Pennsylvania Potato Research Report, 2010

Department of Plant Pathology

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EXECUTIVE SUMMARY

Penn State's Department of Plant Pathology 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 trials included 88 round whites with a few yellow flesh, 38 red-skinned (a few purple skinned) and 38 russet or long white types. The Lehigh location had 59 lines. The Erie location had 51 lines and 32 specialty lines. Breeding lines were contributed by the USDA-ARS, New York, Maine, Michigan, Colorado, North Carolina, Idaho and a few other sources. See **Progress report - Pennsylvania Regional Potato Germplasm Evaluation Program, 2010 on pages 1-2 and tables from different locations on pages 3-30, and supplemental progress report on pages 36-37 and tables from different locations on pages 38-53.**

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 common and 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, 76, 34 and 35 varieties and advanced breeding lines were evaluated for disease resistance to late blight, early blight, and powdery scab, respectively.

Kennebec was considered the moderately resistant check and B0718-3 was the resistant check to late blight. NYD40-50, AF3317-15, Yukon Gem, AF2574-1, NYD40-263, NYD40-35, Premier Russet (A93157-6LS), Classic Russet (A95109-1), MSQ176-5, AWN86514-2, MSQ070-1, B0692-4, AF4121-3, A00286-3Y, LBR1R2R3R4, A00324-1, AF4191-2, AF3317-15, LBR7, AF4122-3, MSM182-1, AC99375-1RU, OR03029-2, ND03036B-2R, NY140, and AF2574-1 were resistant to moderately resistant. See **Evaluation of potato cultivars and breeding lines for resistance to late blight, 2010 page 31.**

Nine cultivars/lines were classified as moderately resistant to early blight, and they were: AF3317-15, Russet Burbank (#400), Premier Russet (A93157-6LS), Alpine Russet (A9305-10), AF2865-4, Classic Russet (A95109-1), Yukon Gem, Kennebec, and NYD40-50. See **Evaluation of potato cultivars and breeding lines for resistance to early blight, 2010 page 32.**

This summer was unusually hot and dry and the powdery scab disease pressure was very low thus making it difficult to separate cultivars/lines into groups. Based on our past years' data, Kennebec and Shepody should be susceptible, and RioGrande Russet, Russet Norkotah and Russet Burbank should be moderately resistant. Cultivars and breeding lines with less powdery scab than Dark Red Norland indicate some level of resistance. See **Evaluation of potato cultivars and breeding lines for resistance to powdery scab, 2010 page 33.**

3. Chemical Control of Potato Diseases

In the late blight fungicide trial 12 different treatments were compared to an untreated control. All of the treatments, except for treatment with PM314 alternated with PM315, significantly suppressed season-long foliar late blight compared to the untreated control. See **Evaluation of fungicides for control of potato late blight, 2010 pages 34.**

In the early blight fungicide trial 7 different treatments were compared to an untreated control. All treatments significantly reduced season-long early blight compared to the untreated control. See **Evaluation of fungicides for control of potato early blight, 2010 pages 35.**

Progress Report—December 16, 2010

Pennsylvania Regional Potato Germplasm Evaluation Program, 2010

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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 plots were established at the following locations: Lehigh Co. (Tables 1, and 2), Erie Co. (Tables 3, 4 & 5) and Rock Springs, Centre Co. (Tables 6-13). The Lehigh location had 20 lines with four replications, 39 lines non-replicated. The Erie location had 20 lines with four replications, 31 lines non-replicated and 32 non-replicate specialty lines. At the Rock Springs location the trials included 69 round whites with a few yellow flesh, 35 red-skinned (a few purple skinned) and 24 russet or long white types in replicated plots, and an additional 19 whites, 3 red-skinned and 14 russet or long white types planted in non-replicated observational plots. The seed spacing was 8-inch within a 10-ft plot except for the russets that were at 10-inch. At the Rock Springs location, a mustard green manure crop was grown and incorporated into the field the previous year. After the wheat harvest, the mustard variety 'Caliente 119' was planted on 28 July 2009. On 14 Sep 2009, the mustard crop was flail chopped and plowed down to incorporate. The field was irrigated with 1.1 in of water on 15 Sep 2009 and the potato crop was planted the following spring. All other pertinent information for individual trials is found within the data tables or in Table 14. We assessed yield, internal defects and external defects, skin color, texture, tuber shape, specific gravity and overall appearance. Vine maturity was assessed for the Rock Springs plots only (Table 6, 8, 10 & 12). Chip quality tests and culinary tests will be conducted over the next few months. The spring was wet followed by hot and dry conditions across the state for most of the growing season. Management information for each site is provided in Table 14.

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:

Across the three trials there were only a few varieties and lines in common. Of those in common the following had high yields relative to Atlantic yield in each of the locations. These varieties or lines were: Snowden, Reba, Lehigh, NY139, NY141, B13-1, and NDA7985-1R.

In the Lehigh location the following lines also had high yield: NY140, NY146, NY147, AF0338-17, and Katahdin. In Erie Co. the following also had high yields: NY138, NY140, NY146, B1992-106, F11-1, Ambra, Rodeo, and W6002-1R.

Based on data of replicated trials at Rock Springs, there were 2 round white clones with marketable yields significantly greater than Atlantic: G73-1 and G4-2; there were another 15 round white clones with marketable yields greater than Atlantic. However, any clone with marketable yield between 227-525cwt is not statistically different than yield of Atlantic.

Round White Chip-stock:
Based on data from replicated trials at Rock Springs, the following lines had higher yields than Atlantic and have specific gravities suitable for chipstock: Snowden, NY139, G27-1, and G89-2.

Round White Tablestock:
Based on data from replicated trials at Rock Springs, the following lines had higher yields than Atlantic and had specific gravities suitable for tablestock: Superior, AF2865-4, AF4047-2, NYD40-263, Lehigh, Reba, NY141, F11-1, G4-2, G73-1, and G101-2.

Red-skinned:
Based on data of replicated trials at Rock Springs, there were 1 red-skinned or purple-skinned clones with marketable yields significantly greater than Chieftain: NDA7985-1R; there were another 4 red-skinned or purple-skinned clones with marketable yields greater than Chieftain: Rodeo, CO99256-2R, B1816-5 and B13-1. Any clone with marketable yield between 355-564cwt is not statistically different from the yield of Chieftain.

Russet-skinned or long white:
Based on data of replicated trials at Rock Springs, there were 2 russet-skinned clones with marketable yields significantly greater than Russet Norkotah #3117: Classic Russet (A95109-1) and AF3001-6; there were another 2 russet-skinned clones with marketable yields greater than Russet Norkotah #3117: Rio Grande Russet and AF3327-28. Any clone with marketable yield between 255-399cwt is not statistically different from the yield of Russet Norkotah #3117.

The Pennsylvania Potato Research Program and a USDA grant 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.). Many of the pesticides used at Rock Springs location were donations from numerous chemical companies. The New York, USDA, Maine, Wisconsin, Idaho, Colorado, Michigan and Canada breeding programs provided seed. Special thanks to Chad Moore, Bob Leiby, Andy Muza, and Sara May 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 Lehigh County, Country View Farm, 2010

Variety/Line	Yield (cwt/A)[1]		%	%	% by size class[3]				%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	of Standard[2]	2	3	4	5		
Atlantic	293	258	88	100	39	43	6	0	3	1.078
Snowden	379	328	86	127	44	37	5	0	1	1.077
Reba	498	447	90	174	33	48	8	0	4	1.075
Chieftain	422	235	56	91	34	20	2	0	36	1.060
Superior	318	233	73	91	45	29	0	0	19	1.063
Russet Norkotah	131	88	66	34	59	5	2	0	6	1.055
Lehigh[yf]	363	313	86	122	28	51	7	1	8	1.068
NY138	251	219	87	85	49	36	2	0	2	1.071
NY139	388	343	88	133	48	39	1	0	3	1.081
NY140	325	277	85	107	55	29	1	0	1	1.064
NY141	395	347	88	135	45	39	4	0	5	1.072
NY145	191	105	54	41	46	8	0	0	0	1.068
NY146	348	330	95	128	38	44	12	0	0	1.073
NY147	392	351	89	136	38	42	9	0	4	1.067
B13-1	382	260	68	101	50	16	1	0	16	1.051
E43-10	354	169	48	65	42	5	0	0	4	1.059
B2152-17[yf]	272	169	62	66	51	11	0	0	4	1.067
AF0338-17	330	294	89	114	41	42	6	0	3	1.072
AF3001-6	356	177	49	69	27	17	5	0	41	1.080
Modoc	326	226	69	88	51	18	0	0	3	1.058
Dark Red Norland*	264	181	69	70	52	17	0	0	14	1.052
NDA7985-1R*	440	371	84	144	37	41	6	0	5	1.060
F36-3*	307	246	80	96	71	10	0	0	0	1.062
Red Scarlett*	354	134	38	52	29	9	0	0	39	1.052
Rodeo*	309	113	37	44	34	2	0	0	27	1.058
B2676-2*	209	142	68	55	60	8	0	0	4	1.079
BCO01044-2*[pur]	266	187	70	73	36	30	4	0	19	1.058
BCO01306-2*[pk]	266	128	48	50	40	8	0	0	17	1.060
MSJ147-1*	64	12	20	5	20	0	0	0	0	1.056
B1992-106*	217	160	74	62	48	26	0	0	6	1.066
AO1143-3C*	326	126	39	49	31	7	0	0	36	1.068
W2978-3*	207	118	57	46	51	7	0	0	8	1.063
Katahdin*	368	279	76	108	50	20	6	0	12	1.063
Yukon Gold*[yf]	212	154	73	60	43	25	5	0	17	1.060

Variety/Line	Yield (cwt/A)[1]		%	%	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	of Standard[2]	2	3	4	5		Gravity
F11-1*[yf]	318	201	63	78	63	0	0	0	5	1.067
Sylvana*[yf]	304	168	55	65	33	19	3	0	19	1.054
Ambra*[yt]	204	31	15	12	15	0	0	0	68	1.050
B2628-10*	207	171	83	66	45	33	4	0	0	1.069
AC96052-1RU*	118	41	35	16	26	9	0	0	30	1.065
Mesa Russet*	165	111	67	43	44	23	0	0	23	1.066
Classic Russet*	245	179	73	70	23	44	6	0	21	1.061
Clearwater Russet*	157	40	25	15	22	3	0	0	47	1.071
Rio Grande Russet*	177	100	56	39	41	15	0	0	23	1.067
W2609-1R*	221	173	78	67	50	18	9	0	6	1.053
W6002-1R*	313	165	53	64	38	15	0	0	27	1.057
Purple Majesty*[pur]	306	166	54	64	40	5	9	0	10	1.070
Adirondack Blue*[pur]	313	171	55	66	40	15	0	0	23	1.065
Adirondack Red*[pk]	290	76	26	30	26	0	0	0	33	1.061
CO97227-2P/W*[pur]	284	87	31	34	31	0	0	0	19	1.080
A99331-2RY*[yf]	172	27	16	11	16	0	0	0	8	1.060
F7-1*[yf]	185	90	49	35	36	13	0	0	32	1.053
G1-17*	140	12	8	5	8	0	0	0	36	1.064
G1-11*[yf]	80	9	11	3	11	0	0	0	45	1.053
W2717-5*	159	66	42	26	42	0	0	0	19	1.065
AF2291-10*	353	148	42	58	23	19	0	0	53	1.086
A00293-2Y*[yf]	110	30	27	12	23	5	0	0	4	1.049
CO95172-3RU*	212	83	39	32	23	7	9	0	39	1.080
W6234-4rus*	304	135	45	52	21	16	7	0	46	1.076
A01010-1*	360	144	40	56	20	16	5	0	48	1.072
LSD	59	59	8		11	10	5	1	6	

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

[2]Percentage of the standard, 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.

Replicated trials are the average of 4 replicates except for those lines with * which were non-replicated.

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

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

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 2. Tuber characteristics, internal and external defects for potato evaluation trial in Lehigh County, Country View Farm, 2010

