Pennsylvania Potato Research Report, 2011

Edited by:

Barbara J. Christ
&
Xinshun Qu

Department of Plant Pathology

The Pennsylvania State University

University Park, PA 16802

TABLE OF CONTENTS

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 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 65 round whites with a few yellow flesh, 37 red-skinned (a few purple skinned) and 23 russet or long white types. The Northampton location had 39 lines and 41 specialty lines. Breeding lines were contributed by the USDA-ARS, New York, Maine, Michigan, Colorado, North Carolina, Oregon, Idaho and a few other sources. See **Progress report - Pennsylvania Regional Potato Germplasm Evaluation Program, 2011 on pages 1-2 and tables from different locations on pages 3-28, and supplemental progress report on pages 34-35 and tables from different locations on pages 36-47.**

2. Breeding for Disease Resistance

There are several projects focused around a cultivated diploid species hybrid population that can be easily intercrossed with common varieties. These are long term projects dealing with early and late blight resistance as well as powdery scab resistance. Results of these projects will not be presented here but results of small trials evaluating soon to be released lines for their reaction to early blight, late blight and powdery scab are presented. In three separate field trials, 73, 37 and 38 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. Yukon Gem, AF3317-15, AF2574-1, Classic Russet, NY145, NYE106-4, Alpine Russet, Joma, Rio Grande Russet, Snowden, Premier Russet, Russet Burbank, AWN86514-2, MSQ176-5, AF3317-15, B0692-4, A00286-3Y, AF4191-2, AF4122-3, MSR061-1, and AC99375-1RU were resistant to moderately resistant. See **Evaluation of potato cultivars and breeding lines for resistance to late blight, 2011 page 29.**

Twelve cultivars/lines were classified as moderately resistant to early blight, and they included: Premier Russet, Russet Burbank, AF3317-15, BNC182-5, AF3001-6, NYE106-4, B1992-106, Alpine Russet, Rio Grande Russet, Kennebec, Snowden, and Yukon Gem. See **Evaluation of potato cultivars and breeding lines for resistance to early blight, 2011 page 30.**

Powdery scab disease pressure was very low this year 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. See **Evaluation of potato cultivars and breeding lines for resistance to powdery scab, 2011 page 31.**

3. Chemical Control of Potato Diseases

In the late blight fungicide trial 10 different treatments were compared to an untreated control. All of the treatments significantly suppressed season-long foliar late blight compared to the untreated control. Treatments with Bravo Weather Stik, Gavel, GWN-4700 + GWN-9941, GWN-4700 + GWN-9938 and Bravo Weather Stik alternated with Zampro had the lowest levels of foliar late blight. See **Evaluation of fungicides for control of potato late blight, 2011 pages 32.**

In the early blight fungicide trial 11 different treatments were compared to an untreated control. All treatments significantly reduced season-long early blight compared to the untreated control, except for CX-10440 at the rate of 3.75 oz/A. See **Evaluation of fungicides for control of potato early blight, 2011 pages 33.**

Progress Report—December 16, 2011

Pennsylvania Regional Potato Germplasm Evaluation Program, 2011

Barbara J. Christ, Xinshun Qu, and Michael Peck
Department of Plant Pathology
The Pennsylvania State University

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: Northampton Co. (Tables 1-3), and Rock Springs, Centre Co. (Tables 4-15). The Northampton location had 23 lines with three replications, 16 lines non-replicated and 41 non-replicate specialty lines. At the Rock Springs location the germplasm trials included 65 round whites with a few yellow flesh, 37 red-skinned (a few purple skinned) and 23 russet or long white types in replicated 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 we also had an early season trial with 44 non-replicate lines which had 90 growth days, and a spacing trial with 28 non-replicate lines in which the seed spacing was 12-inch within a 15-ft plot. All other pertinent information for individual trials is found within the data tables or in Table 16. We assessed yield and external defects, skin color, texture, tuber shape, specific gravity and overall appearance. Chip quality tests and culinary tests will be conducted over the next few months. This spring was wet followed by hot temperatures in July and wet conditions in September and October across the state for most of the growing season. Management information for each site is provided in Table 16.

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

Results:

Across the two locations 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, NY140, and BNC182-5.

In the Northampton location the following lines also had high yield: Reba, Yukon Gold, NY149, AF4013-3, ATCO0293-1w/y, Sifra, Lehigh, Joma, and Smart.

