Pennsylvania Potato Research Report, 2023

Xinshun Qu
&
Adrianna Cohen

Department of Plant Pathology &
Environmental Microbiology

The Pennsylvania State University

University Park, PA 16802

PennState Extension

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Penn State's Department of Plant Pathology & Environmental Microbiology potato research program can be categorized into four areas: 1) variety breeding and evaluation, 2) breeding for disease resistance (focused on early blight, late blight and common scab), 3) biology and genetic variability of potato pathogens (focused on early and late blight and common scab), and 4) integrated pest management of potatoes. Many of these projects are long term and only results of 2023 field trials are presented here.

1. Variety Breeding and Evaluation

Potato variety evaluation trials were conducted at four locations in PA. At the Rock Springs location the variety trial included 115 round whites with a few yellow flesh, 40 red-skinned (a few purple skinned) and 74 russet or long white types. The Lehigh County location and Erie County location had 32 and 28 varieties, respectively. Snack Food Association trial of 6 chipping varieties was conducted in Franklin County. An early variety trial of 24, 21 and 32 varieties was conducted at Lehigh Co., Erie Co. and Rock Springs, Centre Co., respectively. Breeding lines were contributed by USDA-ARS, Maine, New York, North Carolina, Michigan, Idaho, Colorado, Wisconsin and a few other sources. See **Pennsylvania Regional Potato Germplasm Evaluation Program, 2023 on pages 1-2, data tables from different locations on pages 3-38, trial management information on page 39, supplemental processing (chipping and French Fry) report on pages 43-44, processing data tables from different locations on pages 45-52, and descriptions of promising varieties for Pennsylvania on pages 53-55.**

2. Breeding for Disease Resistance

In three separate field trials, 46 potato varieties and advanced breeding lines were evaluated for resistance to common scab, late blight and early blight, respectively at Rock Springs.

In common scab screening trial, cultivars Russet Burbank and Shepody were included as a tolerant and a susceptible check for common scab, respectively. Numerically, although not statistically, Russet Norkotah had a lower disease severity score and disease incidence than Russet Burbank and was considered as tolerant to common scab. Lakeview Russet, NY174, CO15211-1R, Snowden, NCB2607-3 and BNC559-1 were characterized as moderately tolerant because their disease severity score and disease incidence were not significantly different from the check Russet Burbank. See **Evaluation of potato cultivars and breeding lines for resistance to common scab on page 40.**

In late blight screening trial, the most susceptible plots reached 100% disease severity by the end of the season. Cultivar Kennebec was a moderately resistant check and Atlantic

was a susceptible check. Based on AUDPC values, MSAFB609-12, NY177 and NY174 were significantly more resistant than cv. Kennebec. Numerically, although not statistically, AF6601-2, AF5750-16, AF6075-8, AF6565-8, NDAF141Y-3, AF6194-4, Russet Burbank, AF5762-8, AF5707-1, WAF14096-5, AF5071-2, Lakeview Russet, AF5735-8, CO15211-1R and Snowden had lower AUDPC values than Kennebec and were considered as moderately resistant. See **Evaluation of potato cultivars and breeding lines for resistance to late blight on page 41.**

In early blight screening trial, disease pressure from early blight was high and the most susceptible plots reached 100% disease severity by the end of the season. Cultivars Kennebec and Russet Burbank were included as moderately resistant checks and Dark Red Norland was included as a susceptible check. Snowden, NY174, AF6565-8, AF6075-8, AF5762-8, AF5071-2, Lakeview Russet, NY177, Katahdin, AF6601-2 and MSAFB635-15 were characterized as moderately resistant because their AUDPC values were not significantly different from the moderately resistant check Kennebec and lower than the moderately resistant check Russet Burbank. See **Evaluation of potato cultivars and breeding lines for resistance to early blight on page 42.**

Progress Report---December 2023

Pennsylvania Regional Potato Germplasm Evaluation Program, 2023

Xinshun Qu and Adrianna Cohen
Department of Plant Pathology and Environmental Microbiology
The Pennsylvania State University

The objective of this project is to find new potato varieties and advanced breeding lines that have adaptation to Pennsylvania potato growing regions, and have qualities that are suitable for either processing or tablestock use. We cooperate with the project leaders of several other potato breeding programs from the Northeast US and a few programs from the Midwest US and Canada by evaluating their potato germplasm. Data from this project helps breeders determine which lines to focus on for potential release as new varieties and also allows you to focus on very specific lines that may be released in the near future.

Replicated and non-replicated variety evaluation plots were established at the following locations: Lehigh Co. (Tables 1-2), Erie Co. (Tables 3-4) and Rock Springs, Centre Co. (Tables 5-12). The Lehigh location and Erie location had 32 and 28 varieties/lines in non-replicated trial, respectively. At the Rock Springs location the trials included 73 round whites with a few yellow flesh, 30 red-skinned (a few purple skinned) and 22 russet or long white types in replicated plots, and an additional 42 whites, 10 red-skinned and 52 russet or long white types planted in non-replicated observational plots. At Lehigh and Erie locations, the seed spacing was 9-inch within a 15-ft plot except for the russets that were at 12-inch. At Rock Springs location, the seed spacing was 9-inch within a 10-ft plot except for the russets and some whites that were at 12-inch. An early variety trial of 24, 21 and 32 varieties was conducted at Lehigh Co. (Tables 13-14), Erie Co. (Tables 15-16) and Rock Springs, Centre Co. (Tables 17-18), respectively. Snack Food Association trial of 6 chipping varieties was conducted by Pennsylvania Co-Operative Potato Growers, Inc. in Franklin Co. **(**Tables 19-20). Management information for Rock Springs site was provided in Table 21. We assessed yield, tuber size, internal defects and external defects, skin color, texture, tuber shape, specific gravity and overall appearance. French Fry and chip quality tests will be conducted over the next few months.

To interpret this data, one needs to know the yields for the check cultivars such as Atlantic, Snowden, Katahdin, Chieftain, Dark Red Norland, Russet Norkotah or Superior on your farm. Then compare the typical yield for this year on your farm to the data presented here. The yields tend to be inflated from these small plots but the ranking of the yields over the cultivars/lines usually is fairly consistent. Also the same method can be used to compare specific gravity and some of the other parameters. There are a few lines that will be very specific to certain environments so make the comparison to the location that best matches your own or use the Rock Springs location as a fairly typical area for most of PA.

Results:

Lehigh County trial:

At the Lehigh location the following lines had marketable yield higher than Atlantic: Lehigh, NY174, NY177, NY165, MSAA217-3, MSBB626-11 and NC818-24.

Erie County trial:
At the Erie location, the field suffered from deer damage although most varieties had marketable yield higher than Atlantic.

Round white planted 9-inch apart in Rock Springs:
Based on data of replicated trials at Rock Springs, there were 4 round white clones with marketable yields significantly higher than Atlantic: AF6566-1, AF6886-3 , AF6978-1 and SP327, there were another 21 round white clones with marketable yields higher than Atlantic. In non-replicated trial, there were 7 round white clones with marketable yields higher than Atlantic.

Red-skinned planted 9-inch apart in Rock Springs:
Based on data of replicated trials at Rock Springs, NDAF141Y-3, AF6963-8 and A11573-5RYsto had marketable yields significantly higher than Chieftain; there were another 8 red-skinned or purple-skinned clones with marketable yields higher than Chieftain: BNC559-1, CO15211-1R, AF6932-4, AF6963-1, AF6965-5, NDAF1727Y-1, MSZ416-8RY and BNC917-2. In non-replicated trial, 4 clones had marketable yields higher than Chieftain.

Russet-skinned or white planted 12-inch apart in Rock Springs:
Based on data of replicated trials at Rock Springs, Lakeview Russet, AF5707-1 and AF5762-8 had marketable yields significantly higher than Russet Norkotah, there were another 11 clones had marketable yields higher than Russet Norkotah. In non-replicated trial, there were 28 clones had marketable yields higher than Russet Norkotah.

Early season variety trial in Lehigh County:
At the Lehigh location, there were 20 clones had marketable yield higher than Superior.

Early season variety trial in Erie County:
At the Erie location, there were 4 clones had marketable yield higher than Superior.

Early season variety trial in Rock Springs:
Based on data of replicated trials at Rock Springs, Laperla and Belmonda had marketable yields significantly higher than Superior. Dark Red Norland, SP327, NY165, Manistee, A08122-9RY, BNC973-7, Agata, Paroli, Natascha and Satina had marketable yield higher than Superior.

The Pennsylvania Potato Research Program, the Pennsylvania Department of Agriculture and USDA funded this research in conjunction with donations. This research is the result of cooperation of growers, industry and PSU staff. The growers hosting the plots provided contributions (land, fertilizer, pesticides, time, etc.). University of Maine, Cornell University, North Carolina State University. USDA Maine, USDA Idaho, Colorado State University, Michigan State University, University of Wisconsin potato breeding programs and Solanum International, Parkland Seed, Maine Potato Lady, Sterman Masser Inc., Pennsylvania Co-Operative Potato Growers, Inc. provided seed. Special thanks to Nathan Tallman, Bob Leiby, Mike Peck and Jonathan Price who made sure this project was completed.

Table 1. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pick outs and specific gravity for potato evaluation trial in Smokey Wessner's Farm, Lehigh County, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		
Atlantic	455	421	92	100	2	18	49	25	0	6	1.089
Katahdin	430	320	74	76	8	21	45	9	0	18	1.071
Snowden	381	341	90	81	3	25	37	26	2	8	1.083
Chieftain	347	277	80	66	6	27	32	21	0	15	1.067
Russet Norkotah (Texas 296)	360	311	86	74	3	19	39	28	0	11	1.072
Lehigh [y]	494	445	90	106	4	20	54	16	0	6	1.080
SP327	466	408	88	97	8	35	44	9	0	5	1.085
Paroli [y]	821	371	45	88	50	22	15	7	1	4	1.069
NDAF113484B-1	397	361	91	86	3	25	46	20	0	6	1.068
AF5280-5	333	303	91	72	6	29	50	12	0	3	1.067
NY174	546	486	89	116	8	42	38	9	0	3	1.089
NY177	543	503	93	120	5	33	44	13	2	3	1.095
Bliss (NY163)	420	329	78	78	6	26	41	11	0	16	1.088
NY165	488	460	94	109	3	29	53	13	0	2	1.085
Brodie (NY140)	350	330	94	78	4	23	46	26	0	2	1.081
MSAA217-3	502	471	94	112	5	22	49	23	0	1	1.092
MSBB626-11	622	601	97	143	2	22	53	22	0	1	1.094
AC13126-1Wadg	204	169	83	40	16	39	42	2	0	1	1.073
CO11266-1W/Y [y]	375	248	66	59	28	57	9	0	0	6	1.085
Anouk [y]	439	290	66	69	25	54	7	5	0	9	1.078
Ballerina [y]	365	269	74	64	18	46	28	0	0	9	1.062
Libero [y]	322	244	76	58	11	40	35	0	0	13	1.083
Red Apple [y]	411	243	59	58	22	42	17	0	0	19	1.082
Satina [y]	307	226	74	54	13	42	28	4	0	13	1.061
MSZ416-8RY [y]	290	262	90	62	4	25	54	7	3	6	1.067
MSCC553-1R	419	369	88	88	6	45	43	0	0	6	1.084
NC818-24	507	470	93	112	3	21	44	25	2	4	1.091

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		
French Fingerling [y/r]	420	245	58	58	31	48	10	0	0	10	1.076
All Blue [p]	270	193	72	46	27	52	20	0	0	1	1.073
Caribou Russet	444	417	94	99	3	21	42	31	0	3	1.081
A11582-1R	255	179	70	43	25	59	11	0	0	5	1.057
W13103-2Y [y]	507	402	79	96	5	33	37	9	0	16	1.064

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Atlantic, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Non-replicated trial.

Russet varieties were planted 12-in. apart with 15 seed pieces per 15-ft plot, all other varieties were spaced 9-in. apart with 20 seed pieces per 15-ft plot.

Varieties with colored flesh are indicated by [y] for yellow, [r] for red and [p] for purple.

Table 2. Tuber characteristics, internal defects for potato evaluation trial in Smokey Wessner's Farm, Lehigh County, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Atlantic	5	5	5	2	4	5	50	20	PO=Green, growth crack
Katahdin	5	8	7	3	5	5	0	20	PO=Green
Snowden	5	6	5	2	4	5	10	10	PO=Green, growth crack
Chieftain	5	2	7	3	4	5	0	20	PO=Green, second tubers
Russet Norkotah (Texas 296)	6	4	2	4	5	5	50	20	PO=Knobs
Lehigh	6	6	5	3	5	6	0	0	PO=Green, growth crack
SP327	5	6	6	2	4	5	0	30	PO=Knobs
Paroli	6	7	7	3	5	6	0	0	PO=Green, growth crack
NDAF113484B-1	6	2	7	3	5	6	0	10	PO=Growth crack
AF5280-5	6	8	7	2	5	5	0	10	PO=Green
NY174	6	6	6	2	5	5	10	0	PO=Green
NY177	6	6	6	2	5	7	10	0	PO=Green
Bliss (NY163)	5	6	6	2	5	6	10	10	PO=Green, knobs
NY165	6	6	5	2	5	5	0	0	PO=Green
Brodie (NY140)	6	6	7	3	5	5	0	10	PO=Green
MSAA217-3	6	5	5	2	5	7	40	0	PO=Green
MSBB626-11	6	6	6	2	3	7	0	0	PO=Green
AC13126-1Wadg	4	6	6	2	5	6	10	10	PO=Green
CO11266-1W/Y	6	6	5	2	6	7	0	10	PO=Green, second tubers, (small tubers)
Anouk	6	7	6	2	5	6	0	30	PO=Green
Ballerina	6	7	7	5	6	5	0	0	PO=Green
Libero	6	6	4	4	5	5	0	0	PO=Green
Red Apple	4	2	7	3	5	5	0	0	PO=Second tubers, knobs, misshapen
Satina	5	7	6	2	5	6	0	10	PO=Second tubers, green
MSZ416-8RY	5	2	7	2	5	6	0	10	PO=Growth crack
MSCC553-1R	6	2	7	2	5	6	0	10	
NC818-24	5	6	6	2	4	6	0	0	PO=Green, growth crack

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
French Fingerling	4	2	7	5	5	5	0	0	PO=Growth crack, misshapen
All Blue	5	1	6	6	4	5	10	0	PO=Knobs
Caribou Russet	6	5	3	6	6	6	0	20	PO=Knobs
A11582-1R	5	2	7	3	5	5	0	0	PO=Knobs
W13103-2Y	5	7	7	2	5	6	0	0	PO=Green, misshapen

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.

C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.

TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.

Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.

TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 10 tubers. 0 = not observed.

