Pennsylvania Potato Research Report, 2017

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EXECUTIVE SUMMARY

Penn State's Department of Plant Pathology & Environmental Microbiology potato research program can be categorized into five areas: 1) variety breeding and evaluation, 2) breeding for disease resistance (focused on early and late blight, and common and powdery scab), 3) biology and genetic variability of potato pathogens (focused on early and late blight and powdery scab), 4) chemical control and 5) integrated pest management of potatoes. Many of these projects are long term and only yearly results are presented here.

1. Variety Breeding and Evaluation

At the Rock Springs location the variety trial included 87 round whites with a few yellow flesh, 25 red-skinned (a few purple skinned) and 51 russet or long white types. An early variety trial of 36 varieties and a creamer variety trial of 6 varieties were conducted at Rock Springs. The Northampton Co. and Erie Co. had 32 and 38 varieties, respectively. Breeding lines were contributed by the USDA-ARS, New York, Maine, North Carolina, Michigan, Idaho, Wisconsin, Colorado and a few other sources. See **Pennsylvania Regional Potato Germplasm Evaluation Program, 2017 on pages 1-2, and tables from different locations on pages 3-34, supplemental progress report on pages 39-40 and tables from different locations on pages 41-54, and notes on fresh colors of potato varieties/lines on page 55.**

2. Breeding for Disease Resistance

There are several projects focused around a cultivated diploid species hybrid population that can be easily intercrossed with common varieties. These are long term projects dealing with early and late blight resistance as well as powdery scab resistance. Results of these projects will not be presented here but results of small trials evaluating soon to be released lines for their reaction to early blight, late blight and powdery scab are presented. In three separate field trials, 28, 28 and 29 varieties and advanced breeding lines were evaluated for disease resistance to late blight, early blight, and powdery scab, respectively.

Cultivar Kennebec was the moderately resistant check for late blight; only two lines AF4615-5 and AF4648-2 had lower AUDPC values than that of Kennebec and these two lines were considered resistant or moderately resistant. See **Field evaluation of potato cultivars and breeding lines for resistance to late blight in Pennsylvania, 2017 on page 35.**

Kennebec and Russet Burbank were included as moderately resistant check cultivars and Dark Red Norland as susceptible check to early blight. Four other cultivars/lines with AUDPC values of less than 300 were characterized as moderately resistant: AF4615-5,

AF4648-2, AF5225-1, and Katahdin. See **Field evaluation of potato cultivars and breeding lines for resistance to early blight in Pennsylvania, 2017 on page 36.**

Kennebec and Shepody were included as powdery scab susceptible check cultivars which had 25.5% and 25.8 tuber infection, respectively. Russet Burbank was included as a moderately resistant check cultivar which had 7.2% tuber infection. AF3362-1 (Caribou Russet), Russet Norkotah, and ND8068-5Russ had less powdery scab incidence than that of Russet Burbank and thus considered resistant or moderately resistant to tuber infection. See **Field evaluation of potato cultivars and breeding lines for resistance to powdery scab in Pennsylvania, 2017 on page 37.**

3. Chemical Control of Potato Early Blight

In the early blight fungicide trial, 5 different treatments were compared to an untreated control. All treatments significantly reduced season-long early blight compared to the untreated control with the treatments containing Miravis Prime being most effective. All treatments except when Bravo Weather Stik was applied alone significantly increased tuber yield. Symptoms were not observed on tubers from any of the treatments. See **Evaluation of foliar fungicides for control of potato early blight in Pennsylvania, 2017 on page 38.**

Progress Report---December 18, 2017

Pennsylvania Regional Potato Germplasm Evaluation Program, 2017

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The objective of this project is to find new 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 32 and 38 varieties/lines in non-replicated trial, respectively. At the Rock Springs location the trials included 53 round whites with a few yellow flesh, 17 red-skinned (a few purple skinned) and 31 russet or long white types in replicated plots, and an additional 34 whites, 8 red-skinned and 20 russet or long white types planted in non-replicated observational plots. At Northampton Co. 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 36 varieties was conducted at Rock Springs, Centre Co. (Table 13-14). Creamer variety trial of 6 varieties was conducted at Rock Springs, Centre Co. (Table 15). 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 and culinary tests will be conducted over the next few months. Management information for each site is provided in Table 16.

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 trials:
In the Northampton location the following lines had marketable yield higher than Atlantic: Katahdin, AF4138-8, AF4552-5, AF5225-1, NY151, BNC369-4, NY164, Fenway Red, Belmonda, Tosciana, NDAO81453CAB-2C, B3148-12, and Norkotah Russet.

Erie county trials:
In the Erie location the following lines had marketable yield higher than Atlantic: Snowden, AF5225-1, Belmonda, Tosciana, NY152, MSR127-2, W8822-1, and A07705-4.

Round White planted 8-inch apart in Rock Springs:
Based on data of replicated trials at Rock Springs, there were 15 round white clones with marketable yields significantly higher than Atlantic: AF4138-8, AF5225-1, B2869-29, NY161, AF5450-7, B2869-28, B3168-3, BNC470-13, NY149, MSU161-1, MSW485-2, MSX540-4, W9576-11Y, NC606-23, and Connect. There were another 22 round white clones with marketable yields higher than Atlantic: Katahdin, Snowden, Superior, AF4552-5, AF5040-8, AF5280-5, B2904-2, NY157, AF5484-3, AF5563-5, NDAF102629C-4, B3156-2, BNC369-4, NY 151, NY 152, L7-2 (NY163), Reba, MSR127-2, MSV358-3, W8822-1, ACO1144-1W, CO02024-9W, NDA081453CAB-2C, NC470-3, and Toscana.

Red-skinned planted 8-inch apart in Rock Springs:
Based on data of replicated trials at Rock Springs, there were 2 red-skinned or purple-skinned clones with marketable yields higher than Chieftain: Colorado Rose and Elmo,

Russet-skinned or white planted 10-inch apart in Rock Springs:
Based on data of replicated trials at Rock Springs, Belmonda had marketable yield significantly higher than Russet Norkotah. There were another 3 clones with marketable yields higher than Russet Norkotah: AF5407-13, A07705-4, and A08422-2VR,

The results of chipping, French fry and culinary quality tests will be available in March 2018.

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, University of Wisconsin, Michigan State University, North Carolina State University potato breeding programs and Parkland Seed Potatoes, Sunrain, Solanum International, Hanse Seed, HZPC companies 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 Garry Hunsicker Farm, Northampton County, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		
Atlantic	258	223	87	100	53	31	3	0	2	1.090
Snowden	160	140	88	63	65	19	4	0	2	1.078
Katahdin	275	247	90	110	33	52	5	0	4	1.056
Superior	97	87	89	39	55	21	13	0	4	1.065
Chieftain	253	190	75	85	26	43	6	0	19	1.059
Yukon Gold [yl]	112	80	71	36	32	27	12	0	23	1.070
Norwis [yl]	131	93	71	42	22	45	4	0	18	1.055
AF4138-8	324	283	87	127	54	29	5	0	2	1.058
AF4552-5	272	224	83	100	45	32	6	0	4	1.073
AF5225-1	352	292	83	130	52	26	4	0	2	1.065
NY149 [yl]	259	204	79	91	53	26	0	0	4	1.068
NY151	357	285	80	127	34	41	5	0	13	1.058
BNC369-4	360	322	90	144	51	31	8	0	5	1.078
BNC201-1 [yl]	260	212	81	95	28	46	7	0	16	1.072
NY164	285	227	80	101	58	22	0	0	9	1.060
Fenway Red	394	319	81	143	59	22	0	0	5	1.071
Villletta Rose	252	184	73	82	66	7	0	0	2	1.052
Belmonda [yl]	368	289	79	129	57	21	0	0	1	1.079
Lilly [yl]	271	98	36	44	32	4	0	0	6	1.055
Tosciana [yl]	453	300	66	134	63	3	0	0	6	1.066
B2727-2	214	179	84	80	61	23	0	0	5	1.088
NY152	176	154	87	69	53	34	0	0	3	1.079
MSR127-2	221	188	85	84	43	42	0	0	12	1.082
NDAO81453CAB-2C	372	332	89	149	52	37	0	0	2	1.081
B3148-12 [yl]	373	318	85	142	48	37	0	0	3	1.072
AF4659-12 [yl]	478	173	36	77	31	5	0	0	18	1.068
W10209-2R	238	165	69	74	64	6	0	0	2	1.061

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		
Mesa Russet	285	158	56	71	34	20	1	0	29	1.059
ND8068-5RUS	235	176	75	79	54	16	5	0	5	1.083
Dakota TrailBlazer	281	207	74	93	43	24	7	0	18	1.092
Dakota Russet	245	193	79	86	54	25	0	0	9	1.075
Norkotah Russet	369	252	68	113	39	30	0	0	23	1.064

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

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

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

[4]Percentage of total that are pickouts.

Non-replicated trial.

Varieties marked with * 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.

Yellow flesh varieties are indicated with [y1].

Table 2. Tuber characteristics, internal and external defects for potato evaluation trial in Garry Hunsicker Farm, Northampton County, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Atlantic	5	5	5	2	5	5	40	0	2	0	0	0	1	0	0	0
Snowden	4	4	5	2	4	5	40	0	1	0	0	0	0	1	0	0
Katahdin	3	6	7	3	6	5	0	0	0	0	0	0	1	3	0	0
Superior	4	6	6	3	4	5	0	0	0	0	0	0	0	0	0	0
Chieftain	3	3	7	3	5	5	0	0	0	0	2	0	1	3	0	1
Yukon Gold	3	6	7	2	5	5	10	0	0	0	1	0	0	3	0	0
Norwis	3	7	7	3	6	5	0	0	1	0	2	0	0	3	0	0
AF4138-8	5	6	7	3	5	5	20	0	1	0	0	0	0	1	0	0
AF4552-5	4	5	5	2	4	6	0	0	1	0	1	0	0	2	0	0
AF5225-1	3	7	7	2	6	5	10	0	1	0	0	0	0	4	0	0
NY149	4	6	7	3	7	4	40	0	1	0	0	1	0	2	0	0
NY151	4	6	7	2	6	5	0	0	1	0	1	0	2	2	0	0
BNC369-4	5	6	6	3	5	5	20	0	0	0	0	0	1	1	0	0
BNC201-1	4	3	7	2	5	6	20	0	1	0	2	0	2	1	0	0
NY164	4	2	7	2	7	5	0	0	0	0	1	0	1	1	0	0
Fenway Red	3	3	7	2	5	6	0	0	1	0	0	0	2	1	0	0
Villletta Rose	4	2	7	2	7	6	0	0	1	0	0	1	0	2	0	0
Belmonda	4	6	7	3	7	5	0	0	1	0	0	0	0	2	0	0
Lilly	4	9	7	4	7	4	0	0	0	0	0	0	0	2	0	0
Tosciana	4	9	6	3	7	6	0	0	0	0	0	0	1	1	0	0
B2727-2	3	6	6	2	6	5	10	0	0	0	0	0	1	4	0	0
NY152	4	6	6	2	5	5	10	0	1	0	0	0	0	1	0	0
MSR127-2	4	6	5	2	5	5	0	0	1	0	1	0	0	1	0	0
NDAO81453CAB-2C	5	7	7	2	6	5	0	0	1	0	0	0	1	1	0	0
B3148-12	5	6	7	2	6	7	0	0	0	0	0	0	1	1	0	0
AF4659-12	4	8	8	4	7	5	0	0	1	0	0	0	3	1	0	0
W10209-2R	4	2	8	2	6	6	0	0	1	0	0	0	0	2	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Mesa Russet	3	5	3	4	7	5	70	0	1	0	3	1	0	2	0	0
ND8068-5RUS	4	5	3	4	6	5	0	0	0	0	0	0	0	2	0	0
Dakota TrailBlazer	3	5	3	4	7	4	50	0	0	0	2	0	1	3	0	0
Dakota Russet	3	5	3	4	7	5	10	0	0	0	0	0	1	3	0	0
Norkotah Russet	4	4	3	4	6	5	30	0	1	0	0	1	2	1	0	0

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

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

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

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

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G = sunburn, Sc = scab, Sp = sprouts, T = secondary tubers. Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

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, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Atlantic	333	289	87	100	35	41	10	0	7	1.085
Snowden	371	310	83	107	46	29	8	0	8	1.082
Katahdin	334	270	81	93	30	44	7	0	14	1.071
Superior	149	112	75	39	59	16	0	0	8	1.068
Chieftain	330	288	87	100	34	43	10	0	8	1.062
Yukon Gold [yl]	290	239	83	83	16	54	12	0	14	1.078
Norwis [yl]	251	227	90	79	17	47	27	0	7	1.066
AF4138-8	286	220	77	76	41	30	5	0	13	1.064
AF4552-5	277	236	85	82	42	33	10	0	8	1.076
AF5225-1	460	394	86	137	45	41	0	0	6	1.071
NY149 [yl]	275	231	84	80	58	26	0	0	5	1.070
NY151	414	271	66	94	21	38	6	0	30	1.059
BNC369-4	351	283	81	98	9	47	25	0	18	1.082
BNC201-1 [yl]	235	182	78	63	31	42	5	0	18	1.074
NY164	223	182	81	63	38	40	3	0	14	1.063
Colorado Rose	232	148	64	51	26	30	7	0	29	1.070
Villletta Rose	207	131	64	46	57	7	0	0	11	1.058
Belmonda [yl]	477	344	72	119	41	28	3	0	20	1.077
Lilly [yl]	321	241	75	83	49	26	0	0	9	1.059
Tosciana [yl]	503	373	74	129	39	30	6	0	15	1.070
B2727-2	235	176	75	61	54	21	0	0	11	1.084
NY152	420	372	89	129	31	49	9	0	6	1.078
MSR127-2	378	346	92	120	32	55	5	0	5	1.085
AF5040-8	334	260	78	90	57	20	1	0	17	1.086
NY157	295	221	75	76	46	29	0	0	15	1.075
L8-12	321	276	86	96	10	51	25	0	14	1.078
MSV358-3	326	262	80	91	49	28	4	0	9	1.076

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		
W8822-1 [yl]	376	354	94	123	35	56	4	0	0	1.084
W9133-1RUS	317	199	63	69	26	22	15	0	30	1.060
W9433-1RUS	339	223	66	77	14	25	26	0	33	1.079
ND8068-5RUS	239	162	68	56	37	15	15	0	23	1.080
Dakota Russet	239	132	55	46	29	23	3	0	37	1.074
Dakota TrailBlazer	320	246	77	85	16	45	16	0	20	1.093
CO07015-4RU	219	105	48	36	48	0	0	0	13	1.067
CO07049-1RU	316	256	81	89	58	20	4	0	10	1.080
A07705-4	533	350	66	121	19	28	19	0	32	1.072
A08422-2VR	389	255	66	88	28	20	18	0	32	1.075
Norkotah Russet	218	90	41	31	11	17	14	0	54	1.065

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

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

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

[4]Percentage of total that are pickouts.

