

# **Pennsylvania Potato Research Report, 2021**

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## 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 2021 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 98 round whites with a few yellow flesh, 40 red-skinned (a few purple skinned) and 31 russet or long white types. An early season variety trial of 25 varieties was conducted at Rock Springs. An early season papa criolla (small yellow potato) variety trial of 13 varieties was conducted at Rock Springs. The Northampton Co. location and Erie Co. location had 31 and 32 varieties, respectively. Snack Food Association trial of 9 chipping varieties was conducted in Chambersburg. Breeding lines were contributed by USDA-ARS, New York, Maine, North Carolina, Michigan, Idaho, Colorado, Wisconsin and a few other sources. See **Pennsylvania Regional Potato Germplasm Evaluation Program, 2021 on pages 1-2, data tables from different locations on pages 3-35, trial management information on page 36, descriptions of promising varieties for Pennsylvania on pages 37-40, supplemental processing (chipping and French Fry) report on pages 44-45 and tables from different locations on pages 46-52.**

### 2. Breeding for Disease Resistance

In three separate field trials, 24 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, cultivar Dark Red Norland had a lower disease severity score and disease incidence than Russet Burbank and was considered as resistant or moderately resistant as the tolerant check. Superior, AF5492-6, Russet Norkotah, AF5819-2, and NDAF113484B-1 had a similar disease incidence as Russet Burbank and low disease severity score, and only a few small superficial lesions were observed on some tubers of these cultivars/lines. See **Field evaluation of potato cultivars and breeding lines for resistance to common scab in Pennsylvania, 2021 on page 41.**

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. Based on

AUDPC values, NC470-3, AF5406-7, NY165, MSAFB609-12, Snowden, AF5071-2, MSAFB635-15 and Russet Burbank were not significantly more or less resistant than cv. Kennebec. See **Evaluation of potato cultivars and breeding lines for resistance to late blight in Pennsylvania, 2021 on page 42.**

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. Six cultivars/lines were characterized as moderately resistant because their AUDPC values were not significantly different from the moderately resistant check Russet Burbank and lower than the moderately resistant check Kennebec: AF5406-7, AF5071-2, Snowden, Katahdin, AF5492-6 and MSAFB609-12. See **Evaluation of potato cultivars and breeding lines for resistance to early blight in Pennsylvania, 2021 on page 43.**

## **Progress Report---December 2021**

### **Pennsylvania Regional Potato Germplasm Evaluation Program, 2021**

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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: Northampton Co. (Tables 1- 2), Erie Co. (Tables 3-4) and Rock Springs, Centre Co. (Tables 5-12). The Northampton location and Erie location had 31 and 32 varieties/lines in non-replicated trial, respectively. At the Rock Springs location the trials included 54 round whites with a few yellow flesh, 13 red-skinned (a few purple skinned) and 14 russet or long white types in replicated plots, and an additional 44 whites, 27 red-skinned and 17 russet or long white types planted in non-replicated observational plots. At Northampton and Erie locations, the seed spacing was 8-inch within a 20-ft plot except for the russets that were at 10-inch. At Rock Springs location, the seed spacing was 8-inch within a 10-ft plot except for the russets and some whites that were at 10-inch. An early variety trial of 25 varieties was conducted at Rock Springs, Centre Co. (Tables 13-14). An early season papa criolla (small yellow potato) variety trial of 13 varieties was conducted at Rock Springs, Centre Co. (Tables 15). Snack Food Association trial of 9 chipping varieties was conducted by PA co-op at Bryan Bender's Farm in Chambersburg (Tables 16-17). Management information for each site is provided in Table 18. 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:**

#### **Northampton county trial:**

In the Northampton location the following lines had marketable yield higher than Atlantic: Snowden, Superior, AF5280-5, AF5819-2, MSV179-1, MSAFB609-12, Agate, NC818-24, NDAF113484B-1, Red Prairie, NY163, NY165, and Norwis.

**Erie county trial:**

In the Erie location, Chieftain, NDAF102629C-4, AF5280-5, AF5819-2, NC663-21, AF6289-2, NDAF113484B-1, NY163, MSAFB609-12, MSAFB635-15, NC818-24, NY161 had marketable yield higher than Atlantic.

**Round white planted 8-inch apart in Rock Springs:**

Based on data of replicated trials at Rock Springs, there were 8 round white clones with marketable yields significantly higher than Atlantic: BNC815-7, B3403-6, B3292-5, NC663-21, NC669-48, MSX156-1Y, Constance, and Melody; there were another 26 round white clones with marketable yields higher than Atlantic. In non-replicated trial, there were 13 round white clones with marketable yields higher than Atlantic.

**Red-skinned planted 8-inch apart in Rock Springs:**

Based on data of replicated trials at Rock Springs, A08122-9RY and Certa KWS had marketable yields significantly higher than Chieftain; there were another 6 red-skinned or purple-skinned clones with marketable yields higher than Chieftain: Dark Red Norland, AF6289-2, NDAF14113Y-3, BNC839-5, MSBB238-1RY and NDA8512C-1R. In non-replicated trial, AF6709-4 and AF6575-6 had marketable yields higher than Chieftain.

**Russet-skinned or white planted 10-inch apart in Rock Springs:**

Based on data of replicated trials at Rock Springs, AF5735-8, AF5762-8, AF6075-8, AF6075-9, and AF6338-6 had marketable yield higher than Russet Norkotah. In non-replicated trial, AF6296-3, AF6298-2, AF6377-10, AF6377-13, AF6441-3, AF6465-7, AF6471-2, AF6488-5, AAF10736-2, AAF13334-3, AAF15010-1, NDAF13242B-1, NDAF1415Y-2, AAF12139-1 and WAF14006-6 had marketable yields higher than Russet Norkotah.

**Early season variety trial in Rock Springs:**

Based on data of replicated trials at Rock Springs, Agate and BNC718-1 had marketable yields significantly higher than Superior; NDAF102629C-4, CO97232-2R/Y, NDAF14113Y-3, and Atlantic had marketable yields 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, USDA Beltsville, USDA Idaho, Colorado State University, Michigan State University, North Carolina State University, University of Wisconsin potato breeding programs and Solanum International, Parkland Seed, Sterman Masser Inc. provided seed. Special thanks to Bob Leiby 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 Sherwood Geiger's Farm, Northampton County, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		US#1	%	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity
	Total	>1 7/8"				1	2	3	4	5		
Atlantic	456	429	94	100	3	15	41	38	0	3	1.078	
Katahdin	412	363	88	84	4	18	39	30	2	8	1.060	
Snowden	523	507	97	118	2	20	55	22	0	1	1.071	
Superior	364	321	88	75	3	23	51	14	0	8	1.064	
Yukon Gold <sup>y</sup>	351	292	83	68	1	15	28	41	0	15	1.067	
Chieftain	424	358	85	83	6	29	42	14	0	9	1.058	
AF5280-5	551	510	92	119	4	35	47	4	6	3	1.063	
AF5563-5	397	373	94	87	3	21	52	21	0	3	1.073	
AF5819-2	718	663	92	155	6	27	51	14	0	2	1.060	
B3292-5	387	268	69	63	5	9	30	31	0	26	1.058	
NY161 <sup>y</sup>	452	337	74	78	13	39	31	5	0	13	1.060	
MSV093-1Y <sup>y</sup>	402	335	83	78	7	28	46	9	0	10	1.059	
MSV179-1	570	514	90	120	2	14	45	31	0	8	1.056	
MSAFB609-12	502	446	89	104	6	27	48	14	0	6	1.076	
Krone <sup>y</sup>	537	355	66	83	24	52	14	1	0	10	1.063	
Constance <sup>y</sup>	402	343	85	80	9	47	36	3	0	6	1.061	
Abbot	458	366	80	85	8	34	38	8	0	12	1.063	
Agate <sup>y</sup>	681	575	84	134	11	41	38	6	0	5	1.058	
NC727-6	325	271	83	63	12	53	31	0	0	5	1.074	
NC818-24	655	536	82	125	3	16	39	25	2	15	1.070	
NC821-30	435	378	87	88	11	37	47	4	0	2	1.074	
NDAF113484B-1	520	452	87	105	4	24	56	6	0	9	1.051	
Certa KWS	535	391	73	91	20	41	32	1	0	7	1.054	
Red Prairie	579	444	77	104	15	40	32	4	0	9	1.053	
BNC839-5	321	278	86	65	7	43	35	8	0	7	1.058	
NY163	505	471	93	110	4	42	48	4	0	3	1.075	
NY165	627	573	91	133	3	14	50	27	0	5	1.071	

Variety/Line	Yield (cwt/A) <sup>1</sup>		% US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity
	Total	>1 7/8"			1	2	3	4	5		
B2869-29	422	383	91	89	8	47	44	0	0	1	1.076
NC669-48	277	231	83	54	11	50	30	4	0	6	1.063
NC663-21	444	377	85	88	9	38	42	5	0	7	1.063
Norwis	492	459	93	107	1	7	28	46	13	6	1.053

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

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

<sup>3</sup>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.

<sup>4</sup>Percentage of total that are pickouts.

Non-replicated trial.

Russet varieties were planted 10-in. apart with 24 seed pieces per 20-ft plot, all other varieties were spaced 8-in. apart with 30 seed pieces per 20-ft plot.

Varieties with colored flesh are indicated by <sup>y</sup> for yellow.



Table 2. Tuber characteristics, internal defects for potato evaluation trial in Sherwood Geiger's Farm, Northampton County, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>				Internal Defects <sup>2</sup>		Reasons for Pickouts		
	TA	C	TX	Sh	TED	TCS		% HH	% IB
Atlantic	5	6	5	2	6	5	30	10	PO=Green
Katahdin	5	7	7	3	5	5	0	0	PO=Green
Snowden	5	5	5	2	5	6	10	0	PO=Green
Superior	4	6	6	3	5	5	0	0	PO=Green, misshape
Yukon Gold	4	7	7	3	5	5	10	0	PO=Green, pinkeye, growth cracks
Chieftain	5	2	7	3	4	5	0	0	PO=Green
AF5280-5	5	6	7	3	5	5	0	0	PO=Green
AF5563-5	5	7	7	2	5	5	10	0	PO=Misshape, green
AF5819-2	5	6	6	2	4	5	0	0	PO=Green, growth cracks
B3292-5	4	6	6	2	5	5	0	0	PO=Growth cracks, green
NY161	5	9	7	2	4	5	0	0	PO=Green, growth cracks
MSV093-1Y	5	7	7	2	6	6	0	0	PO=Green, misshape
MSV179-1	5	7	6	2	6	6	0	0	PO=Green, growth cracks, misshape
MSAFB609-12	7	6	6	2	7	6	0	0	PO=Green, misshape
Krone	3	9	7	2	6	5	0	0	PO=Green, second growth
Constance	5	9	7	2	5	5	0	30	PO=Misshape, green
Abbot	4	6	6	4	5	4	0	0	PO=Green, knobs
Agate	5	7	7	4	5	6	0	0	PO=Green, misshape
NC727-6	5	7	7	2	6	6	30	0	PO=Green, growth cracks
NC818-24	4	6	6	2	5	6	0	0	PO=Green, misshape
NC821-30	6	5	5	2	5	7	0	0	PO=Green
NDAF113484B-1	5	2	7	2	4	6	0	0	PO=Green, misshape
Certa KWS	4	2	6	2	5	6	10	0	PO=Growth cracks, green
Red Prairie	4	2	6	3	4	5	0	0	PO=Green, second growth
BNC839-5	6	2	8	2	5	7	0	0	PO=Misshape
NY163	6	6	6	2	6	6	0	0	PO=Green, misshape
NY165	6	6	5	3	5	5	0	0	PO=Green

Variety/Line	Tuber Characteristics <sup>1</sup>						Internal Defects <sup>2</sup>			Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB		
B2869-29	5	6	6	2	6	6	0	0	PO=Green	
NC669-48	5	7	7	2	6	5	10	0	PO=Green	
NC663-21	4	7	7	2	5	6	10	0	PO=Green	
Norwis	4	7	7	3	5	5	10	0	PO=Growth cracks, green	

<sup>1</sup>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.