Table 3. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts and specific gravity for potato evaluation trial in Mark Troyer's Farm, Erie County, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Atlantic	201	120	59	100	2	13	26	20	0	39	1.083
Katahdin	267	226	85	189	2	16	20	13	36	13	1.077
Snowden	816	739	91	618	4	36	23	24	7	5	1.086
Chieftain	265	247	93	207	2	18	40	30	5	5	1.066
Lehigh [y]	310	273	88	228	0	12	45	31	0	12	1.078
SP327	358	286	80	239	0	8	38	30	4	20	1.085
Paroli [y]	236	141	60	118	2	14	46	0	0	38	1.068
NDAF113484B-1	177	132	75	110	8	23	34	18	0	17	1.057
NY174	347	296	85	247	2	23	35	27	0	13	1.089
NY177	213	183	86	153	0	5	38	38	6	14	1.091
Bliss (NY163)	300	230	77	193	3	17	48	11	0	20	1.087
NY165	389	320	82	268	2	26	39	13	5	16	1.081
Brodie (NY140)	415	330	80	276	1	8	32	30	10	20	1.087
MSAA217-3	224	183	81	153	0	8	33	29	11	19	1.088
MSBB626-11	298	278	93	232	3	21	53	19	0	4	1.080
Lakeview Russet	179	113	63	95	3	9	21	11	23	34	1.084
Anouk [y]	335	214	64	179	6	24	28	11	0	30	1.084
Ballerina [y]	175	61	35	51	3	15	20	0	0	62	1.080
Libero [y]	314	224	71	188	4	24	36	12	0	24	1.060
A11573-5RYsto [y]	263	216	82	181	3	24	42	16	0	15	1.081
MSBB630-2	436	380	87	318	5	29	40	18	0	7	1.075
MSCC553-1R	130	95	73	79	10	34	22	12	5	17	1.080
NC818-24	393	350	89	293	6	23	43	21	2	5	1.084
French Fingerling [y/r]	261	188	72	157	21	54	19	0	0	7	1.084
All Blue [p]	348	256	74	214	25	50	23	0	0	2	1.079
A11582-1R	81	69	84	57	10	58	26	0	0	6	1.086
W13103-2Y [y]	52	40	77	33	18	63	6	8	0	4	1.076
Portage Russet	166	146	88	122	1	23	37	29	0	11	1.091

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Atlantic, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Non-replicated trial. Varieties with colored flesh are indicated by y for yellow, r for red and p for purple.

Russet varieties * were planted 12-in. apart with 15 seed pieces per 15-ft plot, all other varieties were spaced 9-in. apart with 20 seed pieces per 15-ft plot.

Table 4. Tuber characteristics, internal defects for potato evaluation trial in Mark Troyer's Farm, Erie County, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Atlantic	5	6	5	2	4	5	60	10	PO=Green, growth crack
Katahdin	6	8	8	2	7	6	10	10	PO=Green
Snowden	5	5	5	2	4	5	30	0	PO=Green
Chieftain	5	2	7	3	4	5	0	10	PO=Green
Lehigh	6	7	6	3	5	6	10	0	PO=Green, growth crack
SP327	6	8	7	2	5	4	0	0	PO=Green
Paroli	5	7	7	2	5	6	0	10	PO=Green, growth crack
NDAF113484B-1	5	2	8	2	5	5	0	10	PO=Growth crack
NY174	5	6	6	2	5	5	10	0	PO=Green
NY177	5	6	6	2	5	5	0	0	PO=Green
Bliss (NY163)	4	6	6	2	6	5	0	0	PO=Green
NY165	5	8	6	2	5	4	20	0	PO=Green, growth crack
Brodie (NY140)	5	6	5	2	5	5	0	10	PO=Green
MSAA217-3	6	8	7	2	5	5	0	0	PO=Green
MSBB626-11	7	8	7	2	3	7	0	10	
Lakeview Russet	4	6	4	7	5	5	0	20	PO=Green
Anouk	6	7	7	2	6	5	0	0	PO=Green
Ballerina	5	7	8	2	6	5	0	10	PO=Green
Libero	6	7	8	4	6	5	0	10	PO=Green
A11573-5RYsto	5	5	3	4	5	5	10	0	PO=Green, growth crack
MSBB630-2	6	6	6	2	6	6	20	0	PO=Green
MSCC553-1R	6	2	7	2	4	6	0	10	PO=Growth crack
NC818-24	5	6	6	2	5	6	0	0	PO=Green
French Fingerling	6	2	8	7	5	6	10	0	PO=Green, knobs
All Blue	5	1	7	6	5	5	0	0	PO=Growth crack
A11582-1R	6	2	8	2	5	5	0	0	PO=Green
W13103-2Y	5	2	8	2	6	6	0	0	(small tubers, no yield)
Portage Russet	5	5	4	7	5	5	20	10	PO=Green

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.
TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.
Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.
TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 10 tubers. 0 = not observed.

Table 5. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for round white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Replicate											
Atlantic	415	386	93	100	3	18	60	15	0	4	1.095
Katahdin	325	275	84	71	5	26	39	19	0	11	1.077
Kennebec	498	404	81	104	3	15	34	30	1	16	1.081
Shepody	468	373	80	96	3	16	35	25	4	17	1.078
Snowden	393	362	92	94	5	28	52	11	1	3	1.095
Superior	365	340	93	88	5	20	56	17	0	2	1.072
Yukon Gold [y]	332	303	92	78	1	14	37	35	6	7	1.084
AF5819-2	301	282	94	73	6	30	55	8	0	0	1.082
AF5933-4	365	330	91	85	9	61	30	0	0	0	1.094
AF6165-9	326	295	91	76	8	39	50	2	0	1	1.091
AF6194-4	314	294	93	76	4	46	42	6	0	2	1.076
AF6200-4	463	428	92	111	2	17	42	33	0	6	1.089
AF6522-1	333	245	72	63	28	52	19	1	0	0	1.085
AF6565-8	433	405	93	105	5	32	47	14	0	1	1.087
AF6601-2	442	409	92	106	7	38	44	10	0	1	1.083
B3296-3	342	311	91	80	6	24	53	15	0	3	1.090
BNC816-7	317	285	90	74	9	47	43	0	0	1	1.083
CO10098-5W/Y [y]	182	117	64	30	20	60	4	0	0	16	1.087
MSAFB609-12	395	358	91	93	8	42	42	7	0	2	1.091
MSAFB635-15	341	288	83	75	15	60	23	1	0	2	1.091
NY171	343	316	91	82	9	41	36	11	2	0	1.076
NY174	458	440	96	114	4	34	53	9	0	0	1.090
NY177	480	431	90	112	9	46	36	7	0	2	1.096
WAF14096-5 [y]	541	479	88	124	9	40	39	10	0	3	1.081
Bliss (NY163)	365	325	89	84	8	45	38	6	0	3	1.087
Brodie (NY140)	449	430	96	111	2	20	49	25	2	2	1.078
AF5280-5	437	398	91	103	3	14	39	37	1	6	1.065
AF6200-7	326	301	92	78	3	19	51	22	0	5	1.098
AF6206-3	377	339	90	88	8	44	39	7	0	2	1.089

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
AF6206-5	447	369	82	96	4	30	39	12	2	14	1.099
AF6552-2	425	409	96	106	3	29	54	11	1	1	1.085
AF6652-3	422	404	96	105	3	37	49	10	0	2	1.086
AF6655-1	335	273	83	71	8	40	38	4	0	9	1.086
AF6669-10	408	372	91	96	5	41	39	12	0	3	1.086
AF6671-10	412	389	95	101	4	23	62	9	0	1	1.094
WAF16107-2	461	445	96	115	2	16	56	24	0	2	1.089
WAF17045-2	375	343	92	89	6	37	51	3	0	3	1.084
WAF17049-2	451	405	90	105	4	29	50	11	0	7	1.094
AF6566-1	524	500	95	129	4	26	51	16	2	1	1.096
AF6883-8	313	281	90	73	9	39	49	2	0	2	1.093
AF6886-3	551	527	96	136	2	35	45	14	1	2	1.083
AF6888-15	318	288	90	74	6	26	47	16	1	4	1.077
AF6894-12	669	482	76	125	3	19	41	16	0	21	1.093
AF6896-1	399	347	87	90	7	41	32	12	3	6	1.091
AF6898-1	386	344	88	89	9	38	42	8	0	2	1.092
AF6911-4	450	391	87	101	7	29	49	8	0	7	1.094
AF6978-1	515	497	96	129	3	20	48	25	4	1	1.085
AF6979-3	310	289	93	75	6	38	53	3	0	1	1.078
NDAF1710Y-1 [y]	546	453	83	117	4	23	47	13	0	13	1.091
AF6868-6 [y]	359	324	90	84	10	46	44	0	0	0	1.088
MSAA217-3	378	363	96	94	3	23	48	20	4	1	1.093
MSBB626-11	317	300	95	78	2	14	48	33	0	3	1.089
MSBB635-14	381	368	97	95	3	31	52	14	0	0	1.078
MSBB636-11	419	401	96	104	2	22	52	20	2	3	1.080
MSBB630-2	490	447	91	116	4	35	50	7	0	5	1.080
NC818-24	471	452	96	117	3	18	54	23	2	1	1.085
SP327	521	492	94	127	4	27	56	11	0	2	1.084
CO11266-1W/Y [y]	438	298	68	77	30	56	10	1	0	3	1.088
AC10376-1-2012W/Y [y]	468	252	54	65	35	45	7	2	0	11	1.071
AC13126-1Wadg	368	336	91	87	4	27	46	16	2	5	1.087
BNC182-5	469	421	91	109	4	16	53	21	1	6	1.091
BNC811-15	342	309	91	80	6	34	44	13	0	3	1.086
B3379-2	248	200	80	52	18	46	31	2	0	2	1.095
B3403-6	324	301	93	78	7	46	43	4	0	0	1.095
B2869-29	268	226	84	59	16	42	38	4	0	0	1.093

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
BNC974-1	307	266	87	69	7	21	44	21	0	6	1.082
B3471-1	240	187	76	48	23	57	19	0	0	1	1.086
W13103-2Y [y]	365	317	87	82	9	30	46	12	0	4	1.062
W15240-2Y [y]	496	404	82	105	15	54	25	2	0	3	1.064
W15248-17Y [y]	345	297	85	77	12	47	32	6	0	3	1.062
Anouk [y]	440	283	64	73	33	49	12	3	0	3	1.077
Ballerina [y]	259	165	64	43	36	52	9	3	0	0	1.062
Paroli [y]	366	297	81	77	13	50	30	1	0	6	1.063
Non-replicate											
AF6872-11	279	247	89	64	3	34	46	9	0	9	1.098
AF6876-18	264	245	93	63	7	47	38	8	0	0	1.089
AF6880-9	340	326	96	84	4	40	46	10	0	0	1.087
AF6892-6	338	299	89	77	11	45	38	5	0	0	1.082
AF6901-8	287	265	92	68	8	27	50	15	0	0	1.077
AF6903-3 [y]	333	300	90	78	5	27	52	11	0	5	1.088
AF7095-7 [y]	320	262	82	68	18	52	21	8	0	0	1.088
AF7095-2 [y]	476	356	75	99	23	52	22	0	0	2	1.072
AF7095-4 [y]	521	473	91	132	7	38	41	13	0	2	1.086
AF7114-12	355	299	84	77	15	59	23	1	0	1	1.093
AF7114-15	331	294	89	76	10	69	16	4	0	1	1.091
AF7128-4	340	301	89	78	4	22	50	17	0	7	1.083
AF7129-2	352	326	93	84	7	50	33	9	0	0	1.088
AF7130-6	535	427	80	111	4	20	51	9	0	16	1.092
AF7131-2	496	395	80	102	8	38	41	1	0	13	1.093
AF7140-1	417	369	88	95	8	36	47	6	0	4	1.094
AF7145-2	328	317	96	82	2	32	52	13	0	1	1.083
AF7147-3	481	324	67	84	5	42	20	5	0	28	1.086
AF7149-2	335	307	92	80	6	54	38	0	0	3	1.084
AF7153-4	371	333	90	86	7	31	56	3	0	3	1.081
AF7157-7	356	328	92	85	2	34	48	11	0	6	1.092
AF7159-2	281	236	84	61	4	34	35	15	0	12	1.090
AF7162-3	414	387	93	100	6	52	37	5	0	1	1.093
AF7170-7	333	294	88	76	10	49	36	4	0	2	1.092
AF7172-3	275	252	92	65	8	37	44	11	0	0	1.083

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
AF7173-7	504	444	88	115	4	19	36	33	0	8	1.085
AF7174-3	240	228	95	59	5	33	62	0	0	0	1.078
AF7179-6	414	343	83	89	6	27	49	8	0	11	1.076
AF7183-2	523	477	91	123	4	20	55	16	0	5	1.083
COAF18053-3 [y]	465	386	83	100	5	35	43	5	0	12	1.069
AAF12219-1 [y]	445	314	71	81	23	56	14	0	0	6	1.074
AAF12227-1 [y]	396	363	92	94	2	30	62	0	0	7	1.070
AF7137-4	311	268	86	69	14	67	19	0	0	0	1.084
AF7151-3	397	372	94	96	1	19	56	19	0	5	1.095
AF7166-1	478	388	81	101	1	27	45	10	0	18	1.071
AF7170-9dup1	372	345	93	89	5	34	40	19	0	3	1.083
AF7175-2	344	300	87	78	8	43	38	7	0	5	1.089
AF7182-4	333	299	90	77	10	38	49	3	0	1	1.073
NDAF17137-7	232	217	93	56	7	54	35	5	0	0	1.083
NDAF17139-5	302	270	89	70	11	48	37	4	0	0	1.073
AF7148-2	373	316	85	82	4	10	47	28	0	12	1.076
AF7160-2 [y]	355	292	82	75	12	49	31	3	0	6	1.081
LSD	107	100	9		6	13	15	11	3	7	

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Atlantic, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Planted 9-in. apart with 13 seed pieces per 10-ft plot. Yellow flesh varieties are indicated with [y].

Replicated trials are the average of 3 replicates and the rest are non-replicated.

LSD indicates least significant difference ($P = 0.05$), calculated for replicated varieties.

