4236-1	6	6	2	6	6	0	0	0	40	40	
OBT	31	AF 4245-2	6	6	2	7	6	0	0	0	20	20	
OBT	32	AF 4360-5	7	7	3	8	7	0	0	0	40	40	
OBT	33	AF 4363-2	7	7	2	7	8	0	0	0	60	60	
OBT	34	B 1816-5	1	7	3	6	7	0	0	0	20	20	
OBT	35	B 2152-17	2	8	2	8	8	0	0	0	50	50	
OBT	36	B 2676-2	2	7	3	6	8	0	0	0	40	40	
OBT	37	B 2751-1	7	7	2	8	8	0	0	0	20	20	
OBT	38	B 2756-7	2	8	3	7	8	0	0	0	30	30	
OBT	39	B 2810-2	1	5	2	5	5	0	0	0	30	30	
OBT	40	B 2810-3	1	7	2	6	6	0	0	0	20	20	
OBT	41	B 2818-1	2	8	2	6	7	0	0	1	10	20	
OBT	42	B 2818-8	2	7	2	7	7	0	0	0	40	40	
OBT	43	BCO 01044-2	1	7	3	7	6	0	0	0	30	30	
OBT	44	BNC 193-1	1	8	2	6	6	0	0	0	10	10	

13

<sup>1</sup> See reference table for rating system on page 17.

<sup>2</sup> Number of tubers out of 10 that contain the defect (for some samples, fewer than 10 tubers were rated).



Table 9(cont.). Tuber Characteristics for entries grown in the Ohio Double Observation Trial in 2011.

Study	Entry #	Entry Name	----- External <sup>1</sup> -----				----- Internal <sup>2</sup> -----					% Defected Tubers
			Skin Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear.	Hollow Heart	Brown Center	Necrosis	Vsclr Dsclrtn	
OBD	45	AF 4540-2	6	6	2	5	8	0	0	0	0	29
OBD	46	AF 4540-3	9	7	5	7	9	0	0	0	0	0
OBD	47	AF 4543-3	9	5	3	9	7	0	1	0	0	30
OBD	48	AF 4550-2	7	6	2	5	7	0	0	0	1	60
OBD	49	AF 4565-1	6	5	1	7	5	0	0	0	0	40
OBD	50	AF 4565-2	6	6	2	7	5	0	0	0	1	70
OBD	51	AF 4593-1	7	7	1	7	6	0	0	0	0	20
OBD	52	AF 4594-1	6	5	3	7	7	0	0	0	0	40
OBD	53	AF 4709-2	6	6	2	5	7	0	0	0	0	10

<sup>1</sup> See reference table for rating system on page 17.

<sup>2</sup> Number of tubers out of 10 that contain the defect (for some samples, fewer than 10 tubers were rated).

Table 9(cont.). Tuber Characteristics for entries grown in the Ohio Single Observation Trial in 2011.

Study	Entry #	Entry Name	External <sup>1</sup>					Internal <sup>2</sup>					% Defected Tubers
			Skin Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear.	Hollow Heart	Brown Center	Necrosis	Vsclr Dsclrtn		
OBS	54	AF 4545-1	6	7	2	6	6	0	0	0	1	50	
OBS	55	AF 4547-1	5	4	3	6	5	0	0	0	1	10	
OBS	56	AF 4551-1	2	8	1	6	7	0	0	0	1	50	
OBS	57	AF 4552-4	2	7	2	7	6	0	0	1	5	60	
OBS	58	AF 4552-5	2	6	3	5	6	0	0	0	5	50	
OBS	59	AF 4566-4	7	4	2	6	5	0	0	0	0	0	
OBS	60	AF 4573-2	7	7	2	8	7	0	0	0	4	40	
OBS	61	AF 4587-2	6	4	2	7	5	0	0	1	1	50	
OBS	62	AF 4592-1	7	7	2	7	6	0	0	1	2	30	
OBS	63	AF 4430-2	ND <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	
OBS	64	AF 4640-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
OBS	65	AF 4648-2	5	4	3	8	6	0	0	0	0	0	
OBS	66	AF 4441-14	7	8	2	8	7	0	0	0	4	40	
OBS	67	AF 4441-8	6	5	2	8	6	0	0	0	0	0	
OBS	68	AF 4441-9	7	7	2	8	7	0	0	3	5	60	
OBS	69	AF 4442-1	6	5	2	5	6	1	0	1	5	60	
OBS	70	AF 4442-4	5	4	2	6	6	0	0	1	1	20	
OBS	71	AF 4447-2	6	5	2	6	5	0	0	0	3	30	
OBS	72	AF 4458-2	5	5	2	8	6	0	0	1	5	50	
OBS	73	AF 4463-7	7	6	2	6	6	0	0	0	7	70	
OBS	74	AF 4463-8	6	6	2	6	6	0	1	0	3	40	
OBS	75	AF 4477-4	7	6	2	6	6	0	0	1	7	70	
OBS	76	AF 4518-1	7	6	2	6	5	0	0	0	4	50	
OBS	77	AF 4521-1	7	4	2	7	6	0	0	0	3	30	
OBS	78	AF 4526-2	5	3	4	6	6	0	0	0	2	20	
OBS	79	AF 4543-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
OBS	80	AF 4139-1	2	7	2	5	6	0	0	0	2	20	
OBS	81	AF 4386-16	2	7	2	5	6	0	0	0	4	40	
OBS	82	AF 4387-8	7	5	2	6	6	0	0	1	1	20	
OBS	83	AF 4408-3	7	7	2	5	6	0	0	0	2	20	
OBS	84	AF 4408-5	6	5	2	4	5	0	0	0	6	60	
OBS	85	AF 4421-2	2	7	2	5	6	0	0	0	1	10	
OBS	86	AF 4421-4	6	6	2	7	6	0	2	5	6	90	
OBS	87	AF 4423-5	2	7	2	4	5	0	0	0	2	20	
OBS	88	AF 4430-1	7	5	2	6	6	0	0	0	6	60	
OBS	89	AF 4437-1	7	7	2	5	6	0	0	0	2	20	
OBS	90	AF 4437-5	7	7	2	6	6	0	0	0	3	33	