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Atlantic	4	6	5	2	4	6	0	2	1	0	1	1	1	0	0	0
Snowden	4	6	5	2	4	5	1	1	2	0	0	1	1	0	0	0
Reba	4	6	6	3	5	5	2	0	0	0	0	0	1	0	0	0
Chieftain	4	3	6	3	5	5	0	0	1	0	2	2	1	0	0	3
Superior	4	7	6	3	6	5	0	0	1	0	1	0	1	0	0	0
Russet Norkotah	5	5	3	4	6	5	0	0	1	0	0	0	0	0	0	0
Lehigh[yf]	5	6	6	2	6	6	0	0	1	0	0	0	1	0	1	0
NY138	5	7	7	2	7	6	0	0	0	0	0	0	1	0	0	0
NY139	4	6	6	3	5	5	0	1	1	0	0	0	1	0	0	0
NY140	5	7	6	2	6	6	0	0	0	0	0	0	1	0	0	0
NY141	5	6	6	2	5	5	0	1	1	0	0	0	2	0	0	0
NY145	6	7	7	2	5	6	0	0	0	0	0	0	0	0	0	0
NY146	5	6	6	2	5	6	1	2	1	0	1	0	1	0	0	0
NY147	4	7	6	3	5	5	0	0	0	0	0	0	0	0	0	0
B13-1	4	2	7	3	6	5	0	0	1	0	1	0	0	0	1	1
E43-10	5	7	8	2	7	6	0	0	2	0	0	0	1	0	2	0
B2152-17[yf]	5	2	6	2	7	6	0	0	1	0	0	0	1	0	2	0
AF0338-17	5	6	5	2	5	5	0	0	1	0	1	0	1	0	0	0
AF3001-6	4	6	6	3	6	5	0	0	1	0	0	1	0	0	0	0
Modoc	5	2	7	2	6	6	0	0	2	0	0	0	0	0	0	0
Dark Red Norland*	5	2	7	2	5	5	0	1	0	0	0	0	0	0	0	1
NDA7985-1R*	4	2	7	3	5	5	0	0	2	0	0	1	1	0	0	0
F36-3*	5	2	6	2	6	6	0	0	0	0	0	0	0	0	0	0
Red Scarlett*	3	3	7	3	6	5	0	0	1	0	1	1	1	0	1	1
Rodeo*	3	3	8	3	7	5	0	0	1	0	0	0	0	0	2	0
B2676-2*	5	2	6	2	6	5	0	0	1	0	0	0	0	0	0	0
BCO01044-2*[pur]	4	1	7	3	6	5	0	0	1	0	1	0	0	0	0	0
BCO01306-2*[pk]	5	2	7	2	5	5	0	0	1	0	1	0	2	0	2	1
MSJ147-1*	5	8	7	2	6	5	0	0	0	0	0	0	0	0	0	0
B1992-106*	5	6	5	2	7	7	0	0	2	0	0	0	0	0	0	0
AO1143-3C*	3	7	7	3	6	5	0	0	2	0	0	1	1	0	0	3
W2978-3*	5	7	6	2	6	6	0	0	1	0	0	0	0	0	0	0
Katahdin*	4	8	7	3	6	5	0	0	1	0	0	0	1	0	0	1
Yukon Gold*[yf]	5	7	7	2	5	6	0	0	1	0	1	0	0	0	0	0
F11-1*[yf]	5	6	6	2	7	5	0	0	1	0	0	0	0	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Sylvana*[yf]	5	7	6	2	6	5	0	0	1	0	1	0	0	0	0	2
Ambra*[yf]	4	7	7	3	7	6	0	0	2	0	0	0	0	0	0	1
B2628-10*	5	6	5	2	6	6	0	0	1	0	0	0	0	0	0	0
AC96052-1RU*	5	5	3	4	7	5	0	0	1	0	0	0	0	0	0	1
Mesa Russet*	4	6	1	4	5	5	0	0	1	0	0	0	0	0	0	0
Classic Russet*	4	6	4	4	7	5	0	0	0	0	1	0	0	0	0	0
Clearwater Russet*	4	5	4	4	6	5	0	0	1	0	1	0	0	0	0	0
Rio Grande Russet*	5	6	3	4	6	4	0	0	0	0	1	0	0	0	0	0
W2609-1R*	5	2	7	2	6	6	0	1	0	0	0	0	2	0	0	0
W6002-1R*	5	2	7	2	7	5	0	0	1	0	0	0	1	0	0	0
Purple Majesty*[pur]	4	1	6	3	6	5	0	0	1	0	0	0	0	0	0	1
Adirondack Blue*[pur]	4	1	6	3	6	5	0	0	0	0	0	0	0	0	0	1
Adirondack Red*[pk]	4	2	6	3	6	4	0	0	1	0	0	0	0	0	0	1
CO97227-2P/W*[pur]	4	1	8	3	7	5	0	0	0	0	0	0	0	0	0	1
A99331-2RY*[yf]	6	2**	8	2	5	7	0	0	0	0	0	0	0	0	0	0
F7-1*[yf]	5	2**	7	2	6	5	0	0	0	0	0	0	1	0	1	1
G1-17*	4	2	7	3	7	5	0	0	0	0	0	0	0	0	0	0
G1-11*[yr]	4	7	7	4	7	5	0	0	0	0	0	0	1	0	0	0
W2717-5*	5	7	6	2	6	5	0	0	1	0	0	0	0	0	0	0
AF2291-10*	3	7	6	2	5	5	0	0	1	0	0	0	1	0	0	0
A00293-2Y*[yf]	6	7	7	2	7	5	0	0	1	0	0	0	0	0	0	1
CO95172-3RU*	4	6	4	4	6	5	0	0	2	0	0	0	1	0	0	0
W6234-4rus*	4	6	6	4	6	5	0	0	2	0	0	0	0	0	0	0
A01010-1*	4	5	5	4	6	4	0	0	0	0	0	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. Total number observed out of 16 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.

2** = Red skin with white splotchs.

Table 3. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pick outs and specific gravity for specialty potato evaluation trial in Erie County, Mark Troyer Farm, 2010

Variety/Line	Yield (cwt/A)[1]		%	%	% by size class[3]				Notes
	Total	>1 7/8"	US#1	of Standard[2]	2	3	4	5	
Dark Red Norland	174	142	81	100	53	28	0	0	
Yukon Gold	211	193	92	136	33	40	19	0	
Reba	106	78	74	55	53	12	8	0	
Rodeo	143	85	59	60	56	3	0	0	Red, yellow flesh. Retail/Salad
Ambra	190	113	60	80	53	7	0	0	White, yellow flesh. Retail/Salad
Red Scarlett	177	72	41	51	41	0	0	0	Red, yellow flesh. Retail
Adirondack Blue	196	156	79	110	51	29	0	0	Purple skin, purple flesh
Adirondack Red	189	125	66	88	63	3	0	0	Red skin, red flesh
F7-1	233	203	87	143	67	20	0	0	Red splotchs on skin, yellow flesh
G1-11	160	17	11	12	11	0	0	0	Oblong white tubers with pink eyes, yellow flesh
G1-17	136	5	4	4	4	0	0	0	Red skin, long tubers
G2-1	169	26	16	19	16	0	0	0	Red skin, yellow flesh, long tubers
G4-2	215	58	27	41	27	0	0	0	Red splotches around eyes
G18-1	221	9	4	6	2	1	0	0	Long small tubers
B1816-5	174	94	54	66	54	0	0	0	Purple skin, yellow flesh
B2152-17	155	64	41	45	41	0	0	0	Red skin, yellow flesh
BCO01306-2	181	122	67	86	61	7	0	0	Red skin, red flesh
BCO01044-2	141	126	90	89	65	24	0	0	Purple skin, purple flesh
MSL228-1SPL	82	67	82	48	16	45	21	0	Purple splotchs on skin
MSQ432-2PP	206	156	76	110	65	10	0	0	Purple skin, purple and yellow flesh
MSQ558-2RR	115	32	28	22	28	0	0	0	Red skin, pink flesh
CO97232-2R/Y	150	95	64	67	61	3	0	0	Red skin, yellow flesh
CO97227-2P/PW	150	46	30	32	30	0	0	0	Purple skin, purple and white flesh
CO97222-1R/R	165	111	67	78	50	17	0	0	Red skin, red flesh
CO97226-2R/R	133	49	37	34	37	0	0	0	Red skin, red flesh
AC99330-1P/Y	234	98	42	69	42	0	0	0	Purple skin, yellow flesh
AC99329-7PW/Y	228	174	77	123	57	20	0	0	Purple skin with white splotches, yellow flesh
Purple Majesty	168	65	39	46	39	0	0	0	Purple skin, purple flesh
A99331-2R/Y	334	217	65	153	58	6	0	0	Red skin with white splotches, yellow flesh
AO2267-5PY	119	91	77	64	53	23	0	0	Purple skin, yellow flesh
BNC193-1	163	82	50	58	48	3	0	0	Purple
B2756-2	234	177	76	125	58	18	0	0	Red skin, yellow flesh

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

[2]Percentage of the standard, Dark Red Norland, 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.

Table 4. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts and specific gravity for potato evaluation trial in Erie County, Mark Troyer Farm, 2010

Variety/Line	Yield (cwt/A)[1]		%	%	% by size class[3]				%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	of Standard[2]	2	3	4	5		
Atlantic	240	144	57	100	22	30	5	0	5	1.079
Snowden	269	201	75	139	35	34	6	0	3	1.071
Reba	241	156	64	108	25	35	5	0	5	1.067
Chieftain	189	137	73	95	43	29	1	0	2	1.059
Lehigh[yf]	242	155	64	107	32	29	3	0	4	1.066
NY138	229	183	78	126	40	37	1	0	2	1.071
W6360-1rus	239	76	32	53	31	1	0	0	8	1.075
NY139	289	199	65	138	29	34	2	0	5	1.072
NY140	308	202	64	140	31	31	2	0	5	1.065
NY141	241	149	62	103	33	24	5	0	4	1.069
NY145	208	122	55	84	42	12	0	0	3	1.069
NY146	170	149	87	103	33	43	11	0	1	1.063
NY147	153	110	68	76	50	14	4	0	1	1.057
B13-1	239	144	60	100	56	4	0	0	1	1.049
E43-10	182	87	46	61	42	4	0	0	2	1.057
B1992-106	254	182	69	126	40	26	3	0	2	1.070
BCO01306-2[pk]	211	128	61	88	51	10	0	0	1	1.068
AF3001-6	270	88	33	61	25	7	2	0	10	1.076
Clearwater Russet	177	78	42	54	32	9	1	0	5	1.068
Russet Norkotah	170	51	29	35	25	4	0	0	7	1.066
MSJ147-1*	86	49	57	34	57	0	0	0	23	1.070
W2717-5*	216	105	48	72	33	15	0	0	42	1.076
W2978-3*	166	103	62	71	57	5	0	0	9	1.057
AF2291-10*	154	94	61	65	34	27	0	0	32	1.062
Katahdin*	218	95	43	66	9	30	5	0	54	1.060
Yukon Gold*[yf]	177	69	39	48	6	14	19	0	58	1.064
F11-1*[yf]	298	158	53	110	40	13	0	0	9	1.062
Snowbird*	236	130	55	90	43	12	0	0	35	1.060
Sylvana*[yf]	239	99	41	69	21	21	0	0	50	1.046
Ambra*[yf]	346	229	66	159	37	30	0	0	19	1.053
B2152-17*[yf]	149	46	31	32	31	0	0	0	19	1.068
BCO01044-2*[pur]	78	51	66	35	66	0	0	0	0	1.055
Adirondack Blue*[pur]	176	86	49	60	37	11	0	0	27	1.054
Adirondack Red*[pk]	75	26	34	18	34	0	0	0	29	1.058

Variety/Line	Yield (cwt/A)[1]		%	%	% by size class[3]				%PO[4]	Specific Gravity
	Total	>1 7/8"	US#1	of Standard[2]	2	3	4	5		
Red Scarlett*[yf]	319	61	19	42	19	0	0	0	70	1.059
Rodeo*[yf]	423	222	52	154	34	14	4	0	24	1.071
NDA7985-1R*	216	151	70	105	53	17	0	0	11	1.053
A99331-2R/Y*[yf]	160	64	40	44	30	10	0	0	21	1.062
AC97521-1R/Y*[yf]	198	78	39	54	39	0	0	0	31	1.060
CO97226-2R/R*	44	10	23	7	23	0	0	0	37	1.062
W2609-1R*	178	112	63	77	35	27	0	0	19	1.049
W6002-1R*	239	147	61	102	48	13	0	0	7	1.057
Modoc*	181	67	37	47	37	0	0	0	1	1.052
Classic Russet*	198	71	36	49	32	3	0	0	46	1.062
Premier Russet*	202	36	18	25	11	7	0	0	69	1.076
Rio Grande Russet*	199	79	40	55	36	4	0	0	33	1.072
W2683-2rus*	169	78	46	54	27	20	0	0	40	1.060
W6234-4rus*	124	58	47	40	32	15	0	0	30	1.068
Mesa Russet*	95	50	52	34	41	11	0	0	24	1.058
AC96052-1RU*	189	124	66	86	48	18	0	0	12	1.071
CO95172-3RU*	287	125	44	86	22	15	7	0	48	1.072
LSD	90	81	16		12	12	6	0	2	

[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.

Replicated trials are the average of 4 replicates except for those lines with * which were non-replicated.

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

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

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 5. Tuber characteristics, internal and external defects for potato evaluation trial in Erie County, Mark Troyer Farm, 2010

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Atlantic	5	6	5	2	5	5	1	2	2	0	0	0	2	1	0	0
Snowden	5	6	5	2	4	5	1	0	1	0	0	0	2	0	0	0
Reba	5	7	7	3	4	5	1	0	2	0	0	0	2	0	0	0
Chieftain	5	2	7	3	5	5	0	0	2	0	1	0	1	1	0	0
Lehigh[yf]	5	6	6	3	5	5	0	0	1	0	1	0	2	0	0	0
NY138	5	7	7	3	5	5	1	0	2	0	0	1	1	0	0	0
W6360-1rus	3	6	4	4	6	5	1	0	1	0	0	1	2	0	0	0
NY139	5	6	6	2	5	6	0	1	1	0	0	0	3	0	0	0
NY140	5	7	7	3	6	5	1	0	2	0	0	1	2	0	0	0
NY141	4	6	6	2	6	5	1	0	1	0	0	0	2	0	0	1
NY145	5	7	6	2	5	5	0	0	1	0	0	0	2	0	0	0
NY146	6	7	7	3	6	6	0	0	1	0	0	0	1	0	0	0
NY147	5	7	7	3	6	5	0	0	1	0	0	0	1	0	0	0
B13-1	4	2	7	2	7	5	0	0	1	0	0	0	0	0	0	0
E43-10	5	8	8	2	6	6	0	0	1	0	0	0	1	0	0	0
B1992-106	5	6	5	2	6	6	1	0	3	0	0	0	2	0	0	0
BCO01306-2[pk]	4	2	6	2	6	5	0	0	1	0	0	0	1	0	0	0
AF3001-6	4	6	6	4	7	4	1	0	2	0	1	2	2	0	0	0
Clearwater Russet	4	6	4	4	6	5	0	0	1	0	0	1	2	0	0	0
Russet Norkotah	4	5	3	5	7	5	0	0	1	0	0	2	2	0	0	0
MSJ147-1*	5	7	7	3	5	5	0	0	0	0	0	0	1	0	0	0
W2717-5*	5	6	6	3	6	5	0	1	1	0	0	0	2	0	0	0
W2978-3*	5	6	6	2	6	6	0	0	1	0	0	0	1	0	0	0
AF2291-10*	4	6	6	2	5	5	2	0	2	0	0	0	1	0	0	0
Katahdin*	5	7	8	3	5	5	0	0	2	0	0	0	4	0	0	0
Yukon Gold*[yf]	5	7	7	2	6	5	0	0	3	0	0	0	3	1	0	0
F11-1*[yf]	6	6	7	3	6	5	0	0	1	0	0	0	1	0	0	0
Snowbird*	4	7	6	3	5	5	0	0	1	0	1	0	2	0	0	0
Sylvana*[yf]	5	7	7	3	7	5	0	0	0	0	0	1	3	0	0	0
Ambra*[yf]	4	7	7	3	6	4	0	0	2	0	0	0	2	0	0	0
B2152-17*[yf]	5	2	7	3	6	5	0	0	1	0	0	0	1	0	0	0
BCO01044-2*[pur]	4	1	7	3	6	5	0	0	0	0	0	0	0	0	0	0
Adirondack Blue*[pur]	4	1	7	3	5	6	0	0	0	0	0	2	0	0	0	0
Adirondack Red*[pk]	5	2	8	4	6	5	0	0	1	0	0	0	1	0	0	0
Red Scarlett*[yf]	5	3	6	4	7	6	0	0	1	0	0	4	4	0	0	0
Rodeo*[yf]	4	3	7	4	7	5	0	0	0	0	0	0	4	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
NDA7985-1R*	4	2	7	2	7	5	0	1	1	0	0	1	2	0	0	0
A99331-2R/Y*[yf]	4	2**	7	2	7	5	0	0	0	0	0	0	4	0	1	0
AC97521-1R/Y*[yf]	4	3	7	3	7	4	0	0	1	0	0	1	1	0	0	0
CO97226-2R/R*	5	2	6	3	7	7	0	0	0	0	0	0	1	0	0	0
W2609-1R*	5	2	7	3	7	4	0	0	2	0	1	0	1	0	0	0
W6002-1R*	5	2	7	3	7	5	0	0	1	0	0	0	2	0	0	0
Modoc*	6	2	7	2	6	6	0	0	0	0	0	0	0	0	0	0
Classic Russet*	5	6	5	4	7	5	0	0	0	0	0	2	2	0	0	0
Premier Russet*	4	6	4	4	7	5	1	0	0	0	1	3	2	0	0	1
Rio Grande Russet*	4	6	3	4	7	4	1	0	0	0	1	1	3	0	0	0
W2683-2rus*	4	5	3	4	7	4	0	0	0	0	0	1	3	0	0	0
W6234-4rus*	4	6	4	4	7	4	0	0	0	0	0	1	3	1	0	0
Mesa Russet*	4	6	4	4	7	5	0	0	0	0	0	1	1	0	0	0
AC96052-1RU*	5	5	2	5	7	4	0	0	1	0	0	0	2	0	0	0
CO95172-3RU*	3	6	4	3	7	5	0	0	1	0	0	2	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 smoot

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. Total number observed out of 16 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.