Based on data of replicated trials at Rock Springs, there were another 12 round white clones with marketable yields greater than Atlantic. However, any clone with marketable yield between 292-474cwt 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, AF0338-17, BNC182-5, NY138, NYE106-4, and H15-6.

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: AF2866-3, B2738-3, NY140, G4-2, G73-1, and H15-5.

Red-skinned:
Based on data of replicated trials at Rock Springs, there were 3 red-skinned or purple-skinned clones with marketable yields significantly greater than Chieftain: NY144, NYB13-1 and NDA7985-1R; there were another 16 red-skinned or purple-skinned clones with marketable yields greater than Chieftain. Any clone with marketable yield between 186-378cwt 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 greater than Russet Norkotah #3117: Classic Russet (A95109-1) and AF3362-1. Any clone with marketable yield between 209-361cwt 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, Oregon, Idaho, Colorado, Michigan and Canada breeding programs provided seed. Special thanks to Chad Moore, Bob Leiby, and Andy Muza 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 Northampton County, Garry Hunsickers Farm, 2011

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	443	395	89	100	21	45	21	2	8	1.085
Snowden	441	405	91	103	26	53	12	0	6	1.079
Reba	465	446	96	113	30	49	17	0	3	1.071
Chieftain	543	466	86	118	22	45	19	0	11	1.061
Yukon Gold[yf]	437	402	92	102	19	48	25	0	6	1.074
Superior	424	387	91	98	24	58	9	0	7	1.066
NY138 (Waneta)	413	388	94	98	22	47	25	0	3	1.071
NY139 (Lamoka)	396	348	88	88	34	47	7	0	6	1.076
NY140	475	420	88	106	21	53	15	0	8	1.077
NY141	388	338	87	86	23	47	17	0	8	1.071
NY144	500	364	73	92	52	20	1	0	9	1.048
NY149 (F11-1)[yf]	472	406	85	103	59	26	1	0	1	1.069
B13-1	187	140	75	35	50	20	5	0	9	1.048
AF4013-3[yf]	481	428	89	108	32	50	7	0	7	1.075
AF4222-4	375	340	91	86	18	56	15	2	7	1.073
B1992-106	310	277	90	70	35	47	8	0	4	1.073
B2152-17[yf]	495	400	80	101	49	30	1	0	4	1.068
B2727-2	331	311	94	79	48	43	3	0	1	1.085
B2751-1[yf]	348	264	76	67	35	35	5	0	16	1.076
ATCO0293-1w/y[yf]	546	401	73	102	32	36	6	0	19	1.061
Sylvana[yf]	454	395	87	100	34	45	9	0	10	1.060
Sifra	542	439	81	111	35	43	3	0	11	1.064
Passion[yf]	501	328	65	83	45	21	0	0	16	1.052
Russet Norkotah*	460	339	74	86	24	30	19	0	24	1.069
AF3011-34*	344	306	89	78	44	19	26	0	6	1.073
Goldfinger*[yf]	420	212	50	54	39	12	0	0	27	1.071
A98345-1*	309	222	72	56	22	33	17	0	26	1.074
Lehigh*	498	480	96	122	10	43	37	6	3	1.072
Joma*	620	464	75	118	14	27	33	0	24	1.071

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
Katahdin*	344	325	94	82	25	62	8	0	3	1.063
BNC182-5*	549	515	94	131	24	61	9	0	4	1.083
H4-1*	457	380	83	96	47	36	0	0	6	1.066
MSN105-1*	306	277	90	70	41	34	15	0	3	1.081
Smart*[yf]	632	495	78	125	60	15	3	0	11	1.067
Dk Rd Norland*	478	389	81	99	24	52	6	0	15	1.063
NDA7985-1R*	460	389	85	99	10	45	29	0	14	1.055
CO99076-6R*	339	293	86	74	22	57	7	0	11	1.062
BNC201-1*	474	404	85	102	23	53	9	0	9	1.077
B2676-2*	316	288	91	73	46	40	4	0	3	1.078
LSD	107	101	6		9	12	10	2	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 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.