<sup>2</sup>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 Farm, Erie County, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		% US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity
	Total	>1 7/8"			1	2	3	4	5		
Atlantic	312	261	84	100	4	34	30	19	0	12	1.078
Katahdin	279	226	81	87	4	17	53	12	0	15	1.065
Snowden	286	254	89	97	8	45	44	0	0	4	1.084
Superior	228	201	88	77	4	25	63	0	0	7	1.064
Chieftain	409	346	85	133	2	15	53	17	0	13	1.058
Yukon Gold <sup>y</sup>	242	193	80	74	2	5	34	40	0	18	1.071
NDAF102629C-4	344	310	90	119	7	42	46	2	0	3	1.081
AF5280-5	316	276	87	106	5	30	50	8	0	8	1.060
AF5819-2	384	356	93	136	6	42	46	4	0	1	1.073
B3292-5	299	245	82	94	8	16	51	15	0	10	1.066
CO09128-3W/Y <sup>y</sup>	203	67	33	26	61	33	0	0	0	5	1.053
NC663-21	474	408	86	156	6	31	48	7	0	8	1.072
Red Prairie	311	239	77	91	11	40	37	0	0	12	1.054
BNC839-5	269	241	89	92	6	22	63	4	0	4	1.066
AF6289-2	381	328	86	126	6	30	49	7	0	7	1.065
NDAF113484B-1	335	297	89	114	4	30	56	3	0	8	1.057
MSBB238-IRY <sup>y</sup>	265	220	83	84	6	36	47	0	0	11	1.061
NY163	388	337	87	129	5	29	54	4	0	8	1.078
NY165	239	173	73	66	4	21	36	16	0	23	1.075
MSAFB609-12	331	289	87	111	5	40	47	0	0	8	1.083
MSAFB635-15	318	290	91	111	4	40	48	4	0	5	1.081
W12078-76	200	185	93	71	7	39	45	8	0	1	1.085
NC470-3	190	134	71	51	21	57	14	0	0	8	1.075
BNC821-29	310	235	76	90	3	21	54	0	0	21	1.070
NC818-24	312	282	90	108	5	22	55	14	0	5	1.078
Russet Norkotah	342	241	70	92	10	30	30	10	0	20	1.064
MSV093-1Y	259	224	86	86	6	33	50	3	0	7	1.066

Variety/Line	Yield (cwt/A) <sup>1</sup>		US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity
	Total	>1 7/8"			1	2	3	4	5		
NY161 <sup>y</sup>	514	384	75	147	6	20	49	6	0	20	1.067
Norwis	183	153	83	58	4	8	49	25	0	13	1.058
Lady Amarilla <sup>y</sup>	316	247	78	95	9	46	28	5	0	13	1.069
AAF10615-1	263	196	74	75	13	40	25	10	0	13	1.083
AF5071-2	299	220	74	84	16	47	27	0	0	11	1.086

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

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

<sup>3</sup>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.

<sup>4</sup>Percentage of total that are pickouts.

Non-replicated trial.

Russet varieties \* were planted 10-in. apart with 24 seed pieces per 20-ft plot, all other varieties were spaced 8-in. apart with 30 seed pieces per 20-ft plot.

Varieties with colored flesh are indicated by <sup>y</sup> for yellow.

Table 4. Tuber characteristics, internal defects for potato evaluation trial in in Mark Troyer Farm, Erie County, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>				Internal Defects <sup>2</sup>		Reasons for Pickouts		
	TA	C	TX	Sh	TED	TCS		% HH	% IB
Atlantic	5	6	5	3	5	5	80	0	PO=Green
Katahdin	5	8	7	3	6	5	0	0	PO=Green
Snowden	5	6	5	2	5	5	30	0	PO=Green
Superior	4	7	6	3	4	4	0	0	PO=Misshape
Chieftain	4	3	7	3	5	4	0	0	PO=Green
Yukon Gold	4	9	7	3	6	5	30	0	PO=Green
NDAF102629C-4	6	6	2	7	6	6	20	0	PO=Green
AF5280-5	4	7	6	3	5	5	0	0	PO=Misshape, green
AF5819-2	6	8	7	2	5	6	0	0	PO=Green
B3292-5	5	7	6	3	6	6	0	0	PO=Green, growth cracks
CO09128-3W/Y	6	9	7	2	7	5	0	0	PO=Green
NC663-21	6	8	7	2	5	5	60	0	PO=Green
Red Prairie	7	2	8	3	7	5	0	0	PO=Green
BNC839-5	6	2	7	2	6	6	0	0	PO=Green
AF6289-2	6	2	7	3	7	4	0	0	PO=Green, misshape
NDAF113484B-1	4	2	7	3	5	6	0	0	PO=Green
MSBB238-1RY	4	2	7	3	5	5	0	0	PO=Green
NY163	5	7	7	3	5	6	0	0	PO=Green
NY165	5	7	6	3	6	5	0	0	PO=Green
MSAFB609-12	6	7	6	2	7	5	0	0	PO=Green
MSAFB635-15	6	6	5	2	6	6	20	0	PO=Green
W12078-76	5	7	6	2	6	5	10	0	
NC470-3	6	6	6	2	6	6	0	0	PO=Green
BNC821-29	5	7	6	3	6	6	10	0	PO=Green, growth cracks
NC818-24	6	6	6	2	6	6	0	0	PO=Green
Russet Norkotah	5	5	3	4	6	5	80	0	PO=Misshape, green
MSV093-1Y	5	9	6	2	4	5	10	0	PO=Green

Variety/Line	Tuber Characteristics <sup>1</sup>					Internal Defects <sup>2</sup>		Reasons for Pickouts	
	TA	C	TX	Sh	TED	TCS	% HH		% IB
NY161	5	9	7	3	4	5	10	0	PO=Green
Norwis	4	7	7	3	6	5	30	0	
Lady Amarilla	4	6	6	4	6	4	20	0	PO=Misshape
AAF10615-1	3	7	6	4	6	4	50	0	PO=Green, misshape
AF5071-2	5	6	4	5	7	4	40	0	PO=Misshape, green

<sup>1</sup>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.

<sup>2</sup>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, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		% US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity	Vine Maturity
	Total	>1 7/8"			1	2	3	4	5			
<b>Replicate</b>												
Atlantic	468	439	94	100	2	13	50	30	0	4	1.084	ML
Katahdin	473	417	88	95	1	8	43	34	2	11	1.063	ML
Snowden	547	502	92	114	4	29	52	10	1	4	1.079	ML
Superior	531	479	91	109	2	11	51	26	2	7	1.070	ME
Yukon Gold <sup>y</sup>	298	211	71	48	3	5	26	37	3	26	1.076	ME
AF5280-5	609	529	87	121	6	21	53	13	0	7	1.062	ML
AF5563-5	344	325	94	74	2	10	39	40	5	3	1.075	ML
AF5819-2	567	470	83	107	4	21	43	18	1	13	1.067	M
MSAFB609-12	596	544	91	124	7	33	43	14	1	2	1.083	L
MSAFB635-15	574	515	90	117	8	40	45	5	0	2	1.085	ML
NC470-3	432	392	91	89	8	39	50	2	0	1	1.076	ML
NDAF102629C-4	484	454	94	103	4	23	54	17	0	2	1.067	ML
NY165	526	499	95	114	4	27	57	11	0	2	1.076	ML
AF5931-1	557	518	93	118	2	15	44	32	2	5	1.070	ML
AF6522-1	509	464	91	106	8	39	46	7	0	1	1.077	ML
AF6526-7	552	495	89	113	1	11	48	27	2	10	1.083	ML
AF6541-3	528	474	90	108	5	18	54	17	1	5	1.069	ME
AF6542-16 <sup>y</sup>	537	441	82	100	13	53	27	1	0	5	1.077	M
AF6559-4	558	469	84	107	7	19	36	29	0	9	1.077	L
AF6566-1 <sup>y</sup>	495	387	77	88	3	8	39	25	5	20	1.084	L
AF6608-4 <sup>y</sup>	732	530	73	121	6	19	37	16	1	21	1.071	L
AF6610-2 <sup>y</sup>	486	339	70	77	4	12	28	26	3	26	1.069	L
WAF16220-2	608	520	86	118	3	14	41	24	7	11	1.070	ML
WAF13058-1 <sup>y</sup>	546	438	80	100	6	26	38	14	3	15	1.070	ML
NY161 <sup>y</sup>	646	484	75	110	7	24	36	14	1	18	1.067	ML
NY163	581	540	93	123	3	45	39	9	0	4	1.077	ML
BNC811-15	506	458	90	104	3	25	53	12	0	6	1.080	ML
BNC811-22	543	463	86	106	8	36	45	3	1	6	1.087	ML
BNC811-33	514	435	84	99	3	19	44	17	4	13	1.078	M

Variety/Line	Yield (cwt/A) <sup>1</sup>		% US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity	Vine Maturity
	Total	>1 7/8"			1	2	3	4	5			
BNC815-7	692	611	88	139	6	31	47	10	0	6	1.078	ME
BNC821-9	518	451	87	103	3	12	47	23	5	10	1.073	ML
B3379-1	523	440	84	100	12	46	38	1	0	4	1.077	M
B3379-2	566	512	91	117	9	46	42	3	0	1	1.088	M
B3403-6	589	552	94	126	5	46	48	0	0	1	1.093	ML
B3292-5	649	582	90	132	3	15	40	35	0	7	1.066	ML
NC663-21	745	696	93	158	4	21	37	31	4	3	1.065	L
NC669-48	796	723	91	165	5	20	51	19	0	4	1.071	L
NC727-6	391	342	87	78	6	39	49	0	0	7	1.082	M
NC818-24	566	542	96	123	3	11	49	34	2	1	1.077	L
NC821-30	478	435	91	99	6	20	45	24	1	3	1.093	L
MSV179-1	508	435	86	99	1	6	20	52	8	13	1.060	L
MSX156-1Y <sup>y</sup>	715	673	94	153	2	8	22	37	28	4	1.062	ML
MSZ242-13	442	408	92	93	3	12	45	31	5	5	1.092	ML
MSZ242-09	541	480	89	109	6	30	50	9	1	5	1.088	L
W12078-76	405	378	93	86	3	16	39	29	10	4	1.085	L
A11661-3Y <sup>y</sup>	620	363	59	83	35	53	6	0	0	6	1.063	L
CO09128-3W/Y	281	85	29	19	71	29	1	0	0	0	1.049	E
CO09128-5W/Y <sup>y</sup>	362	226	62	51	37	55	7	0	0	1	1.074	E
CO11023-9W	576	502	87	114	9	35	40	12	0	3	1.072	ML
CO11250-1W/Y <sup>y</sup>	613	425	69	97	12	43	26	0	0	18	1.081	ML
Corsica <sup>y</sup>	526	335	63	76	6	19	29	15	0	31	1.075	M
Constance <sup>y</sup>	697	606	87	138	4	29	49	9	0	9	1.067	ML
Krone <sup>y</sup>	559	379	67	86	13	38	28	2	0	20	1.067	L
Melody <sup>y</sup>	791	597	75	136	9	28	36	11	0	15	1.059	ML
<b>Non-replicate</b>												
Atlantic	581	512	88	100	2	9	40	39	0	10	1.084	ML
Abbot	531	485	91	95	6	37	44	10	0	3	1.070	ME
AF6237-3	443	392	89	77	11	72	17	0	0	0	1.085	ML
AF6606-2 <sup>y</sup>	706	410	58	80	4	10	24	21	4	37	1.067	ML
NDAF1489-4 <sup>y</sup>	579	498	86	97	7	34	52	0	0	8	1.065	ME



Variety/Line	Yield (cwt/A) <sup>1</sup>		% US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity	Vine Maturity
	Total	>1 7/8"			1	2	3	4	5			
WAF16220-4	512	416	81	81	1	10	41	30	0	18	1.080	ML
AF6618-1	454	393	87	77	4	23	33	30	0	9	1.085	M
AF6618-2	526	472	90	92	3	22	68	0	0	7	1.085	ML
AF6626-2	570	444	78	87	7	22	38	18	0	16	1.082	ML
AF6647-4	531	461	87	90	7	27	43	17	0	6	1.079	ML
AF6652-3	554	535	97	105	3	24	54	18	0	0	1.074	ML
AF6655-1	528	414	78	81	8	28	39	12	0	13	1.077	L
AF6664-8	638	589	92	115	4	31	39	22	0	3	1.073	L
AF6664-9	838	765	91	149	2	9	27	41	15	7	1.086	L
AF6665-3	651	590	91	115	7	38	48	4	0	3	1.068	ML
AF6668-3	600	585	97	114	0	17	53	28	0	2	1.072	M
AF6669-10	654	632	97	123	2	23	54	17	2	1	1.077	ML
AF6670-1	734	670	91	131	5	20	49	22	0	3	1.082	VL
AF6671-10	597	585	98	114	2	16	69	13	0	0	1.084	M
AF6675-1	764	655	86	128	2	22	41	23	0	12	1.065	ML
AF6680-2	565	445	79	87	6	15	51	13	0	16	1.076	L
AF6684-9	530	478	90	93	7	18	47	22	3	3	1.077	ML
AF6686-5	459	432	94	84	5	36	50	8	0	1	1.082	ML
AF6687-3	555	509	92	99	3	12	52	27	0	5	1.076	ML
AF6688-2	542	516	95	101	5	30	42	23	0	0	1.064	M
AF6688-8	527	421	80	82	3	9	38	32	0	17	1.078	ML
AF6691-1	642	509	79	99	2	12	23	32	12	19	1.060	ML
AF6717-1	597	472	79	92	5	21	35	23	0	16	1.066	M
AF6722-3	561	375	67	73	6	13	45	8	0	27	1.078	ME
AF6724-2	347	299	86	58	4	26	54	7	0	10	1.071	ME
AF6729-1	517	467	90	91	1	11	55	24	0	8	1.074	ML
AF6729-2	741	510	69	100	4	14	27	28	0	27	1.070	VL
AF6729-6	630	456	72	89	7	15	40	13	4	21	1.070	L
AF6731-1 <sup>y</sup>	610	554	91	108	4	29	56	3	2	5	1.078	M
AF6735-2	697	502	72	98	5	14	40	18	0	23	1.068	ML
AF6743-6 <sup>y</sup>	429	381	89	74	10	53	36	0	0	1	1.089	E
WAF17037-1	532	482	91	94	7	21	53	17	0	2	1.075	ML
WAF17042-7	688	494	72	96	4	12	32	23	5	24	1.072	VL