2** = Red with white splotchs on skin

Table 6. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for round white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

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
Atlantic	512	423	84	100	10	39	34	0	15	1.090	ML
Katahdin	451	385	85	91	18	46	21	0	12	1.073	ML
Kennebec	597	371	64	88	6	28	22	8	34	1.079	ML
Snowden	525	481	92	114	16	52	23	1	7	1.088	ML
Superior	530	458	87	108	17	47	22	1	10	1.072	ME
Yukon Gem[yf]	378	309	82	73	32	41	10	0	10	1.059	E
Yukon Gold[yf]	359	332	93	79	14	48	27	4	4	1.077	M
AF2574-1	582	366	63	86	14	36	12	0	34	1.080	ML
AF2865-4	450	426	95	101	12	40	40	3	3	1.071	ML
AF2866-3	364	345	95	82	16	53	26	0	3	1.068	ML
AF0338-17	525	422	80	100	10	36	31	4	18	1.086	M
B1992-106	440	392	89	93	29	47	13	0	6	1.082	ML
NY138	367	329	90	78	18	53	19	0	7	1.085	ML
NY139 (NYY28-9)	498	441	88	104	21	54	14	0	9	1.080	M
NYB38-40	302	256	86	61	20	56	10	0	10	1.069	M
NY145	392	311	79	74	47	31	0	0	8	1.081	ME
NY146	488	378	78	89	7	42	27	1	22	1.083	ML
NY147	473	439	93	104	10	51	28	3	6	1.072	ML
AF2291-10	476	387	81	92	15	39	27	0	16	1.095	L
AF4047-2	484	452	93	107	10	41	40	2	5	1.072	M
AF2873-1	269	221	82	52	34	37	11	0	6	1.074	E
AF2873-2	344	254	74	60	27	39	9	0	19	1.074	ME
B2628-10	489	411	84	97	22	50	13	0	13	1.085	M
BNC182-5	468	395	85	93	22	38	24	1	9	1.089	ML
BNC202-3[yf]	564	399	71	94	11	39	20	1	27	1.099	ML
Lehigh[yf]	549	499	91	118	13	45	30	4	7	1.078	M
Reba	485	434	90	103	11	43	32	4	9	1.075	M
NY140	430	378	89	90	17	56	16	0	10	1.068	ME
NY141	523	446	85	106	16	55	14	0	12	1.078	ML
D40-266	514	412	80	98	18	48	14	0	17	1.088	M
E43-10	555	487	88	115	41	41	6	0	4	1.064	ML
F11-1[yf]	547	499	91	118	44	45	3	0	1	1.076	ML
F47-3	342	303	89	72	48	40	0	0	4	1.078	ME

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
G1-11[yf]	487	96	20	23	13	7	0	0	58	1.062	ME
G4-2	673	528	78	125	41	34	3	0	10	1.075	ML
G18-1	576	167	29	39	22	6	1	0	19	1.083	M
G20-4	268	193	75	46	38	37	0	0	18	1.076	ME
G20-5	340	280	82	66	59	22	1	0	3	1.072	M
G20-12	416	405	97	96	26	59	12	0	2	1.069	ME
G20-13	328	263	78	62	51	25	2	0	12	1.082	ML
G20-30	297	236	79	56	21	45	13	0	18	1.079	ME
G20-31	455	418	92	99	27	53	11	0	4	1.080	M
G20-33	312	245	78	58	58	19	1	0	3	1.072	E
G20-41	407	342	85	81	22	49	14	0	12	1.084	M
G20-44	295	229	77	54	42	33	3	0	15	1.085	ME
G20-55	292	215	75	51	12	52	11	0	22	1.080	M
G20-58	357	331	93	78	23	59	11	0	5	1.081	ML
G20-63	393	350	89	83	25	52	12	0	6	1.081	ML
G27-1	542	489	90	116	23	50	15	2	6	1.098	ML
G70-3	422	361	85	85	25	43	15	2	10	1.069	M
G73-1	674	560	83	133	12	37	34	1	14	1.072	ML
G77-4	423	369	87	87	54	32	1	0	3	1.071	ME
G86-1	396	369	93	87	17	68	8	0	4	1.085	ML
G87-3	382	358	94	85	20	62	11	0	3	1.082	ME
G89-2	588	521	89	123	35	51	3	0	7	1.098	ML
G101-2	640	514	81	122	37	39	5	0	10	1.079	ML
MSJ126-9Y	359	338	94	80	24	51	15	4	3	1.080	ML
MSL211-3	492	411	82	97	13	46	23	0	15	1.074	M
MSL228-1SPL	255	221	86	52	18	49	19	0	11	1.076	M
MSN105-1	387	345	89	82	27	55	7	0	5	1.085	M
A00293-2Y	382	276	72	65	47	23	2	0	5	1.073	ML
A99433-5Y	481	408	85	97	30	47	8	0	7	1.084	L
A01143-3C	467	313	67	74	21	36	10	0	29	1.079	ML
A02267-1Y	368	308	84	73	49	31	3	0	7	1.055	E
Snowbrid	438	331	76	78	30	35	10	0	16	1.072	M

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
Sylvana	597	408	68	97	24	32	11	0	28	1.069	ML
Ambra	643	455	71	108	25	36	9	0	24	1.069	M
W2717-5	343	283	82	67	30	47	6	0	12	1.089	M
W2978-3	426	384	90	91	42	45	3	0	5	1.073	ME
AF4014-1*	431	345	80	82	13	40	26	0	18	1.086	ML
AF4014-9*	415	400	96	95	40	56	0	0	0	1.074	ME
F57-3*	512	462	90	109	20	66	4	0	5	1.084	ML
AF4125-1*	388	365	94	86	13	41	34	6	4	1.082	ML
AF4130-3*	375	354	95	84	35	60	0	0	0	1.070	ML
AF4130-7*	475	411	87	97	17	44	25	0	11	1.089	L
AF4130-13*	381	311	82	74	16	40	26	0	15	1.077	ML
AF4139-1*	494	327	66	77	13	36	17	0	31	1.083	ML
AF4147-1*	452	331	73	78	36	33	4	0	20	1.078	ML
AF4148-1*	500	328	66	78	17	35	14	0	33	1.095	ML
AF4149-1*	334	262	78	62	30	35	13	0	18	1.084	ML
AF4203-2*	283	245	86	58	50	37	0	0	0	1.080	ME
AF4222-4*	363	344	95	81	22	47	25	0	1	1.083	M
AF4240-3*	292	265	91	63	9	62	20	0	4	1.081	ML
AF4240-6*	499	329	66	78	8	31	26	0	32	1.078	ML
BNC202-7*[yf]	498	450	90	106	21	49	21	0	4	1.098	ML
B2729-1*	300	277	92	66	23	59	11	0	6	1.081	M
B2738-3*	490	422	86	100	8	45	28	5	12	1.070	ML
MSJ147-1*	154	90	58	21	38	20	0	0	0	1.075	ME
LSD	114	102	12		10	13	11	3	12		

[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 [yf].

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 only.

Table 7. Tuber characteristics, internal and external defects for round white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Atlantic	5	6	5	2	4	5	2	0	2	0	1	1	2	0	0	0
Katahdin	5	7	7	3	5	5	1	0	2	0	0	1	2	0	0	0
Kennebec	4	7	7	3	5	4	1	0	2	0	2	2	2	0	0	0
Snowden	5	6	5	2	4	5	2	0	2	0	0	0	2	0	0	0
Superior	4	6	6	3	5	5	1	0	1	0	1	1	2	0	0	0
Yukon Gem[yf]	5	7	7	3	6	5	2	0	2	0	2	1	1	0	0	0
Yukon Gold[yf]	4	6	7	3	6	5	1	0	1	0	1	0	1	0	0	0
AF2574-1	4	6	6	3	5	5	0	0	1	0	2	0	2	0	0	3
AF2865-4	4	6	6	2	4	5	0	0	2	0	1	0	2	0	0	0
AF2866-3	4	7	6	3	5	5	0	0	2	0	0	0	1	0	0	0
AF0338-17	5	6	6	2	4	5	2	0	3	0	1	0	2	0	0	0
B1992-106	5	6	5	2	5	5	2	0	2	0	0	0	2	0	0	0
NY138	5	7	7	3	6	5	1	0	2	0	0	0	2	0	0	0
NY139 (NYY28-9)	4	6	6	2	5	5	1	0	4	0	1	0	2	1	0	0
NYB38-40	5	7	7	3	5	5	0	0	2	0	0	0	2	1	0	0
NY145	5	7	7	2	5	5	1	0	2	0	0	0	2	0	0	0
NY146	5	7	7	3	6	6	1	0	1	0	0	2	2	0	0	1
NY147	4	7	7	3	5	6	1	2	0	0	0	1	1	2	0	0
AF2291-10	4	7	6	2	4	5	2	0	4	0	0	1	2	0	0	0
AF4047-2	5	6	6	2	3	5	2	0	3	0	1	0	0	1	0	0
AF2873-1	5	7	7	2	5	6	0	0	1	0	1	1	0	1	0	0
AF2873-2	5	7	6	3	6	5	0	0	3	0	1	1	2	1	0	0
B2628-10	5	6	6	3	6	5	3	0	1	0	0	1	1	1	0	0
BNC182-5	4	6	6	2	5	5	0	0	3	0	0	0	1	0	0	0
BNC202-3[yf]	3	6	5	3	3	5	2	0	0	0	0	2	2	0	0	0
Lehigh[yf]	5	6	6	3	5	5	2	0	1	0	1	0	1	0	0	0
Reba	5	7	6	3	3	5	2	0	0	0	0	0	2	0	0	0
NY140	5	7	7	3	5	5	1	0	1	0	0	0	2	0	0	0
NY141	5	6	6	3	5	5	1	0	2	0	0	1	2	0	0	1
D40-266	5	7	7	2	5	5	0	0	2	0	0	1	2	1	0	0
E43-10	5	7	7	2	6	5	1	0	2	0	1	0	1	0	0	0
F11-1[yf]	6	6	6	2	6	5	0	0	1	0	0	0	1	0	0	0
F47-3	5	6	5	2	4	6	0	0	2	0	0	1	1	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
G1-11[yf]	4	7	7	4	7	4	0	0	1	0	1	0	2	0	1	0
G4-2	5	6	6	3	6	5	1	0	1	0	1	0	1	0	0	0
G18-1	4	7	7	4	7	4	0	0	2	0	0	0	2	0	0	0
G20-4	5	7	7	2	6	6	0	0	1	0	1	1	0	0	0	0
G20-5	5	6	6	2	5	6	0	0	2	0	0	0	1	0	0	0
G20-12	5	6	6	3	6	5	0	0	2	0	0	0	1	0	0	0
G20-13	5	6	5	2	5	5	1	0	0	0	0	0	2	0	0	0
G20-30	5	6	6	3	5	6	0	0	0	0	0	2	1	0	0	0
G20-31	5	6	6	3	5	5	0	0	2	0	0	1	1	0	0	0
G20-33	5	6	6	2	5	5	0	0	0	0	0	0	1	0	0	0
G20-41	5	6	6	2	4	5	0	0	1	0	1	1	1	0	0	0
G20-44	5	6	5	2	5	5	0	1	2	0	1	1	2	0	0	0
G20-55	5	7	7	3	5	5	0	0	2	0	1	1	1	0	0	0
G20-58	5	6	7	2	5	6	1	0	1	0	0	0	1	0	0	0
G20-63	5	7	7	2	6	6	0	0	1	0	0	0	1	0	0	0
G27-1	5	7	7	2	4	6	1	0	0	0	0	0	1	0	0	0
G70-3	4	7	7	3	4	5	0	0	3	0	0	0	1	0	0	1
G73-1	5	7	7	2	4	6	0	0	1	0	1	0	2	0	0	0
G77-4	6	7	7	2	6	6	0	0	1	0	0	0	1	0	0	0
G86-1	5	7	7	3	5	5	2	0	1	0	0	0	1	0	0	0
G87-3	5	6	6	2	4	6	0	0	1	0	0	0	0	0	0	0
G89-2	5	6	6	3	6	5	3	1	2	0	0	1	1	0	0	0
G101-2	3	6	6	3	6	4	0	0	1	0	1	0	1	0	1	1
MSJ126-9Y	5	6	7	2	5	5	0	0	2	0	0	0	1	1	0	0
MSL211-3	5	7	7	3	6	5	0	0	1	0	1	0	0	1	0	0
MSL228-1SPL	5	6**	7	3	3	5	1	0	2	0	0	1	0	0	0	0
MSN105-1	5	8	7	2	6	5	0	0	2	0	0	0	1	0	0	1
A00293-2Y	5	6	6	2	6	5	0	0	1	0	1	0	1	0	0	0
A99433-5Y	3	6	6	2	5	5	0	0	4	0	0	0	1	0	0	0
A01143-3C	4	6	6	3	5	5	0	0	4	0	1	2	2	0	0	1
A02267-1Y	5	6	7	2	5	5	0	0	1	0	0	0	1	0	0	0
Snowbrid	4	7	7	2	3	5	0	0	1	0	0	0	2	0	0	0
Sylvana	5	7	7	2	6	5	0	0	1	0	2	1	2	0	0	0
Ambra	4	6	7	3	6	5	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	Rhizoc	H	Gr	K	G	Sc	Sp	T
W2717-5	5	6	7	3	6	5	0	0	2	0	1	0	1	0	0	0
W2978-3	5	7	6	2	4	5	1	0	2	0	0	0	0	1	0	0
AF4014-1*	5	6	6	2	4	6	0	0	3	0	0	1	1	0	0	0
AF4014-9*	6	6	6	2	5	6	0	0	0	0	0	0	1	0	0	0
F57-3*	5	6	5	2	5	5	0	0	0	0	0	0	1	0	0	0
AF4125-1*	5	7	6	2	5	6	0	1	2	0	0	0	1	0	0	0
AF4130-3*	5	6	5	2	5	6	0	0	4	0	0	0	0	0	0	0
AF4130-7*	5	6	6	2	6	5	0	0	2	0	0	0	2	0	0	0
AF4130-13*	5	7	7	3	5	5	0	0	2	0	0	0	1	0	0	0
AF4139-1*	5	6	6	2	6	5	1	0	3	0	1	1	1	0	0	0
AF4147-1*	5	6	6	2	5	5	0	0	2	0	0	1	0	0	0	0
AF4148-1*	6	7	7	2	6	5	0	0	1	0	0	2	1	0	0	0
AF4149-1*	4	6	6	2	6	5	0	0	3	0	1	0	1	0	0	0
AF4203-2*	5	6	6	2	5	5	0	0	0	0	0	0	0	0	0	0
AF4222-4*	4	7	7	2	6	5	0	0	2	0	0	0	0	0	0	0
AF4240-3*	5	7	7	2	5	4	0	0	1	0	0	0	0	0	0	0
AF4240-6*	4	6	5	2	5	6	1	2	4	0	1	1	1	0	0	0
BNC202-7*[yf]	5	5	5	2	5	5	0	1	1	0	0	0	0	0	0	0
B2729-1*	6	6	6	2	5	5	0	0	0	0	1	0	0	0	0	0
B2738-3*	5	6	5	2	5	5	1	0	0	0	0	0	1	0	0	0
MSJ147-1*	6	7	7	2	6	6	0	0	0	0	0	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. 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.