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 Northampton County, Garry Hunsickers Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Atlantic	5	5	5	2	4	5	1	0	Green
Snowden	4	5	5	2	5	6	1	0	Green
Reba	5	6	6	3	5	5	0	0	Green
Chieftain	4	2	7	2	5	5	0	0	2nd tubers, Green
Yukon Gold[yf]	5	7	7	2	6	5	0	0	Green
Superior	4	6	6	6	4	4	0	0	Misshapen
NY138 (Waneta)	6	6	7	2	6	5	1	0	Green
NY139 (Lamoka)	5	6	7	2	5	6	0	0	Green
NY140	5	6	6	3	6	5	1	0	Green
NY141	5	7	7	2	6	5	0	0	Green
NY144	4	2	8	2	6	6	0	0	Green, Spouts
NY149 (F11-1)[yf]	6	6	7	2	7	5	0	0	Spouts
B13-1	4	2	7	3	7	5	0	0	Misshapen, Green
AF4013-3[yf]	5	7	7	3	5	5	0	0	Green, Sprouts
AF4222-4	5	6	7	2	7	6	0	0	Green
B1992-106	5	5	5	3	7	6	0	0	Green
B2152-17[yf]	6	2	7	2	7	5	0	0	Green
B2727-2	5	7	6	3	5	5	0	0	Green
B2751-1[yf]	5	6	6	2	5	6	0	0	Green, Growth cracks
ATCO0293-1w/y[yf]	5	6	7	3	5	6	1	0	Spouts, 2nd tubers, Green
Sylvana[yf]	5	6	6	2	5	5	0	0	Knobs, Green
Sifra	4	7	7	2	6	6	0	0	2nd tubers, Green
Passion[yf]	4	2	6	3	7	6	0	0	Misshapen, Green
Russet Norkotah*	5	4	3	4	6	5	0	0	Misshapen, Green
AF3011-34*	6	6	4	4	6	5	0	0	Misshapen, Green
Goldfinger*[yf]	5	7	7	4	6	5	0	0	Misshapen, Green
A98345-1*	5	6	6	4	6	5	3	0	Misshapen
Lehigh*	5	6	6	3	5	5	1	0	Green
Joma*	4	7	7	4	5	5	0	0	Green, Growth cracks

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Katahdin*	5	7	7	3	6	6	0	0	Green
BNC182-5*	5	6	5	2	5	6	0	0	Green
H4-1*	5	7	6	2	4	6	1	0	Green
MSN105-1*	4	7	7	2	5	5	0	0	Green
Smart*[yf]	4	7	7	3	6	5	0	0	Green
Dk Rd Norland*	4	2	8	3	5	5	0	0	Growth cracks, Green
NDA7985-1R*	6	2	8	3	4	5	0	0	Green
CO99076-6R*	5	2	8	2	6	6	0	0	Green
BNC201-1*	5	2	7	2	4	6	0	0	Green
B2676-2*	6	2	7	3	7	5	0	0	Green

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

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

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

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

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

[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.

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 Northampton County, Garry Hunsickers Farm, 2011