Table 6. Tuber characteristics, internal defects for round white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Replicate									
Atlantic	5	6	5	2	4	7	42	25	PO=Green, Growth crack, knobs
Katahdin	5	8	6	3	6	5	8	0	PO=Green, growth crack, misshapen
Kennebec	4	8	7	6	5	6	0	8	PO=Green, growth crack, knobs
Shepody	5	7	6	6	7	5	33	0	PO=Green, growth crack, knobs, misshapen
Snowden	5	6	5	2	4	6	33	0	PO=Green
Superior	5	6	6	4	5	5	0	8	PO=Green
Yukon Gold	4	7	6	3	6	6	50	8	PO=Green, growth crack
AF5819-2	5	7	7	2	4	6	0	17	PO=Green
AF5933-4	5	7	6	2	5	6	0	8	PO=Green
AF6165-9	5	7	6	2	4	5	25	0	PO=Green
AF6194-4	6	7	7	3	5	6	8	8	PO=Green
AF6200-4	5	6	6	2	5	5	8	0	PO=Green, misshapen
AF6522-1	6	6	6	2	5	6	0	0	PO=Green
AF6565-8	5	6	5	2	5	6	25	0	PO=Green
AF6601-2	5	6	6	2	5	6	0	8	PO=Green
B3296-3	5	7	6	2	5	6	8	0	PO=Green, growth crack
BNC816-7	7	6	5	2	7	6	0	0	PO=Green
CO10098-5W/Y	5	7	7	3	6	5	0	0	PO=Green, knobs
MSAFB609-12	5	7	7	2	6	6	0	8	PO=Green
MSAFB635-15	5	6	5	2	5	6	0	0	PO=Green
NY171	5	9	7	4	6	5	0	0	PO=Green, (scab)
NY174	5	6	6	3	5	4	0	8	PO=Green
NY177	4	6	6	2	5	4	0	8	PO=Green
WAF14096-5	5	7	5	2	5	5	8	0	PO=Growth crack, green, knobs
Bliss (NY163)	5	7	6	3	5	5	0	0	PO=Green, growth crack, misshapen
Brodie (NY140)	7	7	6	3	5	5	8	0	PO=Green, misshapen
AF5280-5	5	7	6	4	5	5	8	0	PO=Green, misshapen, growth crack
AF6200-7	4	6	5	3	5	4	0	0	PO=Green, misshapen
AF6206-3	5	6	5	3	5	6	0	0	PO=Green, growth crack

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
AF6206-5	4	6	5	2	4	5	42	0	PO=Green, knobs, growth crack, misshapen, (scab)
AF6552-2	5	7	6	2	4	5	8	8	PO=Green
AF6652-3	5	6	6	2	4	5	33	0	PO=Green
AF6655-1	4	6	6	3	4	5	8	25	PO=Green, knobs, growth crack, (scab)
AF6669-10	5	7	6	3	4	5	8	17	PO=Green, growth crack, misshapen
AF6671-10	5	6	5	3	5	5	8	8	PO=Green, misshapen
WAF16107-2	5	6	5	2	5	4	8	8	PO=Green, (scab)
WAF17045-2	5	5	5	2	5	6	0	8	PO=Green
WAF17049-2	5	7	6	3	4	5	42	0	PO=Green, knobs, misshapen
AF6566-1	6	7	4	3	5	5	0	0	PO=Green, growth crack
AF6883-8	4	5	5	2	5	6	0	0	PO=Green, growth crack
AF6886-3	5	6	5	4	5	5	8	8	PO=Green, misshapen
AF6888-15	5	7	6	2	4	6	0	0	PO=Green
AF6894-12	5	6	6	2	5	5	42	0	PO=Green, growth crack, misshapen
AF6896-1	5	5	5	2	5	5	0	8	PO=Green, misshapen
AF6898-1	4	6	4	3	5	5	33	0	PO=Green, misshapen
AF6911-4	5	6	5	2	4	6	0	8	PO=Green, growth crack
AF6978-1	5	6	5	3	5	5	17	0	PO=Green, growth crack
AF6979-3	4	6	4	2	4	5	0	0	PO=Misshapen
NDAF1710Y-1	5	7	6	3	5	5	0	0	PO=Growth crack, misshapen, green
AF6868-6	4	7	6	2	6	5	17	0	PO=Green
MSAA217-3	5	6	4	3	5	5	58	8	PO=Green
MSBB626-11	5	7	6	2	4	5	0	0	PO=Green, growth crack
MSBB635-14	5	6	5	2	4	4	0	8	PO=Green
MSBB636-11	5	6	5	2	5	5	58	0	PO=Green
MSBB630-2	5	6	5	2	5	6	25	0	PO=Green, (scab)
NC818-24	5	7	5	2	6	6	8	0	PO=Green, misshapen
SP327	5	7	6	2	5	5	8	17	PO=Green, misshapen
CO11266-1W/Y	4	6	5	3	7	5	0	8	PO=Green, misshapen, knobs
AC10376-1-2012W/Y	3	7	6	3	6	6	0	8	PO=Green, knobs, misshapen
AC13126-1Wadg	5	6	5	2	4	5	8	0	PO=Green
BNC182-5	5	6	5	2	5	5	17	0	PO=Green, knobs, growth crack, misshapen
BNC811-15	5	6	6	4	6	5	67	0	PO=Green, growth crack
B3379-2	4	6	5	2	5	5	42	8	PO=Green, growth crack
B3403-6	4	5	4	2	5	5	0	0	
B2869-29	5	7	6	3	5	5	0	0	PO=Green

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
BNC974-1	5	6	6	3	4	5	42	8	PO=Growth crack, green, (scab)
B3471-1	4	7	7	2	6	6	0	0	PO=Green
W13103-2Y	6	7	7	2	6	6	0	8	PO=Green
W15240-2Y	5	7	8	3	6	5	0	0	PO=Green, knobs
W15248-17Y	6	6	6	4	5	5	0	0	PO=Green, misshapen
Anouk	5	7	6	2	5	6	0	0	PO=Green, misshapen
Ballerina	7	9	8	3	7	6	0	0	
Paroli	7	9	7	3	6	6	8	8	PO=Green, growth crack, misshapen
Non-replicate									
AF6872-11	5	7	6	2	6	6	25	0	PO=Green
AF6876-18	5	6	6	2	5	6	0	0	
AF6880-9	5	6	6	2	5	6	0	0	
AF6892-6	5	6	5	2	6	6	0	0	
AF6901-8	4	6	5	2	4	4	0	0	
AF6903-3	5	7	5	3	6	6	25	0	PO=Green,knobs
AF7095-7	3	7	6	4	5	4	0	0	(sprouting)
AF7095-2	6	9	7	3	6	5	0	0	PO=green, (sprouting)
AF7095-4	6	7	7	3	5	6	0	0	PO=green, (sprouting)
AF7114-12	3	7	6	2	5	5	25	0	
AF7114-15	4	7	6	2	4	5	0	0	PO=Green
AF7128-4	4	7	6	3	5	4	0	0	PO=Green, growth crack
AF7129-2	6	6	6	2	5	4	25	25	
AF7130-6	5	7	5	2	4	5	75	0	PO=Green, growth crack, misshapen, knobs
AF7131-2	4	7	6	2	6	4	25	0	PO=Knobs, misshapen, green
AF7140-1	4	7	6	2	4	4	25	0	PO=Growth crack
AF7145-2	6	7	6	3	5	4	0	0	PO=Green
AF7147-3	3	8	7	3	5	5	25	0	PO=Green, growth crack
AF7149-2	5	7	7	2	6	6	0	0	PO=Green
AF7153-4	5	7	6	2	5	4	0	0	PO=Green
AF7157-7	5	7	6	2	5	5	25	0	PO=Green
AF7159-2	4	7	6	3	3	5	0	100	PO=Green, misshapen
AF7162-3	5	7	6	2	3	5	0	50	PO=Green
AF7170-7	4	6	6	2	5	5	0	25	PO=Green
AF7172-3	5	9	7	2	5	5	0	0	

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
AF7173-7	5	9	6	3	7	5	0	0	PO=Green
AF7174-3	4	7	6	2	5	5	0	0	
AF7179-6	5	6	6	2	5	5	25	0	PO=Green
AF7183-2	5	7	6	2	5	3	25	0	PO=Growth crack, knobs, green
COAF18053-3	6	7	6	3	5	5	0	0	PO=Green, growth crack
AAF12219-1	4	7	7	2	7	7	0	0	PO=Green, knobs, misshapen (small tubers)
AAF12227-1	6	7	6	3	5	5	25	0	PO=Green, growth crack
AF7137-4	4	7	6	2	4	7	0	0	
AF7151-3	5	7	6	3	4	4	50	0	PO=Green, growth crack, knobs
AF7166-1	5	7	6	4	5	3	25	0	PO=Green, growth crack, knobs
AF7170-9dup1	5	7	7	2	5	5	25	0	PO=Green
AF7175-2	6	7	6	2	6	7	0	0	PO=Green
AF7182-4	4	9	6	4	6	5	0	0	
NDAF17137-7	4	8	7	2	7	5	0	0	
NDAF17139-5	5	8	8	2	6	6	0	0	
AF7148-2	5	7	7	3	4	6	0	0	PO=Growth crack
AF7160-2	4	7	6	2	5	5	0	0	PO=Growth crack (sprouting)

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.
TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.
Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.
TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 12 tubers for replicated trials and total number out of 4 for non replicated trials. 0 = not observed.

Table 7. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for red or purple skinned potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Replicate											
Chieftain	407	359	89	100	2	14	48	27	0	9	1.069
Dk Red Norland	367	345	94	96	5	38	46	10	0	2	1.066
BNC559-1	407	362	88	101	10	42	38	8	0	2	1.067
BNC833-2 [p]	328	259	78	72	19	50	27	1	0	2	1.071
BNC839-5	261	227	85	63	8	30	44	11	0	6	1.068
BNC917-2 [y]	381	327	85	91	11	40	34	11	0	4	1.072
CO15211-1R	448	394	87	110	11	40	40	7	0	2	1.075
NCB2607-3 [y]	273	227	83	63	11	55	26	2	0	6	1.079
NDAF141Y-3	553	483	87	135	7	32	47	9	0	6	1.074
NDAF12238Y-2	340	287	84	80	15	60	22	2	0	1	1.068
NDAF113484B-1	338	318	94	89	5	26	54	14	0	1	1.061
AAF11546-3	271	240	88	67	9	43	40	5	0	3	1.068
AF6575-6 [y]	360	295	82	82	17	57	19	6	0	1	1.082
AF6694-8	265	232	88	65	8	41	44	3	0	4	1.073
AF6932-4	430	392	91	109	8	33	45	12	0	1	1.068
AF6963-1	447	410	92	114	7	41	42	8	0	1	1.080
AF6963-8	560	518	92	144	4	19	59	13	1	4	1.075
AF6965-5	413	374	91	104	4	26	51	14	0	6	1.078
NDAF1727Y-1	463	418	90	116	4	15	43	32	0	6	1.067
MSZ416-8RY [y]	479	392	83	109	3	14	38	22	9	14	1.073
MSCC553-1R	392	352	89	98	4	22	50	17	0	6	1.075
French Fingerling [y/r]	526	281	53	78	25	35	18	0	0	22	1.080
All Blue [p]	354	210	59	59	27	42	18	0	0	13	1.073
A11582-1R	458	315	68	88	25	49	17	1	0	7	1.067
A11573-5RYsto [y]	593	525	89	146	9	42	38	8	0	2	1.077
BNC839-5	283	264	93	73	5	26	53	14	0	2	1.070
BNC559-1	374	327	87	91	9	45	39	4	0	4	1.067
BNC917-2 [y]	394	362	91	101	8	46	37	7	1	1	1.070
BD1505-4 [y]	75	13	17	4	72	14	3	0	0	11	
Red Apple [y]	488	325	66	91	23	53	13	0	0	11	1.075

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Non-replicate											
AF7090-9	405	368	91	103	7	27	53	11	0	2	1.071
AF7098-4	266	199	75	55	15	48	27	0	0	10	1.067
AF7103-6	254	174	68	49	7	28	32	8	0	25	1.063
AAF15338-5	460	428	93	119	3	32	41	20	0	4	1.055
NDAF17119-4	353	324	92	90	8	39	50	3	0	0	1.066
NDAF17153-1	368	259	70	72	30	55	16	0	0	0	1.078
NDAF1821Y-3	608	559	92	156	4	13	65	10	3	4	1.065
NDAF1825Y-3	419	380	91	106	5	19	57	8	7	4	1.071
AF7093-1	231	215	93	60	7	32	51	10	0	0	1.079
NDAF17155-6	410	338	82	94	18	40	39	3	0	0	1.071
LSD	121	111	7		7	13	12	10	3	6	

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Chieftain, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Replicated trials are the average of 3 replicates and the rest are non-replicated. LSD indicates least significant difference (P = 0.05), calculated for replicated varieties. Varieties with colored flesh are indicated by [y] for yellow, [r] for red and [p] for purple. Plots consisted of 10-ft rows with 13 seed pieces spaced 9-in. apart.

Table 8. Tuber characteristics, internal defects for red skinned potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Replicate									
Chieftain	5	2	7	3	5	6	0	0	PO=Knobs, green, growth crack
Dk Red Norland	5	2	7	2	5	5	8	8	PO=Knobs, growth crack
BNC559-1	5	1	7	3	4	6	0	0	PO=Growth crack, misshapen
BNC833-2	5	1	7	4	5	6	0	0	PO=Misshapen
BNC839-5	6	2	7	2	5	6	0	8	PO=Knobs
BNC917-2	4	1	7	4	5	6	0	0	PO=Knobs,misshapen, growth crack
CO15211-1R	6	2	7	3	6	6	0	8	PO=Growth crack
NCB2607-3	5	2	7	3	5	5	0	0	PO=Growth crack
NDAF141Y-3	5	2	7	3	5	5	0	8	PO=Green, growth crack, misshapen
NDAF12238Y-2	4	2	6	2	5	5	0	0	PO=Green, misshapen
NDAF113484B-1	6	2	7	3	6	7	0	0	PO=Green
AAF11546-3	5	2	7	4	4	7	0	0	PO=Growth crack, misshapen, knobs
AF6575-6	5	1	6	3	7	5	0	0	PO=Growth crack
AF6694-8	5	2	7	2	5	4	0	0	PO=Growth crack, misshapen
AF6932-4	6	2	7	3	5	5	17	0	PO=Green
AF6963-1	6	2	6	3	6	4	0	0	PO=Misshapen, knobs, growth crack
AF6963-8	6	2	7	3	5	5	0	0	PO=Green, growth crack
AF6965-5	6	2	7	4	6	5	0	8	PO=Green
NDAF1727Y-1	5	2	7	3	5	5	50	8	PO=Growth crack, green
MSZ416-8RY	4	2	6	2	5	6	0	0	PO=Growth crack, misshapen
MSCC553-1R	6	2	7	2	5	6	0	0	PO=Misshapen, green
French Fingerling	4	3	7	7	6	5	0	0	PO=Growth crack, green, misshape
All Blue	4	1	6	7	5	5	0	0	PO=Misshapen
A11582-1R	5	2	7	3	7	4	0	0	PO=Knobs, misshapen, green
A11573-5RYsto	8	2	7	2	5	6	0	8	PO=Green
BNC839-5	5	2	6	2	6	6	0	0	PO=Green, (silver scurf)
BNC559-1	5	1	6	3	5	6	0	0	PO=Knobs, growth crack
BNC917-2	5	1	6	4	5	6	0	25	PO=Growth cracks
BD1505-4	5	2	7	2	5	5	17	8	PO=Knobs
Red Apple	5	2	7	3	5	5	0	8	PO=Knobs, growth cracks

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Non-replicate									
AF7090-9	6	2	8	3	7	5	0	0	PO=Misshapen
AF7098-4	6	2	7	2	7	2	0	0	PO=Green, growth crack
AF7103-6	3	2	7	2	7	4	0	0	PO=Growth crack, (scab)
AAF15338-5	5	2	8	3	7	6	25	0	PO=Growth crack
NDAF17119-4	6	2	8	2	5	5	0	0	
NDAF17153-1	5	2	8	2	6	5	0	0	
NDAF1821Y-3	6	2	8	3	6	5	0	0	PO=Green
NDAF1825Y-3	6	2	7	3	5	4	0	0	PO=Green, growth crack
AF7093-1	6	2	8	2	6	5	0	0	
NDAF17155-6	5	1	7	2	7	5	0	0	

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.
TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.
Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.
TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 12 tubers for replicated trials and total number out of 4 for non replicated trials. 0 = not observed.