6** = Tan with purple splotchs on skin

Table 8. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for red or purple skinned potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

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	512	460	90	100	20	48	21	0	7	1.069	ML
Dark Red Norland	403	383	95	83	31	56	9	0	1	1.062	ME
Modoc	435	388	89	84	43	44	3	0	3	1.072	ME
B2152-17[yf]	442	387	87	84	48	34	5	0	1	1.074	ME
BCO01306-2[pk]	452	324	73	71	31	37	5	0	13	1.076	M
B1816-5[yf]	517	468	91	102	31	49	10	0	7	1.070	M
BCO01044-2[pur]	376	316	84	69	20	45	15	3	8	1.070	M
B2676-2	371	338	91	74	56	35	0	0	3	1.079	E
BNC193-1	310	272	87	59	67	21	0	0	1	1.067	ME
BNC201-1[yf]	381	329	86	71	21	53	12	0	9	1.083	ML
Adirondack Blue[pur]	573	423	73	92	21	46	5	0	25	1.074	ME
Adirondack Red[pk]	481	317	66	69	41	26	0	0	25	1.067	ME
B13-1	515	462	90	101	23	60	7	0	8	1.058	M
F7-1[yf]	301	260	86	56	41	42	3	0	4	1.058	ML
F36-3	286	211	74	46	36	36	1	0	19	1.065	ME
G1-17	487	133	27	29	24	3	0	0	35	1.084	ME
G2-1[yf]	590	358	61	78	35	25	0	0	4	1.082	ML
G4-1	457	351	77	76	13	51	13	0	21	1.074	ML
MSN230-1RY[yf]	423	354	82	77	36	29	17	0	14	1.088	ML
Purple Majesty[pur]	539	412	76	90	48	22	6	0	4	1.083	ML
CO97227-2P/PW[pur]	418	317	76	69	48	24	4	0	9	1.089	L
CO97222-1R/R[pk]	421	334	79	73	43	35	1	0	9	1.075	ML
CO97232-2R/Y[yf]	399	351	88	76	31	47	10	0	8	1.062	M
AC97521-1R/Y[yf]	425	301	70	65	39	29	2	0	20	1.078	M
CO97226-2R/R[pk]	161	120	74	26	48	26	0	0	10	1.066	ML
CO99076-6R	393	321	82	70	15	39	27	1	16	1.074	ME
AC99329-7PW/Y[yf]	225	203	90	44	41	46	3	0	1	1.062	E
CO99256-2R	539	478	88	104	30	51	8	0	6	1.075	ML
AC99330-1P/Y[yf]	208	114	54	25	40	14	0	0	2	1.061	E

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
NDA7985-1R	600	516	86	112	18	49	18	0	12	1.069	ML
A99331-2RY[yf]	558	422	76	92	42	31	3	0	8	1.079	ML
Red Scarlett[yf]	569	325	58	71	27	23	8	0	36	1.065	ML
Rodeo[yf]	615	484	79	105	37	36	6	0	11	1.081	ML
W2609-1R	323	282	88	61	43	36	8	0	8	1.058	E
W6002-1R	490	411	83	89	35	38	10	0	6	1.064	ME
MSQ432-2PP*[pur & yf]	569	476	84	103	21	47	16	0	13	1.075	ML
MSQ558-2RR*[pk]	177	82	46	18	46	0	0	0	3	1.067	VE
A02267-5PY*[yf]	431	326	76	71	25	47	3	0	18	1.083	ML
LSD	102	105	11		11	13	9	2	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, 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 only.

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

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

Table 9. Tuber characteristics, internal and external defects for red skinned potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Chieftain	5	2	7	3	5	5	0	0	2	0	1	0	2	0	0	1
Dark Red Norland	5	2	7	2	6	6	0	0	2	0	0	0	0	0	0	0
Modoc	5	2	7	2	5	6	0	0	2	0	0	0	1	0	0	0
B2152-17^{yf}	5	2	7	2	6	5	0	0	2	0	0	0	0	0	0	0
BCO01306-2^{pk}	5	2	7	3	5	5	1	0	2	0	1	0	2	0	0	1
B1816-5^{yf}	5	1	6	3	5	5	0	0	0	0	0	0	1	0	0	0
BCO01044-2^{pur}	5	1	7	3	6	5	0	0	0	0	0	0	0	0	0	0
B2676-2	6	2	7	2	6	6	0	0	0	0	0	0	0	0	0	0
BNC193-1	5	1	7	3	6	5	0	0	1	0	0	0	0	0	0	0
BNC201-1^{yf}	5	2	7	2	4	6	0	0	0	0	1	0	1	1	0	0
Adirondack Blue^{pur}	4	1	6	3	5	5	1	0	2	0	0	2	0	0	0	0
Adirondack Red^{pk}	5	2	7	3	6	5	0	0	2	0	1	2	2	0	0	0
B13-1	4	2	7	3	5	5	0	0	0	0	0	0	0	0	0	0
F7-1^{yf}	5	2**	7	2	6	5	0	0	2	0	0	0	0	0	1	0
F36-3	5	2	6	2	5	6	0	0	1	0	2	0	0	0	0	0
G1-17	4	2	7	4	6	5	0	0	1	0	0	0	1	0	0	0
G2-1^{yf}	5	2	7	4	7	5	0	0	1	0	0	0	2	0	0	0
G4-1	5	6**	6	3	5	5	0	0	2	0	0	1	2	0	0	0
MSN230-1RY^{yf}	4	2	6	3	4	5	0	0	3	0	0	0	0	0	0	0
Purple Majesty^{pur}	4	1	6	3	4	5	0	0	0	0	0	0	0	0	0	0
CO97227-2P/PW^{pur}	5	1	7	3	7	5	1	0	0	0	0	0	0	0	0	0
CO97222-1R/R^{pk}	4	2	7	3	6	5	0	0	0	0	0	0	1	0	0	0
CO97232-2R/Y^{yf}	4	2	7	3	6	5	0	0	3	0	1	0	0	0	0	0
AC97521-1R/Y^{yf}	5	2	7	3	5	4	0	0	2	0	0	2	0	0	0	0
CO97226-2R/R^{pk}	5	2	7	3	3	5	0	0	1	0	0	0	1	0	0	0
CO99076-6R	4	2	8	2	4	5	0	0	1	0	0	1	1	0	0	0
AC99329-7PW/Y^{yf}	5	6***	7	2	5	5	0	0	2	0	0	0	0	0	0	0
CO99256-2R	4	2	7	2	6	6	0	0	4	0	1	0	1	0	0	0
AC99330-1P/Y^{yf}	5	1	7	2	5	5	0	0	1	0	0	0	0	0	0	0
NDA7985-1R	5	2	8	3	5	5	0	0	1	0	0	1	1	0	0	0
A99331-2RY^{yf}	4	2**	7	2	5	5	0	0	0	0	0	0	2	0	1	0
Red Scarlett^{yf}	4	3	6	3	7	5	0	0	1	0	1	2	1	0	0	0
Rodeo^{yf}	4	3	8	4	6	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	Rhizoc	H	Gr	K	G	Sc	Sp	T
W2609-1R	4	2	7	3	6	5	0	0	3	0	1	0	0	0	0	0
W6002-1R	5	2	7	2	6	6	0	0	3	0	1	0	1	0	0	0
MSQ432-2PP*[pur & yf]	4	1	7	3	6	5	0	0	4	0	0	0	0	0	0	0
MSQ558-2RR*[pk]	4	2	7	3	7	5	0	0	2	0	0	0	0	0	0	0
A02267-5PY*[yf]	5	1	7	2	5	5	0	0	0	0	0	0	2	0	0	1

[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. 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.

Varieties with colored flesh are indicated by [yf] for yellow, [pur] for purple, and [rd] for red.

2** = Red with white splotchs on skin; 6** = Tan and red splotchs on skin; 6*** = Tan with purple splotchs on skin.

Table 10. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for russet skinned or long white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

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
Alpine Russet (A9305-10)	433	309	71	95	26	37	8	0	25	1.080	M
Classic Russet (A95109-1)	475	438	92	134	22	48	23	0	6	1.080	ML
Premier Russet (A93157-6LS)	357	241	68	74	41	20	7	0	28	1.093	ML
Rio Grande Russet	485	352	73	108	30	28	15	0	18	1.094	ML
Russet Burbank (#400)	448	202	45	62	14	21	10	0	51	1.079	ML
Russet Norkotah #3117	475	327	69	100	13	29	22	6	29	1.071	M
AF3001-6	508	402	79	123	11	37	25	5	19	1.086	ML
AF3317-15	341	193	55	59	13	23	20	0	42	1.095	L
AF3325-2	230	152	66	46	28	18	20	0	28	1.072	E
AF3327-28	470	334	71	102	16	43	12	0	27	1.078	ML
AF3362-1	326	253	79	77	15	22	42	0	18	1.067	ME
AF4113-2	409	289	70	89	26	37	8	0	25	1.074	ML
AF4124-4	555	305	55	93	15	21	17	2	42	1.081	ML
AC96052-1RU	325	246	76	75	36	26	13	0	17	1.080	ML
CO95172-3RU	401	273	68	83	28	31	9	0	27	1.088	L
CO94035-15RU (Mesa Russet)	365	268	73	82	34	35	4	0	20	1.077	L
Clearwater Russet	357	249	70	76	44	23	3	0	19	1.084	L
A01025-4	319	199	64	61	15	27	22	0	31	1.081	ML
A98345-1	432	321	75	98	21	40	14	0	22	1.087	VL
A01010-1	439	303	69	93	33	21	15	0	26	1.076	ML
Russet Norkotah	397	294	74	90	25	29	14	6	22	1.064	ME
W2683-2rus	411	261	63	80	32	19	13	0	31	1.069	M
W6234-4rus	317	209	68	64	27	36	5	0	28	1.077	ML
W6360-1rus	375	238	62	73	28	26	8	0	33	1.082	VL
AF3008-3*	278	232	83	71	33	50	0	0	10	1.096	M
AF4116-9*	384	221	57	68	3	42	12	0	42	1.073	M
AF4124-7*	341	209	61	64	11	26	24	0	34	1.083	ML
AF4167-1*	344	182	53	56	25	28	0	0	38	1.085	M
AF4172-2*	442	353	80	108	33	43	4	0	13	1.088	M
AF4185-1*	501	414	83	127	24	53	5	0	11	1.078	ML
AF4191-2*	324	201	62	62	33	24	5	0	27	1.078	ML
AF4194-1*	465	247	53	76	10	20	24	0	45	1.086	ML
AF4198-2*	478	243	51	74	7	23	21	0	47	1.081	M
AF4225-2*	486	376	77	115	10	52	15	0	21	1.088	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
AF4296-3*	451	245	54	75	11	32	11	0	42	1.088	L
AF4320-7*	412	272	66	83	16	28	17	5	29	1.084	L
AF4322-5*	148	113	76	35	69	7	0	0	0	1.070	E
AF4342-3*	308	240	78	74	39	36	3	0	13	1.093	ML
LSD	82	72	14		13	11	14	5	14		

[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 #3117 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 only.

Plots consisted of 10-ft rows with 12 seed pieces spaced 10-in. apart.