Variety/Line	Yield (cwt/A)[1]		%	%	% by size class[3]				Vine	Notes
	Total	>1 7/8"	US#1	of Standard[2]	2	3	4	5	Maturity	
Dark Red Norland	142	119	84	100	18	66	0	0	E	
Yukon Gold	193	184	96	155	31	54	10	0	ME	
Reba	230	215	93	180	46	47	0	0	M	
Superior	164	145	89	121	54	35	0	0	E	
Adirondack Red	237	163	69	136	69	0	0	0	E	Red skin, red flesh
Adirondack Blue	276	260	94	218	71	24	0	0	ME	Purple skin, purple flesh
G1-11	195	36	19	31	19	0	0	0	ME	Oblong white tubers with pink eyes, yellow flesh
H52-1	248	198	80	166	56	19	5	0	ML	Purple skin, purple flesh
H63-1	233	207	89	173	78	11	0	0	M	Round white, yellow flesh, pink eyes
H85-2	191	157	82	132	79	3	0	0	ME	Purple splash skin, yellow flesh
H91-1	324	292	90	245	45	45	0	0	ML	Purple skin with white splash, yellow flesh
H122-4	209	206	99	173	60	39	0	0	ML	Pink skin, white flesh
Blackberry	157	134	86	112	50	36	0	0	ME	Purple skin, purple flesh
Raspberry	223	177	79	148	72	8	0	0	ME	Red skin, red flesh
Colonial Purple	240	212	88	178	48	40	0	0	M	Purple skin, white flesh
MSQ432-2PP	81	60	75	51	53	22	0	0	M	Purple skin, purple and yellow flesh
Spartan Splash	205	170	83	142	63	20	0	0	M	White skin with purple splash, yellow flesh
B2152-17	228	169	74	142	70	4	0	0	E	Red skin, yellow flesh
BCO01044-2	205	191	93	160	28	65	0	0	ML	Purple skin, puurple flesh
BCO01306-2	175	149	85	125	73	12	0	0	ML	Red skin, red flesh
BNC201-1	223	193	86	162	51	30	5	0	M	Red skin, yellow flesh
B2756-7	109	74	69	62	46	22	0	0	ME	Red skin, yellow flesh
BNC243-1	275	181	66	152	56	10	0	0	ML	Red skin
AC97521-1R/Y	277	218	78	182	70	9	0	0	ML	Red skin, yellow flesh
CO97222-1R	251	178	71	149	63	8	0	0	M	Red skin, red flesh
Purple Majsety	245	121	49	101	49	0	0	0	ML	Purple skin, purple flesh
NDA7985-1R	356	322	90	269	33	53	4	0	L	Red skin, white flesh
A99331-2RY	251	175	70	147	65	5	0	0	L	Red skin, yellow flesh
Goldfinger	274	127	46	106	46	0	0	0	ML	Oblong tubers, yellow flesh
Passion	274	208	76	175	58	18	0	0	ML	Red skin, yellow flesh
Rodeo	233	200	86	168	75	11	0	0	L	Red skin, yellow flesh
Smart	347	282	81	236	77	4	0	0	M	White skin, yellow flesh
Snowbird	226	195	86	163	50	36	0	0	M	White skin
Lehigh	305	293	96	245	16	76	4	0	ML	
Chieftain	332	322	97	269	37	46	14	0	ML	
Katahdin	209	198	95	166	30	49	15	0	L	
Peter Wilcox	205	165	81	138	70	10	0	0	ML	Purple skin, yellow flesh

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

[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 round white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Atlantic	427	383	90	100	13	49	26	1	8	1.078
JOMA	488	276	56	72	12	28	17	0	42	1.069
Katahdin	328	281	87	73	15	50	22	0	12	1.062
Kennebec	458	232	51	60	10	25	16	0	47	1.064
Snowden	446	427	96	111	38	47	10	0	3	1.077
Superior	402	347	87	91	22	51	14	0	8	1.064
Yukon Gem[yf]	466	343	75	90	22	37	16	0	22	1.062
Yukon Gold[yf]	359	292	82	76	13	36	33	0	16	1.069
AF2574-1	500	318	64	83	17	39	8	0	33	1.070
AF2866-3	473	417	88	109	24	42	21	0	7	1.057
AF4047-2	406	304	75	79	17	39	19	0	21	1.059
AF0338-17	484	397	81	104	16	31	34	0	15	1.075
B1992-106	336	288	85	75	24	49	12	0	11	1.065
BNC182-5	467	413	88	108	24	46	17	0	6	1.079
NY138 (Waneta)	443	394	89	103	9	38	42	0	9	1.072
NY139 (Lamoka)	366	319	87	83	30	41	16	0	10	1.071
NY143 (NYB38-40)	270	226	86	59	37	33	16	0	9	1.056
NY145 (NYD40-35)	331	277	83	72	49	29	0	5	2	1.076
NYE106-4	479	434	91	113	21	46	23	0	5	1.077
AF4013-3[yf]	443	365	82	95	32	43	8	0	9	1.074
AF4125-1	355	327	92	85	23	55	14	0	7	1.069
AF4130-7	418	297	71	77	18	44	9	0	24	1.079
AF4157-6	412	361	88	94	35	48	4	0	8	1.075
AF4222-4	323	304	93	79	16	34	43	0	5	1.068
BNC202-3[yf]	389	265	69	69	13	46	11	0	25	1.073
BNC202-7[yf]	382	315	83	82	34	41	8	0	10	1.080
B2727-2	320	272	85	71	35	44	7	0	10	1.081
B2731-11	339	264	77	69	16	50	12	0	20	1.072
B2738-3	493	456	93	119	18	49	26	0	3	1.058
B2781-3[yf]	480	348	73	91	20	45	8	0	22	1.073
Lehigh[yf]	430	359	84	94	16	39	28	0	14	1.071
Reba	387	332	86	87	16	49	22	0	11	1.062