Table 9. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for russet skinned or white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Replicate											
Lakeview Russet	465	390	84	146	2	16	29	31	8	14	1.080
Russet Burbank	370	257	68	96	6	29	28	11	0	25	1.078
Russet Norkotah	299	267	89	100	9	34	34	19	2	2	1.072
AAF10596-1	371	298	80	112	7	30	35	11	5	12	1.099
AF5071-2	322	251	79	94	7	25	33	18	3	14	1.089
AF5521-1	351	329	93	123	0	11	45	24	12	7	1.092
AF5707-1	420	360	86	135	9	27	47	12	0	5	1.083
AF5735-8	316	289	91	108	4	28	32	27	5	4	1.072
AF5750-16	356	278	78	104	13	45	31	2	0	9	1.078
AF5762-8	395	365	92	137	3	29	42	22	0	5	1.089
AF6075-8	364	262	72	98	8	24	34	14	0	20	1.069
AF6340-6	234	185	78	69	20	40	35	3	0	2	1.070
AF5736-16	374	343	92	129	2	18	49	23	2	6	1.092
AF6298-2	309	262	85	98	4	39	37	9	0	10	1.081
AF6446-17	373	336	90	126	5	39	38	13	0	6	1.074
AF6465-7	329	293	89	110	9	42	32	15	0	2	1.084
Caribou Russet	364	344	94	129	5	17	44	33	0	1	1.075
A12327-5	365	329	90	123	3	17	53	16	4	6	1.078
COA15494-8	415	350	85	131	3	26	46	13	0	12	1.074
W13008-1rus	305	260	85	97	8	28	32	25	0	7	1.078
Portage Russet	407	342	84	128	7	29	34	19	2	9	1.090
Libero [y]	310	259	83	97	12	36	30	17	0	5	1.078

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Non-replicate											
AF6750-3	313	232	74	87	11	19	50	5	0	15	1.073
AF6814-1	191	166	87	62	4	20	37	5	25	10	1.082
AF6855-4	307	257	84	96	8	42	33	9	0	8	1.087
AAF15086-5	443	411	93	154	3	29	29	32	3	4	1.090
AAF16069-2	295	233	79	88	8	30	34	14	0	13	1.084
COAF16277-4	279	249	89	93	4	14	75	0	0	7	1.074
AF6989-3	382	189	49	71	6	16	33	0	0	45	1.075
COAF16090-14	231	183	79	69	12	32	26	21	0	9	1.058
AAF15193-6	440	286	65	107	3	25	36	0	3	32	1.075
AAF15291-5	372	273	73	102	10	40	23	3	8	17	1.082
AAF15402-1	380	266	70	100	3	11	26	29	5	27	1.068
NDAF1791-1	340	313	92	117	8	39	41	12	0	0	1.098
NDAF1791-3	328	316	96	118	4	38	40	19	0	0	1.091
NDAF1791-6	408	376	92	141	6	46	14	32	0	2	1.089
AF6997-1	428	358	84	134	12	21	41	22	0	5	1.083
AF7032-5	390	368	94	138	4	40	44	10	0	1	1.079
AF7033-2	374	333	89	125	11	42	39	8	0	0	1.090
AF7033-3	434	422	97	158	3	13	43	41	0	0	1.068
AF7039-2	467	356	76	133	8	25	35	17	0	16	1.001
AF7039-5	298	234	78	88	7	36	20	22	0	15	1.085
AF7040-8	344	305	89	114	4	46	30	13	0	7	1.071
AF7041-5	496	382	77	143	7	34	26	8	9	16	1.085
AF7043-1	251	221	88	83	0	21	41	26	0	11	1.088
AF7045-1	314	277	88	104	6	23	25	41	0	6	1.076
AF7050-3	407	344	85	129	11	43	42	0	0	4	1.076
AF7055-8	502	460	92	173	7	42	46	5	0	2	1.093
AF7055-9	362	334	92	125	5	36	35	22	0	3	1.076
AF7058-5	483	343	71	129	4	17	32	22	0	25	1.090
AF7066-5	436	284	65	106	4	13	31	21	0	31	1.086
AF7068-3	215	193	90	72	8	37	48	4	0	3	1.092
AF7079-4	377	317	84	119	8	27	23	33	0	8	1.065
AF7088-5	316	233	74	87	3	16	31	28	0	24	1.091

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
COAF17078-3	314	242	77	91	14	34	33	10	0	9	1.082
COAF17033-13	378	319	84	120	10	26	41	18	0	6	1.089
COAF18063-4	366	298	81	112	17	42	34	5	0	1	1.093
COAF18063-7	474	405	85	152	9	33	39	13	0	6	1.093
COAF18186-2	323	274	85	103	15	44	25	16	0	0	1.085
AAF16028-1	348	256	74	96	1	13	32	16	12	25	1.079
AAF16034-8	221	192	87	72	13	43	20	24	0	0	1.078
AAF16043-2	417	213	51	80	5	18	17	16	0	44	1.074
AAF16044-2	166	133	80	50	5	45	27	8	0	14	1.084
AAF16065-1	275	202	73	76	0	32	36	5	0	26	1.090
AAF16132-3	512	471	92	177	6	35	45	12	0	2	1.080
AAF10458-3	363	318	88	119	5	39	40	9	0	8	1.082
AAF10521-2	280	247	88	93	1	30	34	24	0	10	1.092
AAF18476-1	297	256	86	96	10	17	40	29	0	4	1.060
AAF18476-2	336	292	87	109	7	23	25	39	0	7	1.082
NDAF17103-1	368	266	72	100	2	18	33	21	0	26	1.083
NDAF17107-2	344	194	56	73	14	37	13	6	0	30	1.081
NDAF1811-1	361	269	75	101	3	15	29	31	0	22	1.078
NDAF1813-2	196	156	80	59	3	14	28	38	0	17	1.078
AF7038-1	323	149	46	56	4	10	26	11	0	50	1.074
LSD	93	92	12		8	14	14	16	7	9	

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Russet Norkotah for >1 7/8" yield.

[3]Percentage of total yield according to size class: 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Replicated trials are the average of 3 replicates and the rest are non-replicated.

LSD indicates least significant difference ($P = 0.05$), calculated for replicated varieties.

Plots consisted of 10-ft rows with 10 seed pieces spaced 12-in. apart. Yellow flesh varieties are indicated with [y].

Table 10. Tuber characteristics, internal defects for russet skinned or white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Replicate									
Lakeview Russet	5	6	4	6	5	5	17	17	PO=Knobs, green
Russet Burbank	4	5	3	7	5	5	58	0	PO=Knobs, growth crack, green
Russet Norkotah	5	4	2	6	5	5	58	0	PO=Green, misshapen
AAF10596-1	5	4	2	7	6	6	42	0	PO=Green, knobs
AF5071-2	2	4	2	7	7	6	50	0	PO=Green, growth crack, (scab)
AF5521-1	6	4	2	7	8	6	67	0	PO=Green, knobs, growth crack
AF5707-1	5	4	2	6	6	6	25	17	PO=Green, knobs
AF5735-8	4	4	2	7	5	5	17	8	PO=Misshapen, green
AF5750-16	4	6	4	6	5	5	17	17	PO=Knobs, green
AF5762-8	5	4	2	6	5	5	17	0	PO=Misshapen, Knobs
AF6075-8	4	5	3	6	5	5	50	17	PO=Misshapen, knobs, growth crack, green
AF6340-6	5	5	4	6	5	5	0	0	PO=Misshapen
AF5736-16	5	5	3	7	6	5	0	8	PO=Growth crack, misshapen, green
AF6298-2	5	6	4	6	6	5	25	25	PO=Growth crack, green
AF6446-17	5	5	3	7	5	5	50	0	PO=Knobs, green
AF6465-7	6	5	3	6	5	5	25	0	PO=Misshapen
Caribou Russet	6	5	3	7	5	5	0	0	PO=Green
A12327-5	5	4	2	6	5	5	17	0	PO=Knobs, growth crack
COA15494-8	5	5	3	6	5	5	58	0	PO=Growth crack, knobs, misshapen
W13008-1rus	5	6	4	6	5	5	50	0	PO=Growth crack, green
Portage Russet	5	6	4	7	5	5	0	0	PO=Growth crack, green
Libero	5	6	4	6	5	4	0	0	PO=Growth crack, green, knobs

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Non-replicate									
AF6750-3	4	4	2	6	7	6	25	0	PO=Growth crack, knobs, misshapen
AF6814-1	4	5	3	6	5	6	50	25	PO=Growth crack, knobs
AF6855-4	5	5	3	6	6	5	50	25	PO=Growth crack, knobs
AAF15086-5	6	4	2	6	7	5	0	0	PO=Green, Knobs
AAF16069-2	5	4	2	6	6	5	50	0	PO=Growth crack, knobs
COAF16277-4	6	5	3	6	5	6	0	25	PO=Growth crack
AF6989-3	3	4	2	6	5	5	100	0	PO=Knobs
COAF16090-14	4	4	2	6	7	6	0	0	PO=Growth crack, misshapen
AAF15193-6	4	4	2	6	4	5	0	0	PO=Misshapen, growth crack, knobs
AAF15291-5	4	4	2	6	4	5	50	0	PO=Knobs, misshapen
AAF15402-1	4	4	2	6	7	5	0	0	PO=Knobs, misshapen, green, growth crack
NDAF1791-1	4	5	2	6	7	5	0	0	
NDAF1791-3	5	5	3	6	6	5	100	0	
NDAF1791-6	5	4	2	6	6	8	0	0	PO=Green
AF6997-1	5	4	2	6	5	8	75	0	PO=Green
AF7032-5	4	5	3	3	7	8	0	0	PO=Misshapen
AF7033-2	4	5	3	7	7	5	0	0	
AF7033-3	6	6	3	5	8	5	25	0	
AF7039-2	4	5	3	6	7	5	25	0	PO=Knobs, green, misshapen
AF7039-5	3	6	4	6	6	5	0	0	PO=Knobs, growth crack, green, (sprouting)
AF7040-8	4	6	6	4	7	5	0	0	PO=Growth crack, knobs, green
AF7041-5	5	6	4	6	7	5	25	0	PO=Green, knobs, misshapen
AF7043-1	5	5	3	6	6	6	50	0	PO=Growth crack
AF7045-1	3	7	4	8	7	7	0	0	PO=Knobs, growth crack, green
AF7050-3	5	6	4	6	5	5	0	0	PO=Growth crack
AF7055-8	6	5	2	6	7	6	0	0	PO=Green
AF7055-9	6	5	3	6	5	5	75	0	PO=Green, misshapen
AF7058-5	4	5	3	6	5	5	25	0	PO=Misshapen, growth crack, green
AF7066-5	3	4	2	6	6	6	0	0	PO=Growth crack, knobs
AF7068-3	4	6	4	6	5	5	0	0	PO=Green, growth crack
AF7079-4	5	4	2	6	5	5	50	0	PO=Growth crack
AF7088-5	4	5	3	6	8	7	0	0	PO=Green, knobs, misshapen

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
COAF17078-3	3	5	3	6	6	5	50	0	PO=Green, growth crack
COAF17033-13	5	5	2	7	8	7	50	0	PO=Green, knobs
COAF18063-4	5	4	2	6	5	6	50	0	PO=Knobs
COAF18063-7	4	4	2	6	7	5	50	0	PO=Green, knobs, misshapen
COAF18186-2	4	4	2	6	6	5	0	0	
AAF16028-1	4	4	2	6	7	5	25	0	PO=Knobs, growth crack, misshapen, green
AAF16034-8	4	5	3	6	7	5	25	0	
AAF16043-2	4	5	3	6	5	5	50	0	PO=Growth crack, green
AAF16044-2	3	6	4	6	5	5	0	0	PO=Knobs
AAF16065-1	4	5	3	6	5	5	0	0	PO=Growth crack
AAF16132-3	6	4	2	6	6	5	25	0	PO=Green, knobs
AAF10458-3	4	5	4	6	6	5	0	0	PO=Green, knobs
AAF10521-2	5	4	3	6	5	5	0	0	PO=Knobs, growth crack
AAF18476-1	5	4	2	6	7	5	100	0	PO=Knobs
AAF18476-2	6	5	3	6	7	6	25	0	PO=Green
NDAF17103-1	4	4	2	6	7	5	50	0	PO=Knobs, growth crack
NDAF17107-2	3	5	3	6	7	5	25	0	PO=Growth crack, knobs, misshapen, green
NDAF1811-1	4	5	3	6	7	5	25	0	PO=Growth crack, green, knobs
NDAF1813-2	4	5	3	6	6	6	0	0	PO=Misshapen, green
AF7038-1	3	5	3	6	7	5	0	0	PO=Knobs, green

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.
TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.
Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.
TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 12 tubers for replicated trials and total number out of 4 for non replicated trials (marked with *). 0 = not observed.