Variety/Line	Yield (cwt/A) <sup>1</sup>		US#1	%	% of Standard <sup>2</sup>		% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity	Vine Maturity
	Total	>1 7/8"			1	Standard <sup>2</sup>	1	2	3	4	5			
WAF17045-1	502	444	88	87	4	14	72	2	0	8	1.071	ML		
WAF17045-2	566	532	94	104	4	33	53	7	0	2	1.076	ML		
WAF17060-5	557	463	83	90	5	11	27	38	6	12	1.083	ML		
COAF16023-3	592	414	70	81	13	34	35	0	0	17	1.073	ML		
NDAF14188-5	586	559	95	109	1	8	50	35	3	3	1.074	M		
NDAF14316CABY-3	462	414	90	81	7	32	50	8	0	3	1.077	E		
LSD	114	108	8	8	4	9	12	12	5	7				

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

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

<sup>3</sup>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.

<sup>4</sup>Percentage of total that are pickouts.

Planted 8-in. apart with 15 seed pieces per 10-ft plot. Yellow flesh varieties are indicated with <sup>y</sup>.

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, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>					Internal Defects <sup>2</sup>			Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
<b>Replicate</b>									
Atlantic	5	5	5	2	5	5	8	50	PO=Growth cracks, green
Katahdin	4	7	7	3	5	5	0	0	PO=Green
Snowden	5	5	5	2	5	5	8	0	PO=Misshape, green
Superior	4	7	6	4	5	5	0	0	PO=Green, misshape
Yukon Gold	4	7	7	3	6	5	0	0	PO=Pinkeye, growth cracks
AF5280-5	5	7	6	3	6	5	0	0	PO=Second tubers, sprouts, green, misshape
AF5563-5	6	7	7	3	6	5	0	0	PO=Green
AF5819-2	5	7	6	3	5	5	0	0	PO=Pinkeye, green
MSAFB609-12	6	6	6	2	5	5	0	0	PO=Green
MSAFB635-15	4	5	5	2	5	6	0	0	PO=Green, pinkeye
NC470-3	6	5	5	2	6	6	0	0	PO=Green
NDAF102629C-4	5	7	7	3	5	5	0	0	PO=Green, second tubers, misshape
NY165	5	6	6	3	6	5	0	0	PO=Green, misshape
AF5931-1	5	8	7	3	5	5	0	0	PO=Green, misshape
AF6522-1	5	5	5	2	5	5	0	0	PO=Green
AF6526-7	4	6	6	2	5	5	33	0	PO=Green
AF6541-3	5	7	6	2	5	5	0	0	PO=Scab, green
AF6542-16	4	6	6	3	6	5	0	0	PO=Green, second tubers, misshape
AF6559-4	4	7	7	2	5	5	8	0	PO=Green, misshape
AF6566-1	3	7	5	3	5	5	0	8	PO=Green, scab, pinkeye
AF6608-4	4	6	6	2	5	5	0	0	PO=Second tubers, pinkeye, green
AF6610-2	3	7	7	3	5	5	0	0	PO=Green, growth cracks, misshape
WAF16220-2	4	6	6	2	5	5	0	0	PO=Green, growth cracks, knobs
WAF13058-1	5	7	6	2	5	5	0	0	PO=Green, second tubers
NY161	4	9	6	3	4	5	0	0	PO=Green, misshape
NY163	5	7	7	2	6	6	0	0	PO=Green, misshape
BNC811-15	5	5	5	2	5	5	8	0	PO=Green, misshape, growth cracks
BNC811-22	6	6	5	2	5	5	8	0	PO=Green
BNC811-33	5	6	6	2	5	5	33	0	PO=Green, growth cracks

Variety/Line	Tuber Characteristics <sup>1</sup>					Internal Defects <sup>2</sup>			Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
BNC815-7	6	6	5	2	6	6	0	0	PO=Green, growth cracks
BNC821-9	5	6	5	2	5	6	0	0	PO=Green, growth cracks
B3379-1	5	5	5	2	6	6	8	0	PO=Misshape, growth cracks, green
B3379-2	7	6	6	2	6	6	25	42	PO=Green
B3403-6	7	5	5	2	6	6	0	0	PO=Misshape, scab
B3292-5	6	6	6	2	6	5	0	0	PO=Green, growth cracks
NC663-21	5	7	6	2	5	5	0	0	PO=Green, misshape
NC669-48	5	7	6	2	5	5	8	0	PO=Misshape, green, scab, knobs
NC727-6	5	6	6	3	5	5	25	0	PO=Green, misshape
NC818-24	6	5	5	3	6	6	0	0	PO=Green
NC821-30	6	6	5	2	6	5	50	0	PO=Green
MSV179-1	5	6	6	3	6	6	0	0	PO=Green, second tubers, growth cracks
MSX156-1Y	5	7	6	2	6	7	0	0	PO=Green
MSZ242-13	5	6	5	3	6	5	8	0	PO=Green, misshape
MSZ242-09	4	5	5	2	6	5	0	8	PO=Green, misshape
W12078-76	5	6	5	2	6	4	33	0	PO=Green
A11661-3Y	5	9	7	2	5	5	0	0	PO=Green, growth cracks, second tubers
CO09128-3W/Y	4	6	5	2	6	6	0	0	
CO09128-5W/Y	5	6	6	2	6	5	0	0	
CO11023-9W	6	7	7	2	6	6	8	0	PO=Green
CO11250-1W/Y	4	6	6	3	6	4	0	0	PO=Misshape
Corsica	3	6	6	3	6	5	0	0	PO=Misshape, green
Constance	5	9	6	3	6	5	0	0	PO=Misshape, green
Krone	5	9	6	3	5	5	0	0	PO=Green, misshape, second tubers
Melody	5	6	5	3	5	5	0	0	PO=Second tubers, growth cracks, green
<b>Non-replicate</b>									
Atlantic	5	5	5	2	5	6	0	0	PO=Green, misshape
Abbot	5	5	5	3	5	5	0	0	PO=Green
AF6237-3	6	6	5	2	6	6	0	0	
AF6606-2	3	6	5	2	5	5	0	0	PO=Green, knobs
NDAF1489-4	5	9	7	3	4	5	0	0	PO=Second tubers

Variety/Line	Tuber Characteristics <sup>1</sup>					Internal Defects <sup>2</sup>			Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
WAF16220-4	5	7	5	3	5	5	0	0	PO=Green, misshape
AF6618-1	5	6	5	2	6	6	50	0	PO=Misshape, green
AF6618-2	6	5	6	2	5	6	0	0	PO=Green, growth cracks
AF6626-2	3	6	6	3	6	5	25	0	PO=Green, misshape
AF6647-4	4	8	7	2	6	5	50	0	PO=Green, misshape
AF6652-3	6	6	5	2	5	6	0	0	
AF6655-1	4	6	6	2	5	5	0	0	PO=Green, misshape
AF6664-8	5	7	6	3	5	5	0	0	PO=Green
AF6664-9	4	7	6	3	5	5	0	0	PO=Green, misshape
AF6665-3	5	6	6	2	5	6	0	0	PO=Misshape, green
AF6668-3	5	7	6	3	5	5	0	0	PO=Green
AF6669-10	6	6	5	3	6	6	0	0	PO=Green
AF6670-1	5	5	5	3	6	6	0	100	PO=Green
AF6671-10	6	6	5	3	6	6	0	0	
AF6675-1	5	6	6	3	6	5	0	0	PO=Green, misshape
AF6680-2	4	7	6	2	5	6	0	0	PO=Green, second tubers
AF6684-9	6	4	5	2	6	6	0	0	PO=Green
AF6686-5	6	5	5	2	6	6	0	0	PO=Green
AF6687-3	6	6	5	3	6	6	0	0	PO=Green, knobs
AF6688-2	6	6	6	3	6	6	0	0	
AF6688-8	4	6	6	3	5	5	0	25	PO=Green, growth cracks
AF6691-1	5	7	7	3	5	5	0	0	PO=Green, misshape
AF6717-1	4	7	6	3	6	6	0	25	PO=Green, second tubers
AF6722-3	5	7	6	3	6	5	0	0	PO=Green, growth cracks
AF6724-2	4	7	7	3	5	5	0	0	PO=Growth cracks
AF6729-1	6	6	6	3	6	5	0	100	PO=Green, growth cracks
AF6729-2	5	7	7	2	5	6	25	0	PO=Green, growth cracks
AF6729-6	5	7	7	2	6	5	25	0	PO=Green, growth cracks
AF6731-1	5	6	6	2	6	6	0	0	PO=Green
AF6735-2	5	7	7	2	6	6	0	0	PO=Green, growth cracks
AF6743-6	5	6	5	2	5	6	0	0	PO=Misshape
WAF17037-1	5	6	5	2	5	6	0	0	PO=Green, misshape
WAF17042-7	5	7	6	2	5	5	50	0	PO=Green, growth cracks

Variety/Line	Tuber Characteristics <sup>1</sup>					Internal Defects <sup>2</sup>			Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
WAF17045-1		6	5	2	5	5	0	0	PO=Green, growth cracks
WAF17045-2	5	5	5	2	5	6	0	0	PO=Green
WAF17060-5	5	6	5	2	5	5	0	0	PO=Green, growth cracks
COAF16023-3	5	6	6	3	5	4	0	0	PO=Second tubers, green
NDAF14188-5	5	7	6	2	6	4	0	0	PO=Green
NDAF14316CABY-3	5	7	6	2	5	5	0	0	PO=Misshape

<sup>1</sup>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.

<sup>2</sup>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, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		US#1	%	% of					Standard <sup>2</sup>	%	% by size class <sup>3</sup>					Specific Gravity	Vine Maturity
	Total	>1 7/8"			1	2	3	4	5			%PO <sup>4</sup>						
<b>Replicate</b>																		
Chieftain	549	414	76	100	3	9	32	36	0	21	1.063	ML						
Dark Red Norland	539	491	91	119	3	24	58	9	0	6	1.062	E						
NDAF113484B-1	440	400	91	97	2	22	55	13	0	7	1.057	ME						
AF6048-4	516	397	77	96	8	16	44	17	0	15	1.060	ME						
AF6289-2	515	494	96	119	2	21	57	17	1	2	1.064	ME						
NDAF14113Y-3 <sup>y</sup>	543	421	77	102	7	30	41	7	0	16	1.069	ML						
BNC839-5	529	493	93	119	3	12	48	31	2	3	1.064	ML						
MSBB238-1RY <sup>y</sup>	616	525	85	127	6	28	46	12	0	9	1.064	M						
Red Prairie	491	377	77	91	14	35	23	19	0	9	1.060	M						
A08122-9RY <sup>y</sup>	713	603	84	146	9	39	38	8	0	7	1.069	M						
NDA8512C-1R	505	466	92	113	4	23	55	15	0	4	1.065	E						
A08112-7R	393	301	77	73	20	63	13	1	0	4	1.069	VE						
Certa KWS	848	720	85	174	9	33	45	7	0	6	1.058	VL						
<b>Non-replicate</b>																		
Chieftain	631	582	92	100	2	14	41	31	5	6	1.063	ML						
COAF15129-3	632	488	77	84	10	21	37	20	0	13	1.061	E						
NDAF12238Y-2	601	500	83	86	7	38	35	10	0	10	1.071	E						
NDAF13136Y-5	496	449	91	77	5	42	44	5	0	5	1.067	E						
NDAF13273-1	619	562	91	97	6	43	46	2	0	3	1.066	E						
NDAF13296Y-4	667	530	79	91	3	16	39	16	8	18	1.064	ME						
AF6692-1	592	523	88	90	5	37	38	13	0	7	1.067	E						
AF6692-7	664	550	83	95	3	18	34	27	4	14	1.056	ME						
AF6694-1	615	547	89	94	5	16	60	11	2	6	1.058	M						
AF6694-8	645	562	87	97	4	23	42	22	0	9	1.067	M						
AF6694-9	600	563	94	97	5	29	47	11	7	1	1.060	ME						
AF6695-3	561	479	85	82	9	33	48	4	0	6	1.060	M						
AF6698-8	607	343	57	59	3	19	30	7	0	40	1.054	E						
AF6698-9 <sup>pk</sup>	509	437	86	75	10	41	44	0	0	4	1.053	E						

Variety/Line	Yield (cwt/A) <sup>1</sup>		US#1	% of Standard <sup>2</sup>	% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity	Vine Maturity
	Total	>1 7/8"			1	2	3	4	5			
AF6702-1	623	507	81	87	5	31	48	3	14	1.063	ME	
AF6705-2	549	437	80	75	4	20	44	16	16	1.058	ML	
AF6705-6	504	446	88	77	7	31	55	2	5	1.062	E	
AF6705-8	593	524	88	90	11	27	44	15	1	1.063	E	
AF6708-2	499	442	89	76	3	34	55	0	8	1.053	E	
AF6709-4	684	614	90	106	5	19	41	30	5	1.065	ME	
AF6712-7	735	538	73	93	13	26	41	6	14	1.061	M	
AF6575-6 <sup>y</sup>	663	589	89	115	7	44	41	4	4	1.073	M	
WAF17010-9	336	254	76	44	10	34	41	0	14	1.060	VE	
WAF17022-4	328	264	81	45	18	62	19	0	2	1.066	VE	
WAF17022-6	451	385	85	66	6	27	52	6	8	1.062	E	
BNC916-3	414	370	90	64	7	46	43	0	4	1.081	E	
BNC917-2	527	499	95	86	3	44	43	7	2	1.065	E	
LSD	144	128	8		3	9	17	13	8			

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

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

<sup>3</sup>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.