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
NY140	451	416	92	109	16	45	30	0	7	1.066
NY141	454	367	80	96	13	44	24	0	17	1.069
NY149[yf]	417	327	78	85	43	28	6	0	12	1.068
G1-11	294	60	20	16	17	3	0	0	53	1.055
G4-2	603	406	68	106	37	24	7	0	21	1.058
G20-31	354	324	91	85	39	48	4	0	4	1.068
G20-41	374	313	84	82	35	42	7	0	12	1.075
G73-1	547	450	82	117	12	33	36	2	15	1.056
G87-3	295	283	95	74	33	59	4	0	2	1.077
H4-1	244	202	82	53	58	24	0	0	8	1.063
H6-3	483	298	62	78	40	21	1	0	28	1.071
H15-5	481	407	84	106	47	37	0	0	9	1.069
H15-6	454	392	86	102	29	49	8	0	9	1.075
H15-9	349	291	84	76	20	46	17	0	11	1.066
H15-17	399	350	87	91	19	49	19	0	11	1.057
H23-16	226	190	82	49	25	44	14	0	7	1.076
H25-2	359	313	87	82	42	39	6	0	6	1.080
H25-4	358	282	79	73	23	44	9	2	17	1.074
H25-5	375	324	86	84	22	52	12	0	8	1.074
H63-1	373	344	92	90	24	58	10	0	4	1.079
MSL211-3	348	275	78	72	20	45	12	2	18	1.063
MSJ126-9Y[yf]	315	296	94	77	41	47	6	0	2	1.068
A00293-2Y[yf]	398	310	78	81	48	22	8	0	14	1.068
ATCO0293-1W/Y[yf]	388	198	51	52	26	23	2	0	42	1.048
CO00412-5W/Y[yf]	335	167	47	44	42	5	0	0	25	1.076
Snowbird	321	230	71	60	36	34	2	0	23	1.065
Sifra	564	369	67	96	30	32	5	0	25	1.063
Sylvana[yf]	460	280	62	73	22	36	4	0	32	1.057
Smart[yf]	498	317	63	83	36	25	2	0	25	1.066
Goldfinger[yf]	429	132	31	34	27	4	0	0	37	1.073
RZ97-185[yf]	441	237	52	62	27	20	5	0	39	1.072
LSD	88	91	14		12	14	11	2	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, 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.
LSD indicates least significant difference (P = 0.05), calculated for replicated varieties.

Table 5. Tuber characteristics, internal and external defects for round white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Atlantic	5	6	5	2	4	6	2	0	Green, Growth cracks
JOMA	3	7	7	3	5	5	1	0	Knobs, Growth cracks, Green, Scab
Katahdin	4	7	7	3	5	5	2	0	Green, Misshapen
Kennebec	3	7	7	3	5	5	1	0	Knobs, Green, Growth cracks
Snowden	5	6	5	2	5	6	3	0	Green
Superior	5	7	6	3	4	5	0	0	Green
Yukon Gem[yt]	5	7	7	3	7	5	2	0	Misshapen, Green
Yukon Gold[yf]	5	6	7	2	5	5	3	0	Knobs, Green
AF2574-1	4	6	6	2	5	5	0	0	2nd tubers, Green
AF2866-3	4	6	7	3	5	5	0	0	Growth cracks, Green
AF4047-2	4	6	6	3	4	4	2	0	Growth cracks
AF0338-17	5	6	6	3	5	5	2	0	Green, Growth cracks
B1992-106	5	6	5	3	6	5	2	1	Green
BNC182-5	5	6	5	2	6	6	2	0	Green
NY138 (Waneta)	5	7	7	3	7	5	2	0	Green, Growth cracks
NY139 (Lamoka)	5	7	6	3	6	5	0	0	Green, Growth cracks
NY143 (NYB38-40)	4	7	6	3	6	5	0	0	Green
NY145 (NYD40-35)	5	7	7	2	6	5	1	0	Growth cracks, Green
NYE106-4	4	7	5	2	5	6	1	0	Green
AF4013-3[yf]	4	7	8	3	6	5	1	0	Green, Misshapen
AF4125-1	5	7	6	2	5	5	1	0	Green, Hairline cracks
AF4130-7	5	6	6	3	6	6	2	0	Knobs, Green
AF4157-6	5	6	5	3	4	5	1	0	Growth cracks, Green
AF4222-4	5	7	7	2	6	5	1	0	Green
BNC202-3[yf]	3	6	5	3	3	5	2	0	Misshapen, Green
BNC202-7[yf]	5	5	5	2	5	6	2	0	Green
B2727-2	5	6	6	3	5	5	1	0	Green
B2731-11	5	5	5	2	5	6	3	0	Growth cracks, Green
B2738-3	5	6	5	2	4	6	1	0	Green
B2781-3[yf]	4	6	7	2	5	5	2	0	Green, 2nd tubers, Growth cracks
Lehigh[yf]	5	6	6	3	5	5	4	0	Green
Reba	5	6	6	3	4	5	3	0	Green