<sup>1</sup> See reference table for rating system on page 17.

<sup>2</sup> Number of tubers out of 10 that contain the defect (for some samples, fewer than 10 tubers were rated).

<sup>3</sup> ND = No data due to low yield or insufficient tubers for analysis.

Conversion Table for Specific Gravity of Potato Tubers to Content of Starch and Dry Matter % (Calculated from Von Scheele equations: % starch = 17.565 + 199.07 (Sp. Gr.-1.0988); % dry matter = 24.181 + 211.04 (Sp. Gr.-1.0988))

Specific Gravity	Starch %	Dry Matter %	Specific Gravity	Starch %	Dry Matter%
1.050	7.85	13.88	1.081	14.02	20.43
1.051	8.05	14.09	1.082	14.22	20.64
1.052	8.25	14.31	1.083	14.42	20.85
1.053	8.45	14.32	1.084	14.62	21.06
1.054	8.65	14.73	1.085	14.82	21.27
1.055	8.85	14.94	1.086	15.02	21.48
1.056	9.04	15.15	1.987	15.22	21.69
1.057	9.24	15.38	1.088	15.41	21.90
1.058	9.44	15.57	1.089	15.61	22.11
1.059	9.64	15.78	1.090	15.81	22.33
1.060	9.84	15.99	1.091	16.01	22.54
1.061	10.04	16.21	1.092	16.20	22.75
1.062	10.24	16.42	1.093	16.41	22.96
1.063	10.44	16.63	1.094	16.61	23.17
1.064	10.64	16.84	1.095	16.81	23.38
1.065	10.84	17.05	1.096	17.01	23.59
1.066	11.04	17.26	1.097	17.21	23.89
1.067	11.23	17.47	1.098	17.41	24.01
1.068	11.43	17.68	1.099	17.60	24.22
1.069	11.63	17.89	1.100	17.80	24.44
1.070	11.83	18.10	1.101	18.00	24.65
1.071	12.03	18.32	1.102	18.20	24.86
1.072	12.23	18.53	1.103	18.40	25.07
1.073	12.43	18.74	1.104	18.60	25.28
1.074	12.63	18.95	1.105	18.80	25.49
1.075	12.83	19.16	1.106	19.00	25.70
1.076	13.03	19.37	1.107	19.20	25.91
1.077	13.22	19.58	1.180	19.40	26.12
1.078	13.42	19.79	1.109	29.60	26.34
1.079	13.62	20.00	1.110	19.79	26.55
1.080	13.82	220.21	1.111	19.99	26.76

Factors Affecting the Specific Gravity of the White Potato in Maine. Maine Agricultural Experiment Station. Bulletin 583. May 1959.

## TUBER DATA RATING SYSTEM

### 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 netting
7. Mod. smooth
8. Smooth
9. 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. 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 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

### Air Pollution

1. Dead
2. ---
3. Mod. Defol.
4. ---
5. Mod. Injury
6. ---
7. Mild Injury
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. Very poor
2. Poor
3. +
4. --
5. Fair
6. +
7. --
8. Good
9. Excellent