Non-replicated trial.

Varieties marked with * 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.

Yellow flesh varieties are indicated with [yl].

Table 4. Tuber characteristics, internal and external defects for potato evaluation trial in in Mark Troyer Farm, Erie County, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Atlantic	5	6	5	2	4	5	10	0	0	0	0	0	1	0	0	0
Snowden	4	5	5	2	4	5	0	0	0	0	0	0	2	0	0	0
Katahdin	5	7	7	3	5	5	0	0	0	0	0	0	2	1	0	0
Superior	4	7	6	2	4	5	0	0	0	0	0	0	1	0	0	0
Chieftain	5	3	7	2	4	5	0	0	0	0	1	0	1	0	0	0
Yukon Gold	5	6	7	2	6	5	0	0	1	0	1	0	2	0	0	0
Norwis	4	7	7	2	5	6	10	0	0	0	0	0	1	1	0	0
AF4138-8	4	7	6	3	6	5	0	0	0	0	0	0	2	0	0	0
AF4552-5	4	7	6	2	5	5	0	0	1	0	1	0	1	0	0	0
AF5225-1	6	7	6	2	5	5	0	0	0	0	0	0	1	0	0	0
NY149	5	9	7	2	6	5	0	0	0	0	0	0	1	0	0	0
NY151	6	7	6	2	6	6	0	0	0	0	0	0	3	0	0	0
BNC369-4	6	7	5	3	5	6	0	0	0	0	0	0	2	0	0	0
BNC201-1	5	2	6	2	5	5	0	0	0	0	0	0	2	0	0	0
NY164	6	2	6	2	6	5	0	0	0	0	0	0	1	0	0	0
Colorado Rose	5	2	7	3	6	5	0	10	1	0	0	0	2	0	0	0
Villletta Rose	6	2	7	2	7	7	0	0	1	0	0	0	1	0	0	0
Belmonda	6	9	6	3	7	5	0	0	0	0	0	0	3	1	0	0
Lilly	6	9	6	3	6	5	0	0	0	0	0	0	2	0	0	0
Tosciana	6	9	6	3	7	5	0	0	0	0	0	0	2	0	0	0
B2727-2	4	7	6	3	7	5	0	0	1	0	0	0	1	1	0	0
NY152	5	6	5	3	6	6	0	0	1	0	0	0	1	0	0	0
MSR127-2	6	6	5	2	6	5	0	0	0	0	0	0	1	0	0	0
AF5040-8	5	7	6	2	4	5	0	0	0	0	0	0	2	1	0	0
NY157	6	6	5	2	6	5	0	0	0	0	0	0	2	1	0	0
L8-12	5	7	5	2	5	5	10	0	0	0	0	0	1	1	0	0
MSV358-3	5	6	5	2	4	6	20	0	0	0	0	0	1	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
W8822-1	6	5	5	2	6	5	0	0	1	0	0	0	0	0	0	0
W9133-1RUS	5	6	4	4	7	5	10	0	1	0	0	0	1	0	0	0
W9433-1RUS	5	6	4	5	7	4	0	0	0	0	0	0	2	0	0	0
ND8068-5RUS	4	6	5	5	7	4	0	0	0	0	1	0	2	0	0	0
Dakota Russet	4	5	5	4	7	5	0	0	0	0	0	0	3	0	0	0
Dakota TrailBlazer	5	5	4	5	7	5	0	0	0	0	1	0	1	0	0	0
CO07015-4RU	7	5	3	5	7	5	0	0	1	0	0	0	1	0	0	0
CO07049-1RU	5	5	3	5	7	4	0	0	0	0	0	0	1	0	0	0
A07705-4	5	6	4	5	7	5	0	0	0	0	0	1	2	1	0	0
A08422-2VR	5	6	4	4	7	5	10	0	0	0	1	0	2	0	0	0
Norkotah Russet	5	5	3	5	7	5	0	0	0	0	0	0	4	0	0	0

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G = sunburn, Sc = scab, Sp = sprouts, T = secondary tubers.
Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

Table 5. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, specific gravity and vine maturity for round white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5	%PO[4]	Gravity	Maturity
Atlantic	480	330	70	100	7	33	28	2	27	1.096	ML
Katahdin	456	343	75	104	9	35	31	0	22	1.076	ML
Snowden	475	382	81	116	21	50	10	0	19	1.091	ML
Superior	490	410	84	124	25	38	20	0	14	1.072	ME
Yukon Gold [yl]	429	258	61	78	4	23	31	3	36	1.086	M
AF4138-8	551	490	89	149	38	43	8	0	7	1.070	M
AF4552-5	447	377	84	114	18	43	23	0	13	1.086	M
AF4648-2	472	318	68	97	10	37	22	0	30	1.089	ML
AF5040-8 [yl]	473	405	85	123	38	42	5	0	11	1.101	M
AF5225-1 [yl]	651	526	81	160	19	48	13	0	16	1.081	ML
AF5280-5	460	354	77	107	16	41	21	0	19	1.066	M
AF5429-3	586	329	57	100	5	23	26	1	43	1.069	ML
B2869-29	527	450	85	137	35	42	9	0	10	1.099	M
B2904-2	459	370	81	112	12	43	24	2	10	1.088	M
BNC364-1	389	315	82	96	33	41	7	0	14	1.087	M
NY157	489	433	89	131	25	50	14	0	8	1.086	ME
NY161 [yl]	581	468	81	142	31	39	11	0	13	1.080	M
AF5450-7	598	515	86	156	24	50	12	0	12	1.089	ML
AF5484-3 [yl]	464	363	76	110	10	44	22	0	23	1.091	ML
AF5563-5	450	391	87	119	12	33	41	1	12	1.085	ML
NDAF102629C-4	414	332	81	101	10	43	27	0	18	1.078	ME
B2727-2	289	248	84	75	42	34	8	0	13	1.099	M
B2869-28	519	470	91	143	32	54	5	0	6	1.085	M
B3145-22 [yl]	338	213	63	65	12	31	20	0	35	1.068	M
B3148-12 [yl]	466	314	67	95	17	36	13	2	29	1.076	M
B3156-2 [yl]	416	343	83	104	58	25	0	0	3	1.083	E
B3168-3	610	518	85	157	22	50	13	0	10	1.085	M
BNC369-4	518	404	78	123	22	35	19	2	19	1.090	ML
BNC470-13	649	482	74	146	29	42	2	2	21	1.093	ML

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5	%PO[4]	Gravity	Maturity
NY149 [yl]	556	464	83	141	29	43	12	0	9	1.075	ML
NY 151	541	365	68	111	22	33	12	0	28	1.071	ML
NY 152	557	416	75	126	20	33	21	0	23	1.086	ML
L7-2 (NY163)	452	373	83	113	45	27	11	0	10	1.091	ME
L8-12	412	318	77	96	17	38	22	0	21	1.089	ML
Reba	491	397	80	120	16	40	24	0	15	1.072	M
MSR127-2	468	399	85	121	24	47	12	1	11	1.097	ML
MSU161-1	569	501	88	152	16	52	20	0	10	1.078	ML
MSV358-3	458	430	94	131	38	43	13	0	2	1.090	M
MSW485-2	617	515	82	156	30	40	12	0	16	1.095	ML
MSX540-4	541	451	82	137	23	40	19	0	13	1.096	ML
MSY111-01	494	300	61	91	14	31	16	0	36	1.076	ML
MSZ219-14	366	237	65	72	12	28	22	3	33	1.084	L
W8822-1 [yl]	520	404	78	123	22	45	10	0	17	1.095	ML
W9576-11Y [yl]	563	453	81	137	31	39	11	0	14	1.065	ME
W10564-19Y [yl]	251	183	74	56	8	37	29	0	25	1.075	ML
ACO1144-1W	579	432	75	131	32	38	5	0	19	1.081	M
CO02024-9W	459	338	74	103	23	36	14	0	22	1.091	ML
NDA081453CAB-2C	496	417	84	126	11	42	31	0	15	1.093	ML
NC470-3	508	372	75	113	28	32	15	0	20	1.102	ML
NC606-23 [yl]	589	517	88	157	43	41	4	0	6	1.068	ME
NC600-10 [yl]	412	304	74	92	30	33	10	0	21	1.080	ME
Connect [yl]	653	451	70	137	23	32	14	0	25	1.086	ML
Toscana [yl]	662	426	63	129	28	22	14	0	25	1.074	ML
Non-rep*											
Atlantic*	456	265	58	80	6	33	19	0	34	1.096	ML
WAF12065-8*	448	336	75	102	13	30	28	4	24	1.088	ML
B3156-10*	508	465	92	141	23	42	26	0	4	1.087	ML
BNC470-16*	497	344	69	104	11	12	41	4	29	1.077	ML
MSW509-5*	423	298	70	90	11	45	15	0	28	1.084	ML
W9968-5*	542	369	68	112	28	24	15	0	29	1.098	ML
Malou * [yl]	670	529	79	161	33	38	8	0	14	1.068	ME
WAF10629-5*	358	295	83	90	23	29	30	0	15	1.082	ML
AF5658-6* [yl]	455	365	80	111	39	30	11	0	16	1.085	ME

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]					Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5	%PO[4]	Gravity	Maturity
AF5677-4*	507	442	87	134	21	52	13	0	9	1.092	M
NDAF113490C-8*	345	209	61	64	25	32	4	0	33	1.091	ME
AF5819-6*	370	273	74	83	10	44	19	0	22	1.094	ML
AF5825-3*	455	389	85	118	31	49	5	0	9	1.102	ML
MSAFB609-5*	467	373	80	113	27	46	7	0	14	1.093	ML
MSAFB609-12*	490	405	83	123	37	46	0	0	13	1.095	ML
MSAFB610-2* [yl]	467	367	79	111	24	39	16	0	17	1.089	ML
MSAFB626-2*	600	529	88	161	10	60	18	0	11	1.094	L
MSAFB635-3*	606	527	87	160	9	55	23	0	12	1.090	ML
NDAF12139C-2*	478	442	92	134	28	49	15	0	7	1.087	M
AF5801-1*	495	401	81	122	8	46	26	0	18	1.098	ML
WAF13066-2*	366	234	64	71	17	27	19	0	34	1.085	M
B3255-2*	383	295	77	89	49	28	0	0	4	1.076	E
B3260-6*	472	384	81	116	13	54	14	0	18	1.091	ML
B3263-2*	608	426	70	129	25	33	11	0	23	1.092	ML
B3263-3*	611	419	69	127	26	37	6	0	26	1.098	ML
B3263-7*	373	296	79	90	49	23	8	0	15	1.078	E
B3265-7*	428	363	85	110	44	39	2	0	7	1.083	M
B3265-9*	401	318	79	96	46	31	3	0	3	1.083	ME
B3270-10*	402	287	71	87	56	16	0	0	10	1.101	ML
BNC623-2*	466	281	60	85	6	40	14	0	37	1.088	L
BNC626-3*	338	283	84	86	21	51	11	0	13	1.080	ME
BNC626-7*	340	279	82	85	33	49	0	0	7	1.090	ME
BNC626-8*	342	254	74	77	16	45	13	0	21	1.083	ML
BNC648-1* [yl]	379	279	73	85	23	42	9	0	24	1.085	M
BNC626-15*	534	417	78	127	31	33	14	0	18	1.083	ML
LSD	130	119	12		14	14	17	3	11		

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

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

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

[4]Percentage of total that are pickouts.

Planted 8-in. apart with 15 seed pieces per 10-ft plot. Yellow flesh varieties are indicated with [yl].
Replicated trials are the average of 3 replicates except for those lines with * which were non-replicated.
LSD indicates least significant difference ($P = 0.05$), calculated for replicated varieties.