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
NY140	5	6	6	3	5	5	2	0	Green, Misshapen
NY141	5	7	6	3	6	6	1	0	Green, Misshapen
NY149^{yf}	6	6	7	2	6	6	1	0	Rhizoctonia, Green
G1-11	5	7	7	4	4	7	0	0	Misshapen
G4-2	5	7	7	3	6	5	2	0	Green, Misshapen
G20-31	5	6	6	3	6	5	1	0	Green
G20-41	4	7	7	3	5	5	1	0	Green
G73-1	4	7	7	2	6	5	1	0	Rhizoctonia, Green
G87-3	6	6	5	2	5	6	0	0	Green
H4-1	5	7	6	3	5	5	1	1	Growth cracks, Misshapen
H6-3	4	7	7	2	6	5	1	0	Misshapen, 2nd tubers, Green
H15-5	5	5	6	3	5	5	1	0	Green, Misshapen
H15-6	4	5	5	2	4	6	1	0	Knobs, Green
H15-9	5	5	5	3	5	5	2	0	Green, Knobs
H15-17	5	6	6	3	6	5	3	0	Green
H23-16	5	7	7	3	6	5	2	0	Misshapen, Green
H25-2	5	6	6	3	5	5	2	0	Misshapen, Green
H25-4	4	7	7	3	4	5	4	0	Misshapen, Growth cracks
H25-5	6	7	7	3	5	4	0	0	Green
H63-1	5	6	6	2	4	4	1	0	Green, Misshapen
MSL211-3	5	7	7	3	6	4	0	0	Green
MSJ126-9Y^{yf}	4	7	6	3	6	5	1	0	Green
A00293-2Y^{yf}	5	7	8	3	6	4	3	0	Green, Misshapen
ATCO0293-1W/Y^{yf}	4	7	8	3	6	5	2	0	Growth cracks, Green
CO00412-5W/Y^{yf}	4	6	6	3	7	5	2	0	Misshapen, Green
Snowbird	4	7	8	3	6	4	0	0	Growth cracks, Misshapen, Green
Sifra	4	7	7	3	5	5	0	0	Misshapen, 2nd tubers, Green
Sylvana^{yf}	5	7	7	3	6	5	0	1	Rhizoctonia, Green
Smart^{yt}	4	7	8	3	6	5	2	0	Misshapen, Green
Goldfinger^{yf}	4	7	7	4	6	5	2	0	Misshapen, Green
RZ97-185^{yf}	4	6	6	4	5	4	0	0	Misshapen, Green