<sup>4</sup>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 <sup>y</sup> for yellow, <sup>pk</sup> for pink. Plots consisted of 10-ft rows with 15 seed pieces spaced 8-in. apart.



Table 8. Tuber characteristics, internal defects for red skinned potato evaluation trial in Plant Pathology Farm, Rock Springs, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>					Internal Defects <sup>2</sup>		Reasons for Pickouts	
	TA	C	TX	Sh	TED	TCS	% HH		% IB
<b>Replicate</b>									
Chieftain	4	2	7	3	6	5	0	8	PO=Second tubers, knobs, growth cracks
Dark Red Norland	4	2	7	3	5	5	0	0	PO=Growth cracks, second tubers, green
NDAF113484B-1	5	2	7	3	4	5	0	0	PO=Green, knobs, misshape
AF6048-4	5	2	7	3	4	4	0	0	PO=Knobs, growth cracks, green
AF6289-2	5	2	6	3	4	5	0	0	PO=Green, growth cracks
NDAF14113Y-3	5	2	6	3	4	5	0	42	PO=Second tubers, growth cracks, green
BNC839-5	5	2	6	2	4	6	0	0	PO=Green, misshape
MSBB238-1RY	5	2	6	3	4	5	0	0	PO=Misshape, green, second tubers
Red Prairie	6	2	6	3	4	5	0	0	PO=Second tubers, green, misshape
A08122-9RY	5	3	6	3	4	5	0	0	PO=Green, second tubers
NDA8512C-1R	5	2	6	3	4	5	0	0	PO=Growth cracks, green
A08112-7R	6	2	7	2	5	6	0	0	PO=Green
Certa KWS	5	2	6	3	6	5	0	0	PO=Growth cracks, green
<b>Non-replicate</b>									
Chieftain	5	3	6	3	4	5	0	0	PO=Misshape, green
COAF15129-3	4	2	7	3	5	5	0	0	PO=Growth cracks, second tubers, green
NDAF12238Y-2	4	2	7	3	5	5	0	25	PO=Misshape, green
NDAF13136Y-5	4	2	7	2	5	5	0	0	PO=Misshape, green
NDAF13273-1	6	2	7	2	5	5	0	0	PO=Misshape
NDAF13296Y-4	5	2	6	2	4	5	0	0	PO=Second tubers, green
AF6692-1	5	2	7	3	5	5	0	0	PO=Green, growth cracks
AF6692-7	5	2	6	3	5	5	0	100	PO=Growth cracks, green
AF6694-1	4	1	7	3	5	5	0	0	PO=Green, misshape
AF6694-8	5	2	7	2	5	5	0	0	PO=Growth cracks, green
AF6694-9	4	1	7	3	5	5	0	0	PO=Green, misshape
AF6695-3	4	2	7	2	5	6	0	0	PO=Misshape, green
AF6698-8	3	2	6	2	5	6	25	0	PO=Second tubers, growth cracks
AF6698-9	5	2	7	2	4	5	0	25	PO=Second tubers, green

Variety/Line	Tuber Characteristics <sup>1</sup>							Internal Defects <sup>2</sup>		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB		
	AF6702-1	5	2	7	3	4	5	0	0	
AF6705-2	3	1	7	3	5	5	0	0	PO=Growth cracks	
AF6705-6	5	2	7	3	4	5	0	0	PO=Growth cracks	
AF6705-8	5	1	6	3	5	5	0	0	PO=Growth cracks	
AF6708-2	5	2	7	3	5	5	0	0	PO=Growth cracks, green	
AF6709-4	5	2	7	3	5	5	0	0	PO=Growth cracks, green	
AF6712-7	5	2	7	3	5	5	0	0	PO=Second tubers	
AF6575-6	5	1	6	3	4	5	0	0	PO=Second tubers	
WAF17010-9	3	2	7	3	5	5	0	0	PO=Growth cracks	
WAF17022-4	4	2	7	2	5	6	0	0	PO=Green	
WAF17022-6	5	2	7	3	4	5	0	0	PO=Green, knobs	
BNC916-3	5	1	6	3	5	5	0	0	PO=Misshape, knobs	
BNC917-2	5	1	6	3	4	5	0	0	PO=Green, misshape	

<sup>1</sup>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.

<sup>2</sup>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, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		US#1	%	% of Standard <sup>2</sup>					% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity		Vine Maturity
	Total	>1 7/8"			1	2	3	4	5	1	2	3	4	5		Gravity	Gravity	
<b>Replicate</b>																		
Russet Norkotah	544	443	81	100	7	31	26	20	4	12	1.070						ME	
Russet Burbank	610	381	63	86	3	13	23	16	12	34	1.077						L	
AAF10615-1	468	385	82	87	6	21	34	21	6	12	1.085						M	
AF5071-2	617	437	71	99	7	16	24	28	2	22	1.084						ML	
AF5406-7	632	422	67	95	2	17	20	20	10	31	1.075						L	
AF5492-6	491	385	78	87	7	24	31	23	0	15	1.076						ML	
AF5735-8	658	475	73	107	2	12	13	25	23	26	1.077						ML	
AF5762-8	553	501	90	113	2	10	19	44	18	8	1.084						ML	
AF6075-8	758	566	75	128	3	15	17	34	9	22	1.068						L	
AF6075-9	626	558	89	126	2	11	31	32	15	9	1.062						ML	
AF6338-6	676	479	71	108	3	8	16	28	20	27	1.085						L	
NDAF113476CB-3	453	372	82	84	4	25	26	27	5	14	1.075						ML	
MSV093-1Y <sup>y</sup>	483	403	82	91	3	19	45	17	1	15	1.070						L	
Atlantic	724	650	90	147	2	10	43	31	5	8							ML	
<b>Non-replicate</b>																		
Russet Norkotah	472	395	84	100	11	33	26	25	0	5	1.070						ME	
AF6296-3	556	455	82	115	2	23	19	40	0	16	1.082						L	
AF6298-2	568	489	86	124	8	27	34	15	10	6	1.085						ML	
AF6377-10	651	546	84	138	2	7	26	24	27	14	1.069						ML	
AF6377-13	600	439	73	111	3	14	27	14	18	24	1.083						M	
AF6441-3	553	400	72	101	3	14	15	33	10	24	1.074						M	
AF6465-7	545	454	83	115	5	27	29	11	17	12	1.077						ML	
AF6471-2	603	416	69	105	3	13	28	19	9	28	1.074						ML	
AF6488-5	554	465	84	118	8	39	20	25	0	8	1.090						VL	

Variety/Line	Yield (cwt/A) <sup>1</sup>		% of		% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific		Vine Maturity
	Total	>1 7/8"	US#1	Standard <sup>2</sup>	1	2	3	4	5		Gravity		
AAF10736-2	744	514	69	130	4	26	20	23	0	27	1.077		ML
AAF13334-3	613	480	78	122	5	17	29	29	4	17	1.075		ML
AAF15010-1	576	487	85	124	2	13	26	37	9	13	1.089		L
NDAF13242B-1	564	517	92	131	4	19	38	35	0	4	1.078		ML
NDAF1415Y-2	736	542	74	137	2	6	13	28	26	24	1.075		L
AAF12139-1	646	427	66	108	3	15	26	12	13	31	1.073		L
AAF12147-6	544	383	70	97	13	41	21	8	0	17	1.076		ML
WAF14006-6	646	508	79	129	1	10	5	25	38	20	1.067		L
LSD	156	137	10		3	8	10	12	10	9			

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

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

<sup>3</sup>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.

<sup>4</sup>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 12 seed pieces spaced 10-in. apart. Yellow flesh varieties are indicated with <sup>y</sup>.

Table 10. Tuber characteristics, internal defects for russet skinned or white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>				Internal Defects <sup>2</sup>		Reasons for Pickouts		
	TA	C	TX	Sh	TED	TCS		% HH	% IB
<b>Replicate</b>									
Russet Burbank	3	5	3	7	5	5	8	0	PO=Knobs, second tubers, misshape
Russet Norkotah	5	5	3	7	5	5	33	0	PO=Green, misshape, knobs
AAF10615-1	4	6	5	6	5	5	0	0	PO=Misshape, knobs, green
AF5071-2	4	5	3	7	5	5	17	0	PO=Misshape, knobs, green
AF5406-7	3	5	4	7	6	5	0	0	PO=Misshape, green, growth cracks
AF5492-6	5	5	3	6	6	6	0	0	PO=Green, misshape
AF5735-8	4	5	3	6	6	6	0	0	PO=Green, misshape, knobs
AF5762-8	5	4	3	7	5	5	8	0	PO=Misshape, green
AF6075-8	4	5	4	6	6	6	8	0	PO=Misshape, green, knobs
AF6075-9	4	5	3	6	6	6	17	0	PO=Misshape
AF6338-6	4	5	3	6	6	6	0	0	PO=Growth cracks, misshape, green
NDAF113476CB-3	4	5	3	6	6	6	0	0	PO=Green, second tubers, misshape
MSV093-1Y	5	7	6	2	5	6	0	0	PO=Knobs, misshape, green
Atlantic	5	5	5	2	6	6	8	0	PO=Green, growth cracks, knobs
<b>Non-replicate</b>									
Russet Norkotah	6	4	2	6	5	6	0	0	PO=Green, knobs
AF6296-3	5	6	4	7	6	6	25	0	PO=Green, knobs, growth cracks
AF6298-2	5	5	3	7	5	6	50	0	PO=Green, growth cracks
AF6377-10	5	5	2	7	5	6	0	0	PO=Green
AF6377-13	5	4	2	6	6	6	0	0	PO=Knobs, growth cracks, green
AF6441-3	3	5	3	6	5	6	0	0	PO=Scab, misshape, knobs
AF6465-7	5	4	2	7	6	6	0	0	PO=Misshape
AF6471-2	4	5	3	7	6	6	25	0	PO=Scab, growth cracks, green
AF6488-5	4	5	3	6	5	6	75	0	PO=Second tubers, growth cracks

Variety/Line	Tuber Characteristics <sup>1</sup>						Internal Defects <sup>2</sup>		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
AAF10736-2	4	6	4	6	6	6	0	0	PO=Second tubers, misshape
AAF13334-3	4	6	4	6	6	5	0	0	PO=Green, misshape
AAF15010-1	4	5	3	6	6	6	50	0	PO=Green, misshape
NDAF13242B-1	5	4	2	6	6	6	25	25	PO=Misshape
NDAF1415Y-2	3	5	3	6	6	6	50	0	PO=Green, scab, misshape
AAF12139-1	3	4	3	7	6	6	0	0	PO=Green, misshape
AAF12147-6	3	5	4	5	6	6	0	0	PO=Misshape, green
WAF14006-6	4	4	2	6	6	6	25	0	PO=Growth cracks, green

<sup>1</sup>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.