Table 6. Tuber characteristics, internal and external defects for round white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Atlantic	5	6	5	2	4	5	63	13	1	0	2	0	2	0	0	0
Katahdin	4	7	7	3	4	4	25	0	2	0	0	0	1	0	0	0
Snowden	5	6	5	2	5	5	67	0	0	0	0	0	1	1	0	0
Superior	4	7	6	3	5	5	33	0	1	0	1	0	1	0	0	0
Yukon Gold	4	7	8	3	6	5	67	0	1	0	1	1	1	1	0	0
AF4138-8	4	7	6	2	6	5	25	0	1	0	0	0	1	1	0	0
AF4552-5	4	6	6	2	4	5	17	0	2	0	0	0	1	0	0	0
AF4648-2	4	7	7	3	4	4	75	0	1	0	1	0	1	0	0	0
AF5040-8	4	9	6	2	4	5	0	0	1	0	0	0	1	0	0	0
AF5225-1	5	7	6	3	6	5	42	0	2	0	0	0	1	1	0	0
AF5280-5	4	7	6	3	4	5	25	0	1	0	1	0	1	0	0	0
AF5429-3	5	7	7	2	4	6	67	0	0	0	0	0	2	1	0	0
B2869-29	3	6	6	2	5	6	50	0	1	0	0	0	1	0	3	0
B2904-2	5	6	5	3	5	6	83	0	1	0	0	0	1	0	0	0
BNC364-1	5	6	7	3	5	5	8	0	2	0	1	0	1	0	0	0
NY157	4	6	6	2	5	5	13	0	1	0	0	0	1	0	0	0
NY161	5	9	7	3	5	5	25	0	0	0	1	0	2	0	0	0
AF5450-7	5	6	6	2	4	5	8	0	2	0	0	0	1	0	0	0
AF5484-3	5	7	7	3	6	5	50	0	0	0	1	0	1	0	0	0
AF5563-5	4	7	7	3	4	5	50	0	1	0	0	0	1	0	0	0
NDAF102629C-4	4	7	7	3	5	5	0	0	1	0	1	1	1	0	0	0
B2727-2	4	6	6	3	5	5	13	0	2	0	0	1	1	0	0	0
B2869-28	5	6	6	2	5	6	38	0	1	0	1	0	0	1	0	0
B3145-22	5	6	6	3	6	6	8	0	1	0	0	0	2	1	0	0
B3148-12	4	9	7	2	6	6	50	0	0	0	1	1	2	0	0	0
B3156-2	5	9	7	2	5	6	0	0	0	0	0	0	1	0	0	0
B3168-3	5	7	6	2	4	5	8	0	0	0	0	0	1	1	0	0
BNC369-4	5	6	6	3	5	6	75	0	0	0	1	0	2	0	0	0
BNC470-13	5	6	6	2	5	6	0	0	1	0	1	0	2	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
NY149	5	9	7	3	4	6	100	0	1	0	0	0	1	0	0	0
NY 151	5	7	7	2	5	5	8	0	2	0	0	0	3	0	0	0
NY 152	5	6	6	3	5	6	83	0	0	0	0	0	2	0	0	0
L7-2 (NY163)	3	7	7	2	5	6	25	0	0	0	0	0	1	0	0	0
L8-12	4	6	6	2	5	5	63	0	0	0	0	0	2	0	0	0
Reba	5	7	7	3	5	5	67	0	1	0	1	0	1	0	0	0
MSR127-2	4	6	5	2	4	5	17	0	2	0	0	0	1	0	0	0
MSU161-1	5	6	6	2	3	5	38	0	2	0	0	0	1	0	0	0
MSV358-3	5	5	5	2	4	6	0	0		0	0	0	1	0	0	0
MSW485-2	5	6	5	2	5	5	38	0	2	0	0	0	2	0	0	0
MSX540-4	4	6	5	3	4	6	17	0	2	0	0	0	1	1	0	0
MSY111-01	3	7	6	2	5	6	13	0	3	0	1	0	2	0	0	0
MSZ219-14	3	6	5	2	4	5	100	25	0	0	1	0	2	0	0	0
W8822-1	5	5	5	2	5	6	13	0	0	0	0	0	2	0	0	0
W9576-11Y	4	9	6	3	6	6	0	0	2	0	1	0	2	0	0	0
W10564-19Y	5	9	7	3	6	5	0	0	1	0	1	0	1	0	0	0
ACO1144-1W	5	7	6	2	4	6	67	0	0	0	0	1	2	0	0	0
CO02024-9W	5	7	6	3	5	5	8	0	1	0	0	0	2	1	0	0
NDA081453CAB-2C	5	7	7	3	5	5	75	0	2	0	0	0	1	0	0	0
NC470-3	5	5	5	2	6	6	25	0	2	0	0	0	2	0	0	0
NC606-23	5	9	6	3	4	5	0	0	1	0	0	0	1	0	0	0
NC600-10	4	9	7	2	3	5	25	0	1	0	1	0	2	0	0	0
Connect	3	9	6	3	6	3	17	0	2	0	0	1	2	0	0	0
Toscana	5	9	7	3	7	5	0	0	0	0	0	0	3	0	0	0
Non-rep*																
Atlantic	5	6	5	2	4	5	75	25	0	0	1	0	2	0	0	0
WAF12065-8	3	6	7	2	5	6	75	0	2	0	0	0	2	0	0	0
B3156-10	5	7	6	3	4	6	0	0	0	0	0	0	1	0	0	0
BNC470-16	4	6	5	3	5	5	50	0	0	0	0	0	1	0	0	0
MSW509-5	4	6	6	3	5	6	25	0	0	0	0	0	2	0	0	0
W9968-5	4	5	5	3	5	5	25	0	0	0	0	0	2	0	0	0
Malou	5	9	7	3	5	5	0	0	0	0	0	0	2	1	0	0
WAF10629-5	4	7	7	3	6	5	50	0	3	0	1	0	1	0	0	0
AF5658-6	5	9	7	3	6	5	25	0	0	0	0	0	1	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
AF5677-4	3	7	7	2	4	5	0	0	4	0	0	0	1	0	0	0
NDAF113490C-8	4	7	7	3	4	6	0	0	1	0	0	0	2	0	0	0
AF5819-6	3	6	6	2	6	6	25	0	4	0	1	0	1	0	0	0
AF5825-3	3	7	6	2	4	5	75	0	4	0	0	0	1	0	0	0
MSAFB609-5	5	7	7	2	4	6	75	0	0	0	0	0	1	0	0	0
MSAFB609-12	5	6	6	2	5	6	0	0	0	0	0	0	1	0	0	0
MSAFB610-2	5	6	5	2	6	5	0	0	0	0	0	0	2	0	0	0
MSAFB626-2	4	6	5	2	3	6	100	0	0	0	1	0	1	0	0	0
MSAFB635-3	5	6	5	2	5	6	0	0	0	0	0	0	2	0	0	0
NDAF12139C-2	5	7	7	2	5	5	0	0	2	0	0	0	1	0	0	0
AF5801-1	5	8	8	3	5	5	100	0	1	0	0	0	2	0	0	0
WAF13066-2	4	7	7	2	6	6	25	0	0	0	0	1	1	0	0	0
B3255-2	5	?	6	2	5	5	50	0	0	0	0	0	1	0	0	0
B3260-6	4	7	7	3	4	5	0	0	2	0	0	0	2	0	0	0
B3263-2	4	6	5	2	6	6	75	0	2	0	1	0	2	0	0	0
B3263-3	4	6	6	3	5	6	25	0	2	0	1	0	2	0	0	0
B3263-7	5	6	5	2	5	6	0	0	0	0	0	0	1	0	0	0
B3265-7	5	6	5	2	5	6	100	0	1	0	0	0	1	0	0	0
B3265-9	5	6	5	3	6	6	100	0	0	0	0	0	1	0	0	0
B3270-10	5	7	6	3	7	5	0	0	0	0	0	0	1	0	0	0
BNC623-2	4	6	5	2	4	5	100	0	0	0	1	1	2	0	0	0
BNC626-3	3	7	6	2	5	6	100	0	4	0	0	0	1	0	0	0
BNC626-7	4	6	5	2	5	5	100	0	1	0	0	0	1	0	0	0
BNC626-8	4	7	6	3	5	5	100	0	2	0	1	0	1	0	0	0
BNC648-1	4	6	6	2	6	5	25	0	1	0	0	0	2	0	0	0
BNC626-15	5	7	6	3	5	6	100	0	1	0	0	0	2	0	0	0

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G= sunburn, Sc = scab, Sp = sprouts, T = secondary tubers. Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

Table 7. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, specific gravity and vine maturity for red or purple skinned potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity	Maturity
Chieftain	545	461	85	100	15	41	27	1	13	1.075	ML
Dark Red Norland	469	394	84	85	21	58	5	0	13	1.063	E
AF4831-2	539	412	77	89	50	26	1	0	8	1.072	M
AF5245-1	469	422	90	92	41	42	7	0	3	1.077	ME
AF4659-12 [yl]	663	333	50	72	32	16	3	0	32	1.082	ML
AF4985-1	545	411	75	89	17	46	12	0	21	1.072	M
NDAF102691B-7	484	444	92	96	51	38	3	0	3	1.078	ME
NDAF113484B-1	533	418	78	91	16	47	15	0	20	1.067	ML
BNC201-1 [yl]	385	343	89	74	23	58	8	0	7	1.076	M
L26-2 (NY164)	368	320	87	70	25	44	18	0	8	1.072	ML
MSX324-1P	378	351	92	76	35	52	5	0	1	1.084	ME
Villetta Rose	493	428	87	93	45	39	4	0	2	1.069	M
W10209-2R [yl]	266	222	85	48	37	49	0	0	5	1.073	M
N10114-3R	486	423	87	92	34	37	15	1	2	1.070	M
Colorado Rose	538	487	90	106	17	40	33	0	4	1.079	M
Elmo	629	492	77	107	20	39	18	0	19	1.070	ME
Fenway Red	570	451	80	98	33	40	7	0	10	1.082	ME
Non-Rep*				0							
Chieftain*	510	461	90	100	27	44	19	0	7	1.075	ML
AF5806-1*	447	415	93	90	46	44	2	0	0	1.070	E
MSAB607-4* [pur]	620	426	69	92	56	13	0	0	0	1.068	
NDAF1240-1*	323	122	38	26	36	1	0	0	0	1.062	E
NDAF12129-6*	492	412	84	89	48	34	2	0	7	1.083	ML

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity	Maturity
NDAF12143-1*	394	337	86	73	41	36	9	0	4	1.075	M
B3278-3*	268	137	51	30	51	0	0	0	7	1.086	E
BNC646-1*	395	280	71	61	22	40	9	0	21	1.088	ML
LSD	113	130	14		11	18	10	2	13		

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

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

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

[4]Percentage of total that are pickouts.

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

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

Varieties with colored flesh are indicated by ^{yl} for yellow, ^{pur} for purple.

Plots consisted of 10-ft rows with 15 seed pieces spaced 8-in. apart.

Table 8. Tuber characteristics, internal and external defects for red skinned potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Chieftain	5	2	7	3	5	5	17	0	1	0	1	1	1	0	0	0
Dark Red Norland	3	3	7	3	4	5	42	0	1	0	1	1	1	0	0	0
AF4831-2	6	2	8	3	5	6	17	0	1	0	0	0	1	1	0	0
AF5245-1	5	1	8	3	6	4	58	0	1	0	0	0	0	0	0	0
AF4659-12	5	?	7	3	6	5	0	0	1	0	0	0	3	0	0	0
AF4985-1	4	2	8	2	5	5	8	0	0	0	1	0	2	0	0	0
NDAF102691B-7	5	2	7	3	5	5	38	0	1	0	1	0	0	0	0	0
NDAF113484B-1	4	2	7	3	6	5	0	0	0	0	0	1	1	0	0	0
BNC201-1	5	2	7	2	4	6	33	0	1	0	1	1	0	0	0	0
L26-2 (NY164)	5	2	8	3	6	6	0	0	1	0	0	0	1	0	0	0
MSX324-1P	4	1	7	2	4	6	25	0	0	0	0	0	0	0	0	0
Villetta Rose	5	2	7	3	6	6	13	0	1	0	1	0	0	0	0	0
W10209-2R	5	2	6	2	5	5	0	0	0	0	0	0	1	0	0	0
N10114-3R	5	2	7	2	6	5	25	0	1	0	0	0	1	0	0	0
Colorado Rose	5	2	7	3	6	5	50	0	0	0	0	0	1	0	0	0
Elmo	4	2	7	3	4	5	0	0	1	0	0	0	1	2	0	0
Fenway Red	4	2	7	2	6	5	50	0	0	0	0	0	1	0	0	0
Non-Rep*																
Chieftain	5	2	7	3	5	5	0	0	0	0	1	0	0	0	0	0
AF5806-1	5	2	8	2	4	5	0	0	0	0	0	0	0	0	0	0
MSAB607-4	5	1	8	2	6	5	0	0	0	0	0	0	0	0	0	0
NDAF1240-1	6	2	8	2	6	6	0	0	0	0	0	0	0	0	0	0
NDAF12129-6	5	2	7	2	5	5	0	0	1	0	0	0	1	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
NDAF12143-1	4	2	8	2	5	6	0	0	0	0	0	0	0	0	0	0
B3278-3	5	2	7	3	6	6	0	0	1	0	1	0	0	0	0	0
BNC646-1	4	1	7	3	4	6	0	0	0	0	1	0	0	0	0	0