Table 11. Tuber characteristics, internal and external defects for russet skinned or long white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Alpine Russet (A9305-10)	4	6	6	4	6	4	0	0	3	0	1	1	1	0	0	0
Classic Russet (A95109-1)	5	6	4	4	5	5	1	0	1	0	1	1	1	0	0	0
Premier Russet (A93157-6LS)	5	6	4	4	6	5	3	0	1	0	1	1	1	0	0	0
Rio Grande Russet	4	6	4	4	6	4	2	0	1	0	1	0	2	0	0	0
Russet Burbank (#400)	3	6	4	5	5	5	0	0	3	0	2	2	2	0	0	0
Russet Norkotah #3117	4	5	3	4	6	5	1	0	1	0	0	0	2	0	0	0
AF3001-6	5	6	6	4	6	5	1	0	2	0	1	1	2	0	0	0
AF3317-15	4	5	3	4	6	5	1	1	2	0	1	1	2	0	0	0
AF3325-2	5	5	3	5	7	5	1	0	2	0	0	1	2	0	0	0
AF3327-28	3	5	4	4	6	5	0	0	2	0	1	0	2	0	0	0
AF3362-1	5	6	4	4	6	5	0	2	2	0	1	1	1	0	0	0
AF4113-2	5	7	6	4	6	5	0	0	3	0	1	0	2	0	0	0
AF4124-4	4	6	5	4	5	4	0	0	3	0	0	3	2	0	0	0
AC96052-1RU	6	5	3	4	7	5	1	0	1	0	0	0	1	0	0	0
CO95172-3RU	5	6	4	4	6	5	0	0	1	0	0	0	2	0	0	0
CO94035-15RU (Mesa Russet)	4	6	4	4	6	5	0	0	1	0	0	0	1	0	0	0
Clearwater Russet	5	5	3	4	6	5	0	0	1	0	0	0	2	0	0	0
A01025-4	4	7	6	4	6	5	0	0	1	0	0	0	2	1	0	0
A98345-1	4	6	5	4	6	5	2	0	4	0	1	1	1	0	0	0
A01010-1	4	5	3	5	6	4	0	0	1	0	0	2	0	0	0	0
Russet Norkotah	5	5	3	4	6	5	0	0	2	0	0	1	2	0	0	0
W2683-2rus	5	5	3	5	7	4	0	0	2	0	0	0	1	0	0	0
W6234-4rus	4	6	5	4	5	5	0	0	3	0	1	0	2	0	0	0
W6360-1rus	5	6	4	4	6	5	1	0	1	0	0	0	2	0	0	0
AF3008-3*	5	6	6	4	7	5	0	0	3	0	0	0	1	0	0	0
AF4116-9*	5	5	4	5	7	5	0	0	3	0	0	0	2	0	0	0
AF4124-7*	4	6	6	3	7	5	0	0	3	0	0	1	1	0	0	0
AF4167-1*	3	6	4	5	6	5	0	0	2	0	1	0	2	0	0	0
AF4172-2*	4	6	6	4	7	5	0	0	2	0	0	0	1	0	0	0
AF4185-1*	3	5	5	3	6	5	0	0	4	0	0	0	1	0	0	0
AF4191-2*	3	6	6	4	6	5	0	0	2	0	0	1	0	0	0	0
AF4194-1*	4	6	4	5	6	5	0	0	1	0	2	1	2	0	0	0
AF4198-2*	4	6	5	5	7	4	0	0	3	0	0	1	2	0	0	0
AF4225-2*	4	7	7	3	5	5	0	0	0	0	0	1	1	0	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
AF4296-3*	4	5	5	5	6	5	0	0	3	0	0	2	2	0	0	0
AF4320-7*	5	6	4	4	6	4	0	0	0	0	0	1	1	0	0	0
AF4322-5*	6	6	6	3	6	5	0	0	0	0	0	0	0	0	0	0
AF4342-3*	4	6	1	4	6	4	0	0	0	0	0	1	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. 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 12. Total yield, greater than 1 7/8" percent of standard, size distribution, percent pickouts, and specific gravity for NE1031 potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

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
Alpine Russet (A9305-10)	439	289	66	69	26	34	6	0	28	1.080	M
Atlantic	502	421	85	100	11	38	35	0	14	1.090	ML
Chieftain	526	475	90	113	19	48	24	0	6	1.069	ML
Classic Russet (A95109-1)	471	429	91	102	21	46	25	0	7	1.080	ML
Dark Red Norland	419	398	95	95	31	55	9	0	1	1.062	ME
Katahdin	437	355	81	84	18	46	17	0	17	1.073	ML
Kennebec	590	369	64	88	5	29	23	7	34	1.079	ML
Modoc	430	380	88	90	42	45	2	0	3	1.072	ME
Premier Russet (A93157-6LS)	350	237	68	56	40	22	6	0	27	1.093	ML
Rio Grande Russet	483	357	74	85	32	29	13	0	17	1.094	ML
Russet Burbank (#400)	448	193	43	46	15	21	7	0	53	1.079	ML
Russet Norkotah #3117	484	343	71	81	13	33	18	8	27	1.071	M
Snowden	514	469	91	111	18	52	20	1	7	1.088	ML
Superior	511	443	87	105	17	46	24	1	10	1.072	ME
Yukon Gem[yf]	347	284	82	67	32	42	8	0	11	1.059	E
Yukon Gold[yf]	390	351	91	83	12	47	28	3	7	1.077	M
AF2574-1	576	385	67	91	15	39	14	0	30	1.080	ML
AF2865-4	480	433	91	103	11	37	39	4	6	1.071	ML
AF2866-3	382	365	96	87	18	52	26	0	2	1.068	ML
AF3001-6	509	400	78	95	14	37	24	4	20	1.086	ML
AF3317-15	347	177	50	42	11	22	17	0	48	1.095	L
AF3325-2	219	159	74	38	27	25	23	0	21	1.072	E
AF3327-28	458	329	72	78	17	42	13	0	25	1.078	ML
AF3362-1	347	254	75	60	14	26	35	0	22	1.067	ME
AF0338-17	492	400	81	95	11	36	31	3	17	1.086	M
B1992-106	456	413	90	98	31	46	14	0	6	1.082	ML
B2152-17[yf]	427	378	88	90	47	37	4	0	1	1.074	ME
BCO01306-2[pk]	431	326	77	77	34	38	4	0	10	1.076	M
NY138	387	347	90	82	17	50	24	0	8	1.085	ML
NY139 (NYY28-9)	480	414	86	98	25	51	10	0	11	1.080	M

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
NYB38-40	296	258	88	61	24	53	12	0	8	1.069	M
NYD40-35	370	293	79	70	49	30	0	0	6	1.081	ME
NYD40-50	492	375	76	89	6	39	28	3	23	1.083	ML
NYD40-263	469	437	93	104	11	48	32	2	5	1.072	ML
LSD	90	82	12		9	12	12	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. Varieties with colored flesh are indicated by [yf] for yellow and [pk] for pink.

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

Table 13. Tuber characteristics, internal and external defects for NE1031 potato evaluation trial in Rock Springs, Plant Pathology Farm, 2010

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
Alpine Russet (A9305-10)	4	6	6	4	6	4	0	0	3	0	1	1	1	0	0	0
Atlantic	5	6	5	2	4	5	2	0	2	0	1	1	2	0	0	0
Chieftain	5	2	7	3	5	5	0	0	2	0	1	0	2	0	0	1
Classic Russet (A95109-1)	5	6	4	4	5	5	1	0	1	0	1	1	1	0	0	0
Dark Red Norland	5	2	7	2	6	6	0	0	2	0	0	0	0	0	0	0
Katahdin	5	7	7	3	5	5	1	0	2	0	0	1	2	0	0	0
Kennebec	4	7	7	3	5	4	1	0	2	0	2	2	2	0	0	0
Modoc	5	2	7	2	5	6	0	0	2	0	0	0	1	0	0	0
Premier Russet (A93157-6LS)	5	6	4	4	6	5	3	0	1	0	1	1	1	0	0	0
Rio Grande Russet	4	6	4	4	6	4	2	0	1	0	1	0	2	0	0	0
Russet Burbank (#400)	3	6	4	5	5	5	0	0	3	0	2	2	2	0	0	0
Russet Norkotah #3117	4	5	3	4	6	5	1	0	1	0	0	0	2	0	0	0
Snowden	5	6	5	2	4	5	2	0	2	0	0	0	2	0	0	0
Superior	4	6	6	3	5	5	1	0	1	0	1	1	2	0	0	0
Yukon Gem[yf]	5	7	7	3	6	5	2	0	2	0	2	1	1	0	0	0
Yukon Gold[yf]	4	6	7	3	6	5	1	0	1	0	1	0	1	0	0	0
AF2574-1	4	6	6	3	5	5	0	0	1	0	2	0	2	0	0	3
AF2865-4	4	6	6	2	4	5	0	0	2	0	1	0	2	0	0	0
AF2866-3	4	7	6	3	5	5	0	0	2	0	0	0	1	0	0	0
AF3001-6	5	6	6	4	6	5	1	0	2	0	1	1	2	0	0	0
AF3317-15	4	5	3	4	6	5	1	1	2	0	1	1	2	0	0	0
AF3325-2	5	5	3	5	7	5	1	0	2	0	0	1	2	0	0	0
AF3327-28	3	5	4	4	6	5	0	0	2	0	1	0	2	0	0	0
AF3362-1	5	6	4	4	6	5	0	2	2	0	1	1	1	0	0	0
AF0338-17	5	6	6	2	4	5	2	0	3	0	1	0	2	0	0	0
B1992-106	5	6	5	2	5	5	2	0	2	0	0	0	2	0	0	0
B2152-17[yf]	5	2	7	2	6	5	0	0	2	0	0	0	0	0	0	0
BCO01306-2[pk]	5	2	7	3	5	5	1	0	2	0	1	0	2	0	0	1
NY138	5	7	7	3	6	5	1	0	2	0	0	0	2	0	0	0
NY139 (NYY28-9)	4	6	6	2	5	5	1	0	4	0	1	0	2	1	0	0

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		External Defects[3]							
	TA	C	TX	Sh	TED	TCS	HH	IB	Rhizoc	H	Gr	K	G	Sc	Sp	T
NYB38-40	5	7	7	3	5	5	0	0	2	0	0	0	2	1	0	0
NYD40-35	5	7	7	2	5	5	1	0	2	0	0	0	2	0	0	0
NYD40-50	5	7	7	3	6	6	1	0	1	0	0	2	2	0	0	1
NYD40-263	4	7	7	3	5	6	1	2	0	0	0	1	1	2	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 =
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. Total number observed out of 16 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.

Varieties with colored flesh are indicated by ^{yf} for yellow, ^{pk} for pink.

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 14: Management of Evaluation Trials, 2010

Erie County

Planting Date:	25 May for both germplasm and specialty trials
Harvest Date:	3 Sep for specialty trial; 20 Oct for germplasm trial
Previous Crop:	Corn
Fertilizer Rate/A:	At planting: 20 gal/A 32-0-0 (N-P-K) and 15 gal/A 10-34-0 (N-P-K)
Herbicide:	Metolachlor, Sencor, Prowl
Fungicide:	Pencozeb, Copper, Echo, Curzate, Gavel
Insecticide:	Admire, Dimethoate, Asana
Vine Kill:	2 Oct
Rainfall (inches):	June (2.70), July (2.10), August (2.30), September (1.90)
Irrigation:	None

Lehigh County

Planting Date:	5 May
Harvest Date:	23 Sep
Previous Crop:	Cabbage
Fertilizer Rate/A:	At planting: 1,200 lbs/A 14-14-14 (N-P-K)
Herbicide:	Tricor, Medal
Fungicide:	Ridomil M2, Manzate
Insecticide:	Radiant, Admire Pro
Vine Kill:	N/A
Rainfall (inches):	May (1.55), June (6.10), July (4.30), August (1.15), September (0.70)
Irrigation:	N/A

Rock Springs

Planting Date:	27 May
Harvest Date:	11, 12, 13, 15 Oct
Previous Crop:	Wheat followed by mustard green manure
Fertilizer Rate/A:	Pre-plant: 159 lb/A 0-0-60 (N-P-K); at planting: 999 lb/A 10-10-10 (N-P-K)
Herbicide:	Eptam, Dual II Magnum, Sencor, Matrix
Fungicide:	11 applications including Penncozeb 75DF, Manzate Pro, Dithane DF, Bravo WS
Insecticide:	Mocap EC, Admire Pro, Baythroid XL, Radiant SC, Vydate C-LV, Assail, Agri-Mek
Vine Kill:	16 and 22 Sep
Rainfall (inches):	June (2.02), July (3.57), August (4.67), September (3.31)
Irrigation (inches):	6 July (1.10), 23 July (1.10)

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

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Evaluation of potato cultivars and breeding lines for resistance to late blight, 2010.

In two experiments, seventy-eight potato cultivars and advanced breeding lines were evaluated at the Russell E. Larson Agricultural Research Center at Rock Springs, PA. The soil type was a Hagerstown silty clay loam. The previous crop was corn. Potatoes were planted on 15 Jun. The experimental design was a randomized complete block with three replicates in both experiments. The plots were 4 ft long with five seed pieces planted in each plot and 5 ft breaks between plots within a row. Fertilization was 656 lb/A of 19-19-19 (N-P-K) banded in-the-row during planting. Liquid N fertilizer was applied at 33.0 lb/A on 16 Jul and 16.5 lb/A on 19 Jul while hilling. Precipitation was 2.02, 3.57, 4.67, and 3.31 in. for Jun, Jul, Aug, and Sep, respectively. On 12 Aug, spreader rows were inoculated with a mixture of four isolates of *Phytophthora infestans*, at a concentration of 7.7×10^4 sporangia/ml, to promote a uniform spread of the pathogen to all treatment plots. This summer was unusually hot and dry. Overhead irrigation was applied at 0.75 in. on 12 Jul, 0.50 in. on 26 Jul. Sprinklers were used daily after inoculation for 1 hour each day for 24 days to increase humidity in the plant canopy. Disease ratings were determined by visually assessing each 4-ft plot and estimating the percentage of diseased foliage caused by late blight. Assessments were made on 23, 27, 31 Aug and 5 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. 9.1, SAS Institute, Cary, NC).

Kennebec was considered the moderately resistant check for experiment #1; therefore, NYD40-50, AF3317-15, Yukon Gem, AF2574-1, NYD40-263, NYD40-35, Premier Russet (A93157-6LS), and Classic Russet (A95109-1) were considered resistant to moderately resistant. In experiment #2, B0718-3 was the resistant check. Lines MSQ176-5, AWN86514-2, MSQ070-1, B0692-4, AF4121-3, A00286-3Y, LBR1R2R3R4, A00324-1, AF4191-2, AF3317-15, LBR7, AF4122-3, MSM182-1, AC99375-1RU, OR03029-2, ND03036B-2R, NY140, and AF2574-1 also were resistant to moderately resistant.

Cultivar/Line	AUDPC[z]	Cultivar/Line	AUDPC	Cultivar/Line	AUDPC
Experiment #1		Experiment #1 (continued)		Experiment #2 (continued)	
NYD40-50	27.7 l[y]	AF3362-1	747.5 bc	NY140	83.0 m-o
AF3317-15	30.3 l	Atlantic	765.0 b	AF2574-1	98.8 m-o
Yukon Gem	31.7 l	NYB38-40	786.7 b	MSR061-1	128.0 mn
AF2574-1	65.0 kl	Dark Red Norland	917.5 a	BNC202-3	157.5 m
NYD40-263	83.3 kl	AF3325-2	941.7 a	CO99053-3RU	168.3 m
NYD40-35	124.2 j-l	B2152-17	981.7 a	Dakota TrailBlazer	287.2 l
Kennebec (check)	143.3 i-k	Modoc	998.3 a	A00293-2Y	326.5 kl
Premier Russet (A93157-6LS)	223.8 ij			AO96141-3	386.5 jk
Classic Russet (A95109-1)	241.2 i			CO00412-5W/Y	450.8 ij
Alpine Russet (A9305-10)	399.0 h	Experiment #2		LBR5	452.0 ij
Snowden	454.2 gh	MSQ176-5	11.7 o	Clearwater Russet	489.5 hi
AF2865-4	477.5 gh	AWN86514-2	11.7 o	A99326-1PY	496.5 g-i
RioGrande Russet	487.3gh	MSQ070-1	13.0 o	AO96305-3	503.7 f-i
Katahdin	515.0 g	B0692-4	13.0 o	ND050174B-5R	521.5 e-i
B1992-106	539.2 g	B0718-3 (check)	13.0 o	Alpine Russet (A9305-10)	580.0 d-h
AF3327-28	545.0 fg	AF4121-3	13.0 o	LBR9	593.2 c-g
Russet Burbank (#400)	549.0 e-g	A00286-3Y	16.3 o	A98345-1	600.0 c-f
Yukon Gold	643.3 d-f	LBR1R2R3R4	22.3 o	MSQ086-3	603.3 c-e
Russet Norkotah 3117	650.8 c-e	A00324-1	22.3 o	A01010-1	630.0 cd
AF3001-6	688.3 b-d	AF4191-2	22.3 o	AC99329-7PW/Y	661.8 cd
NY139 (NYY28-9)	698.3 b-d	AF3317-15	25.7 o	A99331-2RY	662.2 cd
BCO01306-2	703.3 b-d	LBR7	26.5 o	B2731-3	682.3 c
NY138	706.7 b-d	AF4122-3	27.7 o	B2747-15	800.7 b
AF2866-3	712.5 b-d	MSM182-1	29.7 o	ND8229-3	840.8 b
Superior	723.3 b-d	AC99375-1RU	35.0 no	B2738-3	866.7 b
Chieftain	727.5 b-d	OR03029-2	45.0 no	A0008-1TE	890.0 b
AF0338-17	743.3 b-d	ND03036B-2R	54.3 no	B2746-1	1056.7 a

[z] AUDPC = Area under the disease progress curve.