<sup>2</sup>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 NE1731<sup>1</sup> potato evaluation trial in Plant Pathology Farm, Rock Springs, 2021

Variety/Line	Yield (cwt/A) <sup>2</sup>		US#1		% of Standard <sup>3</sup>		% by size class <sup>4</sup>					%PO <sup>5</sup>	Specific Gravity	Vine Maturity	Merit Score <sup>6</sup>
	Total	>1 7/8"	US#1	%	Standard <sup>3</sup>	%	1	2	3	4	5				
Atlantic	472	438	93	100	100	100	2	11	47	35	0	5	1.084	ML	2
Chieftain	573	429	76	98	98	98	3	11	26	36	2	21	1.063	ML	2
Dark Red Norland	560	491	88	112	112	112	3	24	57	7	0	9	1.062	E	2
Katahdin	481	427	89	97	97	97	1	8	40	38	2	10	1.063	ML	2
Russet Burbank	639	383	61	87	87	87	3	13	23	14	10	36	1.077	L	3
Russet Norkotah	534	443	83	101	101	101	7	31	29	20	3	10	1.070	ME	2
Snowden	555	513	92	117	117	117	3	25	52	14	2	4	1.079	ML	2
Superior	530	486	92	111	111	111	2	14	48	28	2	6	1.070	ME	2
Yukon Gold <sup>y</sup>	310	225	72	51	51	51	3	4	26	36	7	25	1.076	ME	2
AAF10615-1	467	382	82	87	87	87	6	20	34	21	6	13	1.085	M	2
AF5071-2	606	429	71	98	98	98	7	19	26	23	2	22	1.084	ML	2
AF5280-5	585	506	86	115	115	115	6	22	52	13	0	7	1.062	M	2
AF5406-7	637	417	66	95	95	95	2	15	20	20	11	32	1.075	L	3
AF5492-6	486	388	79	88	88	88	6	26	31	21	2	15	1.076	ML	2
AF5563-5	313	295	94	67	67	67	2	10	39	39	6	4	1.075	ML	2
AF5819-2	582	487	84	111	111	111	5	22	43	18	1	11	1.067	M	2
MSAFB609-12	602	552	92	126	126	126	7	35	43	13	1	2	1.083	L	1
MSAFB635-15	579	499	86	114	114	114	8	40	43	4	0	6	1.085	ML	2
NC470-3	432	396	92	90	90	90	7	40	49	3	0	1	1.076	ML	2
NDAF102629C-4	486	450	93	103	103	103	4	20	54	19	0	4	1.067	ML	2
NDAF113484B-1	444	408	92	93	93	93	2	21	56	14	1	7	1.057	ME	2
NY165	522	494	94	113	113	113	4	29	57	9	0	2	1.076	ML	1
LSD	94	79	8	8	8	8	2	8	10	13	6	7			

<sup>1</sup>NE1731 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.

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

<sup>3</sup>Percentage of the standard, Atlantic, for >1 7/8" yield. <sup>4</sup>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.

<sup>5</sup>Percentage of total that are pickouts. <sup>6</sup>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 10-in. apart with 12 seed pieces per 10-ft plot, all other varieties were spaced 8-in. apart with 15 seed pieces per 10-ft plot.

Varieties with colored flesh are indicated by <sup>y</sup> for yellow.

Table 12. Tuber characteristics, internal and external defects for NE1731 potato evaluation trial in Plant Pathology Farm, Rock Springs, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>				Internal Defects <sup>2</sup>		Reasons for Pickouts		
	TA	C	TX	Sh	TED	TCS		% HH	% IB
Atlantic	5	5	5	2	5	5	19	38	PO=Green, misshape, growth crack
Chieftain	4	2	7	3	6	5	0	13	PO=Second tuber, knob, growth crack
Dark Red Norland	4	2	7	3	5	5	0	0	PO=Growth crack, second tuber, green
Katahdin	4	7	7	3	5	5	0	0	PO=Green
Russet Burbank	3	5	3	7	5	5	6	0	PO=Knob, second tuber, misshape
Russet Norkotah	5	5	3	7	5	5	25	0	PO=Green, misshape, knob
Snowden	5	5	5	2	5	5	6	0	PO=Misshape, green
Superior	4	7	6	4	5	5	0	0	PO=Green, misshape
Yukon Gold	4	7	7	3	6	5	0	0	PO=Pinkey, growth crack
AAF10615-1	4	6	5	6	5	5	0	0	PO=Misshape, knob, green
AF5071-2	4	5	3	7	5	5	19	0	PO=Misshape, knob, green
AF5280-5	5	7	6	3	6	5	0	0	PO=Second tuber, misshape, sprout
AF5406-7	3	5	4	7	6	5	0	0	PO=Misshape, green, growth crack
AF5492-6	5	5	3	6	6	6	0	0	PO=Green, misshape
AF5563-5	6	7	7	3	6	5	0	0	PO=Green
AF5819-2	5	7	6	3	5	5	0	0	PO=Pinkey, green
MSAFB609-12	6	6	6	2	5	5	0	0	PO=Green
MSAFB635-15	4	5	5	2	5	6	0	0	PO=Green, pinkey
NC470-3	6	5	5	2	6	6	0	0	PO=Green, growth crack
NDAF102629C-4	5	7	7	3	5	5	0	0	PO=Green, knob
NDAF113484B-1	5	2	7	3	4	5	0	0	PO=Green, misshape, growth crack
NY165	5	6	6	3	6	5	0	0	PO=Green, misshape

<sup>1</sup>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.

<sup>2</sup>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 10-in. apart with 12 seed pieces per 10-ft plot, all other varieties were spaced 8-in. apart with 15 seed pieces per 10-ft plot.



Table 13. 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, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		% of Standard <sup>2</sup>					% by size class <sup>3</sup>					Specific Gravity
	Total	>1 7/8"	US#1	1	2	3	4	5	%PO <sup>4</sup>				
<b>Replicate</b>													
Superior	421	382	91	100	3	13	50	27	0	7	1.070		
Dark Red Norland	462	363	79	95	7	33	40	6	0	15	1.067		
Yukon Gold <sup>y</sup>	373	266	71	70	2	11	30	29	1	27	1.075		
Envol	514	332	64	87	3	17	32	13	3	33	1.073		
Queen Anne <sup>y</sup>	507	345	68	90	16	45	20	3	0	15	1.059		
Abbot	515	379	73	99	10	37	32	4	0	17	1.076		
Agate <sup>y</sup>	655	497	75	130	9	47	25	3	0	16	1.065		
AAC Hamer	434	371	86	97	11	49	35	2	0	3	1.077		
NDAF102629C-4	487	416	85	109	8	41	40	4	0	6	1.079		
B2157-17 <sup>y</sup>	501	371	74	97	23	62	11	1	0	4	1.076		
NY160	505	351	69	92	26	55	13	1	0	4	1.076		
BNC718-1 <sup>y</sup>	525	489	93	128	3	22	56	15	0	4	1.070		
BNC833-2 <sup>p</sup>	488	359	73	94	16	41	25	7	0	10	1.066		
B3355-6 <sup>p</sup>	446	350	78	92	20	63	14	1	0	2	1.065		
CO97232-2R/Y <sup>y</sup>	478	425	88	111	10	44	32	11	0	2	1.064		
NDAF12143-1	427	307	71	80	11	28	29	14	0	17	1.067		
NDAF14113Y-3 <sup>y</sup>	628	473	75	124	15	47	26	2	0	11	1.067		
B2869-29	453	375	83	98	11	40	35	7	0	6	1.088		
Atlantic	482	399	82	104	4	17	43	22	1	13	1.084		
<b>Non-replicate</b>				0									
MSAF635-15	332	309	93	81	3	39	47	6	0	4	1.086		
NC470-3	423	374	88	98	10	42	46	0	0	2	1.079		
MSZ242-13	335	317	95	83	1	8	44	37	6	5	1.080		

Variety/Line	Yield (cwt/A) <sup>1</sup>		%		% of					% by size class <sup>3</sup>					%PO <sup>4</sup>	Specific Gravity
	Total	>1 7/8"	US#1	Standard <sup>2</sup>	1	2	3	4	5	1	2	3	4	5		
NY163	479	372	78	97	5	24	40	14	0	17					1.074	
NY165	430	380	88	99	7	38	41	9	0	4					1.074	
W12078-76	325	306	94	80	2	13	48	34	0	4					1.071	
LSD	80	94	12		7	12	13	10	2	10						

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

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

<sup>3</sup>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.

<sup>4</sup>Percentage of total that are pickouts. Varieties with colored flesh are indicated by <sup>y</sup> for yellow, <sup>p</sup> for purple.

Replicated trials are the average of 3 replicates and the rest are non-replicated. LSD indicates least significant difference (P = 0.05) for replicated trial.

Planted 8-in. apart with 15 seed pieces per 10-ft plot.

Table 14. Tuber characteristics, internal defects for potato early variety trial in Plant Pathology Farm, Rock Springs, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>				Internal Defects <sup>2</sup>			Reasons for Pickouts	
	TA	C	TX	Sh	TED	TCS	% HH		% IB
<b>Replicate</b>									
Superior	4	7	6	4	3	4	0	0	PO=Growth cracks, green
Dark Red Norland	5	2	7	3	5	5	0	0	PO=Green, growth cracks, misshape
Yukon Gold	4	9	7	3	6	5	8	8	PO=Growth cracks, green, pink eye
Envol	4	7	6	3	4	5	0	0	PO=Pink eye, growth cracks
Queen Anne	4	9	6	4	7	4	0	0	PO=Growth cracks misshape, 2nd tubers
Abbot	4	7	6	4	6	4	0	0	PO=Growth cracks, misshape
Agate	5	9	6	3	6	4	0	0	PO=Growth cracks
AAC Hamer	4	7	6	2	6	6	0	0	
NDAF102629C-4	4	6	5	2	5	5	0	0	PO=Growth cracks
B2157-17	5	2	7	3	6	4	0	0	PO=Green, growth cracks, misshape
NY160	6	3	7	3	6	5	0	0	PO=Growth cracks, misshape
BNC718-1	5	1	6	2	6	5	0	0	PO=Growth cracks, misshape
BNC833-2	5	1	7	4	6	5	0	0	PO=Growth cracks, misshape
B3355-6	6	1	7	3	4	5	0	0	PO=Misshape
CO97232-2R/Y	4	2	6	3	7	5	0	0	PO=Growth cracks
NDAF12143-1	4	2	8	2	6	6	0	0	PO=Green, misshape
NDAF14113Y-3	5	2	7	3	5	5	0	0	PO=Misshape, growth cracks, green
B2869-29	4	7	6	2	6	5	8	0	PO=Growth cracks, green
Atlantic	5	5	5	2	5	5	42	17	PO=Green, growth cracks
<b>Non-replicate</b>									
MSAF635-15	5	6	5	2	6	6	0	0	PO=Growth cracks
NC470-3	5	5	5	2	6	5	0	0	PO=Growth cracks
MSZ242-13	5	6	5	2	6	6	25	0	PO=Growth cracks

Variety/Line	Tuber Characteristics <sup>1</sup>						Internal Defects <sup>2</sup>		Reasons for Pickouts
	TA	C	TX	Sh	TED	TCS	% HH	% IB	
NY163	4	7	7	2	6	5	0	0	PO=Misshape
NY165	5	7	5	2	6	4	0	0	PO=Misshape
W12078-76	5	7	6	2	6	4	0	0	PO=Growth cracks

<sup>1</sup>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.

<sup>2</sup>Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 12 tubers for replicate trial and 4 tubers for non replicated trial. 0 = not observed.

Table 15. Total yield, size distribution, and external characteristic for early season papa criolla (small yellow potato) variety trial in Plant Pathology Farm, Rock Springs, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>			% by size class <sup>2</sup>			Tuber Characteristics <sup>3</sup>			Notes
	Total	1	2	3	TA	C	TX	Sh		
BD1505-4	149	0	63	37	4	2	7	3	Dark Yellow flesh, not uniform shape SS=4	
BD1560-1	249	0	75	25	4	9	6	4	Nice yellow flesh, not uniform shape	
BD1569-5	188	0	60	40	4	3	6	2	ss=7, skin dark red to pink, stems sticking	
BD1435-3	111	1	53	46	4	6	6	2	Stems sticking	
BD1339-2	315	0	49	51	3	3	7	4	Too many shapes, not solid skin color, yellow flesh has some red streaks	
BD1403-5	291	0	36	64	3	2	7	3	Dark red, all tubers are sprouted, nice yellow flesh SS=4	
BD910-2	219	0	45	55	4	6	3	3	Some sprouts, 2nd tubers, a few pointed tubers, nice yellow flesh	
BD932-3	144	0	45	55	3	9	7	3	Not uniform shape, some pointed tubers, sprouts	
BD952-1	215	0	60	40	4	2	6	4	Infected lenticels SS=4	
BD958-2	266	0	36	64	3	6	5	4	Dark yellow flesh, lots of 2nd tubers, some pointed tubers	
BD1153-7	259	1	40	59	4	6	7	3	Sprouts, 2nd tubers	
BD1265-5	110	2	71	27	4	9	6	2	Almost all tubers sprouted, stems sticking, nice yellow flesh	
BD1222-1	387	1	41	58	4	9	7	3	Sprouts, stems sticking	

<sup>1</sup>Yield Total = yield including all size categories 1, 2, and 3.