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G= sunburn, Sc = scab, Sp = sprouts, T = secondary tubers. Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

Table 9. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, specific gravity and vine maturity for russet skinned or white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity	Maturity
Russet Burbank	511	187	37	59	9	17	11	0	62	1.086	L
Russet Norkotah	440	317	72	100	9	30	27	6	25	1.071	M
Caribou Russet	410	226	55	71	6	22	24	4	44	1.084	ML
AF4296-3	525	304	58	96	10	21	25	2	40	1.087	ML
AF4615-5	467	317	68	100	14	27	27	0	31	1.095	VL
ND8068-5Russ	292	242	82	76	16	35	31	0	13	1.082	E
AF5164-19	525	219	43	69	3	14	26	0	57	1.077	ML
AF5179-4	372	189	51	59	11	23	17	0	47	1.095	ML
AF5407-13	502	367	72	116	17	26	29	0	25	1.087	ML
AF5468-5	446	295	66	93	16	26	23	2	30	1.083	ML
WAF10073-3RUS	466	201	44	64	5	15	24	0	55	1.076	ML
W9133-1rus	420	207	49	65	9	22	19	0	49	1.072	ML
W9433-1rus	525	277	53	87	3	13	35	2	46	1.080	L
W9523-1rus	474	267	56	84	18	25	14	0	41	1.081	M
Mesa Russet	388	250	65	79	11	25	28	0	31	1.078	L
CO07015-4RU	305	208	68	66	37	26	5	0	20	1.075	ME
CO8231-1RU	442	236	54	74	12	20	22	0	43	1.087	ML
A07098-4	390	253	65	80	20	31	15	0	30	1.090	ML
A07705-4	593	368	62	116	9	20	33	0	35	1.078	L
A07769-4	440	270	62	85	19	25	17	0	35	1.086	ML
A08422-2VR	558	334	61	105	3	20	36	2	38	1.084	ML
A08422-4VRsto	439	304	69	96	7	29	33	0	29	1.083	ML
A11194-1	452	261	58	82	13	15	30	0	40	1.079	M
A10595-13VRsto	426	234	55	74	14	19	22	0	40	1.076	ML
COA11012-13	524	261	50	82	12	19	17	2	45	1.092	ML
Dakota Russet	354	175	51	55	9	20	17	5	48	1.088	ML
Dakota Trialblazer	301	180	60	57	10	24	27	0	37	1.104	ML
Targhee Russet	344	219	63	69	14	25	24	0	34	1.084	ML

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific	Vine
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity	Maturity
Barcelona [yl]	529	298	56	94	11	19	26	0	42	1.068	L
Belmonda [yl]	665	412	62	130	11	33	18	0	36	1.093	L
Atlantic	369	234	64	74	11	28	22	3	35	1.087	ML
Non-Rep*				0							
Russet Norkotah*	494	351	71	111	10	30	31	0	27	1.071	M
AF5071-2*	606	395	65	124	7	16	43	0	33	1.093	M
AF5312-1*	490	282	58	89	12	22	23	0	39	1.077	ML
CO07049-1RU*	248	176	71	56	36	16	19	0	23	1.080	ML
CO8065-2RU*	227	106	47	33	19	28	0	0	35	1.090	ML
CWO8071-2rus*	443	263	59	83	21	27	11	0	38	1.088	ML
CWO8221-5rus*	433	318	74	100	16	31	27	0	23	1.070	ML
AF4872-2*	487	149	31	47	6	12	13	0	68	1.088	ML
AAF08434-1*	368	182	50	57	22	17	11	0	39	1.083	ML
WAF10612-1*	706	461	65	145	14	22	29	0	32	1.090	ML
AF5599-5*	561	409	73	129	22	28	23	0	22	1.094	ML
AF5613-3*	534	251	47	79	4	16	23	4	49	1.079	ML
AF5628-2*	438	201	46	64	6	10	31	0	50	1.073	ML
AF5644-8*	514	384	75	121	35	18	22	0	19	1.087	L
AF5651-23*	436	240	55	76	19	19	17	0	37	1.086	ML
WAF12060RUS-14*	447	290	65	92	10	25	30	0	31	1.092	M
COAF11018-7*	351	190	54	60	20	27	7	0	37	1.088	M
COAF11018-10*	356	193	54	61	11	19	24	0	40	1.090	ML
COAF11112-10*	456	334	73	105	9	30	35	0	20	1.073	ML
COAF11112-13*	472	305	65	96	7	16	42	0	33	1.070	M
LSD	89	75	16		8	10	11	5	17		

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

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

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

[4]Percentage of total that are pickouts.

Replicated trials are the average of 3 replicates except for those lines with * which were 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 [yl].

Table 10. Tuber characteristics, internal and external defects for russet skinned or white potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Russet Burbank	3	5	3	5	6	4	83	0	0	0	1	3	3	0	0	0
Russet Norkotah	5	5	3	5	7	5	67	0	0	0	0	1	1	0	0	0
Caribou Russet	3	6	3	4	7	4	0	0	1	0	1	1	1	0	0	0
AF4296-3	3	6	6	4	7	5	50	0	1	0	0	2	2	0	0	0
AF4615-5	3	6	5	4	7	4	25	0	1	0	1	1	1	0	0	0
ND8068-5Russ	3	6	4	4	7	5	8	0	0	0	0	0	1	0	0	0
AF5164-19	3	6	5	4	4	5	42	0	0	0	1	0	3	1	0	0
AF5179-4	2	6	6	4	7	4	0	0	0	0	0	1	2	1	0	0
AF5407-13	3	6	5	4	7	4	25	0	0	0	0	0	1	0	0	0
AF5468-5	3	6	4	4	6	5	33	0	0	0	0	0	1	0	0	0
WAF10073-3RUS	3	5	3	5	6	4	0	0	1	0	0	3	1	0	0	0
W9133-1rus	4	6	5	4	6	5	8	0	0	0	0	0	2	1	0	0
W9433-1rus	3	6	6	4	7	4	13	0	1	0	0	1	2	0	0	0
W9523-1rus	4	5	3	4	7	5	0	0	0	0	2	0	1	0	0	0
Mesa Russet	4	5	3	4	7	5	67	0	2	0	1	0	1	0	0	0
CO07015-4RU	5	5	3	5	6	5	25	0	0	0	0	0	1	0	0	0
CO8231-1RU	4	6	4	4	7	5	38	0	0	0	1	0	2	1	0	0
A07098-4	3	7	6	4	7	5	0	0	0	0	0	1	1	0	0	0
A07705-4	4	6	4	5	6	5	17	0	0	0	0	1	1	0	0	0
A07769-4	3	6	4	4	6	5	50	0	0	0	0	0	2	1	0	0
A08422-2VR	3	6	4	5	7	5	13	0	1	0	0	1	2	0	0	0
A08422-4VRsto	3	6	5	4	5	4	0	0	0	0	0	0	1	1	0	0
A11194-1	3	6	6	4	5	4	0	0	2	0	0	0	1	2	0	0
A10595-13VRsto	3	6	6	4	6	5	25	0	0	0	0	0	1	1	0	0
COA11012-13	4	5	3	5	6	4	17	0	0	0	0	0	2	0	0	0
Dakota Russet	3	6	6	3	5	4	25	0	0	0	0	0	1	0	0	0
Dakota Trialblazer	4	6	4	4	6	5	50	0	0	0	1	1	1	0	0	0
Targhee Russet	4	5	2	4	6	4	0	0	0	0	1	1	0	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Barcelona	4	8	7	3	5	5	25	0	1	0	1	1	2	0	0	0
Belmonda	5	9	7	3	6	5	17	0	0	0	0	0	3	1	0	0
Atlantic	4	6	5	2	4	5	25	0	0	0	1	0	1	1	0	0
Non-Rep*																
Russet Norkotah	5	5	3	5	7	5	75	0	0	0	0	1	1	0	0	0
AF5071-2	4	6	4	5	7	4	25	0	0	0	0	1	1	0	0	0
AF5312-1	4	6	3	4	6	4	0	0	0	0	1	1	2	0	0	0
CO07049-1RU	4	5	3	4	6	4	0	0	0	0	0	0	1	0	0	0
CO8065-2RU	3	4	3	3	7	5	100	0	0	0	1	0	1	0	0	0
CWO8071-2rus	4	6	5	4	6	5	25	0	0	0	0	0	2	0	0	0
CWO8221-5rus	5	5	2	5	7	5	25	0	0	0	1	0	1	0	0	0
AF4872-2	3	7	6	4	6	5	50	0	0	0	0	3	1	0	0	0
AAF08434-1	3	5	4	6	5	3	0	0	0	0	0	0	1	0	0	0
WAF10612-1	4	5	3	5	6	5	25	0	1	0	0	0	2	0	0	0
AF5599-5	5	6	3	4	6	4	0	0	1	0	0	0	2	0	0	0
AF5613-3	3	6	5	4	6	5	0	0	1	0	1	1	2	0	0	0
AF5628-2	3	5	4	3	5	5	25	0	1	0	0	0	2	0	0	0
AF5644-8	4	4	3	4	7	5	25	0	2	0	0	0	2	0	0	0
AF5651-23	3	6	1	4	7	5	50	0	1	0	1	0	1	0	0	0
WAF12060RUS-14	5	5	3	5	7	5	50	0	1	0	0	0	2	0	0	0
COAF11018-7	3	6	4	4	6	5	25	0	0	0	1	1	0	0	0	0
COAF11018-10	4	5	3	5	6	5	0	0	0	0	1	1	1	0	0	0
COAF11112-10	4	5	3	4	7	5	0	0	1	0	0	0	1	0	0	0
COAF11112-13	4	5	3	4	7	5	0	0	0	0	0	0	2	0	0	0

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G = sunburn, Sc = scab, Sp = sprouts, T = secondary tubers.
Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

Table 11. Total yield, greater than 1 7/8", percent of standard, size distribution, percent pickouts, specific gravity and vine maturity for NE1231 potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific	Vine	Merit
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity	Maturity	Score[5]
Atlantic	480	330	70	100	7	33	28	2	27	1.096	ML	2
Katahdin	456	343	75	104	9	35	31	0	22	1.076	ML	2
Snowden	456	371	82	113	20	48	13	0	17	1.091	ML	2
Superior	475	393	83	119	22	40	20	0	15	1.072	ME	2
Yukon Gold [yl]	406	270	68	82	7	28	29	3	29	1.086	M	2
AF4138-8	549	496	91	150	37	47	7	0	5	1.070	M	1
AF4552-5	443	381	86	116	20	45	21	0	12	1.086	M	2
AF4648-2	460	321	71	97	12	38	21	0	27	1.089	ML	3
AF5040-8 [yl]	433	378	88	115	44	39	4	0	8	1.101	M	2
AF5225-1 [yl]	619	516	84	156	20	51	12	0	13	1.081	ML	1
AF5280-5	456	357	79	108	15	38	26	0	18	1.066	M	2
AF5429-3	576	357	63	108	6	26	29	1	37	1.069	ML	3
B2869-29	481	412	86	125	36	43	6	0	8	1.099	M	3
B2904-2	435	355	82	108	17	41	23	2	9	1.088	M	4
BNC364-1	379	315	84	96	39	40	5	0	12	1.087	M	2
NY157	489	433	89	131	25	50	14	0	8	1.086	ME	1
NY161 [yl]	581	468	81	142	31	39	11	0	13	1.080	M	2
Chieftain	530	458	87	139	16	44	26	1	11	1.075	ML	2
Dark Red Norland	458	373	81	113	22	53	6	0	15	1.063	E	3
AF4831-2	525	409	79	124	48	28	2	0	7	1.072	M	1
AF5245-1	454	414	91	126	39	46	6	0	2	1.077	ME	2
Russet Burbank	512	184	36	56	8	18	9	0	63	1.086	L	4
Russet Norkotah	451	316	71	96	9	27	27	7	28	1.071	M	3
AF3362-1	412	241	58	73	9	21	23	4	41	1.084	ML	4

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific	Vine	Merit
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity	Maturity	Score[5]
AF4296-3	511	318	63	96	9	25	27	2	35	1.087	ML	4
AF4615-5	459	322	71	98	15	30	26	0	28	1.095	VL	4
ND8068-5Russ	297	247	83	75	15	34	33	0	14	1.082	E	4
LSD	84	76	11		10	11	11	3	11			

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

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

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

[4]Percentage of total that are pickouts.

[5]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 [yl] for yellow.