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

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

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Evaluation of potato cultivars and breeding lines for resistance to early blight, 2010.

Thirty-four potato cultivars and advanced breeding lines were evaluated at the Russell E. Larson Agricultural Research Center at Rock Springs, PA. The soil type was a Hagerstown silty clay loam. The previous crop was corn. Entries were planted on 2 Jun in a randomized complete block design with three replicates. Plots consisted of a single row 4 ft long with five seed pieces planted in each plot with a 4 ft break between plots. Each entry had an adjacent row of the susceptible cultivar Dark Red Norland. Fertilization was 999 lb/A of 10-10-10 (N-P-K) banded in-the-row during planting. Precipitation was 2.02, 3.57, 4.67, and 3.31 in. for Jun, Jul, Aug, and Sep, respectively. Overhead irrigation was applied at 1.15 in. on 7 Jul, 1.0 in. on 29 Jul, 1.1 in. on 9 Aug and 1.0 in. on 30 Aug. Spreader rows were inoculated with conidia of the early blight pathogen on 29 Jul. A mixture of three isolates of *Alternaria solani*, with a concentration of 1.13×10^5 conidia/ml, was used to promote a uniform spread of the pathogen to all treatment plots. For each plot, the percentage of diseased foliage was visually assessed on 24 Aug and 3, 10, 17 and 23 Sep. 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. 9.1, SAS Institute, Cary, NC).

Nine cultivars/lines were classified as moderately resistant, and they were: AF3317-15, Russet Burbank (#400), Premier Russet (A93157-6LS), Alpine Russet (A9305-10), AF2865-4, Classic Russet (A95109-1), Yukon Gem, Kennebec, and NYD40-50.

Cultivar/Line	AUDPC[Z]	Cultivar/Line	AUDPC
AF3317-15	83.0 n[Y]	NY139 (NYY28-9)	579.2 g-i
Russet Burbank (#400)	98.0 n	NYB38-40	589.2 gh
Premier Russet (A93157-6LS)	99.3 n	Chieftain	615.0 gh
Alpine Russet (A9305-10)	111.7 mn	NYD40-263	659.2 gh
AF2865-4	153.7 l-n	BCO01306-2	686.7 gh
Classic Russet (A95109-1)	233.7 l-n	Russet Norkotah 3117	791.7 fg
Yukon Gem	271.0 k-n	AF2866-3	793.3 fg
Kennebec	298.7 k-n	AF0338-17	950.8 ef
NYD40-50	304.5 k-n	Yukon Gold	985.0 ef
Snowden	335.0 j-m	AF3362-1	990.0 ef
AF3001-6	340.8 j-m	Superior	1032.5 e
RioGrande Russet	342.5 j-m	Atlantic	1054.2 e
B1992-106	350.0 i-l	NYD40-35	1085.8 e
Katahdin	466.7 h-k	Modoc	1370.0 d
AF2574-1	478.3 h-k	B2152-17	1738.3 c
AF3327-28	498.3 h-k	Dark Red Norland	2241.7 b
NY138	562.5 g-j	AF3325-2	2483.3 a

[Z] AUDPC = area under the disease progress curve.

[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.

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

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Evaluation of potato cultivars and breeding lines for resistance to powdery scab, 2010.

Thirty-five potato cultivars and advanced breeding lines were planted in a naturally infested field in Potter Co., PA on 20 May. The soil type was a Mardin silt loam. The previous crop was snap beans. Plots consisted of 6 ft rows, which were arranged in a randomized complete block design with three replications. Within each plot, 8 seed pieces were spaced 8-in. apart. Fertilizer was banded in-the-furrow at a rate of 1200 lb/A 8.5-8.5-11.4 (N-P-K). Precipitation was 3.08, 3.75, 5.88, and 2.87 in. for May, Jun, Jul, and Aug, respectively. Standard crop management procedures and a recommended program for control of early and late blight were followed. Reglone at 1.0 pt/A was applied as a vine kill on 7 Sep. Tubers were harvested on 21 Sep. The tubers were visually assessed, and 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. Data was subjected to an analysis of variance test, and means were separated using Fisher's protected least significant difference test (SAS v. 9.1, SAS Institute, Cary, NC).

This summer was unusually hot and dry and the powdery scab disease pressure was very low thus making it difficult to separate cultivars/lines into groups (resistant, moderately resistant, moderately susceptible, and susceptible). Based on our past years' data, Kennebec and Shepody should be susceptible, and RioGrande Russet, Russet Norkotah and Russet Burbank should be moderately resistant. Cultivars and breeding lines with less powdery scab than Dark Red Norland indicate some level of resistance.

Cultivar/Line	Powdery Scab Incidence (%)	Cultivar/Line	Powdery Scab Incidence (%)
AF3317-15	0.0 h[z]	NYD40-50	5.7 d-h
AF3325-2	0.0 h	AF3001-6	5.9 c-h
RioGrande Russet	0.0 h	AF0338-17	6.4 c-h
Classic Russet (A95109-1)	0.7 gh	B2152-17	6.9 c-h
Chieftain	0.8 gh	Superior	7.5 b-h
BCO01306-2	1.1 f-h	Kennebec	7.9 b-h
B1992-106	1.2 f-h	Yukon Gold	8.2 b-h
Premier Russet (A93157-6LS)	1.4 f-h	NYD40-263	8.8 b-g
AF3362-1	1.5 f-h	AF2574-1	9.4 b-f
Russet Norkotah 3117	1.9 f-h	NYD40-35	9.5 b-f
Russet Burbank (#400)	2.4 e-h	AF3327-28	10.4 b-e
Dark Red Norland	3.8 d-h	Katahdin	10.7 b-e
Atlantic	4.0 d-h	NY139 (NYY28-9)	12.0 b-d
Snowden	4.3 d-h	AF2866-3	14.3 a-c
Modoc	4.4 d-h	AF2865-4	15.6 ab
Yukon Gem	5.0 d-h	NYB38-40	20.8 a
Alpine Russet (A9305-10)	5.4 d-h	Shepody	22.3 a
NY138	5.6 d-h		

[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.

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

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Evaluation of fungicides for control of potato late blight, 2010.

Fungicides were evaluated on potato cv. 'Atlantic' at the Russell E. Larson Agricultural Research Center at Rock Springs, PA. The soil type was a Hagerstown silty clay loam. The previous crop was corn. Potatoes were planted on 8 Jun. 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. Fertilization was 656 lb/A of 19-19-19 (N-P-K) banded in-the-row during planting. Liquid N fertilizer was applied at 33.0 lb/A on 16 Jul and 16.5 lb/A on 19 Jul while hilling. Precipitation was 2.02, 3.57, 4.67, and 3.31 in. for Jun, Jul, Aug, and Sep, respectively. Spreader rows were inoculated with the late blight pathogen on 12 Aug. A mixture of four isolates of *Phytophthora infestans*, with a concentration of 7.7×10^4 sporangia/ml, was used to promote a uniform spread of the pathogen to all treatment plots. This summer was unusually hot and dry. Overhead irrigation was applied at 0.75 in. on 12 Jul, 0.50 in. on 26 Jul. Sprinklers were used daily after inoculation for 1 hour each day for 24 days to increase humidity in the plant canopy. 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 nozzles and boom nozzles so that both sides and the top of each plant were sprayed. Disease ratings were determined by visually assessing the middle row of each plot for the percentage of diseased foliage caused by late blight. The plots were rated on 23, 27, 31 Aug and 5 Sep and the assessments were used to calculate the area under the disease progress curve (AUDPC). Plants were vine killed on 10 and 16 Sep with Reglone at 2.0 pt/A and 1.0 pt/A, respectively. The middle row of each plot was harvested on 8 Oct. Tubers were sorted and yield data were collected. Disease and yield data were subjected to analysis of variance and Fisher's protected least significant difference test (SAS v. 9.1, SAS Institute, Cary, NC).

All of the treatments, except for treatment with PM314 alternated with PM315, significantly suppressed season-long foliar late blight compared to the untreated control. Treatments with Bravo, Zampro at 14.0 fl oz/A and at 4.8 fl oz/A, Gavel, GWN-4700 + GWN-9941, and GWN-9823 had the lowest levels of foliar late blight and had significantly higher yields than the control.

Treatment and rate of product per acre (application timing[z])	AUDPC[y]	Yield (cwt/A)[x]
Untreated Control	661.1 a[w]	292.2 ef
Bravo WS 1.5 pt (A, B, C, D)	28.5 f	367.1 bc
Zampro SC 14.0 fl oz + Induce 0.5% v/v (A, C)	24.0 f	354.6 c-d
Zampro SC 4.8 fl oz + Penetrator 0.5% v/v (A, C)	71.4 f	346.4 cd
CX9090 0.5 lb (A, B, C, D)	481.4 c	311.8 d-f
CX9090 0.5 lb + Cueva 2.0 qt (A, B, C, D)	347.8 d	292.7 ef
CX9080 1.0 lb + Kocide 3000 DF 1.5 lb (A, B, C, D)	219.1 e	326.7 c-e
Gavel 75DF 2.0 lb (A, B, C, D)	7.0 f	397.8 ab
GWN-4700 80WP 4.0 oz + GWN-9941 6SC 1.25 pt (A, B, C, D)	12.0 f	414.5 a
GWN-9823 66WDG 6.4 oz (A, B, C, D)	23.6 f	366.2 bc
PM314 4.2 lb (A) PM315 1.0 lb (B, C, D)	589.6 ab	274.0 f
PM314 4.2 lb (A) PM315 1.0 lb (B, D) Bravo 1.5 pt (C)	503.6 bc	285.2 ef
PM314 4.2 lb (A) PM315 1.0 lb (B, D) Manzate ProStick 75DF 2.0 lb (C)	547.4 bc	296.2 ef

[z] Dates of fungicide applications were as follows: A = 10 Aug, B = 17 Aug, C = 24 Aug, D = 31 Aug.
[y] AUDPC = Area under disease progress curve.
[x] cwt/A = hundred weight per acre for tubers with diameter greater than 1.875 inches.
[w] Means followed by the same letter are not significantly different at $P = 0.05$ as determined by Fisher's protected least significant difference test.

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

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Evaluation of fungicides for control of potato early blight, 2010.

Fungicides were evaluated for managing early blight on potato cv. 'Atlantic' at the Russell E. Larson Agricultural Research Center at Rock Springs, PA. The soil type was a Hagerstown silty clay loam. The previous crop was corn. Potatoes were planted on 28 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. Fertilization was 999 lb/A of 10-10-10 banded in-the-row at planting. Precipitation was 2.02, 3.57, 4.67, and 3.31 in. for Jun, Jul, Aug, and Sep, respectively. Overhead irrigation was applied at 1.15 in. on 7 Jul, 1.0 in. on 29 Jul, 1.1 in. on 9 Aug and 1.0 in. on 30 Aug. Spreader rows were inoculated on 29 Jul. A mixture of three isolates of *Alternaria solani*, with a concentration of 1.13×10^5 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 nozzles and boom nozzles so that both sides and the top of each plant were sprayed. This summer was unusually hot and dry, which slowed the development of early blight disease. On 24 Aug and 3, 10, 17 and 23 Sep each plot was visually assessed for the percentage of diseased foliage caused by early blight. The five visual assessments of early blight infection were used to calculate the AUDPC. Plants were vine killed on 29 Sep with Reglone at 2.0 pt/A. The middle row of each plot was harvested on 7 Oct. Tubers were sorted and yield data was collected. Disease and yield data were subjected to analysis of variance and Fisher's protected least significant difference test (SAS v. 9.1, SAS Institute, Cary, NC).

All treatments significantly reduced season-long early blight compared to the untreated control. Treatment with BAS518 was numerically the most effective compared to the other treatments. Yields were significantly higher in most treated plots compared to the control except in the plots treated with Echo Zn alternated with Luna Tranquility and Reason and Scala alternated in a tank-mix with Dithane Rainshield.

Treatment and rate of product per acre (application timing[z])	AUDPC[y]	Yield (cwt/A)[x]
Untreated Control	560.0 a[w]	375.0 b
Bravo WS 1.5 pt (A-H)	82.1 b	464.2 a
Echo Zn SC 2.0 pt (A, C, E, G)		
Luna Tranquility 500SC 11.0 oz (B, D, F, H)	27.5 c	421.5 ab
Dithane Rainshield 75WG 2.0 lb (A-H)		
Reason 500SC 4.0 oz (A, C, E, G)		
Scala 60SC 7.0 oz (B, D, F, H).	32.6 c	426.5 ab
Headline EC 6.0 oz (A-H)	31.0 c	460.1 a
BAS518 2.0 lb (A-H)	13.0 c	457.2 a
BAS703 02F 4.0 oz (A-H)	21.5 c	449.5 a
BAS500 17F 6.15 oz (A-H)	26.8 c	447.6 a

[z] Dates of fungicide applications were as follows: A = 28 Jul, B = 4 Aug, C = 11 Aug, D = 18 Aug, E = 25 Aug, F = 1 Sep, G = 8 Sep, H = 15 Sep.

[y] AUDPC = Area under disease progress curve.

[x] cwt/A = hundred weight per acre for tubers with diameter greater than 1.875 inches.

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

Supplemental Progress Report, 2010----------March 17, 2011

Pennsylvania Regional Potato Germplasm Evaluation Program, 2010

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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: Lehigh, Erie and the Russell E. Larson Agricultural Research Center at Rock Springs, Centre Co. Please see the Progress Report from December 2010 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). 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 sliced. Center slices (12 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; see tables 5-8 for details.