<sup>2</sup>Percentage of total yield according to size class. 1 = < 1 in., 2 = 1 - 1.625 in., 3 = > 1.625 in.

<sup>3</sup>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 = s light 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.

Planted 8-in. apart with 15 seed pieces per 10-ft plot.

Table 16. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickout, merit score for SNAC Chip Trial in Pennsylvania, 2021

Variety/Line	Yield (cwt/A) <sup>1</sup>		% US#1	% of Standard <sup>2</sup>					% by size class <sup>3</sup>					% PO <sup>4</sup>	Merit Score <sup>5</sup>
	Total	>1 7/8"		1	2	3	4	5	1	2	3	4	5		
Snowden	407	375	92	100	6	34	43	15	0	2	2				
Lamoka	361	337	93	90	4	29	59	5	0	3	2				
NYOR14Q9-9	293	274	93	73	7	35	50	9	0	0	2				
NY163	342	288	85	77	14	58	24	2	0	1	3				
MSZ242-13	395	341	86	91	4	23	46	17	0	10	4				
MSW474-1	329	288	87	77	10	40	39	8	0	3	3				
W12078-76	345	305	88	82	10	53	34	1	0	2	2				
NY165	428	372	87	99	8	35	42	10	0	5	3				
MSAF605- 4	418	384	92	103	6	43	47	1	0	2	2				
LSD <sup>6</sup>	64	58	4		3	8	10	7							

<sup>1</sup>Yield Total = all yield including pickouts. US#1 Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.

<sup>2</sup>Percentage of the standard, Snowden, for >1 7/8" yield.

<sup>3</sup>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.

<sup>4</sup>Percentage of total that are pickouts.

<sup>5</sup>Merit Score: 1 = excellent; 2 = very good; 3 = good; 4 = fair; 5 = poor.

<sup>6</sup>LSD indicates least significant difference ( $P = 0.05$ ). 4 replications.

Table 17. Tuber characteristics, internal and external defects for for SNAC Chip Trial in Pennsylvania, 2021

Variety/Line	Tuber Characteristics <sup>1</sup>							Internal Defects <sup>2</sup>			External Defects <sup>3</sup>					Reasons for Pickouts	
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp		T
Snowden	6	6	5	3	4	5	0	0	1	0	0	0	1	1	0	0	PO=Green, misshape
Lamoka	4	6	6	4	6	4	0	0	1	0	0	0	2	1	0	0	PO=Green
NYOR14Q9-9	5	6	6	3	6	4	0	0	1	0	0	0	1	1	0	0	
NY163	4	7	5	4	5	4	13	0	1	0	1	1	1	1	0	0	PO=Green
MSZ242-13	3	5	5	3	6	4	0	0	1	0	1	1	1	0	0	5	PO=Green, Knobs, misshape
MSW474-1	5	5	5	3	4	6	6	0	1	0	0	0	1	0	1	0	PO=Green, misshape
W12078-76	7	6	5	2	6	5	25	0	1	0	0	0	0	1	0	0	PO=Green, Knobs, misshape
NY165	5	6	6	4	7	5	0	0	1	0	0	0	2	0	0	0	PO=Green, knobs
MSAF605-4	7	5	5	2	5	6	0	0	1	0	0	0	1	0	0	0	PO=Green

<sup>1</sup>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.

<sup>2</sup>Internal Defects: HH = hollow heart, IB = internal browning. Percent of total number observed out of 16 tubers (4 tubers per rep, 4 reps).

<sup>3</sup>External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G = sunburn, Sc = scab, Sp = sprouts, T = secondary tubers. 0 to 9 from none to very severe.

Table 18: Management of evaluation trials, 2021

**Rock Springs**

Trial	Germplasm trial
Planting Date:	19, 20 May
Harvest Date:	11, 13 and 14 October
Previous Crop:	Wheat, cover crop in fall
Fertilizer Rate/A:	28 April: Epston Salt 100 lb/A with 10 ft Gandy 3 May: Gypsum 21-10-0 (N-P-K) at 950 lb/A with 10 ft Gandy 14 May: 0-0-60 (N-P-K) at 125 lb/A with 10 ft Gandy 18 May: 10-10-10 (N-P-K) at 1200 lb/A with 10 ft Gandy 24 June: liquid N (39 lb/A) at Hilling
Herbicide:	Eptam 7E, Medal EC, ommi Mrtribuzin, Matrix
Fungicide:	Luna Tranquility, Manzate Pro-Stick, Bravo WS, Endura, Quadris Opti, Revus Top, Orondis Opti, Omni Chlorothalonil, Zing!
Insecticide:	Lambda T2, Omni imidacloprid, Rimon, Fulfill, PBO
Vine Kill:	10 and 15 September for white and red varieties 20 and 30 September for russet varieties
Rainfall (inches):	June (4.48), July (3.82), August (4.91), September (9.01)

Trial	Early variety trial
Planting Date:	19, 20 May
Harvest Date:	21 September
Previous Crop:	Wheat, cover crop in fall
Fertilizer Rate/A:	28 April: Epston Salt 100 lb/A with 10 ft Gandy 3 May: Gypsum 21-10-0 (N-P-K) at 950 lb/A with 10 ft Gandy 14 May: 0-0-60 (N-P-K) at 125 lb/A with 10 ft Gandy 18 May: 10-10-10 (N-P-K) at 1200 lb/A with 10 ft Gandy 24 June: liquid N (39 lb/A) at Hilling
Herbicide:	Eptam 7E, Medal EC, ommi Mrtribuzin, Matrix
Fungicide:	Luna Tranquility, Manzate Pro-Stick, Bravo WS, Endura, Quadris Opti, Revus Top, Orondis Opti, Omni Chlorothalonil, Zing!
Insecticide:	Lambda T2, Omni imidacloprid, Rimon, Fulfill, PBO
Vine Kill:	20 and 25 August
Rainfall (inches):	June (4.48), July (3.82), August (4.91), September (9.01)



Table 19. Descriptions of promising varieties for Pennsylvania

## FRESH MARKET

### **AF5280-5** from University of Maine

- A medium maturity variety, the skin is buff color and smooth with oval shape tubers.
- At Rock Springs over 7 years, marketable yield averages 117% of Atlantic and 118% of Katahdin. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 72% compared to 68% for Katahdin in the same size class. Specific gravity averages 1.060 compared to 1.066 for Katahdin. AF5280-5 averages 6% for both hollow heart and internal browning. Katahdin average 5% hollow heart and 4% internal browning. Pickouts averages 10% compared to 12% for Katahdin, pickouts were mostly green.
- In the Southeast trials over 3 years the marketable yield of AF5280-5 averages 113% of Atlantic and 140% of Katahdin. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 85% compared to 72% for Katahdin in the same size class. Specific gravity averages 1.061 compared to 1.059 for Katahdin. AF5280-5 averages 5% for hollow heart and had no internal browning. Katahdin averages 7% hollow heart and had no internal browning.
- In the Erie County trial in 2021 the yield for AF5280-5 was 106% of Atlantic and 122% of Katahdin. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class was 80% compared to 70% for Katahdin in the same size class. Specific gravity was 1.060 compared to 1.065 for Katahdin. AF5280-5 and Katahdin had no internal defects.

### **MSAFB609-12** from University of Maine

- A medium late maturity variety, the skin is buff color and slightly netted and an oval shape.
- At Rock Springs over 3 years the marketable yield averages 133% of Atlantic and 139% of Katahdin. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 77% compared to 70% for Katahdin in the same size class. Specific gravity averages 1.076 compared to 1.067 for Katahdin. MSAFB609-12 had no hollow heart and average 3% for internal browning, Katahdin had no hollow heart and 8% internal browning.
- In the 2021 Southeast trial the marketable yield for MSAFB609-12 was 104% of Atlantic and 123% of Katahdin. Tubers in the 2 $\frac{1}{2}$ " to 4" size class were 62% compared to 69% for Katahdin in the same size class. Specific Gravity was 1.076, Katahdin was 1.060. Neither variety had internal defects.
- In the 2021 Erie County trial the marketable yield for MSAFB609-12 was 111% of Atlantic and 128% of Katahdin. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class were 87% compared to 70% for Katahdin in the same size class. Specific Gravity was 1.083, Katahdin was 1.065. MSAFB609-12 had no internal defects, Katahdin had 30% hollow heart.

## REDS

### **NDAF113484B-1** from University of Maine

- A medium early variety with smooth skin and the tuber is oval shape.
- At Rock Springs over 5 years the marketable yield averages 90% of Chieftain and 100% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 77% compared to 64% for

Chieftain and 79% for Dark Red Norland in the same size class. Specific gravity averages 1.056 compared to 1.063 for Chieftain and 1.057 for Dark Red Norland. NDAF113484B-1 had no hollow heart and average 7% internal browning, Chieftain averages 3% hollow heart and 8% internal browning, Dark Red Norland averages 8% hollow heart and had no internal browning.

- In the Southeast trials over 2 years the marketable yield of NDAF113484B-1 averages 115% of Chieftain and 107% of Atlantic. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 86% compared to 69% for Chieftain. Specific gravity averages 1.048 compared to 1.055 for Chieftain. Both varieties had no hollow heart, NDAF113484B-1 averages 5% internal browning compared to 10% for Chieftain.
- In the Erie County trials over 2 years the marketable yield of NDAF113484B-1 averages 79% of Chieftain and 81% of Atlantic. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 83% compared to 60% for Chieftain. Specific gravity averages 1.060 compared to 1.061 for Chieftain. NDAF113484B-1 had no internal defects. Pickouts for NDAF113484B-1 average 11% and 20% for Chieftain, pickouts were mostly green.

#### **Red Prairie** from University of Wisconsin

- A medium maturity with smooth skin and oval shape tubers.
- At Rock Springs over 5 years the marketable yield average 93% of Chieftain and 109% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 71% compared to 65% for Chieftain and 74% for Dark Red Norland in the same size class. Specific gravity average 1.059 compared to 1.064 for Chieftain and 1.058 for Dark Red Norland. Red Prairie had no hollow heart and average 10% internal browning, Chieftain had no hollow heart and 13% internal browning, Dark Red Norland had no internal defects.
- In the Southeast trials over 3 years the marketable yield of Red Prairie average 98% of Chieftain and 101% of Atlantic. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 73% compared to 74% for Chieftain. Specific gravity average 1.056 compared to 1.062 for Chieftain. Red Prairie had no internal defects.
- In the Erie County trials over 3 years the marketable yield of Red Prairie average 79% of Chieftain and 99% of Atlantic. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 62% compared to 63% for Chieftain. Specific gravity average 1.059 compared to 1.062 for Chieftain. Red Prairie had no internal defects. Pickouts for Red Prairie average 13% compared to 11% for Chieftain, pickouts were mostly green.

## **CHIPPING**

#### **NY163** from Cornell University

- A medium season variety with round tubers.
- At Rock Springs over 4 years, marketable yield averages 126% of Atlantic and 102% of Snowden. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 81% compared to 58% for Atlantic and 83% for Snowden in the same size class. Specific gravity averages 1.084 compared to 1.088 for Atlantic and 1.084 for Snowden. NY163 averages 6% hollow heart and no internal browning, Atlantic averages 28% for both hollow heart and internal browning, Snowden averages 21% for hollow heart and 8% for internal browning. Chip color was equal to Snowden.

- In the Southeast trials over 3 years the marketable yield averages 83% of Atlantic and 79% of Snowden. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 82% compared to 69% for Atlantic and 82% for Snowden in the same size class. Specific gravity averages 1.087 compared to 1.089 for Atlantic and 1.081 for Snowden. NY 163 had no internal defects. Chip color was better than Snowden.
- In the Erie County trials over 3 years the marketable yield averages 108% of Atlantic and 105% of Snowden. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 73% compared to 65% for Atlantic and 70% for Snowden in the same size class. Specific gravity averages 1.082 compared to 1.081 for Atlantic and 1.079 for Snowden. Pickouts for NY163 average 17% compared to 18% for Atlantic and 14% for Snowden, pickouts were green, growth cracks. Chip Color was better than Snowden.