Table 12. Tuber characteristics, internal and external defects for NE1231 potato evaluation trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Atlantic	5	6	5	2	4	5	67	8	1	0	2	0	2	0	0	0
Katahdin	4	7	7	3	4	4	42	0	2	0	0	0	1	0	0	0
Snowden	5	6	5	2	5	5	75	0	0	0	0	0	1	1	0	0
Superior	4	7	6	3	5	5	38	0	1	0	1	0	1	0	0	0
Yukon Gold	4	7	8	3	6	5	63	0	1	0	1	1	1	1	0	0
AF4138-8	4	7	6	2	6	5	31	0	1	0	0	0	1	1	0	0
AF4552-5	4	6	6	2	4	5	19	0	2	0	0	0	1	0	0	0
AF4648-2	4	7	7	3	4	4	75	0	1	0	1	0	1	0	0	0
AF5040-8	4	9	6	2	4	5	0	0	1	0	0	0	1	0	0	0
AF5225-1	5	7	6	3	6	5	31	0	2	0	0	0	1	1	0	0
AF5280-5	4	7	6	3	4	5	19	0	1	0	1	0	1	0	0	0
AF5429-3	5	7	7	2	4	6	69	0	0	0	0	0	2	1	0	0
B2869-29	3	6	6	2	5	6	38	0	1	0	0	0	1	0	3	0
B2904-2	5	6	5	3	5	6	88	0	1	0	0	0	1	0	0	0
BNC364-1	5	6	7	3	5	5	6	0	2	0	1	0	1	0	0	0
NY157	4	6	6	2	5	5	8	0	1	0	0	0	1	0	0	0
NY161	5	9	7	3	5	5	42	0	0	0	1	0	2	0	0	0
Chieftain	5	2	7	3	5	5	13	0	1	0	1	1	1	0	0	0
Dark Red Norland	3	3	7	3	4	5	50	0	1	0	1	1	1	0	0	0
AF4831-2	6	2	8	3	5	6	19	0	1	0	0	0	1	1	0	0
AF5245-1	5	1	8	3	6	4	50	0	1	0	0	0	0	0	0	0
Russet Burbank	3	5	3	5	6	4	81	0	0	0	1	3	3	0	0	0
Russet Norkotah	5	5	3	5	7	5	75	0	0	0	0	1	1	0	0	0
AF3362-1	3	6	3	4	7	4	0	0	1	0	1	1	1	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
AF4296-3	3	6	6	4	7	5	44	0	1	0	0	2	2	0	0	0
AF4615-5	3	6	5	4	7	4	19	0	1	0	1	1	1	0	0	0
ND8068-5Russ	3	6	4	4	7	5	6	0	0	0	0	0	1	0	0	0

[1]Tuber Characteristics: TA = tuber appearance: 1 = very poor, 5= fair, 9 = excellent.
C = skin color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.

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

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

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G = sunburn, Sc = scab, Sp = sprouts, T = secondary tubers.
Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

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, 2017

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Superior	487	379	77	100	26	33	18	0	20	1.069
Dark Red Norland	459	389	84	103	42	37	5	0	6	1.058
NY149 [yl]	451	370	82	98	38	39	4	0	9	1.071
AF5215-2 [yl]	567	443	78	117	40	34	4	0	13	1.073
AF5414-1 [pk]	454	388	86	102	47	28	10	0	3	1.066
NDAF102573-2	557	466	84	123	35	39	10	0	10	1.068
AF5533-2 [pk]	565	418	74	110	39	32	3	0	18	1.074
AF5633-2	656	501	77	132	51	23	2	0	7	1.070
NDAF113458-2	782	646	82	170	33	45	4	0	11	1.065
B2152-17 [yl]	615	523	85	138	40	42	2	0	5	1.063
Lilly [yl]	577	386	66	102	47	16	3	0	13	1.059
Belmonda [yl]	719	451	63	119	31	24	8	0	31	1.071
Smart [yl]	760	446	59	118	41	14	5	0	31	1.063
Nobless [yl]	618	325	53	86	41	12	0	0	33	1.072
Colomba [yl]	791	649	82	171	20	42	21	0	13	1.049
Primabella [yl]	832	481	57	127	24	26	6	1	36	1.056
Viviana [yl]	540	407	76	107	37	38	1	0	19	1.063
Julinka [yl]	735	527	72	139	36	25	10	0	24	1.069
Oriana [yl]	682	480	70	127	49	20	1	0	16	1.067
Noelle [yl]	604	379	63	100	32	26	5	0	26	1.060
Erika [yl]	600	370	61	98	39	22	0	0	24	1.068
Musica [yl]	674	453	67	120	41	24	3	0	23	1.062
Fioretta [yl]	635	326	52	86	33	18	1	0	37	1.059
Queen Anne [yl]	616	433	70	114	50	20	0	0	13	1.058
Laperla [yl]	742	496	67	131	16	30	21	0	29	1.056
Montreal	474	356	75	94	39	34	2	0	16	1.065

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Red Apple [yl]	623	349	56	92	45	10	0	0	13	1.069
NY150	518	244	47	64	41	6	0	0	19	1.075
Anouk [yl]	752	446	59	118	39	20	0	0	23	1.065
Yellow Star [yl]	578	333	57	88	34	21	1	0	33	1.073
AC97521-1R/Y [yl]	700	464	66	123	35	23	8	0	20	1.075
CO05037-3W/Y [yl]	566	396	70	105	53	15	2	0	15	1.072
Non-Rep*				0						
AF4831-2*	745	625	84	165	56	28	0	0	5	1.060
B3156-2* [yl]	472	394	83	104	52	32	0	0	8	1.070
B3168-3*	514	440	86	116	18	42	26	0	11	1.072
Colorado Rose*	436	325	75	86	23	21	30	0	22	1.060
LSD	124	117	10		11	11	6	0	9	

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

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

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

[4]Percentage of total that are pickouts.

The trial was replicated trial with 3 replications except for those lines with * which were non-replicated.

LSD indicates least significant difference ($P = 0.05$).

Varieties with colored flesh are indicated by [yl] for yellow, and [pk] for pink.

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

Table 14. Tuber characteristics, internal and external defects for potato early variety trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Superior	4	7	5	4	3	4	8	0	0	0	0	0	2	0	0	0
Dark Red Norland	5	2	7	4	3	5	8	0	0	0	0	0	1	1	0	0
NY149	6	7	7	5	6	5	83	0	0	0	0	1	1	1	0	0
AF5215-2	6	7	7	3	5	5	33	0	0	0	1	0	1	1	0	1
AF5414-1	4	2	6	5	5	5	25	0	0	0	0	0	0	0	0	0
NDAF102573-2	5	2	7	3	5	5	8	0	1	0	1	0	0	1	0	0
AF5533-2	6	9	7	3	6	5	8	0	0	0	0	0	2	1	0	0
AF5633-2	6	1	7	2	4	6	8	0	2	0	0	0	0	1	0	0
NDAF113458-2	6	7	6	3	5	5	25	0	1	0	1	0	2	0	0	0
B2152-17	7	2	6	4	5	5	0	0	0	0	0	0	1	0	0	0
Lilly	6	7	6	5	6	5	0	0	1	0	0	0	1	1	0	0
Belmonda	4	7	6	4	6	6	0	0	1	0	0	0	2	1	0	0
Smart	4	9	7	3	6	5	0	0	1	0	0	0	3	1	0	0
Nobless	4	9	6	3	6	5	0	0	0	0	0	0	1	3	0	0
Colomba	5	9	7	3	5	5	0	0	0	0	1	0	1	1	0	0
Primabella	6	9	8	6	5	5	0	0	1	0	1	1	3	1	0	0
Viviana	7	9	7	3	6	6	0	0	0	0	0	0	1	1	0	0
Julinka	5	7	7	3	6	5	0	0	0	0	0	0	2	1	0	0
Oriana	6	9	8	3	6	5	0	0	1	0	0	1	1	2	0	0
Noelle	4	7	7	4	6	4	0	0	0	0	0	0	1	1	0	0
Erika	8	9	7	6	8	7	0	0	0	0	0	0	2	0	0	0
Musica	4	6	6	4	6	7	8	0	1	0	0	0	2	1	0	0
Fioretta	7	9	8	5	7	4	8	0	1	0	0	0	2	2	0	0
Queen Anne	8	7	7	6	7	6	0	0	0	0	0	0	2	1	0	0
Laperla	3	7	7	3	7	4	25	0	1	0	0	2	1	2	0	1
Montreal	7	7	8	2	7	5	17	0	0	0	1	0	1	1	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	% HH	% IB	R	H	Gr	K	G	Sc	Sp	T
Red Apple	5	2	6	5	5	6	0	0	1	0	1	0	1	0	0	0
NY150	7	8	7	3	5	7	0	0	1	0	0	0	1	1	0	0
Anouk	5	9	6	2	6	5	0	0	1	0	0	0	2	2	0	0
Yellow Star	4	9	7	3	6	5	0	0	0	0	0	0	1	3	0	0
AC97521-1R/Y	5	2	7	4	6	4	0	0	1	0	0	0	1	1	0	0
CO05037-3W/Y	5	9	7	3	7	4	0	0	1	0	0	0	2	0	0	0
Non-rep*																
AF4831-2	6	2	7	2	6	5	0	0	0	0	0	0	1	0	0	0
B3156-2	3	7	8	2	3	6	0	0	3	0	0	0	1	0	0	0
B3168-3	5	7	6	2	4	5	25	0	0	0	0	0	2	1	0	0
Colorado Rose	4	2	7	3	6	5	25	25	0	0	0	0	1	0	0	0

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

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

[3]External Defects: R = Rhizoctonia, H = hairline cracks, Gr = growth cracks, K = knobs, G = sunburn, Sc = scab, Sp = sprouts, T = secondary tubers.
Scale = 0-4, with 0 = not observed, 1 = slight to 4 = very severe.

Table 15. Total yield, size distribution, and external characteristic for potato creamer variety trial in Plant Pathology Farm, Rock Springs, 2017

Variety/Line	Yield (cwt/A)[1]	Total tuber number	% by size class[2]						Tuber Characteristics[3]			
	Total		1		2		3		TA	C	TX	Sh
			Number	weight	Number	weight	Number	weight				
Jazzy [yl]	125	113	19	6	79	89	2	5	4	7	8	3
Anouk	152	99	15	3	63	54	22	43	5	9	8	2
Yellow Star [yl]	64	47	21	5	69	70	10	25	5	7	7	2
Rosemarie [pk]	204	278	45	23	55	76	0	1	2	3	7	2
Little Giant [yl]	107	150	44	20	56	80	0	0	5	2	7	2
Violetta	139	152	36	16	59	72	4	13	3	1	7	4
LSD	46	48	12	7	10	7	4	11				

[1]Yield Total = yield including all size categories 1, 2, and 3.

[2]Percentage of total tuber number and yield according to size class. 1 = < 1 in., 2 = 1 - 1.625 in., 3 = > 1.625 in.

[3]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.

The trial was replicated trial with 3 replications and planted 6-in. apart. LSD indicates least significant difference (P = 0.05).
Varieties with colored flesh are indicated by [yl] for yellow, [pk] for pink.

Table 16: Management of evaluation trials, 2017

Rock Springs

Trial	Germplasm
Planting Date:	8 June
Harvest Date:	26, 27 October and 9 November
Previous Crop:	Wheat
Fertilizer Rate/A:	9 May: Calcium 21%. At planting: 987 lb/A 10-10-10 (N-P-K) 7 July: 57 lb/A liquid N
Herbicide:	Eptam 7E, Medal EC, TriCor DF, Matrix
Fungicide:	Gavel 75DF, Manzate ProStik, Bravo WS, Elatus, Tanos
Insecticide:	Admire Pro, Assail, Baythroid XL, Lambda
Vine Kill:	21 and 26 September
Rainfall (inches):	June (4.70), July (8.04), August (3.69), September (1.63)

Trial	Early variety
Planting Date:	5 June
Harvest Date:	28 September
Previous Crop:	Soybeans
Fertilizer Rate/A:	At planting: 987 lb/A 10-10-10 (N-P-K) 30 June: 38 lb/A liquid N
Herbicide:	Eptam 7E, Medal EC, TriCor DF, Matrix
Fungicide:	Gavel 75DF, Manzate ProStik, Bravo WS, Elatus, Tanos
Insecticide:	Admire Pro, Radiant SC, Baythroid XL, Agri-Mek, Lambda
Vine Kill:	31 August, 8 and 15 September
Rainfall (inches):	June (4.70), July (8.04), August (3.69), September (1.63)

Trial	Creamer variety
Planting Date:	2 June
Harvest Date:	
Previous Crop:	Wheat
Fertilizer Rate/A:	9 May: Calcium 21%. At planting: 987 lb/A 10-10-10 (N-P-K)
Herbicide:	Eptam 7E, Medal EC, TriCor DF, Matrix
Fungicide:	Gavel 75DF, Manzate ProStik, Bravo WS, Elatus, Tanos
Insecticide:	Admire Pro, Avaunt, Baythroid XL, Assail, Lambda
Vine Kill:	25 and 31 July, 9 and 14 August, 15 and 21 September
Rainfall (inches):	June (4.70), July (8.04), August (3.69), September (1.63)

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

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Field evaluation of potato cultivars and breeding lines for resistance to late blight in Pennsylvania, 2017.

Twenty-eight 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 14 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 5-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 4.70, 8.04, 3.69, and 1.63 in. for Jun, Jul, Aug, and Sep, respectively. On 14 Aug, spreader rows were spray-inoculated with a mixture of four isolates of *Phytophthora infestans* clonal lineage US-23, at a concentration of 8.8×10^4 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. Assessments were made on 25 Aug and 1, 5, 8, 11, and 15 Sep. Disease data were expressed as area under the disease progress curve (AUDPC), subjected to analysis of variance, and means separated using Fisher's protected least significant difference test (SAS v. 9.4, SAS Institute, Cary, NC).

Late blight disease pressure was high and the most susceptible plots reached 100% disease severity by the end of the season. Cultivar Kennebec was the moderately resistant check; only two lines AF4615-5 and AF4648-2 had lower AUDPC values than that of Kennebec and these two lines were considered resistant or moderately resistant.