Results

Yield results and listings of noteworthy varieties/lines were provided in the December 2010 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 many noteworthy lines from the short term storage chipping in December: two lines from the Lehigh County trial (E43-10, A01143-3C); one from the Erie County trial (NY145) and eleven from the Rock Springs trial (NY138, AF2291-10, AF2873-1, BNC182-5, NY140, D40-266, G20-44, A01143-3C, W2717-5, AF4130-7, MSJ147-1).

From the results of the 3 week reconditioning the noteworthy lines are: Lehigh (W2978-3); Erie (NY139); Rock Springs (NYD40-35, F47-3, G20-13, G20-31, G20-55, G20-63, W2717-5).

From the results of the 6 week reconditioning the noteworthy lines are: Erie (NY138, NY145); Rock Springs (NY138, NYD40-35, D40-266, F47-3, G89-2, A01143-3C, AF4149-1).

French fry Tests (Tables 5-8)
From the Lehigh County location, all lines tested in December had good french fry color; at Erie County, AF3001-6, Premier Russet and AC960522-1RU had the best fry color when tested in December and at Rock Springs, Premier Russet, AF3001-6, AF3325-2, AC96052-1RU, CO94035-15RU, Clearwater Russet, A01025-4, A98345-1, A01010-1, W2683-2rus, W6234-4rus, W6360-1rus, AF3008-3, AF4167-1, AF4198-2, AF4296-3, AF4320-7 and AF4342-3 had the best color.

Tablestock Tests (Table 9)
There were several new lines tested for tablestock varieties. Many of the lines that were boiled retained their white or yellow color with no sloughing therefore, suggesting that they are better suited for this purpose than Katahdin. Of the 163 lines tested for culinary characteristics, 30 were unacceptable for color, texture or sloughing.

This research was funded in part by the Pennsylvania Potato Research Program and a Special USDA grant. Growers, industry and cooperating breeding programs contributed to this project. We would like to acknowledge Chad Moore, Bob Leiby, Andy Muza, Sara May, and other part time staff. Without their assistance to this project, we could not accomplish all the research and prepare this report.

Table 1. Chip color results of potato evaluation in Lehigh County, Sherwood Geiger Farm, 2010 - 2011.

Variety/ Line	Specific Gravity	Chip Color		
		Dec.[1]	Feb.[2]	Feb.[3]
Atlantic	1.078	4	6	4
Snowden	1.077	4	4	3
Reba	1.075	4	5	6
Superior	1.063	6	7	7
Lehigh[YF]	1.068	4	5	6
NY138	1.071	5	5	4
NY139	1.081	4	4	5
NY140	1.064	5	5	5
NY141	1.072	4	6	5
NY145	1.068	4	5	4
NY146	1.073	5	5	5
NY147	1.067	5	6	4
E43-10	1.059	3	5	6
AF0338-17	1.072	4	5	5
MSJ147-1	1.056	4	-	-
B1992-106	1.066	5	5	5
A01143-3C	1.068	3	4	4
W2978-3	1.063	-	3	4
Yukon Gold[YF]	1.060	-	7	6
F11-1[YF]	1.067	-	6	5
Sylvana[YF]	1.054	-	7	5
B2628-10	1.069	5	5	5
W2717-5	1.065	4	6	4
AF2291-10	1.086	5	4	5

[1] Dec. = Stored at 55^0F from November 19, 2010 and chipped on December 19, 2010
[2] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F three weeks prior to chipping on February 4, 2011.
[3] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F six weeks prior to chipping on February 24, 2011.

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 Erie County, Mark Troyer Farm, 2010 - 2011.

Variety/ Line	Specific Gravity	Chip Color		
		Dec.[1]	Feb.[2]	Feb.[3]
Atlantic	1.079	4	5	4
Snowden	1.071	5	3	4
Reba	1.067	4	6	5
Lehigh[YF]	1.066	7	6	7
NY138	1.071	4	4	3
NY139	1.072	5	3	4
NY140	1.065	4	5	4
NY141	1.069	5	6	5
NY145	1.069	3	4	3
NY146	1.063	5	4	4
NY147	1.057	5	5	4
E43-10	1.057	6	7	7
B1992-106	1.070	4	6	5
MSJ147-1	1.070	5	4	4
W2717-5	1.076	4	5	4
W2978-3	1.057	6	6	5
AF2291-10	1.062	5	6	5
F11-1YF	1.062	-	9	8
Snowbird	1.060	-	8	7
Sylvana[YF]	1.046	-	10	8
Ambra[YF]	1.053	-	9	9

[1] Dec. = Stored at 55^0F from November 19, 2010 and chipped on December 19, 2010
[2] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F three weeks prior to chipping on February 3, 2011.
[3] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F six weeks prior to chipping on February 24, 2011.

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 at Rock Springs, Centre County, 2010 - 2011.

Variety/ Line	Specific Gravity	Chip Color		
		Dec.[1]	Feb.[2]	Feb.[3]
Atlantic	1.090	4	4	5
Katahdin	1.073	7	6	5
Kennebec	1.079	6	6	6
Snowden	1.088	4	3	4
Superior	1.072	5	6	7
Yukon Gem[YF]	1.059	5	6	7
Yukon Gold[YF]	1.077	6	7	7
AF2574-1	1.080	8	7	8
AF2865-4	1.071	6	9	7
AF2866-3	1.068	6	7	7
AF0338-17	1.086	4	5	6
B1992-106	1.082	4	6	5
Waneta(NY138)	1.085	3	4	3
Lamoka(NY139)	1.080	4	4	4
NYB38-40	1.069	5	4	5
NYD40-35	1.081	4	3	3
NYD40-50	1.083	5	4	5
NYD40-263	1.072	6	5	4
AF2291-10	1.095	3	5	5
AF4047-2	1.072	5	6	5
AF2873-1	1.074	3	6	5
AF2873-2	1.074	5	7	8
B2628-10	1.085	5	5	5
BNC182-5	1.089	3	6	5
BNC202-3[YF]	1.099	5	5	5
Lehigh[YF]	1.078	5	6	5
Reba	1.075	4	6	6
NY140	1.068	3	4	4
NY141	1.078	6	6	5
D40-266	1.088	3	4	3
E43-10	1.064	7	7	7
F11-1[YF]	1.076	7	7	7
F47-3	1.078	4	3	3
G1-11[YF]	1.062	9	10	10
G4-2	1.075	9	10	9
G18-1	1.083	6	6	6
G20-4	1.076	4	6	5
G20-5	1.072	4	5	5
G20-12	1.069	4	6	6
G20-13	1.082	5	3	4
G20-30	1.079	4	6	6
G20-31	1.080	4	3	4
G20-33	1.072	5	5	5
G20-41	1.084	5	4	5
G20-44	1.085	3	6	6
G20-55	1.080	4	3	4
G20-58	1.081	4	4	4
G20-63	1.081	4	3	5
G27-1	1.098	4	4	5
G70-3	1.069	5	6	6

Table 3. continued.

Variety/ Line	Specific Gravity	Chip Color		
		Dec.[1]	Feb.[2]	Feb.[3]
G73-1	1.072	7	7	7
G77-4	1.071	6	5	5
G86-1	1.085	4	4	4
G87-3	1.082	5	4	5
G89-2	1.098	4	4	3
G101-2	1.079	5	5	6
MSJ126-9Y[YF]	1.080	6	5	5
MSL211-3	1.074	8	8	9
MSL228-1SPL	1.076	6	8	6
MSN105-1	1.085	8	7	7
A00293-2Y[YF]	1.073	6	6	6
A99433-5Y[YF]	1.084	7	7	7
A01143-3C	1.079	3	5	3
A02267-1Y[YF]	1.055	6	7	6
Snowbrid	1.072	6	6	7
Sylvana[YF]	1.069	7	6	7
Ambra[YF]	1.069	7	7	7
W2717-5	1.089	3	3	4
W2978-3	1.073	5	5	5
AF4014-1	1.086	7	7	7
AF4014-9	1.074	5	6	5
F57-3	1.084	4	6	5
AF4125-1	1.082	5	4	6
AF4130-3	1.070	7	7	6
AF4130-7	1.089	3	4	6
AF4130-13	1.077	7	7	7
AF4139-1	1.083	5	4	4
AF4147-1	1.078	5	5	5
AF4148-1	1.095	6	6	6
AF4149-1	1.084	4	5	3
AF4203-2	1.080	6	5	6
AF4222-4	1.083	7	7	7
AF4240-3	1.081	5	5	6
AF4240-6	1.078	7	6	6
BNC202-7[YF]	1.098	5	5	6
B2729-1	1.081	6	6	6
B2738-3	1.070	7	6	6
MSJ147-1	1.075	3	4	4
AF4225-2	1.088	-	5	5

[1] Dec. = Stored at 55^0F from November 19, 2010 and chipped on December 13 & 14, 2010
[2] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F three weeks prior to chipping on January 31 & February 1, 2011.
[3] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F six weeks prior to chipping on February 21 & 22, 2011.

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 potato evaluation for NE1031 at Rock Springs, Centre County, 2010 - 2011.

Variety/ Line	Specific Gravity	Chip Color		
		Dec.[1]	Feb.[2]	Feb.[3]
Atlantic	1.090	4	4	5
Katahdin	1.073	7	6	5
Kennebec	1.079	6	6	6
Snowden	1.088	4	3	4
Superior	1.072	5	6	7
Yukon Gem[YF]	1.059	5	6	7
Yukon Gold[YF]	1.077	6	7	7
AF2574-1	1.080	8	7	8
AF2865-4	1.071	6	9	7
AF2866-3	1.068	6	7	7
AF0338-17	1.086	4	5	6
B1992-106	1.082	4	6	5
Waneta(NY138)	1.085	3	4	3
Lamoka(NY139)	1.080	4	4	4
NYB38-40	1.069	5	4	5
NYD40-35	1.081	4	3	3
NYD40-50	1.083	5	4	5
NYD40-263	1.072	6	5	4

[1] Dec. = Stored at 55^0F from November 19, 2010 and chipped on December 13 & 14, 2010
[2] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F three weeks prior to chipping on January 31 & February 1, 2011.
[3] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F six weeks prior to chipping on February 21 & 22, 2011.

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 and marketable yield, specific gravity, and French fry color for russet skinned or long white potato evaluation trial in Lehigh County, Sherwood Geiger Farm, 2010.

Variety/ Line	Yield (cwt/A)[1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec[5]
Atlantic	293	258	100	3	1.078	-
Russet Norkotah	131	88	34	6	1.055	00
AF3001-6	356	177	69	41	1.080	00
AC96052-1RU	118	41	16	30	1.065	00
Mesa Russet*	165	111	43	23	1.066	00
Classic Russet*	245	179	70	21	1.061	0
Clearwater Russet*	157	40	15	47	1.071	00
Rio Grande Russet*	177	100	39	23	1.067	00
CO95172-3RU*	212	83	32	39	1.080	00
W6234-4rus*	304	135	52	46	1.076	00
A01010-1*	360	144	56	48	1.072	00

[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 19, 2010 and fried on December 7, 2010.

Replicated trials are the average of 4 replicates except for those lines with * which were non-replicated.

Table 6. Total and marketable yield, specific gravity, and French fry color for russet skinned or long white potato evaluation trial in Erie County, Mark Troyer Farm, 2010.

Variety/ Line	Yield (cwt/A)[1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec[5]
Atlantic	240	144	100	5	1.079	-
W6360-1rus	239	76	53	8	1.075	0
AF3001-6	270	88	61	10	1.076	00
Clearwater Russet	177	78	54	5	1.068	0
Russet Norkotah	170	51	35	7	1.066	1
Classic Russet*	198	71	49	46	1.062	1
Premier Russet*	202	36	25	69	1.076	00
Rio Grande Russet*	199	79	55	33	1.072	1
W2683-2rus*	169	78	54	40	1.060	0
W6234-4rus*	124	58	40	30	1.068	0
Mesa Russet*	95	50	34	24	1.058	0
AC960522-1RU*	189	124	86	12	1.071	00
CO95172-3RU*	287	125	86	48	1.072	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 19, 2010 and fried on December 7, 2010.

Replicated trials are the average of 4 replicates except for those lines with * which were non-replicated.

Table 7. Total and marketable yield, specific gravity, vine maturity, and French fry color for russet skinned or long white potato evaluation trial in Rock Springs Plant Pathology farm, 2010 - 2011.

Variety/Line	Yield (cwt/A)[1]		% of	Percent[3]	Specific	Vine	French Fry Color[4]		
	Total	>1 7/8"	Standard[2]	Pickouts	Gravity	Maturity	Dec.[5]	Jan.[6]	Feb.[7]
Alpine Russet (A9305-10)	433	309	95	25	1.08	M	0	1	0
Classic Russet (A95109-1)	475	438	134	6	1.08	ML	0	1	1
Premier Russet (A93157-6LS)	357	241	74	28	1.093	ML	00	00	00
Rio Grande Russet	485	352	108	18	1.094	ML	0	1	0
Russet Burbank (#400)	448	202	62	51	1.079	ML	1	00	0
Russet Norkotah #3117	475	327	100	29	1.071	M	1	1	1
AF3001-6	508	402	123	19	1.086	ML	00	00	00
AF3317-15	341	193	59	42	1.095	L	1	00	00
AF3325-2	230	152	46	28	1.072	E	0	0	0
AF3327-28	470	334	102	27	1.078	ML	1	0	00
AF3362-1	326	253	77	18	1.067	ME	1	0	1
AF4113-2	409	289	89	25	1.074	ML	1	1	0
AF4124-4	555	305	93	42	1.081	ML	1	1	1
AC96052-1RU	325	246	75	17	1.080	ML	0	00	0
CO95172-3RU	401	273	83	27	1.088	L	1	0	0
CO94035-15RU (Mesa Russet)	365	268	82	20	1.077	L	0	00	00
Clearwater Russet	357	249	76	19	1.084	L	0	0	00
A01025-4	319	199	61	31	1.081	ML	0	0	0
A98345-1	432	321	98	22	1.087	VL	0	00	00
A01010-1	439	303	93	26	1.076	ML	0	0	0
Russet Norkotah	397	294	90	22	1.064	ME	2	1	2
W2683-2rus	411	261	80	31	1.069	M	0	0	0
W6234-4rus	317	209	64	28	1.077	ML	0	0	00
W6360-1rus	375	238	73	33	1.082	VL	0	0	0
AF3008-3*	278	232	71	10	1.096	M	0	00	00
AF4116-9*	384	221	68	42	1.073	M	1	1	1
AF4124-7*	341	209	64	34	1.083	ML	1	0	0
AF4167-1*	344	182	56	38	1.085	M	00	0	0
AF4172-2*	442	353	108	13	1.088	M	1	1	0
AF4185-1*	501	414	127	11	1.078	ML	1	0	0
AF4191-2*	324	201	62	27	1.078	ML	1	1	1
AF4194-1*	465	247	76	45	1.086	ML	1	2	1
AF4198-2*	478	243	74	47	1.081	M	0	0	0
AF4225-2*	486	376	115	21	1.088	ML	0	-	-

Table 7. continued.