#### **NY165 from Cornell University**

- A medium late season variety with oval tubers.
- At Rock Springs over 3 years, marketable yield averages 110% of Atlantic and 87% of Snowden. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 81% compared to 63% for Atlantic and 86% for Snowden in the same size class. Specific gravity averages 1.080 compared to 1.085 for Atlantic and 1.081 for Snowden. NY165 average 3% hollow heart and 3% internal browning, Atlantic averages 17% for hollow heart and 33% for internal browning, Snowden averages 8% for hollow heart and 11% for internal browning. Chip color is equal to Snowden.
- In the Southeast trials over 3 years the marketable yield average 117% of Atlantic and 104% of Snowden. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 76% compared to 76% for Atlantic and 82% for Snowden in the same size class. Specific gravity averages 1.072 compared to 1.082 for Atlantic and 1.076 for Snowden. NY165 had no hollow heart and 7% internal browning, Atlantic averages 30% for hollow heart and 45% for internal browning, Snowden averages 10% for hollow heart and 27% for internal browning. Chip color is equal to Snowden.
- In the Erie County trial over 3 years the marketable yield averages 73% of Atlantic and 87% of Snowden. Specific gravity average 1.075 compared to 1.081 for Atlantic and 1.079 for Snowden. NY165 had no hollow heart and 3% internal browning, Atlantic average 73% for hollow heart and had no internal browning, Snowden average 43% for hollow heart and had no internal browning. Pickouts for NY165 average 22%, 18% for Atlantic and 14% for Snowden, pickouts were green. Chip color was equal to Snowden.

#### **EARLY SEASON – (from 20015 to 2021 average 88 days)**

##### **Queen Anne from Solanum International**

- A yellow flesh variety with smooth white skin and tubers are mostly oblong.
- At Rock Springs over 3 years, marketable yield averages 97% of Superior and 97% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 68% compared to 64% for Superior and 75% for Dark Red Norland in the same size class. Specific gravity averages 1.061 compared to 1.070 for Superior and 1.063 for Dark Red Norland. In three years, it has had no internal defects. Pickouts average 13% compared to 11% for Superior and Dark Red Norland. Pickouts were mostly green.

#### **Agate** from Solanum International

- A yellow flesh variety with a slight net yellow skin and tubers are oval.
- At Rock Springs in 2021, marketable yield was 130% of Superior and 137% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class were 72% compared to 83% for Superior and 73% for Dark Red Norland in the same size class. Specific gravity was 1.065, 1.070 for Superior and 1.067 for Dark Red Norland. Had no internal defects. Pickouts were 16% compared to 15% for Dark Red Norland, Superior had none. Pickouts were growth cracks.

#### **ACC Hamer** from Parkland seed

- Has a white slightly net skin and tubers are round.
- At Rock Springs in 2021, marketable yield was 97% of Superior and 102% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class were 84% compared to 83% for Superior and 73% for Dark Red Norland in the same size class. Specific gravity was 1.065, 1.070 for Superior and 1.067 for Dark Red Norland. Had no internal defects.

#### **NDAF14113Y-3** from University of Maine

- A yellow flesh variety with smooth red skin and tubers are oval shape.
- At Rock Springs over 2 years, marketable yield averages 130% of Superior and 122% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 80% compared to 75% for Superior and 81% for Dark Red Norland in the same size class. Specific gravity was 1.070, 1.075 for Superior and 1.068 for Dark Red Norland. Had no internal defects.

### **SPECIALTY**

#### **BNC718-1** from USDA Beltsville

- A yellow flesh variety with smooth purple skin, tubers are round.
- At Rock Springs over 2 years, marketable yield averages 134% of Superior and 127% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 80% compared to 75% for Superior and 81% for Dark Red Norland in the same size class. Specific gravity was 1.072, 1.075 for Superior and 1.068 for Dark Red Norland. Had no internal defects.

#### **NY160** from Cornell University

- Has smooth pink skin and tubers are oval shape.
- At Rock Springs over 2 years, marketable yield averages 102% of Superior and 96% of Dark Red Norland. Tubers in the 1 $\frac{7}{8}$ " to 3 $\frac{1}{4}$ " size class average 73% compared to 75% for Superior and 81% for Dark Red Norland in the same size class. Specific gravity was 1.075, 1.075 for Superior and 1.068 for Dark Red Norland. Had no internal defects.

## Field evaluation of potato cultivars and breeding lines for resistance to common scab in Pennsylvania, 2021.

Twenty-four 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 13 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 4.48, 3.82, 4.91, and 9.01 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. Plants were vine killed on 15 Sep with Reglone (2.0 pt/A). Tubers were harvested on 1 Oct and were visually assessed for common scab on 6, 7 Oct. Predominant lesion type was scored for each tuber on a 0 to 3 ordinal scale: 0 = no symptom, 1 = superficial, 2 = raised, and 3 = pitted. Percent lesion coverage for each tuber was scored on a 0 to 6 ordinal scale, where 0 = no scab, 1 = > 0 – 2%, 2 = >2 – 5%, 3 = >5 – 10%, 4 = >10 – 25%, 5 = >25 – 50%, and 6 = >50%. The ordinal data per plot were transformed to disease severity score as follows:  $[\sum(\text{Percent lesion coverage} \times \text{predominant lesion type} \times \text{number of tubers in each category}) / (18 \times \text{total number of potato tubers evaluated})] \times 100$ . 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, cultivar Dark Red Norland had a lower disease severity score and disease incidence than Russet Burbank and was considered as resistant or moderately resistant as the tolerant check. Superior, AF5492-6, Russet Norkotah, AF5819-2, and NDAF113484B-1 had a similar disease incidence as Russet Burbank and low disease severity score, and only a few small superficial lesions were observed on some tubers of these cultivars/lines.

Cultivar/Line	Common scab severity score	Common scab incidence (%)	Cultivar/Line	Common scab severity score	Common scab incidence (%)
Dark Red Norland	2.0 i <sup>z</sup>	31.5 f	NC470-3	8.7 c-i	93.4 ab
Russet Burbank	2.6 i	43.6 ef	Atlantic	9.0 c-i	82.5 abc
Superior	2.8 hi	47.5 def	AF5406-7	10.1 c-i	96.6 ab
AF5492-6	2.9 hi	46.5 def	Snowden	12.4 b-h	74.2 a-d
Russet Norkotah	3.2 ghi	31.9 f	Katahdin	12.7 b-g	96.1 ab
AF5819-2	4.0 f-i	53.8 c-f	MSAFB635-15	13.6 b-f	100.0 a
NDAF113484B-1	5.3 f-i	54.4 c-f	Yukon Gold	15.1 b-e	98.1 ab
NDAF102629C-4	5.7 e-i	77.1 abc	Kennebec	15.3 bcd	96.7 ab
AF5280-5	6.1 d-i	77.3 abc	Chieftain	16.6 bc	100.0 a
NY165	6.2 d-i	69.7 b-e	AF5071-2	17.1 bc	92.6 ab
AF5563-5	7.0 d-i	77.6 abc	AAF10615-1	20.8 ab	97.7 ab
MSAFB609-12	8.3 c-i	86.0 ab	Shepody	29.2 a	100.0 a

<sup>z</sup> 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 = 9.6 for severity score and 28.9 for incidence). Each value is the mean of three replicates.

### Evaluation of potato cultivars and breeding lines for resistance to late blight in Pennsylvania, 2021.

Twenty-three 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 8 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 4.48, 3.82, 4.91, and 9.01 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  $1.05 \times 10^4$  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 16, 21, 26, 29 Sep and 3, 6 Oct. 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. Based on AUDPC values, NC470-3, AF5406-7, NY165, MSAFB609-12, Snowden, AF5071-2, MSAFB635-15 and Russet Burbank were not significantly more or less resistant than cv. Kennebec.

Cultivar/Line	Mean AUDPC <sup>z</sup>	Cultivar/Line	Mean AUDPC
NC470-3	38 e <sup>y</sup>	Katahdin	450 b
AF5406-7	61 e	Russet Norkotah	457 b
NY165	66 e	AF5563-5	488 b
MSAFB609-12	80 de	Atlantic	498 b
Kennebec	142 cde	AAF10615-1	523 b
Snowden	217 cd	Chieftain	537 b
AF5071-2	248 c	AF5280-5	678 a
MSAFB635-15	249 c	AF5819-2	681 a
Russet Burbank	261 c	Dark Red Norland	706 a
AF5492-6	401 b	Superior	772 a
NDAF102629C-4	403 b	NDAF113484B-1	784 a
Yukon Gold	410 b		

<sup>z</sup> AUDPC = Area under the disease progress curve was calculated from 16 Sep to 6 Oct according to the formula:  $\sum_{i=1}^n [(R_{i+1} + R_i)/2] [t_{i+1} - t_i]$ , where  $R$  = disease severity rating (% of leaf surface affected) at the  $i$ th observation,  $t_i$  = time (days) since the previous rating at the  $i$ th observation, and  $n$  = total number of observations. Each value is the mean of three replicates.

<sup>y</sup> 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 = 137).

### Evaluation of potato cultivars and breeding lines for resistance to early blight in Pennsylvania, 2021.

Twenty-three 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 13 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 4.48, 3.82, 4.91, and 9.01 in. for Jun, Jul, Aug, and Sep, respectively. Natural early blight infection was observed in the field in the middle of Jul. 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  $5.7 \times 10^4$  conidia/ml on 17 Jul. For each plot, the percentage of symptomatic foliage was visually assessed on a 0 to 100% scale on 25 Jul and 1, 8, 14, 21 Aug. 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. Six cultivars/lines were characterized as moderately resistant because their AUDPC values were not significantly different from the moderately resistant check Russet Burbank and lower than the moderately resistant check Kennebec: AF5406-7, AF5071-2, Snowden, Katahdin, AF5492-6 and MSAFB609-12.

Cultivar/Line	AUDPC <sup>z</sup>	Cultivar/Line	AUDPC
AF5406-7	114 i	Yukon Gold	408 def
Russet Burbank	189 hi	AF5280-5	418 c-f
AF5071-2	193 hi	Atlantic	425 c-f
Snowden	226 ghi	AF5819-2	450 cde
Katahdin	229 ghi	NC470-3	458 cde
AF5492-6	254 f-i	AAF10615-1	480 cde
MSAFB609-12	317 e-h	NDAF102629C-4	527 bcd
Kennebec	346 e-h	Superior	585 bc
Chieftain	370 d-g	Russet Norkotah	588 bc
MSAFB635-15	372 d-g	NDAF113484B-1	672 ab
NY165	387 d-g	Dark Red Norland	821 a
AF5563-5	406 def		

<sup>z</sup> AUDPC = area under the disease progress curve was calculated from 25 Jul to 21 Aug according to the formula:  $\sum_{i=1}^n [(R_{i+1} + R_i)/2] [t_{i+1} - t_i]$ , where  $R$  = disease severity rating (% of leaf surface affected) at the  $i$ th observation,  $t_i$  = time (days) since the previous rating at the  $i$ th observation, and  $n$  = total number of observations. Each value is the mean of three replicates.

<sup>y</sup> 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 = 176).

## **Supplemental Progress Report, 2021-----March 31, 2022**

### **Pennsylvania Regional Potato Germplasm Evaluation Program, 2021**

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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: Northampton Co., Erie Co., and the Russell E. Larson Agricultural Research Center at Rock Springs, Centre Co. Please see the Progress Report from January 2022 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, cut in half, and sliced. Eight slices from the center of each half were used for chipping. Slices 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. Center 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 2022 progress report.

#### **Chipping (Tables 1-4)**

Atlantic and Snowden are the standard varieties to use for comparing the chip color of the other lines.

All eight lines directly from out of field had the best color at Rock Springs: Atlantic, B2869-29, MSAF635-15, NC470-13, MSZ242-13, NY163, NY165 and W12078-76.



There were a few noteworthy lines from the short term storage chipping in December. At Northampton County, Atlantic, Snowden, AF5563-5 and NY163 had the best color; MSAFB609-12, NC818-24, NC821-30, NY165 and B2869-29 had acceptable color. At Erie County, NY163, MSAFB609-12 and W12078-76 had the best color; Atlantic, Snowden, NY165, MSAFB635-15 and NC470-3 had acceptable color. At Rock Springs, Snowden, AF5563-5, MSAFB635-15, NC470-3, NY165, AF6522-1, NY163, MSZ242-13, MSZ242-09, W12078-76, CO11023-9W, Corsica and AF6237-3 had the best color; Atlantic, MSAFB609-12, AF6526-7, BNC811-22, BNC821-9, B3379-1, B3403-6, NC818-24, NC821-30 and WAF16220-4 had acceptable color.

From the results of the 3 week reconditioning the noteworthy lines are: At Northampton County, Snowden, MSAFB609-12 and NY163 had the best color; Atlantic, AF5563-5, NC821-30, NY165 and B2869-29 had acceptable color. At Erie County, Snowden and NC470-3 had the best color; NY163, NY165, MSAFB609-12, MSAFB635-15 and W12078-76 had acceptable color. At Rock Springs, AF6522-1, NY163 and CO11023-9W had the best color; Snowden, AF5563-5, MSAFB609-12, NC470-3, NY165, AF6526-7, BNC811-22, B3403-6, MSZ242-13, MSZ242-09, W12078-76, Corsica, AF6237-3 and WAF16220-4 had acceptable color.