Cultivar/Line	AUDPC[z]		Cultivar/Line	AUDPC	
AF4615-5	29	o[y]	AF3362-1 (Caribou Russet)	501	ghi
AF4648-2	168	n	AF4138-8	536	fgh
Kennebec	282	m	AF5040-8	538	fgh
AF5225-1	295	m	BNC364-1	546	fgh
Russet Burbank	301	m	Chieftain	556	fgh
AF5429-3	361	klm	AF4831-2	569	efg
NY157	385	jkl	Atlantic	618	def
AF5280-5	425	ijk	AF4552-5	658	cde
AF4296-3	434	ijk	AF5245-1	675	bcd
B2904-2	461	hij	Superior	718	bc
Katahdin	467	hij	Yukon Gold	750	bc
Russet Norkotah	476	g-j	B2869-29	763	b
Snowden	485	ghi	Dark Red Norland	922	a
NY161	500	ghi	ND8068-5Russ	992	a

[z] AUDPC = Area under the disease progress curve was calculated from 25 Aug to 15 Sep according to the formula: $\sum^{n}{}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the ith observation, t_i = time (days) since the previous rating at the ith observation, and n = total number of observations.

[y] Means followed by the same letter are not significantly different at $P = 0.05$ as determined by Fisher's protected least significant difference test (LSD = 98).

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

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Field evaluation of potato cultivars and breeding lines for resistance to early blight in Pennsylvania, 2017.

Twenty-eight 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. Entries were planted on 18 May in a randomized complete block design with three replicates. 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 4.70, 8.04, 3.69, and 1.63 in. for Jun, Jul, Aug, and Sep, respectively. On 13 Jul, spreader rows were spray-inoculated with a conidial mixture of two isolates of *Alternaria solani*, at a concentration of 1.5×10^4 conidia/ml, to promote uniform spread of the pathogen to all treatment plots. For each plot, the percentage of diseased foliage was visually assessed on a 0 to 100% scale on 25 and 31 July, and 6, 11, 16, and 21 Aug. Disease data were expressed as the area under the disease progress curve (AUDPC), subjected to an analysis of variance and means separated using Fisher's protected least significant difference test (SAS v. 9.4, SAS Institute, Cary, NC).

Early blight disease pressure was high and the most susceptible cultivar (cv. Dark Red Norland; susceptible check) reached 100% foliar disease severity by the end of the season. Kennebec and Russet Burbank were included as moderately resistant check cultivars. Four other cultivars/lines with AUDPC values of less than 300 were characterized as moderately resistant: AF4615-5, AF4648-2, AF5225-1, and Katahdin.

Cultivar/Line	AUDPC[z]	Cultivar/Line	AUDPC
AF4615-5	119 j[y]	Atlantic	412 fgh
Russet Burbank	167 ij	AF5280-5	507 efg
AF4648-2	181 ij	AF3362-1 (Caribou Russet)	544 ef
AF5225-1	188 ij	AF5040-8	546 ef
Katahdin	240 hij	NY161	548 ef
Kennebec	284 hij	AF4831-2	549 ef
Snowden	309 hi	Superior	556 ef
B2904-2	312 hi	B2869-29	591 e
AF4138-8	332 ghi	AF4552-5	665 de
Chieftain	340 ghi	AF5245-1	807 cd
AF4296-3	381 fgh	Russet Norkotah	868 c
BNC364-1	389 fgh	Yukon Gold	938 bc
NY157	389 fgh	Dark Red Norland	1095 b
AF5429-3	390 fgh	ND8068-5Russ	1331 a

[z] 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 ith observation, t_i = time (days) since the previous rating at the ith observation, and n = total number of observations.

[y] Means followed by the same letter are not significantly different at $P = 0.05$ as determined by Fisher's protected least significant difference test (LSD = 176).

POTATO (*Solanum tuberosum*)
Powdery scab; *Spongospora subterranea*

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Field evaluation of potato cultivars and breeding lines for resistance to powdery scab in Pennsylvania, 2017.

Twenty-nine potato cultivars and advanced breeding lines were planted in a naturally infested commercial field in Potter Co., PA on 23 May. The soil type was a Mardin silt loam. The experimental design was a randomized complete block design with three replications. The plots were 6-ft long with 8 seed pieces planted in each plot and 5-ft breaks between plots within a row. Precipitation was 3.22, 3.62, 4.60, 1.60 and 2.55 in. for May, Jun, Jul, Aug, and Sep, respectively. Standard crop management practices and a recommended fungicide program for the management of early and late blight in Pennsylvania were followed. Reglone (1.0 oz/A) was applied to vine kill on 20 Aug. Tubers were harvested on 12 Sep and were visually assessed on 7 Nov. The number of tubers with powdery scab was determined from the total number of tubers per plot. Disease incidence was calculated as the percentage of tubers with powdery scab, 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).

Kennebec and Shepody were included as susceptible check cultivars which had 25.5% and 25.8 tuber infection, respectively. Russet Burbank was included as a moderately resistant check cultivar which had 7.2% tuber infection. AF3362-1 (Caribou Russet), Russet Norkotah, and ND8068-5Russ had less powdery scab incidence than that of Russet Burbank and thus considered resistant or moderately resistant to tuber infection.

Cultivar/Line	Powdery Scab Incidence (%)	Cultivar/Line	Powdery Scab Incidence (%)
AF3362-1 (Caribou Russet)	2.8 i[z]	AF4552-5	19.6 a-i
Russet Norkotah	4.6 hi	BNC364-1	22.1 a-h
ND8068-5Russ	6.7 ghi	AF5280-5	22.9 a-g
Russet Burbank	7.2 ghi	Dark Red Norland	22.9 a-g
AF4648-2	7.7 f-i	B2904-2	22.9 a-g
NY157	8.2 f-i	Yukon Gold	24.1 a-g
Snowden	9.8 e-i	Kennebec	25.5 a-f
Atlantic	10.6 d-i	Shepody	25.8 a-f
AF5225-1	11.7 c-i	AF4831-2	26.7 a-e
Chieftain	12.6 b-i	AF5429-3	28.3 a-d
AF4138-8	13.1 b-i	B2869-29	28.3 a-d
AF4296-3	13.4 b-i	AF5245-1	29.4 abc
AF5040-8	13.7 b-i	NY161	30.7 ab
Superior	15.7 a-i	Katahdin	33.8 a
AF4615-5	19.5 a-i		

[z] Means followed by the same letter are not significantly different at $P = 0.05$ as determined by Fisher's protected least significant difference test (LSD = 18.2).

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

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Evaluation of fungicides for control of potato early blight in Pennsylvania, 2017.

Fungicides were evaluated for managing early blight on potato cv. Atlantic at The Pennsylvania State University Russell E. Larson Agricultural Research Center in Pennsylvania Furnace, PA. The soil type was a Hagerstown silty clay loam. The previous crop was wheat. Potatoes were planted on 18 May. The experimental design was a randomized complete block with four replicates. Plots were three rows wide (36 in. spacing between rows) and 10 ft long with 8 in. seed piece spacing. Precipitation was 4.70, 8.04, 3.69, and 1.63 in. for Jun, Jul, Aug, and Sep, respectively. Spreader rows were spray-inoculated on 13 Jul. A mixture of two isolates of *Alternaria solani*, at a concentration of 1.5×10^4 conidia/ml, was used to promote a uniform spread of the pathogen to all treatment plots. Fungicides were applied with a tractor-mounted, N_2-pressurized side boom sprayer at 30 psi and 45 gal/A. The spray boom was equipped with drop and boom nozzles so that both sides and the top of each plant were uniformly sprayed. On 25 and 31 July, and 6, 11, 16, 21, 24 and 29 Aug, and 5 Sep each plot was visually assessed for the percentage of foliage with early blight on a 0 to 100% scale. The nine visual assessments of early blight infection were used to calculate the area under disease progress curve (AUDPC). Plants were vine killed on 8 Sep and 15 Sep with Reglone (2.0 pt/A). The middle row of each plot was harvested on 25 Sep. Tubers were sorted and yield and disease data were collected on 30 Oct. Disease data were subjected to analysis of variance and Fisher's protected least significant difference test (SAS v. 9.4, SAS Institute, Cary, NC).

All treatments significantly reduced season-long early blight compared to the untreated control with the treatments containing Miravis Prime being most effective. All treatments except when Bravo Weather Stik was applied alone significantly increased tuber yield. Symptoms were not observed on tubers from any of the treatments.

Treatment and rate/A	Days after first application[z]	AUDPC[y]	Total Yield[w]
Bravo Weather Stik 6 SC 1.5 pt	0, 15, 29, 43		
Miravis Prime 11.4 oz	8, 22, 36, 50	143 d[x]	431 ab
Bravo Weather Stik 6 SC 1.5 pt	0, 15, 29, 43		
Miravis Prime 6.8 oz	8, 22, 36, 50	147 d	461 a
Bravo Weather Stik 6 SC 1.5 pt	0, 15, 29, 43		
F9652-1 15.4 oz + Koverall 2 lb + Dyne-amic 16 oz	8, 50		
Omega 8 oz + Dyne-amic 16 oz	22		
Luna Tranquility 11 oz + Koverall 2 lb + Dyne-amic 16 oz	36	182 cd	483 a
Bravo Weather Stik 6 SC 1.5 pt	0, 15, 29, 43		
F9652-1 15.4 oz + Koverall 2 lb + Dyne-amic 16 oz	8, 22, 36, 50	254 c	445 a
Bravo Weather Stik 6 SC 1.5 pt	0, 8, 15, 22, 29, 36, 43, 50	907 b	385 bc
Untreated Control		1628 a	364 c
LSD (0.05)		94	59

[z] First fungicide application was 11 Jul.

[y] AUDPC = Area under disease progress curve was calculated from 25 July to 5 Sep according to the formula: $\sum^{n}{}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the ith observation, t_i = time (days) since the previous rating at the ith observation, and n = total number of observations.

[w] Total yield excluding symptomatic or rotted diseased tubers, cwt/A = hundred weight per acre of asymptomatic tubers.

[x] Means followed by the same letter within columns are not significantly different at $P = 0.05$ as determined by Fisher's protected least significant difference test.

Supplemental Progress Report, 2017----------March 26, 2018

Pennsylvania Regional Potato Germplasm Evaluation Program, 2017

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The objective of this project is to find new breeding lines that are well adapted to Pennsylvania potato growing conditions, and have qualities that are suitable for either processing or tablestock 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, Erie and the Russell E. Larson Agricultural Research Center at Rock Springs, Centre Co. Please see the Progress Report from December 2017 for details. During the winter months, tests were performed to evaluate germplasm for chip, French fry processing and culinary qualities. Storage ability, sprouting, and other traits were also noted as the tests were conducted. Presented in this report are the chip processing results (Tables 1-4), French fry results (Tables 5-8), and the culinary quality results (Table 9-10). 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. We did not perform out of the field chip testing this year. Storage temperatures are listed at the bottom of each table. The chipping procedure at the PSU 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 slices (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 December 2017 progress report.

Chipping (Tables 1-4)
There was no chipping directly out of the field (within two-three days of harvesting). Atlantic and Snowden are the standard varieties to use for comparing the chip color of the other lines.

There were a few noteworthy lines from the short term storage chipping in December: At Rock Springs, B2904-2, NDAF102629C-4, B2727-2, NY 152, L7-2 (NY163), L8-12, MSR127-2, ACO1144-1W, AF5801-1 and B3270-10 had acceptable color. At Northampton County, Atlantic, Snowden, B2727-2 and NY152 had the best color; Norwis, AF4552-5, BNC369-4, MSR127-2, NDAO81453CAB-2C and B3148-12 had acceptable color. At Erie County, Snowden, B2727-2, MSR127-2, NY157 and L8-12 had the best color; Atlantic, Superior, Norwis, AF4552-5, BNC369-4, NY152, AF5040-8, MSV358-3 and W8822-1 had acceptable color.

From the results of the 3 week reconditioning the noteworthy lines are: At Rock Springs, Snowden, NDAF102629C-4, NY 152, MSR127-2 and MSAFB635-3 had the best color; AF4648-2, AF5040-8,

AF5280-5, AF5429-3, B2904-2, BNC364-1, NY157, AF5563-5, B2727-2, BNC470-13, L7-2 (NY163), L8-12, MSV358-3, MSW485-2, MSY111-1, W8822-1, ACO1144-1W, WAF10629-5, BNC470-16, W9968-5, WAF10629-5, NDAF113490C-8, AF5825-3, NDAF12139C-2, AF5801-1, WAF13066-2, B3263-2, B3265-9, B3270-10, BNC623-2, BNC626-7 and BNC626-15 had acceptable color. At Northampton County, Atlantic, Snowden, Norwis and NY152 had acceptable color. At Erie County, Snowden, B2727-2, MSR127-2 and L8-12 had the best color; AF4552-5, NY152, AF5040-8, NY157 and MSV358-3 had acceptable color.