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

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

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

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

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

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

Table 6. 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, 2011

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Chieftain	451	282	62	100	16	33	13	0	33	1.059
Dark Red Norland	356	326	92	116	29	58	5	0	4	1.057
Modoc	421	377	90	134	37	42	11	0	4	1.064
Red Sunset	294	256	86	91	19	57	10	0	11	1.051
B2152-17[yf]	426	372	88	132	48	38	2	0	2	1.063
BCO01306-2[pk]	442	348	79	123	42	34	3	0	11	1.068
NY144	566	404	72	143	42	25	5	0	15	1.059
NYB13-1	588	492	83	175	37	43	3	0	13	1.049
B2538-5	429	319	73	83	23	36	14	0	25	1.062
B2676-2	259	199	78	52	39	37	2	0	9	1.074
B1816-5[yf]	352	298	85	106	48	37	0	0	9	1.064
BCO01044-2[pur]	390	347	89	123	23	53	12	0	6	1.060
BNC201-1[yf]	369	331	90	117	39	49	2	0	4	1.074
B2756-7[yf]	252	195	78	69	42	36	0	0	8	1.066
Adirondack Blue[pur]	408	282	69	100	20	32	16	0	29	1.065
Adirondack Red[pk]	405	257	62	91	44	15	4	0	28	1.060
H52-1[pur]	332	195	59	69	34	25	0	0	35	1.066
H73-1	371	283	74	100	34	36	4	0	18	1.056
H85-2[yf]	324	262	80	93	51	29	0	0	8	1.074
H90-4	372	298	80	106	62	17	2	0	5	1.069
H91-1[yf]	487	275	55	97	20	28	7	0	40	1.065
H122-4	472	373	79	132	9	45	23	2	20	1.056
Blackberry[pur]	458	362	79	128	18	38	23	0	19	1.050
MSR226-1RR[pk]	365	252	70	89	43	25	3	0	15	1.061
MSN215-2P	300	205	69	73	38	28	3	0	28	1.072
MSQ432-2PP[pur]	256	196	75	69	23	43	8	0	20	1.064
Spartan Splash[yf]	425	356	84	126	41	39	4	0	8	1.069
NDA7985-1R	519	421	81	149	18	54	9	0	15	1.054
A99331-2RY[yf]	472	353	74	125	50	24	1	0	10	1.067

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
AC97521-1R/Y[yf]	409	254	61	90	43	19	0	0	23	1.067
CO97222-1R[pk]	369	265	72	94	47	24	1	0	9	1.061
CO99076-6R	239	182	76	64	13	49	14	0	20	1.067
CO99256-2R	365	300	82	106	43	36	3	0	7	1.060
CO0291-5R	150	102	64	36	26	35	3	0	27	1.055
Purple Majesty[pur]	507	274	55	97	38	16	0	0	26	1.070
Rodeo[yf]	344	193	56	68	34	22	0	0	30	1.067
Passion[yf]	539	367	70	130	39	30	1	0	17	1.064
LSD	99	96	14		14	15	9	1	13	

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

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

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

[4]Percentage of total that are pickouts.

Replicated trials are the average of 3 replicates.

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

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 7. Tuber characteristics, internal and external defects for red skinned potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Chieftain	5	2	7	3	6	5	0	0	2nd tubers, Green, Growth cracks
Dark Red Norland	5	2	7	3	5	5	0	0	Growth cracks
Modoc	6	2	7	2	5	6	1	0	Growth cracks
Red Sunset	5	2	8	3	5	6	1	1	Green
B2152-17^{yf}	5	2	6	3	6	5	0	0	Green
BCO01306-2^{pk}	5	2	8	2	5	5	1	0	2nd tubers, Green
NY144	5	2	8	3	6	5	0	0	Green, Misshapen
NYB13-1	5	2	7	3	6	5	0	0	Misshapen
B2538-5	4	1	7	3	4	5	0	0	Misshapen, Growth cracks
B2676-2	5	2	7	2	6	6	0	0	Green, Misshapen
B1816-5^{yf}	5	1	6	3	6	5	1	0	Knobs
BCO01044-2^{pur}	5	1	7	3	6	5	1	0	Misshapen
BNC201-1^{yf}	5	2	7	2	5	6	0	0	Green
B2756-7^{yf}	5	2	8	3	5	6	1	0	Misshapen
Adirondack Blue^{pur}	5	1	7	3	5	5	1	0	Knobs, Misshapen
Adirondack Red^{pk}	5	2	7	3	5	5	0	0	Misshapen, Green
H52-1^{pur}	5	1	7	4	7	5	0	0	Misshapen, Growth cracks
H73-1	5	2	7	2	6	6	0	0	Misshapen
H85-2^{yf}	5	6**	6	2	5	6	1	0	Growth cracks
H90-4	5	2	6	2	6	6	0	0	Green
H91-1^{yf}	3	8**	7	3	5	5	0	0	Misshapen, Knobs, Green
H122-4	5	3	8	3	5	5	0	0	Green, Misshapen
Blackberry^{pur}	5	1	8	4	6	5	0	0	Misshapen, Scab
MSR226-1RR^{pk}	4	1	8	4	5	5	0	0	Misshapen
MSN215-2P	5	1	7	3	5	5	2	0	Misshapen
MSQ432-2PP^{pur}	5	1	7	4	6	5	0	0	Misshapen
Spartan Splash^{yf}	5	6**	7	3	6	5	1	0	Misshapen, Green
NDA7985-1R	6	2	7	3	6	5	0	1	Green, Growth cracks
A99331-2RY^{yf}	5	2**	8	2	6	5	0	0	Misshapen, Green, Growth cracks