Table 11. Total yield, greater than 1 7/8", percent of standard, size distribution, percent pickouts, specific gravity and merit score for NE2231[1] potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Yield (cwt/A)[2]		%	% of	% by size class[4]					%PO[5]	Specific	Merit
	Total	>1 7/8"	US#1	Standard[3]	1	2	3	4	5		Gravity	Score[6]
Atlantic	341	319	94	100	3	21	58	16	0	3	1.095	3
Chieftain	427	384	90	121	2	14	49	27	0	8	1.069	2
Dk Red Norland	325	303	92	95	6	41	43	8	0	2	1.066	2
Katahdin	355	308	86	97	5	25	42	18	0	9	1.077	2
Kennebec	474	382	80	120	4	16	36	27	1	16	1.081	3
Lakeview Russet	452	379	84	119	2	15	33	30	6	14	1.080	3
Russet Burbank	336	237	70	74	7	29	28	11	3	23	1.078	4
Russet Norkotah	305	275	90	86	8	30	37	22	2	2	1.072	3
Shepody	456	368	81	115	3	18	37	23	3	16	1.078	3
Snowden	358	331	92	104	6	33	49	9	1	2	1.095	2
Superior	341	319	93	100	5	18	60	15	0	2	1.072	2
Yukon Gold [y]	303	277	92	87	1	17	39	32	4	7	1.084	3
AAF10596-1	374	310	83	97	7	26	36	18	4	10	1.099	3
AF5071-2	338	273	81	86	7	25	37	16	3	12	1.089	4
AF5521-1	321	290	88	91	2	13	40	27	9	10	1.092	4
AF5707-1	444	385	87	121	8	28	44	14	0	6	1.083	3
AF5735-8	317	285	90	90	4	31	29	23	7	6	1.072	3
AF5750-16	363	290	80	91	12	40	33	6	0	8	1.078	4
AF5762-8	389	350	90	110	3	25	43	22	0	7	1.089	3
AF5819-2	324	301	93	95	6	30	53	10	0	0	1.082	2
AF5933-4	326	293	90	92	10	62	28	0	0	0	1.094	2
AF6075-8	372	273	73	86	7	25	36	11	0	20	1.069	4
AF6165-9	323	286	89	90	10	41	46	2	0	1	1.091	2
AF6194-4	338	308	91	97	6	42	45	4	0	2	1.076	2
AF6200-4	440	406	92	128	2	15	45	30	2	5	1.089	2

Variety/Line	Yield (cwt/A)[2]		%	% of	% by size class[4]					%PO[5]	Specific	Merit
	Total	>1 7/8"	US#1	Standard[3]	1	2	3	4	5		Gravity	Score[6]
AF6340-6	245	200	81	63	18	38	40	3	0	1	1.070	3
AF6522-1	321	240	74	75	26	48	25	1	0	0	1.085	2
AF6565-8	417	387	93	121	6	37	45	11	0	1	1.087	3
AF6601-2	395	362	91	114	9	44	40	8	0	1	1.083	2
B3296-3	294	267	91	84	6	25	55	11	0	3	1.090	2
BNC559-1	408	360	87	113	11	42	39	6	0	2	1.067	2
BNC816-7	310	271	87	85	12	50	37	0	0	1	1.083	2
BNC833-2 [p]	280	220	78	69	21	48	29	1	0	2	1.071	2
BNC839-5	251	218	86	68	8	31	44	11	0	6	1.068	2
BNC917-2 [y]	367	320	87	101	10	40	33	14	0	3	1.072	2
CO10098-5W/Y [y]	183	120	66	38	21	62	3	0	0	14	1.087	4
CO15211-1R	389	340	86	107	12	45	36	5	0	1	1.075	2
MSAFB609-12	383	344	90	108	9	43	42	5	0	1	1.091	2
MSAFB635-15	326	276	84	87	15	63	20	1	0	1	1.091	2
NCB2607-3 [y]	257	213	83	67	11	52	30	1	0	6	1.079	3
NDAF141Y-3	500	432	86	135	9	38	39	8	0	5	1.074	2
NDAF12238Y-2	343	287	83	90	16	60	21	2	0	1	1.068	2
NY171	342	313	91	98	8	40	37	12	1	1	1.076	2
NY174	433	413	95	130	5	36	52	7	0	0	1.090	2
NY177	441	397	90	125	9	42	40	8	0	1	1.096	2
WAF14096-5 [y]	515	456	88	143	9	40	41	8	0	3	1.081	2
LSD	100	100	8		6	12	14	10	4	6		

[1]NE2231 is an integrated, seven-state (Florida, Maine, North Carolina, New York, Ohio, Pennsylvania, and Virginia) potato breeding and variety development project for the eastern U.S.

[2]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[3]Percentage of the standard, Atlantic, for >1 7/8" yield. [4]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[5]Percentage of total that are pickouts. [6]Merit score: 1 = outstanding; 2 = keep; 3 = marginal; 4 = drop.

Replicated trials are the average of 4 replicates. LSD indicates least significant difference (*P= 0.05*).

Russets were planted 12-in. apart with 10 seed pieces per 10-ft plot, all other varieties were spaced 9-in. apart with 13 seed pieces per 10-ft plot.

Varieties with colored flesh are indicated by [y] for yellow and [p] for purple.

Table 12. Tuber characteristics, internal and external defects for NE2231 potato evaluation trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Atlantic	5	6	5	2	4	7	38	31	PO=Green, growth crack, knobs
Chieftain	5	2	7	3	5	6	0	0	PO=Knobs, green, growth crack
Dk Red Norland	5	2	7	2	5	5	6	6	PO=Knobs, growth crack
Katahdin	5	8	6	3	6	5	19	0	PO=Green, growth crack, misshapen
Kennebec	4	8	7	6	5	6	0	6	PO=Green, growth crack, knobs
Lakeview Russet	5	6	4	6	5	5	13	19	PO=Knobs, green
Russet Burbank	4	5	3	7	5	5	50	0	PO=Knobs, growth crack, green
Russet Norkotah	5	4	2	6	5	5	56	0	PO=Green, misshapen
Shepody	5	7	6	6	7	5	25	6	PO=Green, growth crack, knobs, misshapen
Snowden	5	6	5	2	4	6	25	0	PO=Green
Superior	5	6	6	4	5	5	0	6	PO=Green
Yukon Gold	4	7	6	3	6	6	56	6	PO=Green, growth crack
AAF10596-1	5	4	2	7	6	6	56	0	PO=Green, knobs
AF5071-2	2	4	2	7	7	6	50	0	PO=Green, growth crack, (scab)
AF5521-1	6	4	2	7	8	6	75	0	PO=Green, knobs, growth crack
AF5707-1	5	4	2	6	6	6	38	13	PO=Green, knobs
AF5735-8	4	4	2	7	5	5	19	6	PO=Misshapen, green
AF5750-16	4	6	4	6	5	5	31	13	PO=Knobs, green
AF5762-8	5	4	2	6	5	5	25	6	PO=Misshapen, knobs
AF5819-2	5	7	7	2	4	6	0	25	PO=Green
AF5933-4	5	7	6	2	5	6	0	6	PO=Green
AF6075-8	4	5	3	6	5	5	38	13	PO=Misshapen, knobs, growth crack, green
AF6165-9	5	7	6	2	4	5	19	0	PO=Green
AF6194-4	6	7	7	3	5	6	6	6	PO=Green
AF6200-4	5	6	6	2	5	5	6	0	PO=Green, misshapen

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
AF6340-6	5	5	4	6	5	5	0	0	PO=Misshapen
AF6522-1	6	6	6	2	5	6	0	0	PO=Green
AF6565-8	5	6	5	2	5	6	31	0	PO=Green
AF6601-2	5	6	6	2	5	6	0	6	PO=Green
B3296-3	5	7	6	2	5	6	6	0	PO=Green, growth crack
BNC559-1	5	1	7	3	4	6	0	0	PO=Growth crack, misshapen
BNC816-7	7	6	5	2	7	6	0	0	PO=Green
BNC833-2	5	1	7	4	5	6	0	0	PO=Misshapen
BNC839-5	6	2	7	2	5	6	0	6	PO=Knobs
BNC917-2	4	1	7	4	5	6	0	0	PO=Knobs,misshapen, growth crack
CO10098-5W/Y	5	7	7	3	6	5	0	0	PO=Green, knobs
CO15211-1R	6	2	7	3	6	6	0	13	PO=Growth crack
MSAFB609-12	5	7	7	2	6	6	0	6	PO=Green
MSAFB635-15	5	6	5	2	5	6	0	0	PO=Green
NCB2607-3	5	2	7	3	5	5	0	0	PO=Growth crack
NDAF141Y-3	5	2	7	3	5	5	0	6	PO=Green, growth crack, misshapen
NDAF12238Y-2	4	2	6	2	5	5	0	0	PO=Green, misshapen
NY171	5	9	7	4	6	5	0	0	PO=Green, (scab)
NY174	5	6	6	3	5	4	0	6	PO=Green
NY177	4	6	6	2	5	4	6	6	PO=Green
WAF14096-5	5	7	5	2	5	5	6	0	PO=Growth crack, green, knobs

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.

C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.

TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.

SH = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.

TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 16 tubers (4 per replication). 0 = not observed.

Russets were planted 12-in. apart with 10 seed pieces per 10-ft plot, all other varieties were spaced 9-in. apart with 13 seed pieces per 10-ft plot.

Table 13. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pick outs and specific gravity for potato early variety trial in Smokey Wessner's Farm, Lehigh County, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Superior	154	138	89	100	11	37	36	17	0	0	1.076
Dark Red Norland	196	163	83	118	17	45	39	0	0	0	1.056
Yukon Gold [y]	125	111	89	81	11	49	30	10	0	0	1.078
Atlantic	355	337	95	245	5	44	51	0	0	0	1.093
Envol	223	218	97	158	3	41	40	16	0	0	1.069
Manistee	291	268	92	194	8	29	53	10	0	0	1.089
Mackinaw	368	330	90	240	10	51	39	0	0	0	1.093
SP327	316	287	91	209	9	37	43	12	0	0	1.081
CO99076-6R	228	198	87	144	13	35	45	6	0	0	1.068
NY171	367	295	81	215	19	54	27	0	0	0	1.071
A08122-9RY [y]	387	342	88	249	12	46	43	0	0	0	1.072
NDA8512C-1R	259	235	91	171	9	52	39	0	0	0	1.069
BNC816-3	207	192	92	139	8	45	43	4	0	0	1.082
BNC916-3	156	128	82	93	18	59	23	0	0	0	1.095
B3451-8 [y]	191	156	81	113	19	53	28	0	0	0	1.083
Constance [y]	228	204	90	148	10	34	48	8	0	0	1.071
Cersia [y]	195	65	33	47	67	33	0	0	0	0	1.074
Laperla [y]	616	542	88	394	12	37	45	6	0	0	1.056
Goldeye [y]	270	201	75	146	25	57	12	6	0	0	1.058
Agata [y]	485	441	91	321	9	59	28	5	0	0	1.059
Paroli [y]	381	343	90	249	10	44	40	0	6	0	1.069
Natascha [y]	317	270	85	196	15	50	32	3	0	0	1.075
Golden Globe [y]	366	324	89	235	11	55	21	12	0	0	1.068
Belmonda [y]	249	183	73	133	27	50	23	0	0	0	1.075

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Superior, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Non-replicated trial. Planted 9-in. apart with 13 seed pieces per 10-ft plot.

Varieties with colored flesh are indicated by [y] for yellow.

Table 14. Tuber characteristics, internal defects for potato early variety trial in Smokey Wessner's Farm, Lehigh County, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Superior	4	7	6	3	4	4	0	10	PO=Green, growth crack, knobs
Dark Red Norland	4	2	7	3	4	5	0	0	PO=Green, knobs
Yukon Gold	4	7	7	3	5	5	0	20	PO=Green, growth cracks
Atlantic	5	5	5	2	6	6	10	0	PO=Green, growth cracks
Envol	6	7	6	2	5	6	0	0	PO=Green, growth cracks
Manistee	7	6	6	2	5	5	0	0	PO=Green, growth cracks
Mackinaw	6	6	6	2	4	5	10	0	PO=Green
SP327	6	8	7	2	7	6	10	0	PO=Green
CO99076-6R	6	2	7	2	5	6	0	10	PO=Green
NY171	7	8	7	4	5	4	0	0	PO=Green, knobs
A08122-9RY	5	2	7	2	3	6	0	0	PO=Green, knobs
NDA8512C-1R	6	2	6	2	5	7	0	0	PO=Growth crack, green
BNC816-3	4	5	5	2	5	6	0	0	PO=Green
BNC916-3	6	1	7	3	5	5	0	0	PO=Growth crack, knobs
B3451-8	5	6	6	2	7	6	0	0	PO=Green, growth cracks
Constance	6	9	7	3	7	5	0	10	PO=Green
Cersia	4	2	8	7	6	6	0	0	PO=Green, growth cracks, misshapen
Laperla	5	6	7	2	6	5	10	20	PO=Green, knobs, misshape
Goldeye	5	9	6	4	7	4	0	0	PO=Misshapen
Agata	7	7	7	4	7	7	0	0	PO=Green, growth crack
Paroli	7	7	8	3	7	7	0	0	PO=Green
Natascha	5	9	7	3	7	5	0	0	PO=Green, growth cracks, misshapen
Golden Globe	6	9	6	2	6	6	0	0	PO=Green, knobs
Belmonda	6	9	6	3	7	6	0	10	PO=Green, knobs

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.

C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.

TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.

Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.

TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 10 tubers. 0 = not observed.

Table 15. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts and specific gravity for potato early variety trial in Mark Troyer's Farm, Erie County, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Superior	450	420	93	100	3	34	53	6	0	4	1.075
Dark Red Norland	187	156	83	37	6	32	35	16	0	11	1.062
Yukon Gold [y]	379	338	89	81	4	14	43	33	0	6	1.073
Atlantic	447	358	80	85	1	12	36	33	0	19	1.085
Manistee	257	164	64	39	2	16	37	11	0	34	1.076
Mackinaw	810	633	78	151	3	24	44	10	0	19	1.089
SP327	168	141	84	34	3	15	59	10	0	13	1.095
CO99076-6R	198	180	91	43	9	16	59	16	0	0	1.070
NY171	291	228	78	54	7	48	25	5	0	14	1.075
A08122-9RY [y]	742	692	93	165	4	38	48	7	0	3	1.076
NDA8512C-1R	505	402	80	96	7	28	39	13	0	14	1.079
BNC916-3	114	90	79	21	9	39	39	0	0	12	
B3451-8	334	254	76	60	2	16	43	18	0	22	1.071
Constance [y]	389	222	57	53	1	18	23	12	4	42	1.076
Cersia [y]	219	73	33	17	64	33	0	0	0	2	1.075
Laperla [y]	581	459	79	109	3	19	36	24	0	18	1.062
Goldeye [y]	488	381	78	91	14	45	29	5	0	8	1.064
Agata [y]	529	431	82	103	7	34	44	0	4	12	1.066
Paroli [y]	224	91	41	22	3	12	24	5	0	56	
Natascha [y]	367	218	59	52	5	26	19	14	0	36	1.070
Belmonda [y]	216	112	52	27	4	22	23	7	0	44	1.076

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Superior, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

Non-replicated trial. Planted 9-in. apart with 13 seed pieces per 10-ft plot.

Varieties with colored flesh are indicated by [y] for yellow.

Table 16. Tuber characteristics, internal defects for potato early variety trial in Mark Troyer's Farm, Erie County, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Superior	5	6	5	3	4	4	0	30	PO=Green, misshapen
Dark Red Norland	6	2	8	3	4	5	0	0	PO=Green, growth crack
Yukon Gold	4	6	7	2	5	6	80	10	PO=Growth crack, (PVY)
Atlantic	5	6	5	2	5	6	0	10	PO=Green, growth crack
Manistee	5	6	6	2	5	4	20	0	PO=Green, growth crack
Mackinaw	5	6	7	2	4	5	0	10	PO=Green, growth crack, second tubers
SP327	5	7	6	2	5	4	0	0	PO=Green
CO99076-6R	5	2	7	2	5	6	0	0	PO=Green, growth crack, knobs
NY171	5	6	7	4	5	5	0	20	PO=Green, growth crack
A08122-9RY	7	2	7	2	4	6	20	0	PO=Growth crack
NDA8512C-1R	4	2	7	2	4	7	0	0	PO=Green, knobs
BNC916-3	6	1	7	3	6	4	0	0	PO=Green, (small tubers)
B3451-8	6	7	7	3	6	5	0	20	PO=Green
Constance	5	7	8	3	7	4	20	0	PO=Green, knobs, growth crack
Cersia	6	3	8	6	7	7	0	0	PO=Green
Laperla	6	7	7	2	5	5	0	10	PO=Green, knobs
Goldeye	6	7	8	3	7	4	10	0	PO=Green, (small tubers)
Agata	7	7	7	4	7	4	0	20	PO=Green
Paroli	4	7	7	3	5	5	10	0	PO=Green, growth crack
Natascha	7	7	8	4	7	4	10	0	PO=Green, growth crack , misshapen
Belmonda	6	7	8	3	6	5	0	0	PO=Green, knobs

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.
TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.
Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.
TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 10 tubers. 0 = not observed.