From the results of the 6 week reconditioning the noteworthy lines are: At Rock Springs, B2727-2, L7-2 (NY163), BNC470-16 and W9968-5 had the best color; Snowden, AF5040-8, AF5429-3, BNC364-1, NY157, AF5563-5, NDAF102629C-4, L8-12, Reba , MSR127-2, MSW485-2, MSX540-4, ACO1144-1W, AF5825-3, MSAFB609-5, MSAFB610-2, MSAFB635-3, NDAF12139C-2, AF5801-1, B3260-6, B3263-2, B3265-9, B3270-10, BNC623-2, BNC626-3 and BNC626-7 had acceptable color. At Northampton County, Atlantic, Snowden and NY152 had acceptable color. At Erie County, B2727-2 and L8-12 had the best color; Atlantic, Snowden, AF4552-5, NY152, MSR127-2, AF5040-8, NY157, MSV358-3 and W8822-1 had acceptable color.

From the results of the chipping directly from 45°F the noteworthy lines are: At Rock Springs, NY157, AF5563-5, NDAF102629C-4, NY 152, L7-2 (NY163), L8-12, MSR127-2, MSY111-1, ACO1144-1W, W9968-5, NDAF113490C-8, AF5825-3, MSAFB635-3, B3260-6 and B3270-10 had acceptable color. At Northampton County, NY152 had acceptable color. At Erie County, NY157 and MSV358-3 had the best color; Atlantic, Snowden, Norwis, B2727-2, NY152, MSR127-2 and L8-12 had acceptable color.

French fry Tests (Tables 5-8)
At Rock Springs, AF5164-19, AF5407-13, W9523-1rus, Mesa Russet, CO07015-4RU, A07769-4, COA11012-13, Dakota Russet, CO8065-2RU, CWO8071-2rus and WAF12060RUS-14 had the best French fry color. At Northampton County, Mesa Russet, ND8068-5RUS, Dakota Trailblazer and Dakota Russet had the best color. At Erie County, W9433-1RUS, ND8068-5RUS, Dakota Russet, Dakota TrailBlazer, CO07015-4RU and CO07049-1RU had the best color.

Tablestock Culinary Tests (Table 9-10)
Of the 113lines tested for culinary characteristics, only 7 were unacceptable for color and sloughing or soggy. All lines in early season evaluation trial except Primabella were acceptable for color and sloughing or soggy.

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, North Carolina State University, USDA Idaho, Colorado State University, University of Wisconsin, Michigan State University potato breeding programs and Parkland Seed Potato, Sunrain, Solanum International, HZPC companies provided seed. Special thanks to Bob Leiby and Andy Muza who made sure this project was completed.

Table 1. Chip color results of potato evaluation at Rock Springs, Centre County, 2017 - 2018.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Mar.[3]	Feb.[4]
Atlantic	1.096	7	6	7	8
Katahdin	1.076	10	9	7	10
Snowden	1.091	7	3	4	6
Superior	1.072	8	9	7	9
Yukon Gold[YF]	1.086	9	9	9	10
AF4138-8	1.070	9	7	7	8
AF4552-5	1.086	7	6	6	7
AF4648-2	1.089	7	4	6	7
AF5040-8[YF]	1.101	6	5	5	7
AF5225-1 $_{YF}$	1.081	10	10	9	10
AF5280-5	1.066	7	5	7	7
AF5429-3	1.069	7	5	5	6
B2869-29	1.099	7	6	7	8
B2904-2	1.088	5	5	6	6
BNC364-1	1.087	6	5	5	6
NY157	1.086	6	5	5	4
NY161[YF]	1.080	7	6	6	7
AF5450-7	1.089	8	7	6	7
AF5484-3[YF]	1.091	10	6	6	8
AF5563-5	1.085	6	5	5	4
NDAF102629C-4	1.078	5	3	4	5
B2727-2	1.099	5	4	3	6
B2869-28	1.085	8	7	7	8
B3145-22[YF]	1.068	9	7	7	8
B3148-12[YF]	1.076	10	7	8	8
B3156-2[YF]	1.083	8	8	8	8
B3168-3	1.085	7	6	6	6
BNC369-4	1.090	7	6	7	7
BNC470-13	1.093	7	4	6	6
NY149[YF]	1.075	8	8	7	8
NY 151	1.071	9	8	9	10
NY 152	1.086	4	3	6	5
L7-2 (NY163)	1.091	4	5	3	5
L8-12	1.089	4	4	5	4
Reba	1.072	6	6	5	6
MSR127-2	1.097	5	3	5	5
MSU161-1	1.078	10	8	8	9
MSV358-3	1.090	7	5	6	7
MSW485-2	1.095	7	5	4	7
MSX540-4	1.096	6	6	4	6
MSY111-1	1.076	6	5	6	5
MSZ219-14	1.084	6	6	7	7
W8822-1[YF]	1.095	6	5	6	6
W9576-11Y	1.065	8	7	9	8
W10564-19Y[YF]	1.075	10	10	9	10
ACO1144-1W	1.081	5	4	5	5
CO02024-9W	1.091	8	6	6	6
NDA081453CAB-2C	1.093	7	6	6	7
NC470-3	1.102	6	6	6	6
NC606-23[YF]	1.068	10	8	8	8

Table 1. Continued.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Mar.[3]	Feb.[4]
NC600-10[YF]	1.080	8	8	7	7
WAF10629-5	1.088	6	4	6	6
B3156-10	1.087	10	9	9	10
BNC470-16	1.077	6	5	3	6
MSW509-5	1.084	6	6	6	7
W9968-5	1.098	6	4	3	5
WAF10629-5	1.082	6	4	6	6
AF5658-6[YF]	1.085	7	6	6	6
AF5677-4	1.092	7	6	6	7
NDAF113490C-8	1.091	6	5	6	5
AF5819-6	1.094	7	6	6	7
AF5825-3	1.102	7	5	5	4
MSAFB609-5	1.093	6	6	4	6
MSAFB609-12	1.095	8	6	6	7
MSAFB610-2[YF]	1.089	8	6	5	7
MSAFB626-2	1.094	8	7	7	7
MSAFB635-3	1.090	6	3	4	5
NDAF12139C-2	1.087	6	4	5	6
AF5801-1	1.098	4	5	5	6
WAF13066-2	1.085	6	4	6	6
B3260-6	1.091	6	6	4	5
B3263-2	1.092	7	5	5	7
B3263-3	1.098	7	6	6	6
B3263-7	1.078	10	8	8	9
B3265-7	1.083	6	7	6	6
B3265-9	1.083	6	5	5	6
B3270-10	1.101	4	5	5	4
BNC623-2	1.088	7	5	5	6
BNC626-3	1.080	6	6	5	6
BNC626-7	1.090	6	4	5	6
BNC626-8	1.083	7	6	7	-
BNC648-1[YF]	1.085	7	7	6	7
BNC626-15	1.083	6	5	6	7

[1] Dec. = Stored at 55^0F from December 7, 2017 and chipped on December 12 - 13, 2017.
[2] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to chipping on February 12 - 13, 2018.
[3] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to chipping on March 7 - 8, 2018.
[4] Feb. = Stored at 45^0F from December 18, 2017 and chipped on February 26 - 27, 2018.

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

YF = Yellow Flesh

Table 2. Chip color results of potato evaluation in Northampton County, Garry Hunsicker Farm, 2017 - 2018.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Mar.[3]	Feb.[4]
Atlantic	1.090	3	4	5	6
Snowden	1.078	3	4	5	6
Superior	1.065	7	-	-	-
Yukon Gold[YF]	1.070	7	-	-	-
Norwis[YF]	1.055	5	5	6	7
AF4138-8	1.058	7	6	7	10
AF4552-5	1.073	5	6	6	7
AF5225-1	1.065	9	10	9	9
NY149[YF]	1.068	6	7	6	8
NY151	1.058	9	8	9	9
BNC369-4	1.078	5	7	7	8
B2727-2	1.088	3	6	6	6
NY152	1.079	3	4	5	4
MSR127-2	1.082	5	6	6	6
NDAO81453CAB-2C	1.081	4	7	7	7
B3148-12[YF]	1.072	5	8	7	7

[1] Dec. = Stored at 55^0F from November 30, 2017 and chipped on December 11, 2017.
[2] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to chipping on February 14, 2018.
[3] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to chipping on March 5, 2018.
[4] Feb. = Stored at 45^0F from December 18, 2017 and chipped on February 28, 2018.

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

YF = Yellow Flesh

Table 3. Chip color results of potato evaluation in Erie County, Mark Troyer Farm, 2017 - 2018.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Mar.[3]	Feb.[4]
Atlantic	1.085	4	6	4	5
Snowden	1.082	3	3	5	4
Superior	1.068	4	-	-	-
Yukon Gold[YF]	1.078	6	-	-	-
Norwis[YF]	1.066	5	7	6	5
AF4138-8	1.064	6	7	7	7
AF4552-5	1.076	5	5	4	6
AF5225-1	1.071	7	8	7	7
NY149[YF]	1.070	6	8	7	8
NY151	1.059	7	10	8	10
BNC369-4	1.082	5	7	6	6
B2727-2	1.084	3	3	3	4
NY152	1.078	4	5	5	4
MSR127-2	1.085	3	3	4	4
AF5040-8	1.086	4	4	4	6
NY157	1.075	3	5	5	3
L8-12	1.078	3	3	3	5
MSV358-3	1.076	4	5	4	3
W8822-1[YF]	1.084	4	6	5	7

[1] Dec. = Stored at 55^0F from November 30, 2017 and chipped on December 11, 2017.
[2] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to chipping on February 14, 2018.
[3] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to chipping on March 5, 2018.
[4] Feb. = Stored at 45^0F from December 18, 2017 and chipped on February 28, 2018.

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

YF = Yellow Flesh

Table 4. Chip color results of NE1231 potato evaluation at Rock Springs, Centre County, 2017 - 2018.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Feb.[3]	Feb.[4]
Atlantic	1.096	7	6	7	8
Katahdin	1.076	10	9	7	10
Snowden	1.091	7	3	4	6
Superior	1.072	8	9	7	9
Yukon Gold[YF]	1.086	9	9	9	10
AF4138-8	1.070	9	7	7	8
AF4552-5	1.086	7	6	6	7
AF4648-2	1.089	7	4	6	7
AF5040-8[YF]	1.101	6	5	5	7
AF5225-1[YF]	1.081	10	10	9	10
AF5280-5	1.066	7	5	7	7
AF5429-3	1.069	7	5	5	6
B2869-29	1.099	7	6	7	8
B2904-2	1.088	5	5	6	6
BNC364-1	1.087	6	5	5	6
NY157	1.086	6	5	5	4
NY161[YF]	1.080	7	6	6	7

[1] Dec. = Stored at 55^{0}F from December 7, 2017 and chipped on December 12 - 13, 2017.
[2] Feb. = Stored at 45^{0}F from December 18, 2017 than transferred to 55^{0}F three weeks prior to chipping on February 12 - 13, 2018.
[3] Mar. = Stored at 45^{0}F from December 18, 2017 than transferred to 55^{0}F six weeks prior to chipping on March 7 - 8, 2018.
[4] Feb. = Stored at 45^{0}F from December 18, 2017 and chipped on February 26 - 27, 2018.

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

YF = 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 at Rock Springs Plant Pathology Farm, 2017.

Variety/ Line	Yield (cwt/A) [1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec.[5]	Feb.[6]	Mar.[7]
Russet Burbank	511	187	59	62	1.086	2	2	2
Russet Norkotah	440	317	100	25	1.071	1	2	3
Caribou Russet	410	226	71	44	1.084	2	1	1
AF4296-3	525	304	96	40	1.087	1	0	00
AF4615-5	467	317	100	31	1.095	3	1	1
ND8068-5Russ	292	242	76	13	1.082	1	0	0
AF5164-19	525	219	69	57	1.077	0	0	0
AF5179-4	372	189	59	47	1.095	0	1	0
AF5407-13	502	367	116	25	1.087	0	0	0
AF5468-5	446	295	93	30	1.083	2	1	1
WAF10073-3RUS	466	201	64	55	1.076	2	2	2
W9133-1rus	420	207	65	49	1.072	1	1	2
W9433-1rus	525	277	87	46	1.080	2	1	0
W9523-1rus	474	267	84	41	1.081	0	0	00
Mesa Russet	388	250	79	31	1.078	0	0	0
CO07015-4RU	305	208	66	20	1.075	0	0	0
CO8231-1RU	442	236	74	43	1.087	0	1	0
A07098-4	390	253	80	30	1.090	1	2	1
A07705-4	593	368	116	35	1.078	1	1	1
A07769-4	440	270	85	35	1.086	00	0	00
A08422-2VR	558	334	105	38	1.084	2	2	2
A08422-4VRsto	439	304	86	29	1.083	1	1	1
A11194-1	452	261	82	40	1.079	1	0	0
A10595-13VRsto	426	234	74	40	1.076	0	0	1
COA11012-13	524	261	82	45	1.092	00	00	00
Dakota Russet	354	175	55	48	1.088	00	00	00
Dakota Trialblazer	301	180	57	37	1.104	0	1	0
Targhee Russet	344	219	69	34	1.084	0	0	1
Non Rep								
Russet Norkotah*	494	351	111	27	1.071	1	2	3
AF5071-2*	606	395	124	33	1.093	1	0	0
AF5312-1*	490	282	89	39	1.077	1	1	1
CO07049-1RU*	248	176	56	23	1.080	0	1	1
CO8065-2RU*	227	106	33	35	1.090	0	0	0
CWO8071-2rus*	443	263	83	38	1.088	0	0	0
CWO8221-5rus*	433	318	100	23	1.070	1	1	1
AF4872-2*	487	149	47	68	1.088	0	0	1
AAF08434-1*	368	182	57	39	1.083	0	0	1
WAF10612-1*	706	461	145	32	1.090	1	0	0
AF5599-5*	561	409	129	22	1.094	2	1	1
AF5613-3*	534	251	79	49	1.079	0	1	1
AF5628-2*	438	201	64	50	1.073	1	2	1
AF5644-8*	514	384	121	19	1.087	1	2	2
AF5651-23*	436	240	76	37	1.086	1	1	1
WAF12060RUS-14*	447	290	92	31	1.092	0	0	0
COAF11018-7*	351	190	60	37	1.088	1	2	2
COAF11018-10*	356	193	61	40	1.090	1	2	1
COAF11112-10*	456	334	105	20	1.073	2	2	2
COAF11112-13*	472	305	96	33	1.070	0	1	0

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

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

[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from December 7, 2017 and fried on December 14 - 15, 2017.
[6] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to frying on February 19 - 20, 2018.
[7] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to frying on March 12 - 13, 2018.