From the results of the 6 week reconditioning the noteworthy lines are: At Northampton County, Snowden, MSAFB609-12, NC821-30 and NY165 had the best color; Atlantic, AF5563-5, NC818-24 and NY163 had acceptable color. At Erie County, Snowden, NY163, NY165, W12078-76 and NC470-3 had the best color; Atlantic, MSAFB609-12 and MSAFB635-15 had acceptable color. At Rock Springs, MSAFB609-12, NC470-3, AF6522-1, NY163, MSZ242-13, W12078-76, Corsica and AF6237-3 had the best color; Snowden, AF5563-5, MSAFB635-15, NY165, BNC811-22, B3403-6, NC821-30, MSZ242-09 and WAF16220-4 had acceptable color.

From the results of the chipping directly from 45°F the noteworthy lines are: At Northampton County, NY163 had the best color; Snowden, AF5563-5 and MSAFB609-12 had acceptable color. At Erie County, Snowden had the best color; NY163, NY165, MSAFB635-15 and W12078-76 had acceptable color. At Rock Springs, Snowden, NC470-3 and AF6237-3 had the best color; AF5563-5, NY165, AF6522-1, NY163, BNC811-22, NC821-30, MSZ242-13, MSZ242-09, W12078-76, CO11023-9W and Corsica had acceptable color.

### **French fry Tests (Tables 5-7)**

At Rock Springs, AAF10615-1, AF5071-2, AF5762-8, MSV093-1Y, AF6298-2, AF6377-10, AF6471-2, AAF10736-2 and AAF12147-6 had the best color. At Northampton County, Norwis and MSV093-1Y had the best color. At Erie County, Lady Amarilla and AAF10615-1 had the best color.

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Table 1. Out of field chip color results of early season potato evaluation in Plant Pathology & Environmental Microbiology Farm, 2021.

Variety/line	Specific Gravity	Chip Color
Atlantic	1.084	3
B2869-29	1.088	3
MSAF635-15	1.086	3
NC470-13	1.079	3
MSZ242-13	1.080	3
NY163	1.074	2
NY165	1.074	2
W12078-76	1.071	3

Harvest and chipping on August 17, 2021; 89 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 Sherwood Giger’s Farm, Northampton County, 2021.

Variety/ Line	Specific Gravity	Chip Color			
		Dec. <sup>1</sup>	Feb. <sup>2</sup>	Feb. <sup>3</sup>	Mar. <sup>4</sup>
Atlantic	1.078	3	5	5	6
Snowden	1.071	3	3	3	4
AF5563-5	1.073	3	4	4	5
MSAFB609-12	1.076	4	3	3	4
NC818-24	1.070	5	6	5	-
NC821-30	1.074	4	5	3	6
NY163	1.075	3	3	4	3
NY165	1.071	4	4	3	6
B2869-29	1.076	4	4	6	-

<sup>1</sup> Dec. = Stored at 55<sup>0</sup>F from December 3, 2021 and chipped on December 16, 2021.

<sup>2</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021 then transferred to 55<sup>0</sup>F three weeks prior to chipping on February 7, 2022.

<sup>3</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F six weeks prior to chipping on February 24, 2022.

<sup>4</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021 and chipped on March 3, 2022.

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 Mark Troyer's Farm, Erie County, 2021.

Variety/ Line	Specific Gravity	Chip Color			
		Dec. <sup>1</sup>	Feb. <sup>2</sup>	Feb. <sup>3</sup>	Mar. <sup>4</sup>
Atlantic	1.078	4	6	5	7
Snowden	1.084	4	3	3	3
NY163	1.078	3	4	3	4
NY165	1.075	5	4	3	5
MSAFB609-12	1.083	3	5	4	6
MSAFB635-15	1.081	4	4	4	5
W12078-76	1.085	3	5	3	5
NC470-3	1.075	4	3	3	-
BNC821-29	1.070	6	7	-	-
NC818-24	1.078	6	7	-	-

<sup>1</sup> Dec. = Stored at 55<sup>0</sup>F from December 3, 2021 and chipped on December 16, 2021.

<sup>2</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021 then transferred to 55<sup>0</sup>F three weeks prior to chipping on February 7, 2022.

<sup>3</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F six weeks prior to chipping on February 24, 2022.

<sup>4</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021 and chipped on March 3, 2022.

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 Plant Pathology & Environmental Microbiology Farm, 2021.

Variety/ Line	Specific Gravity	Chip Color			
		Dec. <sup>1</sup>	Feb. <sup>2</sup>	Feb. <sup>3</sup>	Mar. <sup>4</sup>
Atlantic	1.084	4	6	7	7
Snowden	1.079	3	4	4	3
AF5563-5	1.075	3	5	4	4
MSAFB609-12	1.083	4	4	3	6
MSAFB635-15	1.085	3	6	5	6
NC470-3	1.076	3	4	3	3
NY165	1.076	3	5	5	5
AF6522-1	1.077	3	3	3	4
AF6526-7	1.083	4	5	6	-
NY163	1.077	3	3	3	4
BNC811-22	1.087	4	5	5	4
BNC821-9	1.073	4	6	6	-
B3379-1	1.077	5	6	-	-
B3379-2	1.088	6	-	-	-
B3403-6	1.093	4	5	5	6
NC818-24	1.077	5	6	-	-
NC821-30	1.093	4	6	5	5
MSZ242-13	1.092	3	4	3	5
MSZ242-09	1.088	3	4	4	4
W12078-76	1.085	3	5	3	5
CO11023-9W	1.072	3	3	6	4
Corsica <sup>y</sup>	1.075	3	4	3	5
AF6237-3	1.085	3	4	3	3
WAF16220-4	1.080	4	4	5	7

<sup>1</sup> Dec. = Stored at 55<sup>0</sup>F from December 3, 2021 and chipped on December 16, 2021.

<sup>2</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021 then transferred to 55<sup>0</sup>F three weeks prior to chipping on February 7, 2022.

<sup>3</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F six weeks prior to chipping on February 24, 2022.

<sup>4</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021 and chipped on March 3, 2022.

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

<sup>y</sup> = Yellow flesh

Table 5. Total yield, greater than 1 7/8" yield, specific gravity, and French fry color for russet skinned or long white potato evaluation trial in Centre County, Plant Pathology & Environmental Microbiology Farm, 2021.

Variety/ Line	Yield (cwt/A) <sup>1</sup>		% of Standard <sup>2</sup>	Percent <sup>3</sup> Pickouts	Specific Gravity	French Fry Color <sup>4</sup>		
	Total	>1 7/8"				Dec. <sup>5</sup>	Feb. <sup>6</sup>	Feb. <sup>7</sup>
Russet Norkotah	544	443	100	12	1.070	1	1	1
Russet Burbank	510	381	86	34	1.077	0	1	1
AAF10615-1	468	385	87	12	1.085	00	00	00
AF5071-2	617	437	99	22	1.084	0	0	0
AF5406-7	632	422	95	31	1.075	1	1	1
AF5492-6	491	385	87	15	1.076	0	1	0
NY161 <sup>y</sup>	646	484	110	18	1.067	1	2	2
Constance <sup>y</sup>	697	606	138	9	1.067	1	2	2
AF5762-8	553	501	113	8	1.084	0	0	0
AF6075-8	758	566	128	22	1.068	1	2	1
AF6338-6	676	479	108	27	1.085	1	1	1
NDAF113476CB-3	453	372	84	14	1.075	1	2	1
MSV093-1Y <sup>y</sup>	483	403	81	15	1.070	0	0	0
<b>Non-replicated</b>								
Russet Norkotah	472	395	100	5	1.070	1	1	1
AF6296-3	556	455	115	16	1.082	1	1	2
AF6298-2	568	489	124	6	1.085	00	0	0
AF6377-10	651	546	138	14	1.069	00	00	0
AF6377-13	600	439	111	24	1.083	1	1	2
AF6441-3	553	400	101	24	1.074	2	1	2
AF6465-7	545	454	115	12	1.077	1	1	1
AF6471-2	603	416	105	28	1.074	0	0	0
AF6488-5	554	465	118	8	1.090	1	1	0
AAF10736-2	744	514	130	27	1.077	0	00	0
AAF13334-3	613	480	122	17	1.075	0	1	0
AAF15010-1	576	487	124	13	1.089	1	0	0
NDAF13242B-1	564	517	131	4	1.078	1	2	1
NDAF1415Y-2	736	542	137	24	1.075	1	2	1
AAF12139-1	646	427	108	31	1.073	0	1	00
AAF12147-6	544	383	97	17	1.076	0	0	0
WAF14006-6	646	508	129	20	1.067	2	1	2

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

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

<sup>3</sup> Percentage of total that are pickouts.

<sup>4</sup> French Fry Color: USDA Scale Color Standards for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.

<sup>5</sup> Dec. = Stored at 55<sup>0</sup>F from December 3,2021 then fried on December 9, 2021.

<sup>6</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F three weeks prior to frying on February 1, 2022.

<sup>7</sup> Feb. = Stored at 45<sup>0</sup>F from December 9,2021, then transferred to 55<sup>0</sup>F six weeks prior to frying on February 23, 2022.

Replicated trials are the average of 3 replicates except for those lines which were non-replicated

y = Yellow Flesh

Table 6. Total yield, greater than 1 7/8" yield, specific gravity, and French fry color for russet skinned or long white potato evaluation trial in Northampton County, Sherwood Geiger's Farm, 2021.

Variety/ Line	Yield (cwt/A) <sup>1</sup>		% of Standard <sup>2</sup>	Percent <sup>3</sup> Pickouts	Specific Gravity	French Fry Color <sup>4</sup>		
	Total	>1 7/8"				Dec. <sup>5</sup>	Feb. <sup>6</sup>	Feb. <sup>7</sup>
Atlantic	456	429	100	3	1.078	-	-	-
Norwis	492	459	107	6	1.053	0	0	0
NY161 <sup>y</sup>	452	337	78	13	1.060	0	1	1
MSV093-1Y <sup>y</sup>	402	335	78	10	1.059	-	0	00
Constance <sup>y</sup>	402	343	80	6	1.061	2	3	2

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

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

<sup>3</sup> Percentage of total that are pickouts.

<sup>4</sup> French Fry Color: USDA Scale Color Standards for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.

<sup>5</sup> Dec. = Stored at 55<sup>0</sup>F from December 3, 2021 then fried on December 9, 2021.

<sup>6</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F three weeks prior to frying on February 1, 2022.

<sup>7</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F six weeks prior to frying on February 23, 2022.

Non – replicated trial.

Russets were planted 10-in. apart with 24 seed pieces per 20-ft plot, Atlantic were spaced 8-in. apart with 30 seed pieces per 20-ft plot.

y = Yellow Flesh

Table 7. Total yield, greater than 1 7/8" yield, specific gravity, and French fry color for russet skinned or long white potato evaluation trial in Erie County, Mark Troyer Farm, 2021.

Variety/ Line	Yield (cwt/A) <sup>1</sup>		% of Standard <sup>2</sup>	Percent <sup>3</sup> Pickouts	Specific Gravity	French Fry Color <sup>4</sup>		
	Total	>1 7/8"				Dec. <sup>5</sup>	Feb. <sup>6</sup>	Feb. <sup>7</sup>
Atlantic	312	261	100	12	1.078	-	-	-
Russet Norkotah	342	241	92	20	1.064	1	1	2
MSV093-1Y <sup>y</sup>	259	224	86	7	1.066	0	1	0
NY161 <sup>y</sup>	514	384	147	20	1.067	2	1	1
Norwis	183	153	58	13	1.058	0	1	0
Lady Amarilla <sup>y</sup>	316	247	95	13	1.069	00	0	0
AAF10615-1	263	196	75	13	1.083	0	00	00
AF5071-2	299	220	84	11	1.086	1	0	0

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

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

<sup>3</sup> Percentage of total that are pickouts.

<sup>4</sup> French Fry Color: USDA Scale Color Standards for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.

<sup>5</sup> Dec. = Stored at 55<sup>0</sup>F from December 3, 2021 then fried on December 9, 2021.

<sup>6</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F three weeks prior to frying on February 1, 2022.

<sup>7</sup> Feb. = Stored at 45<sup>0</sup>F from December 9, 2021, then transferred to 55<sup>0</sup>F six weeks prior to frying on February 23, 2022.

Non – replicated trial.

Russets were planted 10-in. apart with 24 seed pieces per 20-ft plot, Atlantic were spaced 8-in. apart with 30 seed pieces per 20-ft plot.

y = Yellow Flesh