Table 17. Total yield, greater than 1 7/8", size distribution, percent pickouts, and specific gravity for potato early variety trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	1	2	3	4	5		Gravity
Superior	313	295	94	100	4	27	50	17	0	2	1.073
Dark Red Norland	343	310	90	105	7	43	42	6	0	3	1.065
Yukon Gold [y]	284	259	91	88	3	17	50	21	2	6	
Atlantic	303	274	90	93	3	20	50	20	0	7	1.087
Envol	98	89	91	30	9	30	59	0	2	0	1.069
Russet Norkotah (Texas 296)	311	237	77	80	5	23	27	24	3	19	1.063
SP327	447	376	84	128	9	29	41	14	0	7	
NY171	264	213	79	72	17	39	33	7	0	4	1.068
NY165	425	407	96	138	3	30	52	14	0	1	1.076
Manistee	395	361	91	122	3	21	49	21	0	5	1.083
Mackinaw	218	177	81	60	6	28	44	10	0	12	1.079
CO99076-6R	260	213	82	72	6	14	43	25	0	12	1.068
A08122-9RY	448	384	84	130	10	33	41	10	0	6	1.072
NDA8512C-1R	340	278	82	94	6	25	49	8	0	12	1.070
BNC816-3	295	245	82	83	13	34	40	9	0	5	1.081
BNC833-2 [p]	173	147	84	50	16	37	42	4	0	0	1.066
B2152-17 [y]	181	158	70	54	29	11	50	9	0	1	1.068
BNC916-3	237	198	84	67	14	53	26	5	0	2	1.080
BNC973-7	370	302	82	102	8	22	50	11	0	10	1.077
BNC981-1	167	150	90	51	6	26	41	23	0	4	1.077
B3451-8 [y]	228	193	85	65	12	39	43	2	0	4	1.088
B3465-4	238	194	80	66	18	50	30	0	0	1	1.068
Constance [y]	341	288	85	97	8	29	38	18	0	7	1.072
Cersia [y]	211	93	46	32	52	35	11	0	0	3	1.080
Laperla [y]	662	556	84	188	6	22	46	16	0	10	1.058
Goldeve [y]	340	280	82	95	17	51	31	0	0	0	
Agata [y]	517	453	87	154	10	41	39	7	0	3	1.059
Paroli [y]	342	302	88	102	7	21	40	19	9	5	1.064
Natascha [y]	490	426	86	144	12	38	40	9	0	1	1.076
Satina [y]	353	328	93	111	5	27	47	18	0	3	1.067
Golden Globe [y]	337	236	70	80	10	41	25	2	2	20	1.069
Belmonda [y]	619	562	91	190	4	30	42	16	3	5	1.076
LSD	195	186	14		12	18	16	14	5	7	

[1]Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Superior, for >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts. Varieties with colored flesh are indicated by [y] for yellow, [p] for purple. Planted 9-in. apart with 13 seed pieces per 10-ft plot. Replicated trials are the average of 2 replicates. LSD indicates least significant difference (P = 0.05) for replicated trial.

Table 18. Tuber characteristics, internal defects for potato early variety trial in Plant Pathology Farm, Rock Springs, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Superior	5	6	5	3	5	5	0	0	PO=Growth crack
Dark Red Norland	6	2	7	2	5	6	13	0	PO=Growth crack
Yukon Gold	4	7	6	3	6	5	13	13	PO=Growth crack
Atlantic	5	6	6	3	5	5	38	13	PO=Growth crack
Envol	5	8	6	3	5	5	0	13	PO=Knobs
Russet Norkotah (Texas 296)	5	4	2	7	5	5	63	13	PO=Knobs
SP327	5	8	7	2	4	5	25	0	PO=Knobs, green
NY171	6	7	7	6	5	5	0	0	PO=Green
NY165	6	6	6	2	5	5	0	0	PO=Green
Manistee	6	6	5	2	4	5	13	13	PO=Green, growth crack
Mackinaw	4	6	6	3	5	5	0	0	PO=Green, misshapen, growth crack
CO99076-6R	5	2	7	3	5	6	0	13	PO=Growth crack, knobs
A08122-9RY	5	2	7	3	5	5	13	0	PO=Growth crack, green
NDA8512C-1R	4	2	7	2	5	6	0	0	PO=Green
BNC816-3	5	6	5	2	5	6	0	13	PO=Green, growth crack
BNC833-2	5	1	7	6	5	5	13	0	
B2152-17	5	2	7	2	5	5	0	0	PO=Growth crack, (scab)
BNC916-3	5	1	7	2	5	5	0	0	PO=Growth crack, knobs
BNC973-7	6	7	6	2	5	6	13	0	PO=Growth crack, green
BNC981-1	5	2	7	2	5	6	13	0	PO=Growth crack
B3451-8	5	7	6	2	5	5	13	0	PO=Growth crack, green
B3465-4	5	7	7	4	5	5	0	0	PO=Green
Constance	6	7	7	4	5	5	13	0	PO=Green
Cersia	5	2	8	6	6	4	0	0	PO=Green, misshapen
Laperla	5	7	7	2	5	6	0	38	PO=Growth crack, green, misshapen
Goldeye	6	7	6	5	6	5	0	13	PO=Green
Agata	6	7	7	6	5	5	0	0	PO=Green
Paroli	6	7	6	4	6	6	0	0	PO=Green, growth crack, misshapen, knobs
Natascha	5	7	6	2	5	7	0	0	PO=Green, growth crack, misshapen, knobs
Satina	4	6	5	2	5	4	0	0	PO=Green, knobs, growth crack
Golden Globe	5	7	6	2	6	7	0	0	PO=Green, misshapen, knobs
Belmonda	6	6	6	4	6	6	13	0	PO=Green, misshapen

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.

C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.

TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.

Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.

TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.

[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 8 tubers for replicate trial. 0 = not observed.

Table 19. Total yield, greater than 1 7/8" yield, percent of standard, size distribution and percent pickout for SNAC Chip Trial in Bryan Bender's Farm, Franklin County, 2023

Variety/Line	Yield (cwt/A)[1]		% US#1	% of Standard[2]	% by size class[3]					% PO[4]
	Total	>1 7/8"			1	2	3	4	5	
Snowden	401	329	82	100	5	25	45	12	0	13
Lamoka	462	403	87	122	2	18	44	24	1	11
AF6200-4	505	381	75	116	2	8	45	20	3	23
MSAFB635-15	397	326	81	99	10	39	39	3	0	8
NY174	440	386	88	117	3	12	39	34	2	9
NY177	452	387	85	118	6	32	46	7	0	9
LSD[5]	76	72	11		2	9	7	7	2	11

[1]Yield Total = all yield including pickouts. US#1 Yield >1 7/8" (marketable yield) = categories 2, 3, 4 and 5 excluding pickouts.

[2]Percentage of the standard, Snowden, for US#1 >1 7/8" yield.

[3]Percentage of total yield according to size class. 1=<1.875 in., 2=1.875-2.5 in., 3=2.5-3.25 in., 4=3.25-4.0 in., 5=>4.0 in.

[4]Percentage of total that are pickouts.

[5]LSD indicates least significant difference (*P= 0.05*). 3 replications.

Table 20. Tuber characteristics and internal defects for SNAC Chip Trial in Bryan Bender's Farm, Franklin County, 2023

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
Snowden	5	5	5	2	4	5	7	13	PO=Greem, (scab)
Lamoka	5	6	6	3	5	5	0	7	PO=Green, second tubers, growth crack
AF6200-4	3	6	6	3	6	5	7	0	PO=Green, knobs, (scab)
MSAFB635-15	6	5	6	2	7	6	0	0	PO=Green
NY174	5	6	6	3	6	4	0	0	PO=Greem, misshapen, (scab)
NY177	5	7	6	2	6	5	0	0	PO=Greem, (scab)

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.
TX = skin texture: 1 = partial russet, 2 = heavy russet, 3 = mod. russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = mod. smooth, 8 = smooth, 9 = very smooth.
Sh = tuber shape: 1 = round, 2 = mostly round, 3 = round-oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong-long, 7 = mostly long, 8 = long, 9 = cylindrical.
TED = tuber eye depth: 1 = very deep, 5 = medium, 9 = very shallow. TCS = tuber cross section: 1 = very flat, 5 = intermediate, 9 = very round.
[2]Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 15 tubers (5 tubers per rep, 3 reps).

Table 21: Management of Evaluation Trials, 2023

Rock Springs

Trial	Germplasm trial
Planting Date:	16-18 May
Harvest Date:	10-12 October
Previous Crop:	Wheat, cover crop in fall
Fertilizer Rate/A:	18 April: 21-0-0 (N-P-K) at 875 lb/A with 10 ft Gandy 12 May: 21-10-10 (N-P-K) at 630 lb/A with 10 ft Gandy 12 May: 0-0-60 (N-P-K) at 195 lb/A with 10 ft Gandy 29 June: liquid N (74 lb/A) at Hilling
Herbicide:	Eptam 7E, Medal EC, Ommi Mrtribuzin 75DF
Fungicide:	Luna Tranquility, Manzate Pro-Stick, Endura, Tanos, Revus Top, Orondis Opti, Omni Chlorothalonil 720SC, Equus, Bravo Weather Stick, Gavel
Insecticide:	Lambda T2, Radiant SC, PBO, Admire Pro. Elatus
Vine Kill:	11, 18 September
Rainfall (inches):	June (4.61), July (7.19), August (5.19), September (3.09)

Trial	Early variety trial
Planting Date:	16 May
Harvest Date:	11 October
Previous Crop:	Wheat, cover crop in fall
Fertilizer Rate/A:	18 April: 21-0-0 (N-P-K) at 875 lb/A with 10 ft Gandy 12 May: 21-10-10 (N-P-K) at 630 lb/A with 10 ft Gandy 12 May: 0-0-60 (N-P-K) at 195 lb/A with 10 ft Gandy 29 June: liquid N (74 lb/A) at Hilling
Herbicide:	Eptam 7E, Medal EC, Omni Metribuzin 75DF
Fungicide:	Luna Tranquility, Manzate Pro-Stick, Endura, Tanos, Revus Top, Orondis Opti, Omni Chlorothalonil 720SC, Equus, Bravo Weather Stick, Gavel
Insecticide:	Lambda T2, Radiant SC, PBO, Admire Pro. Elatus
Vine Kill:	18 August
Rainfall (inches):	June (4.61), July (7.19), August (5.19), September (3.09)

POTATO (*Solanum tuberosum*)
Common scab; *Streptomyces* spp.

X.S. Qu and A. Cohen
Department of Plant Pathology & Environmental Microbiology
The Pennsylvania State University
University Park, PA 16802

Evaluation of potato cultivars and breeding lines for resistance to common scab, 2023

Forty-six potato cultivars and advanced breeding lines were planted in a naturally infested field at The Pennsylvania State University Russell E. Larson Agricultural Research Center in Pennsylvania Furnace, PA on 31 May. The soil type was a Hagerstown silty clay loam. The experimental design was a randomized complete block design with three replications. The plots were 4-ft long with five seed pieces planted in each plot and 5-ft breaks between plots within a row. Precipitation was 4.61, 7.19, 5.19, and 3.09 in. for Jun, Jul, Aug, and Sep, respectively. Standard crop management practices, and a recommended fungicide program for the management of early and late blights in Pennsylvania, were followed. Tubers were harvested on 19 Oct and were visually assessed for common scab on 13, 14 Nov. Percent surface common scab lesion coverage for each tuber was scored on a 0 to 100% scale and disease severity score was expressed as an average of percent scab lesion coverages of all tubers in each plot. Disease incidence was expressed as the percentage of tubers with common scab symptoms in each plot. Disease data were subjected to an analysis of variance test, and means were separated using Fisher's protected least significant difference test (SAS v. 9.4, SAS Institute, Cary, NC).

Cultivars Russet Burbank and Shepody were included as a tolerant and a susceptible check for common scab, respectively. Numerically, although not statistically, Russet Norkotah had a lower disease severity score and disease incidence than Russet Burbank and was considered as tolerant to common scab. Lakeview Russet, NY174, CO15211-1R, Snowden, NCB2607-3 and BNC559-1 were characterized as moderately tolerant because their disease severity score and disease incidence were not significantly different from the check Russet Burbank.

Cultivar/Line	Common scab severity score	Common scab incidence (%)	Cultivar/Line	Common scab severity score	Common scab incidence (%)
Russet Norkotah	0.65 i[z]	22.5 m	Shepody	5.97 c-i	87.9 a-e
Russet Burbank	0.73 hi	27.0 m	BNC839-5	6.04 c-i	61.2 c-k
AF5762-8	1.92 g-i	53.1 g-l	AF6340-6	6.23 c-i	90.7 abc
Lakeview Russet	2.27 f-i	49.6 i-m	AF5521-1	6.31 c-i	83.2 a-f
Superior	2.36 f-i	53.1 g-l	AF5750-16	6.35 c-i	72.3 a-j
NY174	2.74 f-i	49.9 i-m	B3296-3	6.73 c-i	77.4 a-i
CO15211-1R	2.89 f-i	44.6 j-m	AF6522-1	7.00 c-i	91.6 ab
Snowden	3.02 f-i	51.8 h-m	AF5819-2	7.22 c-i	85.0 a-f
AF6194-4	3.18 f-i	67.6 b-k	BNC816-7	7.87 c-i	88.9 a-e
NCB2607-3	3.59 e-i	42.1 klm	BNC917-2	8.80 c-i	82.2 a-g
BNC559-1	3.80 e-i	50.8 i-m	AF5707-1	9.15 c-i	81.6 a-h
NDAF12238Y-2	3.83 e-i	59.0 e-k	Chieftain	9.35 c-i	82.8 a-g
AF6565-8	3.86 e-i	79.4 a-i	NY171	9.77 b-h	71.7 a-k
AF5735-8	4.19 e-i	69.8 a-k	BNC833-2	9.85 b-g	76.8 a-i
MSAFB609-12	4.54 d-i	68.7 b-k	Yukon Gold	10.53 b-g	57.1 f-k
NDAF141Y-3	4.78 d-i	76.7 a-i	MSAFB635-15	11.02 b-f	99.5 a
NY177	4.82 c-i	78.2 a-i	Kennebec	12.44 b-e	89.8 a-d
CO10098-5W/Y	5.25 c-i	69.8 a-k	WAF14096-5	12.51 b-e	90.8 abc
AF6200-4	5.32 c-i	66.9 b-k	AF6165-9	12.55 b-e	89.2 a-d
Atlantic	5.61 c-i	81.5 a-h	AF5933-4	13.37 bcd	99.0 a
AF6075-8	5.74 c-i	60.6 d-k	AAF10596-1	13.89 bc	89.7 a-d
Katahdin	5.87 c-i	78.1 a-i	AF6601-2	18.79 b	95.2 ab
Dark Red Norland	5.91 c-i	69.6 a-k	AF5071-2	31.47 a	95.1 ab

[z] Means followed by the same letter are not significantly different within column category at $P = 0.05$ as determined by Fisher's protected least significant difference test (LSD = 9.09 for severity score and 29.9 for incidence). Each value is the mean of three replicates.