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

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, Garry Hunsicker Farm 2017.

Variety/ Line	Yield (cwt/A) [1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec.[5]	Feb.[6]	Mar.[7]
Atlantic	258	223	100	2	1.090	-	-	-
Mesa Russet*	285	158	71	29	1.059	0	0	0
ND8068-5RUS*	235	176	79	5	1.083	00	00	0
Dakota TrailBlazer*	281	207	93	18	1.092	00	00	00
Dakota Russet*	245	193	86	9	1.075	0	0	0
Norkotah Russet*	369	252	113	23	1.064	1	1	0

[1] Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.
[2] Percentage of the standard, Atlantic for >1 7/8" yield.
[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from November 30, 2017 and fried on December 15, 2017.
[6] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to frying on February 20, 2018.
[7] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to frying on March 12, 2018.

Non – replicated trial.
*= Russets and long whites 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.

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 2017.

Variety/ Line	Yield (cwt/A) [1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec.[5]	Feb.[6]	Mar.[7]
Atlantic	333	289	100	7	1.085	-	-	-
W9133-1RUS*	317	199	69	30	1.060	0	1	1
W9433-1RUS*	339	223	77	33	1.079	00	0	0
ND8068-5RUS*	239	162	56	23	1.080	00	00	00
Dakota Russet*	239	132	46	37	1.074	00	0	00
Dakota TrailBlazer*	320	246	85	20	1.093	00	00	00
CO07015-4RU*	219	105	36	13	1.067	0	00	00
CO07049-1RU*	316	256	89	10	1.080	0	00	00
A07705-4*	533	350	121	32	1.072	0	1	1
A08422-2VR*	389	255	88	32	1.075	0	1	1
Norkotah Russet*	218	90	31	54	1.065	1	0	1

[1] Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.
[2] Percentage of the standard, Atlantic for >1 7/8" yield.
[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from November 30, 2017 and fried on December 15, 2017.
[6] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to frying on February 20, 2018.
[7] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to frying on March 12, 2018.

Non – replicated trial.
*= Russets and long whites 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.

Table 8. Total yield, greater than 1 7/8" yield, specific gravity, and French fry color for russet skinned or long white NE1231 potato evaluation trial at Rock Springs Plant Pathology Farm, 2017.

Variety/ Line	Yield (cwt/A) [1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec.[5]	Jan.[6]	Feb.[7]
Russet Burbank	511	187	59	62	1.086	2	2	2
Russet Norkotah	440	317	100	25	1.071	1	2	3
Caribou Russet	410	226	71	44	1.084	2	1	1
AF4296-3	525	304	96	40	1.087	1	0	00
AF4615-5	467	317	100	31	1.095	3	1	1
ND8068-5Russ	292	242	76	13	1.082	1	0	0

[1] Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.
[2] Percentage of the standard, Russet Norkotah for >1 7/8" yield.
[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from December 7, 2017 and fried on December 14 - 15, 2017.
[6] Feb. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F three weeks prior to frying on February 19 - 20, 2018.
[7] Mar. = Stored at 45^0F from December 18, 2017 than transferred to 55^0F six weeks prior to frying on March 12 - 13, 2018.

Replicated trials are the average of 4 replicates

Table 9. Baking, boiling, microwaving results of tablestock test for Germplasm evaluation trial in Rock Springs, Plant Pathology Farm, 2017.

Variety/ Line	Boil[1] Color[3]	Texture[4]	Sloughing[5]	Microwave[2] Color	Texture
Atlantic	1	2	-	1	1
Katahdin	1	3	-	1	2
Snowden	1	2	-	1	2
Superior	1	3	-	1	2
Yukon Gold[YF]	3	2	-	3	1
AF4138-8	1	3	-	1	2
AF4552-5	1	3	-	1	1
AF4648-2	1	2	-	1	2
AF5040-8[YF]	3	2	-	3	2
AF5225-1[YF]	2	2	-	1	3
AF5280-5	1	3	-	1	2
AF5429-3	2	2	1	1	1
B2869-29	1	2	-	1	2
B2904-2	1	2	-	1	2
BNC364-1	1	3	-	1	2
NY157	1	3	-	1	2
NY161[YF]	3	2	-	3	2
AF5450-7	1	2	-	1	1
AF5484-3	1	2	-	1	1
AF5563-5	1	2	-	1	2
NDAF102629C-4	1	3	-	1	2
WAF12065-8	1	2	-	1	2
B2727-2	1	2	-	1	1
B2869-28	1	2	-	1	2
B3145-22[YF]	3	3	-	3	4
B3148-12[YF]	3	3	-	3	2
B3156-2[YF]	2	2	-	2	3
B3156-10	1	2	-	1	2
B3168-3	1	2	-	1	2
BNC369-4	1	3	-	1	2
BNC470-13	1	2	-	1	2
BNC470-16	1	2	-	1	1
NY149[YF]	3	3	-	3	2
NY 151	1	3	-	1	3
NY 152	1	2	-	1	1
L7-2 (NY163)	1	2	-	1	2
L8-12	1	2	1	1	3
Reba	1	3	-	1	2
MSR127-2	1	2	-	1	2
MSU161-1	1	3	-	1	2
MSV358-3	1	2	-	1	2
MSW485-2	1	2	-	1	2
MSW509-5	1	2	-	1	2
MSX540-4	1	2	-	1	2
MSY111-01	1	2	-	1	3
MSZ219-14	1	3	-	1	3
W8822-1YF	2	3	-	2	2
W9576-11Y[YF]	3	3	-	3	3
W9968-5	1	2	-	1	1
W10564-19YYF	3	3	-	3	2

Table 9. Continued

Variety/ Line	Boil[1] Color[3]	Texture[4]	Sloughing[5]	Microwave[2] Color	Texture
ACO1144-1W	1	2	-	1	2
CO02024-9W	1	2	-	1	1
NDA081453CAB-2C	1	2	1	1	1
NC470-3	1	2	1	1	1
NC606-23[YF]	3	2	-	3	3
NC600-10[YF]	3	2	-	3	2
Connect[YF]	3	2	-	3	2
Toscana[YF]	3	3	-	3	2
Reds					
Chieftain	1	2	-	1	3
Dark Red Norland	1	3	-	1	3
AF4831-2	1	3	-	1	2
AF5245-1	1	2	-	1	3
AF4659-12[YF]	3	2	-	3	2
AF4985-1	1	3	-	1	3
NDAF102691B-7	1	3	-	1	2
NDAF113484B-1	1	3	-	1	2
BNC201-1[YF]	2	2	-	2	2
L26-2 (NY164)	2	3	-	2	3
MSX324-1P	1	2	-	1	2
Villetta Rose	1	3	-	1	2
W10209-2R[YF]	1	3	-	1	4
N10114-3R	2	2	-	1	2
Colorado Rose	1	2	-	1	1
Elmo	1	3	-	1	3
Fenway Red	1	2	-	1	3
Russets					
Russet Burbank	1	3	-	1	1
Russet Norkotah	1	2	-	1	1
Caribou Russet	1	2	-	1	1
AF4296-3	1	2	-	1	2
AF4615-5	2	3	-	1	1
ND8068-5Russ	1	3	-	1	1
AF5071-2	1	2	-	1	2
AF5164-19	1	3	1	1	1
AF5179-4	2	2	-	1	1
AF5312-1	1	3	-	1	1
AF5407-13	1	2	-	1	1
AF5468-5	1	3	-	1	1
WAF10073-3RUS	1	3	-	1	2
W9133-1rus	1	3	1	1	2
W9433-1rus	2	3	-	1	2
W9523-1rus	1	3	-	1	2
Mesa Russet	1	2	-	1	1
CO07015-4RU	1	2	-	1	2
CO07049-1RU	1	2	-	1	2
CO8065-2RU	1	2	1	1	1
CO8231-1RU	1	2	1	1	2
CWO8071-2rus	1	2	-	1	2
CWO8221-5rus	1	3	-	1	2
A07098-4	1	2	-	1	1

Table 9. Continued

Variety/ Line	Boil[1] Color[3]	Texture[4]	Sloughing[5]	Microwave[2] Color	Texture
A07705-4	1	2	-	1	1
A07769-4	1	2	-	1	1
A08422-2VR	1	3	-	1	1
A08422-4VRsto	1	3	-	1	1
A11194-1	1	2	-	1	1
A10595-13VRsto	1	3	-	1	2
COA11012-13	1	3	-	1	1
Dakota Russet	1	2	-	1	1
Dakota Trialblazer	1	2	-	1	1
Targhee Russet	1	3	-	1	1
Barcelona[YF]	3	2	-	3	2
Belmonda	3	2	-	3	1

Tested: January 29 - 25, 2018 thru February 15, 2018
[1] Boil 20 minutes.
[2] Microwave 4 – 8 minutes.
[3] Color scored as follows: 1=white, 2=slightly yellow, 3=yellow, 4=white with gray edges, 5=gray with dark edges.
[4]Texture scored as follows: 1=dry (mealy, 3= medium, 5=soggy.
[5]Sloughing scored as follows: 1=some sloughing, 2= severe sloughing.

YF = Yellow Flesh

Table 10. Baking, boiling, microwaving results of tablestock test for Early Season evaluation trial in Rock Springs, Plant Pathology Farm, 2017.

Variety/ Line	Boil[1] Color[3]	Texture[4]	Sloughing[5]	Microwave[2] Color	Texture
Superior	1	3	-	1	2
Dark Red Norland	1	3	-	1	3
NY149[YF]	3	3	-	3	2
AF5215-2[YF]	3	2	-	3	2
AF5414-1	*	3	-	*	3
NDAF102573-2	1	3	-	1	2
AF5533-2	1	2	-	1	2
AF5633-2	P	3	-	P	3
NDAF113458-2	1	3	-	1	3
B2152-17[YF]	3	3	-	3	3
Lilly[YF]	3	3	-	3	3
Belmonda[YF]	3	3	-	3	2
Smart[YF]	3	3	-	3	2
Nobless[YF]	3	3	-	3	2
Colomba[YF]	3	3	-	3	2
Primabella[YF]	3	4	-	3	4
Viviana[YF]	3	3	-	3	2
Julinka[YF]	3	3	-	3	2
Oriana[YF]	3	2	-	3	3
Noelle[YF]	3	3	-	3	3
Erika[YF]	3	3	-	3	2
Musica[YF]	3	3	-	3	3
Fioretta[YF]	3	3	-	3	2
Queen Anne[YF]	3	3	-	3	3
Laperla[YF]	3	3	-	3	3
Montreal	2	3	-	2	2
Red Apple[YF]	3	3	-	3	2
NY150	1	3	-	-	-
Anouk[YF]	3	3	-	3	2
Yellow Star[YF]	3	3	-	3	2
AC97521-1R/Y[YF]	3	3	-	3	3
CO05037-3W/Y[YF]	3	3	-	3	3
AF4831-2	1	3	-	1	3
B3156-2[YF]	3	3	-	3	3
B3168-3	1	3	-	1	3
Colorado Rose	1	3	-	1	2

Tested: January 23 - 25, 2018
[1] Boil 20 minutes.
[2] Microwave 4 – 8 minutes.
[3] Color scored as follows: 1=white, 2=slightly yellow, 3=yellow, 4=white with gray edges, 5=gray with dark edges.
[4]Texture scored as follows: 1=dry (mealy, 3= medium, 5=soggy.
[5]Sloughing scored as follows: 1=some sloughing, 2= severe sloughing.

YF = Yellow Flesh
* = Red flesh
P = Purple flesh

Yellow Flesh Notes

We rated the yellow flesh in March.
We used Yukon Gold that was grown at Rock Springs

Scale:
YF1 - lighter than Yukon Gold
YF2 – equal to Yukon Gold
YF3 - darker than Yukon Gold

	YF 1	YF 2	YF 3
Rock Springs Germplasm Trial	AF5225-1	AF5040-8	AF4659-12 (red skin)
	W10209-2R	AF5658-6	NY161
		MSAFB610-2	BNC201-1 (red skin)
		NY149	NC600-10
		B3145-22	W9576-11Y
		B3148-12	W10564-19Y
		B3156-2	Connect
		BNC648-1	Toscana
		NC606-23	
		W8822-1	
		Barcelona	
		Malou	

Purple Flesh Variety
MSAB607-4 (Purple skin)
Not solid purple flesh, had white streak in middle of tuber