Variety/Line	Yield (cwt/A)[1]		% of	Percent[3]	Specific	Vine	French Fry Color[4]		
	Total	>1 7/8"	Standard[2]	Pickouts	Gravity	Maturity	Dec.[5]	Jan.[6]	Feb.[7]
AF4296-3*	451	245	75	42	1.088	L	00	00	0
AF4320-7*	412	272	83	29	1.084	L	0	00	00
AF4322-5*	148	113	35	0	1.070	E	0	-	0
AF4342-3*	308	240	74	13	1.093	ML	00	00	00

[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 #3117 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 19, 2010 and fried on December 8, 2010.
[6] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F three weeks prior to frying on January 27 & 26, 2011.
[7] Mar. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F six weeks prior to frying on Febuary 16 & 17, 2011.

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

Table 8. Total and marketable yield, specific gravity, vine maturity, and French fry color for russet skinned or long white NE1031 potato evaluation trial in Rock Springs Plant Pathology farm, 2010 - 2011.

Variety/Line	Yield (cwt/A)[1]		% of	Percent[3]	Specific	Vine	French Fry Color[4]		
	Total	>1 7/8"	Standard[2]	Pickouts	Gravity	Maturity	Dec.[5]	Jan.[6]	Feb.[7]
Atlantic	502	421	100	14	1.08	ML	-	-	-
Alpine Russet (A9305-10)	439	289	69	28	1.08	M	0	1	0
Classic Russet (A95109-1)	471	429	102	7	1.08	ML	0	1	1
Premier Russet (A93157-6LS)	350	237	56	27	1.093	ML	00	00	00
Rio Grande Russet	483	357	85	17	1.094	ML	0	1	0
Russet Burbank (#400)	448	193	46	53	1.079	ML	1	00	0
Russet Norkotah #3117	484	343	81	27	1.071	M	1	1	1
AF3001-6	509	400	95	20	1.086	ML	00	00	00
AF3317-15	347	177	42	48	1.095	L	1	00	00
AF3325-2	219	159	38	21	1.072	E	0	0	0
AF3327-28	458	329	78	25	1.078	ML	1	0	00
AF3362-1	347	254	60	22	1.067	ME	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 19, 2010 and fried on December 8, 2010.
[6] Feb. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F three weeks prior to frying on January 27 & 26, 2011.
[7] Mar. = Stored at 45^0F from November 30, 2010 than transferred to 55^0F six weeks prior to frying on Febuary 16 & 17, 2011.

Replicated trials are the average of 4 replicates.

Russets were planted 10-in. apart with 12 seed pieces per 10-ft plot, Atlantic was spaced 8-in. apart with 15 seed pieces per 10-ft plot.

Table 9. Baking, boiling, microwaving results of tablestock test for Germplasm evaluation trial in Rock Springs, Plant Pathology Farm, 2010.

Variety/	Boil[1]			Bake[2]		Microwave[3]	
Line	Color[4]	Texture[5]	Sloughing[6]	Color	Texture	Color	Texture
Atlantic	1	2	1	1	2	1	2
Katahdin	1	3		1	2	1	2
Kennebec	1	3	1	1	2	1	2
Snowden	1	2	1	1	2	1	3
Superior	1	3		1	3	1	3
Yukon Gem[YF]	3	3		3	2	3	3
Yukon Gold[YF]	3	3		3	2	3	3
AF2574-1	1	3		1	3	1	2
AF2865-4	1	3		1	3	1	2
AF2866-3	1	4		1	3	1	4
AF0338-17	1	3		1	3	1	3
B1992-106	1	3		1	3	1	3
NY138	1	3		1	2	1	3
NY139 (NYY28-9)	1	3		1	2	1	3
NYB38-40	1	3		1	3	1	3
NYD40-35	1	3		1	2	1	2
NYD40-50	1	3		1	1	1	2
NYD40-263	1	3		1	2	1	2
AF2291-10	1	3		1	2	1	2
AF4047-2	1	3		1	3	1	3
AF2873-1	1	2		1	2	1	2
AF2873-2	1	3		1	2	1	2
AF4014-1	1	3		1	2	1	2
AF4014-9	1	3		1	3	1	3
B2628-10	1	3		1	2	1	1
BNC182-5	1	2		1	2	1	2
BNC202-3[YF]	3	3	1	3	3	3	3
Lehigh[YF]	3	3		3	3	3	3
Reba	1	3		1	3	1	3
NY140	1	3		1	2	1	3
NY141	1	3	1	1	2	1	3
D40-266	4	3		1	2	1	3
E43-10	1	4		1	3	1	4
F11-1[YF]	3	2		3	2	3	3
F47-3	4	2		1	2	1	3
F57-3	1	2	1	1	4	1	4
G1-11[YF]	3	3		2	2	3	3
G4-2	2	3		2	3	2	3
G18-1	2	3		2	3	2	3
G20-4	1	3		1	3	1	3
G20-5	1	3		1	3	1	3
G20-12	1	3		1	3	1	3
G20-13	1	3		1	3	1	3
G20-30	1	3		1	3	1	3
G20-31	1	3		1	4	1	3
G20-33	1	3		1	3	1	3
G20-41	1	3		1	3	1	2
G20-44	4	3		2	3	1	2
G20-55	1	3		1	3	1	2
G20-58	1	3		1	3	1	2

Table 9. Continued.

Variety/ Line	Boil[1] Color[4]	Texture[5]	Sloughing[6]	Bake[2] Color	Texture	Microwave[3] Color	Texture
G20-63	1	3		1	3	1	3
G27-1[YF]	3	2		3	3	3	3
G70-3[YF]	3	3		3	2	3	2
G73-1	1	3		1	3	1	2
G77-4	1	3		1	3	1	3
G86-1	4	3		1	3	1	3
G87-3	1	2		1	2	1	2
G89-2	1	2		1	3	1	3
G101-2[YF]	3	2		3	4	2	2
MSJ126-9Y[YF]	3	3		2	2	2	3
MSL211-3	1	3		1	3	1	3
MSL228-1SPL	1	3		1	3	1	3
MSN105-1	1	3		1	2	1	2
A00293-2Y[YF]	3	3		3	3	3	3
A99433-5Y[YF]	2	3		2	3	2	3
A01143-3C	4	2		1	2	1	2
A02267-1Y[YF]	3	3		3	2	3	2
Snowbrid	1	3	1	1	2	1	2
Sylvana[YF]	3	3		3	3	3	2
Ambra[YF]	3	3		3	2	3	2
W2717-5	1	3		1	2	1	1
W2978-3	1	2		1	2	1	3
AF4125-1	1	3		1	2	1	2
AF4130-3	1	3		1	2	1	3
AF4130-7	1	3	1	1	2	1	2
AF4130-13	1	3		1	3	1	3
AF4139-1	1	2		1	2	1	2
AF4147-1	1	3		1	2	1	2
AF4148-1	1	3		1	2	1	2
AF4149-1	1	2		1	2	1	3
AF4203-2	1	4		1	2	1	3
AF4222-4	1	3		1	2	1	2
AF4240-3	1	3		1	3	1	2
AF4240-6	1	2		1	2	1	2
BNC202-7[YF]	3	2		3	2	3	2
B2729-1	1	2		1	2	1	2
B2738-3	1	2		1	2	1	2
MSJ147-1	1	3		1	3	1	2
Reds							
Chieftain	1	3		1	3	1	2
Dark Red Norland	1	3		1	3	1	3
Modoc	1	4		1	2	1	1
B2152-17[YF]	3	3		3	2	3	2
BCO01306-2	Pk	3	1	Pk	2	Pk	4
B1816-5	3	3		3	2	3	3
BCO01044-2[Pur]	Pur	3		Pur	2	Pur	2
B2676-2	1	3		1	2	1	3
BNC193-1	1	3		1	3	1	3
BNC201-1[YF]	3	2		3	2	3	2
Adirondack Blue[Pur]	Pur	3		Pur	3	Pur	3
Adirondack Red	Pk	3		Pk	3	Pk	2

Table 9. Continued.

Variety/ Line	Boil[1] Color[4]	Texture[5]	Sloughing[6]	Bake[2] Color	Texture	Microwave[3] Color	Texture
B13-1	1	3		1	3	1	3
F7-1[YF]	3	3		3	3	3	3
F36-3	1	3		1	3	1	3
G1-17	1	3		1	2	1	2
G2-1[YF]	3	3		3	1	3	1
G4-1	1	3		1	2	1	2
MSN230-1RY[YF]	3	3		3	2	3	2
Purple Majesty[Pur]	Pur	3		Pur	2	Pur	2
CO97227-2P/PW[Pur]	Pur	2	1	Pur	1	Pur	2
CO97222-1R/R	Pk	2	1	Pk	2	Pk	1
CO97232-2R/Y[YF]	3	3		3	3	3	2
AC97521-1R/Y[YF]	3	3		3	2	3	2
CO97226-2R/R	?	2		?	2	?	2
CO99076-6R	1	3		1	3	1	3
AC99329-7PW/Y[YF]	3	4		3	2	3	4
CO99256-2R	1	3		1	2	1	2
AC99330-1P/Y[YF]	3	3		3	3	3	4
NDA7985-1R	1	3		1	3	1	2
A99331-2RY[YF]	3	3		3	1	3	2
Red Scarlett[YF]	3	3		3	2	3	2
Rodeo[YF]	3	3		3	2	3	2
W2609-1R	1	4		1	2	1	3
W6002-1R	1	4		1	3	1	3
MSQ432-2PP	?	3		?	1	?	2
MSQ558-2RR	SPk	2	1	SPk	2	SPk	2
A02267-5PY[YF]	3	2		3	2	3	3
Russets							
Alpine Russet (A9305-10)	1	3		1	2	1	3
Classic Russet (A95109-1)	1	3		1	2	1	3
Premier Russet (A93157-6LS)	1	2		1	2	1	2
Rio Grande Russet	1	3		1	3	1	2
Russet Burbank (#400)	1	3		1	2	1	2
Russet Norkotah #3117	1	3		1	3	1	2
AF3001-6	1	3		1	3	1	2
AF3317-15	1	3		1	1	1	2
AF3325-2	1	2		1	2	1	3
AF3327-28	1	3		1	3	1	3
AF3362-1	1	3		1	3	1	2
AF4113-2	1	2		1	3	1	3
AF4124-4	1	3	1	1	2	1	2
AC96052-1RU	1	3		1	2	1	2
CO95172-3RU	1	3	1	1	2	1	2
CO94035-15RU (Mesa Russet)	1	2		1	3	1	3
Clearwater Russet	1	2		1	2	1	3
A01025-4	1	2		1	2	1	3
A98345-1	1	2		1	2	1	2
A01010-1	1	3		1	1	1	2
Russet Norkotah	2	3		1	3	1	3
W2683-2rus	2	2		1	2	1	3
W6234-4rus	1	3		1	2	1	2
W6360-1rus	1	3		1	3	1	3

Table 9. Continued.

Variety/ Line	Boil[1] Color[4]	Texture[5]	Sloughing[6]	Bake[2] Color	Texture	Microwave[3] Color	Texture
AF3008-3	1	2	1	1	1	1	2
AF4116-9	1	2		1	3	1	3
AF4124-7	1	3		1	2	1	2
AF4167-1	1	3		1	2	1	2
AF4172-2	1	2		1	1	1	3
AF4185-1	1	2		1	3	1	3
AF4191-2	1	3		1	2	1	3
AF4194-1	1	3		1	2	1	2
AF4198-2	1	3		1	2	1	2
AF4225-2	1	3		1	2	1	2
AF4296-3	1	3		1	2	1	2
AF4320-7	1	3		1	2	1	3
AF4342-3	1	3		1	2	1	3

Tested: January 10, 2011. January 17 thru 21, 2011 and January 24 &25, 2011.
[1] Boil 20 minutes.
[2] Bake 45 min. – 1 hr.
[3] Microwave 4 – 8 minutes.
[4] Color scored as follows: 1=white, 2=slightly yellow, 3=yellow, 4=white with gray edges, 5=gray with dark edges.
[5] Texture scored as follows: 1=dry (mealy, 3= medium, 5=soggy.
[6] Sloughing scored as follows: 1=some sloughing, 2= severe sloughing.

YF = Yellow Flesh
Pur = Purple Flesh
Pk = Pink Flesh
Rd = Red Flesh

Yellow Flesh Notes

We rated the yellow flesh in December.
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

Rock Springs:	YF1	YF2	YF3
	G101-2	Yukon Gold	G27-1
		B1816-5 (purple skin)	CO97232-2R/Y (red skin)
		B2152-17 (red skin)	AC97521-1R/Y (red skin)
		BNC201-1 (red skin)	AC99330-1P/Y (purple skin)
		BNC202-3	A00293-2Y
		BNC202-7	A02267-1Y
		Lehigh	A02267-5PY (purple skin)
		F7-1 (red skin)	A99331-2RY (red skin)
		F11-1	
		G1-11	
		G2-1 (red skin)	
		G20-33	
		G70-3	
		MSJ126-9Y	
		MSN230-1RY (red skin)	
		AC99329-7PW/Y (purple with tan splotches)	
		Yukon Gem	
		A99433-5Y	
		Ambra	
		Red Scarlett (red skin)	
		Rodeo (red skin)	
		Sylvana	

Rock Springs chip notes for yellow flesh lines.
Dec. = G27-1 had the best chip color.
These clones had acceptable chip color: Yukon Gem, BNC202-3, BNC202-7, Lehigh, G20-33, G70-3 and G101-2.
3weeks = G27-1 had the best chip color.
These clones had acceptable chip color: BNC202-3, BNC202-7, G20-33, G101-2 and MSJ126-9Y.
At 6 weeks these clones had acceptable chip color: BNC202-3, Lehigh, G20-33, G27-1 and MSJ126-9Y.

Chipping notes for color flesh

We chip the samples one time in December, from 55^0F storage.

The purple flesh clones were BCO01044-2, Adirondack Blue, Purple Majesty and CO97227-2P/PW. Purple Majesty and CO97227-2P/PW had the best chip color.

The red flesh clones were BCO01306-2, Adirondack Red, CO97222-1R/R, CO97226-2R/R and MSQ558-2RR. CO97222-1R/R and Adirondack Red had the best chip color.