POTATO (*Solanum tuberosum*)
Late blight; *Phytophthora infestans*

X.S. Qu and A. Cohen
Department of Plant Pathology & Environmental Microbiology
The Pennsylvania State University
University Park, PA 16802

Evaluation of potato cultivars and breeding lines for resistance to late blight, 2023

Forty-six potato cultivars and advanced breeding lines were evaluated at The Pennsylvania State University Russell E. Larson Agricultural Research Center in Pennsylvania Furnace, PA. The soil type was a Hagerstown silty clay loam. Potatoes were planted on 6 Jun. The experimental design was a randomized complete block with three replicates. The plots were 4-ft long with five seed pieces planted in each plot and 4-ft breaks between plots within a row. Each treatment row had an adjacent row of the susceptible cv. Atlantic as a spreader row. Precipitation was 4.61, 7.19, 5.19, and 3.09 in. for Jun, Jul, Aug, and Sep, respectively. Natural late blight infection was not observed in the field. On 15 Aug, spreader rows were spray-inoculated with a mixture of four isolates of *Phytophthora infestans* clonal lineage US-23, at a concentration of 1.2×10^5 sporangia/ml, to promote uniform spread of the pathogen to all treatment plots. Overhead sprinklers were used for approximately one hour daily when the weather was dry and hot to increase humidity in the plant canopy after infection. Disease ratings were determined by visually assessing each 4-ft plot and estimating the percentage of late blight symptomatic foliage on a 0 to 100% scale. Ratings were taken on 26 Aug and 2, 8, 15, 18, 21 Sep. Disease data were expressed as area under the disease progress curve (AUDPC), subjected to analysis of variance, and means were separated using Fisher's protected least significant difference test (SAS v. 9.4, SAS Institute, Cary, NC).

The most susceptible plots reached 100% disease severity by the end of the season. Cultivar Kennebec was a moderately resistant check and Atlantic was a susceptible check. Based on AUDPC values, MSAFB609-12, NY177 and NY174 were significantly more resistant than cv. Kennebec. Numerically, although not statistically, AF6601-2, AF5750-16, AF6075-8, AF6565-8, NDAF141Y-3, AF6194-4, Russet Burbank, AF5762-8, AF5707-1, WAF14096-5, AF5071-2, Lakeview Russet, AF5735-8, CO15211-1R and Snowden had lower AUDPC values than Kennebec and were considered as moderately resistant.

Cultivar/Line	Mean AUDPC[z]	Cultivar/Line	Mean AUDPC
MSAFB609-12	19 u[y]	NY171	397 j-p
NY177	24 tu	Shepody	405 j-o
NY174	26 tu	AF5933-4	433 i-o
AF6601-2	45 stu	BNC839-5	438 i-o
AF5750-16	59 stu	Katahdin	550 h-n
AF6075-8	64 stu	AF6165-9	567 h-m
AF6565-8	71 stu	Chieftain	587 g-l
NDAF141Y-3	112 r-u	Russet Norkotah	604 g-l
AF6194-4	128 q-u	Atlantic	631 f-k
Russet Burbank	140 p-u	B3296-3	636 f-k
AF5762-8	143 p-u	Superior	639 e-j
AF5707-1	244 o-u	AAF10596-1	671 d-i
WAF14096-5	244 o-u	AF5819-2	677 d-i
AF5071-2	257 o-u	Yukon Gold	730 c-h
Lakeview Russet	261 o-u	NDAF12238Y-2	822 b-g
AF5735-8	284 o-t	CO10098-5W/Y	884 b-f
CO15211-1R	300 n-s	NCB2607-3	898 b-e
Snowden	305 m-s	BNC559-1	908 bcd
Kennebec	306 m-s	BNC816-7	947 abc
AF6522-1	356 l-r	AF6340-6	995 ab
AF6200-4	375 k-q	Dark Red Norland	999 ab
AF5521-1	387 j-q	BNC917-2	1023 ab
MSAFB635-15	390 j-p	BNC833-2	1188 a

[z] AUDPC = Area under the disease progress curve was calculated from 26 Aug to 21 Sep according to the formula: $\sum^{n}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the ith observation, t_i = time (days) since the previous rating at the ith observation, and n = total number of observations. Each value is the mean of three replicates.

[y] Means followed by the same letter are not significantly different at $P = 0.05$ as determined by ANOVA followed by Fisher's protected least significant difference test (LSD = 261).

POTATO (*Solanum tuberosum*)
Early blight; *Alternaria solani*

X.S. Qu and A. Cohen
Department of Plant Pathology & Environmental Microbiology
The Pennsylvania State University
University Park, PA 16802

Evaluation of potato cultivars and breeding lines for resistance to early blight, 2023

Forty-six potato cultivars and advanced breeding lines were evaluated at The Pennsylvania State University Russell E. Larson Agricultural Research Center in Pennsylvania Furnace, PA. The soil type was a Hagerstown silty clay loam. Potatoes for each entry were planted on 26 May in plots arranged in a randomized complete block design with three replicates per entry. Plots consisted of a single 4-ft long row with five seed pieces planted in each plot, with a 4-ft break between plots. Each entry had an adjacent row of the susceptible cv. Dark Red Norland as a spreader row. Precipitation was 4.61, 7.19, 5.19, and 3.09 in. for Jun, Jul, Aug, and Sep, respectively. To promote uniform spread of the pathogen to all treatment plots, spreader rows were spray-inoculated with a conidial mixture of two isolates of *Alternaria solani*, at a concentration of 5.2×10^4 conidia/ml on 21 Jul. For each plot, the percentage of symptomatic foliage was visually assessed on a 0 to 100% scale on 11, 18, 25 Aug and 1, 4, 7 Sep. Disease data were compared by calculating the area under the disease progress curve (AUDPC), subjected to analysis of variance, and means were separated using Fisher's protected least significant difference test (SAS v. 9.4, SAS Institute, Cary, NC).

Disease pressure from early blight was high and the most susceptible plots reached 100% disease severity by the end of the season. Cultivars Kennebec and Russet Burbank were included as moderately resistant checks and Dark Red Norland was included as a susceptible check. Snowden, NY174, AF6565-8, AF6075-8, AF5762-8, AF5071-2, Lakeview Russet, NY177, Katahdin, AF6601-2 and MSAFB635-15 were characterized as moderately resistant because their AUDPC values were not significantly different from the moderately resistant check Kennebec and lower than the moderately resistant check Russet Burbank.

Cultivar/Line	AUDPC[z]	Cultivar/Line	AUDPC
Snowden	144 o[y]	NY171	306 h-o
NY174	156 o	AF5750-16	313 h-o
AF6565-8	157 o	AF5707-1	315 h-o
Kennebec	161 o	Shepody	342 h-o
AF6075-8	162 o	Atlantic	384 h-n
AF5762-8	168 no	BNC917-2	395 g-m
AF5071-2	168 no	CO15211-1R	428 f-l
Lakeview Russet	177 mno	Russet Norkotah	429 f-k
NY177	179 mno	AF6194-4	444 f-j
Katahdin	180 mno	AF5933-4	485 f-l
AF6601-2	194 mno	B3296-3	503 fgh
MSAFB635-15	195 mno	AF6522-1	608 efg
Russet Burbank	200 mno	Superior	622 ef
AF5521-1	201 mno	AAF10596-1	641 ef
Chieftain	207 l-o	BNC816-7	736 de
AF5735-8	208 l-o	BNC839-5	759 cde
WAF14096-5	218 k-o	Dark Red Norland	909 bcd
AF6200-4	220 k-o	CO10098-5W/Y	923 bcd
AF6165-9	227 j-o	NCB2607-3	923 bcd
BNC559-1	262 j-o	Yukon Gold	978 bc
NDAF141Y-3	265 i-o	AF6340-6	989 b
MSAFB609-12	298 h-o	NDAF12238Y-2	1011 b
AF5819-2	302 h-o	BNC833-2	1314 a

[z] AUDPC = area under the disease progress curve was calculated from 11 Aug to 7 Sep according to the formula: $\sum^{n}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the ith observation, t_i = time (days) since the previous rating at the ith observation, and n = total number of observations. Each value is the mean of three replicates.

[y] Means followed by the same letter are not significantly different at $P = 0.05$ as determined by ANOVA followed by Fisher's protected least significant difference test (LSD = 221).

Supplemental Progress Report, 2023----------March 13, 2024

Pennsylvania Regional Potato Germplasm Evaluation Program, 2023

Xinshun Qu and Adrianna Cohen
Department of Plant Pathology & Environmental Microbiology
The Pennsylvania State University

The objective of this project is to find new potato varieties and advanced breeding lines that are well adapted to Pennsylvania potato growing conditions and have qualities that are suitable for processing use. We cooperate with the directors of several other potato breeding programs from the Northeast US and a few programs from outside the Northeast by evaluating their potato germplasm. Data from this project helps breeders determine which lines to consider for potential release as new varieties, thereby bringing about new potato varieties for you.

Regional trials were established in three counties across Pennsylvania: Lehigh Co., Erie Co., and the Russell E. Larson Agricultural Research Center at Rock Springs, Centre Co. Please see the Progress Report from January 2024 for details. During the winter months, tests were performed to evaluate germplasm for chip and French fry processing. Presented in this report are the chip processing results (Tables 1-4) and French fry results (Tables 5-7). The data are collected from small samples, which may not reflect all possible variations one may see within a commercial harvest.

Materials and Methods

From harvest until November, tuber samples were placed in a pole barn where they were subjected to fluctuating temperatures. Storage temperatures are listed at the bottom of each table. The chipping procedure at the PSU Chip Lab was as follows. Four tubers from each breeding line/variety were peeled and sliced. Eight slices from the center of each tuber were used for chipping. Slices (32 over the 4 tubers) were fried at 365°F. The chip samples were rated on a scale of 1-10, which is in accordance with the Snack Food Color Chart. The oil used for chipping was soy-based oil (Bakers Chef heavy-duty oil). French fry tests were conducted as follows. Four tubers were peeled and cut into strips. Nine strips from the center of each tuber were used for frying. Strips (36 over the 4 tubers) were blanched in water for 3 minutes at 185°F then fried for 3 minutes at 365°F. The samples were rated using the USDA scale.

Results

Yield results and listings of noteworthy varieties/lines were provided in the January 2024 progress report.

Chipping (Tables 1-4)
Atlantic and Snowden are the standard varieties to use for comparing the chip color of the other lines.

From out of field chipping at Rock Springs, Manistee had the best color; Atlantic, SP327, NY165, Mackinaw, BNC816-3, and B3451-8 had acceptable color.

From chipping after 3 week reconditioning: At Rock Springs, Snowden, AF5933-4, AF6601-2, MSAFB635-15, NY174, NY177, NY163, Brodie(NY140), AF6894-12, AF6898-1, AF6978-1, MSAA217-3, AF6876-18, and AF6892-6 had the best color; AF6165-9, AF6200-4, AF6522-1, AF6565-8, B3296-3, BNC816-7, MSAFB609-12, AF6200-7, AF6206-3, AF6206-5, AF6552-2, AF6652-3, AF6655-1, AF6669-10, AF6671-10, WAF16107-2, WAF17045-2, WAF17049-2, AF6883-8, AF6886-3, AF6911-4, AF6979-3, MSBB626-11, MSBB635-14, MSBB636-11, MSBB630-2, SP327, AC13126-1Wadg, BNC811-15, B3379-2, B3403-6, B2869-29, B3471-1, AF6872-11, and AF6880-9 had acceptable color. At Lehigh County, NY174 had the best color; Snowden, SP327, NY177, NY163, NY165, Brodie (NY140), MSAA217-3, MSBB626-11,

AC13126-1Wadg, NC818-24, and Caribou Russet had acceptable color. At Erie County, Snowden, NY177, NY163, NY165, and Brodie (NY140) had the best color; Atlantic, SP327, NY174, MSAA217-3, MSBB626-11, MSBB630-2, and NC818-24 had acceptable color.

From chipping after 6 week reconditioning: At Rock Springs, Snowden, AF6165-9, AF6522-1, AF6601-2, BNC816-7, MSAFB635-15, NY174, NY177, AF6894-12, AF6898-1, MSBB635-14, and AF6876-18 had the best color; Atlantic, AF5933-4, AF6565-8, B3293-3, MSAFB609-12, NY163, Brodie (NY140), AF6200-7, AF6206-3, AF6206-5, AF6552-2, AF6652-3, AF6655-1, AF6669-10, AF6671-10, WAF16107-2, WAF17045-2, WAF17049-2, AF6883-8, AF6886-3, AF6911-4, AF6978-1, AF6979-3, MSAA217-3, MSBB626-11, MSBB636-11, MSBB630-2, SP327, AC13126-1Wadg , BNC182-5, BNC811-15, B3379-2, AF6872-11, AF6880-9, and AF6892-6 had acceptable color. At Lehigh County, NY174, NY177, NY165, and MSAA217-3 had the best color; Atlantic, Snowden, SP327, Brodie (NY140), and AC13126-1Wadg had acceptable color. At Erie County, Snowden, NY163, NY165, and Brodie (NY140) had the best color; SP327, NY174, NY177, MSAA217-3, MSBB626-11, MSBB630-2, and NC818-24 had acceptable color.

From chipping directly from 45°F: At Rock Springs, Snowden, AF5933-4, AF6601-2, NY177, AF6206-5, AF6655-1, WAF17045-2, AF6894-12, AF6898-1, MSBB636-11, AF6876-18, and AF6892-6 had the best color; AF6165-9, AF6522-1, AF6565-8, B3296-3, BNC816-7, MSAFB609-12, MSAFB635-15, NY174, NY163, Brodie (NY140), AF6200-7, AF6206-3, AF6552-2, AF6652-3, AF6669-10, AF6671-10, WAF16107-2, WAF17049-2, AF6883-8, AF6886-3, AF6911-4, AF6978-1, MSAA217-3, MSBB635-14, MSBB630-2, SP327, and AF6880-9 had acceptable color. At Lehigh County, NY174 and NY163 had the best color; NY177, NY165, Brodie (NY140), and AC13126-1Wadg had acceptable color. At Erie County, NY177, NY163, NY165, and Brodie (NY140) had the best color; Snowden, NY177, and NC818-24 had acceptable color.

French fry Tests (Tables 5-7)

At Rock Springs, Lakeview Russet, AAF10596-1, AF5071-2, AF5521-1, AF5762-8, SP327, AF5736-16, AF6298-2, AF6465-7, A12327-5, COA15494-8, Portage Russet, AF6855-4, AAF16069-2, COAF16277-4, and AAF15291-5 had the best color. At Lehigh County, SP327 had the best color. At Erie County, SP327, Lakeview Russet, and Portage Russet had the best color.

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Table 1. Out of field chip color results of early season potato evaluation in Centre County, Russell E. Larson Agricultural Research Center at Rock Springs, 2023.

Variety/line	Specific Gravity	Chip Color
Atlantic	1.087	4
SP327	-	5
NY165	1.076	4
Manistee	1.083	3
Mackinaw	1.079	5
BNC816-3	1.081	4
B3451-8	1.088	4

Harvest and chipping on August 18, 2023; 92 days from planting.

Chip color is based on a 1 – 10 scale with 1 = lightest, 10 = darkest, 1 – 5 = acceptable chip color.

Table 2. Chip color results of potato evaluation in Centre County, Russell E. Larson Agricultural Research Center at Rock Springs, 2023.

Variety/line	Specific Gravity	Chip Color		
		Feb[1]	Mar[2]	Mar[3]
Atlantic	1.095	6	5	6
Snowden	1.095	3	3	3
AF5933-4	1.094	3	4	3
AF6165-9	1.091	4	3	4
AF6200-4	1.089	5	6	6
AF6522-1	1.085	4	3	4
AF6565-8	1.087	4	4	4
AF6601-2	1.083	3	3	3
B3296-3	1.090	4	4	4
BNC816-7	1.083	4	3	5
MSAFB609-12	1.091	4	4	5
MSAFB635-15	1.091	3	3	4
NY174	1.090	3	3	4
NY177	1.096	3	3	3
NY163	1.087	3	4	4
Brodie (NY140)	1.078	3	4	4
AF6200-7	1.098	5	5	5
AF6206-3	1.089	4	4	4
AF6206-5	1.099	4	4	3
AF6552-2	1.088	4	4	5
AF6652-3	1.085	5	5	5
AF6655-1	1.086	4	4	3
AF6669-10	1.086	4	4	4
AF6671-10	1.094	4	5	4
WAF16107-2	1.089	4	4	4
WAF17045-2	1.084	4	4	3
WAF17049-2	1.094	5	5	4
AF6883-8	1.093	4	5	4
AF6886-3	1.083	4	5	4
AF6894-12	1.093	3	3	3
AF6896-1	1.091	6	7	8
AF6898-1	1.092	3	3	3
AF6911-4	1.094	4	4	5
AF6978-1	1.085	3	4	4
AF6979-3	1.078	5	5	8
MSAA217-3	1.093	3	4	5
MSBB626-11	1.089	5	5	6
MSBB635-14	1.078	4	3	4
MSBB636-11	1.080	4	4	3
MSBB630-2	1.080	4	4	4
NC818-24	1.085	6	7	6
SP327	1.084	4	4	5
AC13126-1Wadg	1.087	5	5	6
BNC182-5	1.091	6	5	6
BNC811-15	1.086	5	5	6

B3379-2	1.095	5	5	6
B3403-6	1.095	5	6	6
B2869-29	1.093	5	6	6
B3471-1	1.086	5	6	6
Caribou Russet	1.075	6	6	7
AF6872-11	1.098	5	5	7
AF6876-18	1.089	3	3	3
AF6880-9	1.087	4	4	5
AF6892-6	1.082	3	4	3

[1] Feb. = Stored at 45°F from November 30, 2023 then transferred to 55°F three weeks prior to chipping on February 12, 2024.

[2] Mar. = Stored at 45°F from November 30, 2023 then transferred to 55°F six weeks prior to chipping on March 6, 2024.

[3] Mar. = Stored at 45°F from November 30, 2023 and chipped on March 5, 2024.

Chip color is based on a 1 – 10 scale with 1 = lightest, 10 = darkest, 1 – 5 = acceptable chip color.

Table 3. Chip color results of potato evaluation in Lehigh County, Smokey Wessner's Farm, 2023.

Variety/line	Specific Gravity	Chip Color		
		Feb[1]	Mar[2]	Mar[3]
Atlantic	1.089	7	5	7
Snowden	1.083	4	4	6
SP327	1.085	5	5	6
NY174	1.089	3	3	3
NY177	1.095	4	3	4
NY163	1.088	4	x	3
NY165	1.085	4	3	4
Brodie (NY140)	1.081	4	4	5
MSAA217-3	1.092	5	3	6
MSBB626-11	1.073	5	6	6
AC13126-1Wadg	1.073	5	4	5
NC818-24	1.091	5	6	7
Caribou Russet	1.081	5	6	7

[1] Feb. = Stored at 45°F from November 30, 2023 then transferred to 55°F three weeks prior to chipping on February 12, 2024.

[2] Mar. = Stored at 45°F from November 30, 2023 then transferred to 55°F six weeks prior to chipping on March 5, 2024.

[3] Mar. = Stored at 45°F from November 30, 2023 and chipped on March 5, 2024.

Chip color is based on a 1 – 10 scale with 1 = lightest, 10 = darkest, 1 – 5 = acceptable chip color.

Table 4. Chip color results of potato evaluation in Erie County, Mark Troyer's Farm, 2023.

Variety/line	Specific Gravity	Chip Color		
		Feb[1]	Mar[2]	Mar[3]
Atlantic	1.083	5	6	6
Snowden	1.086	3	3	4
SP327	1.085	5	5	6
NY174	1.089	4	4	3
NY177	1.091	3	4	4
NY163	1.087	2	3	3
NY165	1.081	3	3	3
Brodie (NY140)	1.087	2	3	3
MSAA217-3	1.088	4	4	7
MSBB626-11	1.080	4	5	6
MSBB630-2	1.075	5	4	6
NC818-24	1.084	5	5	5

[1] Feb. = Stored at 45°F from November 30, 2023 then transferred to 55°F three weeks prior to chipping on February 12, 2024.

[2] Mar. = Stored at 45°F from November 30, 2023 then transferred to 55°F six weeks prior to chipping on March 6, 2024.

[3] Mar. = Stored at 45°F from November 30, 2023 and chipped on March 5, 2024.

Chip color is based on a 1 – 10 scale with 1 = lightest, 10 = darkest, 1 – 5 = acceptable chip color.

Table 5. French fry color for russet skinned or long white potato evaluation trial in Centre County, Russell E. Larson Agricultural Research Center at Rock Springs, 2023.

Variety/line	Specific Gravity	French Fry Color		
		Feb[1]	Mar[2]	Mar[3]
Kennebec	1.081			0
Lakeview Russet	1.080	0	0	1
Russet Burbank	1.078	1	1	
Russet Norkotah	1.072	1	1	
Yukon Gold	1.084			3
AAF10596-1	1.099	00	00	
AF5071-2	1.089	00	00	
AF5521-1	1.092	00	00	
AF5707-1	1.083	1	1	
AF5750-16	1.078	2	1	
AF5762-8	1.089	00	0	
AF6075-8	1.069	1	1	
SP327	1.084	00	00	
AF5736-16	1.092	00	00	
AF6298-2	1.081	0	0	
AF6446-17	1.074	0	1	
AF6465-7	1.084	0	0	
Caribou Russet	1.075	1	2	2
A12327-5	1.078	0	0	
COA15494-8	1.074	00	0	
Portage Russet	1.090	0	0	0
Libero	1.078	2	1	2
AF6750-3	1.073	1	1	
AF6814-1	1.082	1	1	
AF6855-4	1.087	0	0	
AAF15086-5	1.090	1	1	
AAF16069-2	1.084	0	0	
COAF16277-4	1.074	0	0	
AF6989-3	1.075	1	0	
COAF16090-14	1.058	2	4	
AAF15193-6	1.075	1	1	
AAF15291-5	1.082	0	0	
AAF15402-1	1.068	1	1	
NDAF1791-1	1.098	0	1	
NDAF1791-3	1.091	0	1	
NDAF1791-6	1.089	1	1	
AF6997-1	1.083	0	1	0

[1] Feb. = Stored at 45°F from November 30, 2023, then transferred to 55°F three weeks prior to frying on February 13, 2024.

[2] Mar. = Stored at 45°F from November 30, 2023, then transferred to 55°F six weeks prior to frying on March 4, 2024.

[3] Mar. = Stored at 45°F from November 30, 2023 and fried on March 4, 2024.

French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.

Table 6. French fry color for russet skinned or long white potato evaluation trial in Lehigh County, Smokey Wessner's Farm, 2023.

Variety/line	Specific Gravity	French Fry Color		
		Feb[1]	Mar[2]	Mar[3]
Russet Norkotah	1.072	1	1	
SP327	1.085	0	00	
Libero	1.083	1	1	1
Caribou Russet	1.081	1	0	2

[1] Feb. = Stored at 45°F from November 30, 2023, then transferred to 55°F three weeks prior to frying on February 13, 2024.

[2] Mar. = Stored at 45°F from November 30, 2023, then transferred to 55°F six weeks prior to frying on March 4, 2024.

[3] Mar. = Stored at 45°F from November 30, 2023 and fried on March 4, 2024.

French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.

Table 7. French fry color for russet skinned or long white potato evaluation trial in Erie County, Mark Troyer Farm, 2023.

Variety/line	Specific Gravity	French Fry Color		
		Feb[1]	Mar[2]	Mar[3]
SP327	1.085	0	00	
Lakeview Russet	1.084	00	0	
Libero	1.060	1	1	1
Portage Russet	1.091	00	0	0

[1] Feb. = Stored at 45°F from November 30, 2023, then transferred to 55°F three weeks prior to frying on February 13, 2024.

[2] Mar. = Stored at 45°F from November 30, 2023, then transferred to 55°F six weeks prior to frying on March 4, 2024.

[3] Mar. = Stored at 45°F from November 30, 2023 and fried on March 4, 2024.

French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.

Promising Potato Varieties for Pennsylvania

Fresh Market

AF5280-5: a fresh market variety with a medium maturity from University of Maine

- In Rock Springs trials over 8 years marketable yield averaged 123% of Atlantic.
- In Southeastern Pennsylvania trials over 5 years marketable yield averaged 110% of Atlantic.
- In Erie County trials over 2 years marketable yield averaged 105% of Atlantic.

Tubers are round to oblong with slightly netted skin. Low levels of pickouts; misshapen, sunburn, and some growth cracks have been observed. It had average 5% hollow heart and 5% internal browning. Over 15 trials the specific gravity averaged 0.026 less than Atlantic. Has moderate scab resistance.

Brodie (NY140): a dual-purpose variety with late maturity from Cornell University

- Evaluated between 2004-2015, and 2023
- Large tubers with round-oblong shape and smooth skin
- Higher marketable yields than Atlantic at three locations
- Gravity lower that Atlantic
- Fair appearance
- Size profile similar to Atlantic
- Low levels of pickouts
- Good chip color from cold storage

Russets

Portage Russet: a dual purpose variety from University of Wisconsin

- Mostly long shape with light russet texture, similar to Silverton
- High marketable yield. In one Rock Springs trial marketable yield averaged 128% of Russet Norkotah, 122% of Russet Norkotah in Erie Co.
- Low levels of pickouts
- Good for storage

Caribou Russet: a dual purpose variety with mid-season maturity from University of Maine

- Mostly oblong with a light russet texture
- Very uniform shape and type
- High yield. In Rock Springs trials over 10 years marketable yield averaged 103% of Russet Norkotah
- Low levels of pickouts
- High tolerance to heat and drought
- Moderate common scab resistance

Libero: a russet skin with light yellow flesh variety from Parkland Seed

- Medium early variety well suited for the fresh market with good frying capabilities
- Oblong-long tubers with a uniform light russet texture and light yellow flesh color

- In one Rock Springs trial marketable yield averaged 97% of Russet Norkotah
- Baked, roasted, boiled, mashed, or as fresh-cut fries
- Very low levels of pickouts

Reds

NDAF113484B-1: a red skin variety with medium early maturity from University of Maine

- In Rock Springs trials over 7 years marketable yield averaged 86% of Chieftain.
- In Southeastern Pennsylvania trials over 4 years marketable yield averaged 101% of Chieftain.
- In Erie County trials over 4 years marketable yield averaged 88% of Chieftain.

Tubers are mostly round with moderate smooth skin. Low levels of pickouts; sunburn have been observed. Over 15 trials the specific gravity averaged 0.019 lower than Chieftain. Average yields are similar to Dark Red Norland, holds its color well in storage. It has moderate scab, shatter and black spot resistance.

A11573-5RYsto: a red skin with yellow flesh variety from USDA Idaho

- Dark red skin, yellow flesh
- Mostly round with moderately smooth skin
- Highest overall appearance
- High yield, marketable yield 146% of Chieftain at Rock Springs
- Small size profile
- Low levels of pickouts

Chipping

Bliss (NY163): a chip variety with medium maturity from Cornell University

- In Rock Springs trials over 6 years marketable yield averaged 113% of Atlantic.
- In Southeastern Pennsylvania trials over 4 years marketable yield averaged 76% of Atlantic.
- In Erie County trials over 5 years marketable yield averaged 122% of Atlantic

Tubers are mostly round with moderately smooth skin. Low levels of pickouts; sunburn and growth cracks have been observed. Over 15 trials the specific gravity averaged 0.004 lower than Atlantic. Chip color has been equal to Snowden. It has moderate scab resistance.

NY174: a chip variety from Cornell University

- In one Rock Springs trial marketable yield averaged 114% of Atlantic.
- In one Southeastern Pennsylvania trial marketable yield averaged 116% of Atlantic.
- In one Erie County trial marketable yield averaged 247% of Atlantic.

Tubers are round-oblong with a slight net. No pickouts. Over 3 trials the specific gravity averaged the same as Atlantic. Tubers averaged 34% in the 1 7/8" to 2 ½" size class and 53% in the 2 ½" to 3 ½" size class.

SP327: a chipping variety from Sunrise Potato

- In Rock Springs trials 2 years marketable yield averaged 124% of Atlantic.

- In Southeastern Pennsylvania trials 2 years marketable yield averaged 83% of Atlantic.
- In Erie County trials 2 years marketable yield averaged 173% of Atlantic.

Tubers are round with slightly netted skin. Low levels of pickouts; sunburn observed. It had an average 4% hollow heart and 9% internal browning. Over 6 trials the specific gravity averaged 0.006 less than Atlantic.

Early Season

Laperla: early maturing variety from Solanum International

- Very early tablestock and mainly marketed straight from the field
- Attractive smooth yellow skin and light yellow flesh
- Mostly round tubers
- High yielding, marketable yield 145% of Superior at Rock Springs
- Good drought tolerance
- Suitable for organic production
- Susceptible to Metribuzin (Sencor)

Natascha: early maturing variety from Hanse Seed

- Tubers are mostly round with slightly netted skin.
- Marketable yield was 144% of Superior. 38% of tubers were in the 1 7/8" to 2 ½" size class and 40% in the 2 ½" to 3 ½" size class. It has no hollow heart or internal defects and low levels of pickouts.
- Specific gravity was 0.015 less than Superior.

NY165: early to mid-season chipstock from Cornell University

- Mostly round to oblong tubers with slightly netted skin
- Specific gravity has averaged 0.007 less than Atlantic
- High marketable yields (better than Snowden)
- Specific gravity has averaged 0.007 less than Atlantic
- Very good chip color out of cold storage (better than Snowden)
- No hollow heart or internal defects
- Low levels of pickouts
- Moderately resistant to common scab