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
AC97521-1R/Y[yf]	5	2	7	3	6	4	0	0	Misshapen, Green
CO97222-1R[pk]	3	2	6	2	6	6	0	0	Scab, Misshapen, Green
CO99076-6R	5	2	7	3	6	5	0	0	Green, Growth cracks
CO99256-2R	5	2	8	3	6	6	1	0	Green, Growth cracks
CO0291-5R	5	2	7	3	5	5	1	0	Green, Growth cracks
Purple Majesty[pur]	4	1	6	3	6	5	2	0	Misshapen
Rodeo[yf]	4	2	7	3	6	5	1	0	Misshapen, Green
Passion[yf]	5	2	7	4	6	4	0	0	Green, Misshapen

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

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

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

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

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

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

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

2** = Red with white splotchs on skin; 6** = Tan skin with purple splashs; 8** = White with purple splash skin.

Table 8. 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, 2011

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Alpine Russet (A9305-10)	301	137	46	48	29	17	0	0	41	1.072
Classic Russet (A95109-1)	442	350	79	123	24	36	16	4	17	1.067
Premier Russet (A93157-LS)	317	181	55	64	32	18	5	0	32	1.078
Rio Grande Russet	368	245	67	86	33	21	13	0	23	1.072
Russet Burbank (#400)	437	89	20	31	9	6	6	0	78	1.072
Russet Norkotah #3117	434	285	66	100	19	21	26	0	31	1.059
AF3001-6	337	156	47	55	18	22	7	0	50	1.066
AF3317-5	327	142	43	50	13	22	8	0	51	1.088
AF3362-1	427	309	71	108	14	29	28	0	26	1.069
AF4040-2	356	130	36	46	8	19	9	0	61	1.074
AF3011-34	326	205	63	72	25	36	3	0	32	1.074
AF4172-2	298	204	68	72	22	46	0	0	25	1.075
AF4185-1	398	245	60	86	28	32	0	0	32	1.062
AF4372-2	230	100	46	35	29	17	0	0	43	1.066
AF4320-7	306	135	44	47	20	18	6	0	46	1.074
AF4320-15	370	70	19	25	8	11	0	0	77	1.073
A01025-4	392	249	63	87	18	28	18	0	33	1.074
A98345-1	354	217	62	76	27	19	7	9	32	1.077
A02062-1TE	301	141	45	49	9	19	15	3	50	1.067
AC99375-1RU	364	186	49	65	24	21	4	0	43	1.063
CO99053-3RU	348	212	61	75	20	25	16	0	33	1.068
CO99053-4RU	386	236	61	83	20	23	18	0	33	1.067
CO99100-1RU	323	202	63	71	18	35	9	0	28	1.068
LSD	96	76	15		12	13	9	4	16	

[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.

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

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

Table 9. Tuber characteristics, internal and external defects for russet skinned or long white potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Alpine Russet (A9305-10)	4	6	6	4	7	4	0	0	Knobs, Green, Misshapen
Classic Russet (A95109-1)	5	5	4	5	6	5	2	0	Knobs, Green
Premier Russet (A93157-LS)	5	5	4	4	5	6	3	0	Knobs, Growth cracks, Green
Rio Grande Russet	4	5	3	4	7	5	4	0	Knobs, Green, Growth cracks
Russet Burbank (#400)	4	6	4	5	5	4	3	0	Misshapen, Knobs
Russet Norkotah #3117	5	5	3	4	6	5	2	0	Misshapen, Knobs
AF3001-6	4	6	6	4	6	5	1	0	Knobs, Green, Growth cracks
AF3317-5	4	5	3	4	6	5	2	0	Misshapen, Green
AF3362-1	5	6	4	4	6	4	0	0	Misshapen
AF4040-2	4	6	6	4	6	4	1	0	Misshapen, Growth cracks, Green
AF3011-34	4	6	6	4	6	4	1	0	Misshapen, Growth cracks
AF4172-2	4	6	6	4	6	4	2	0	Misshapen
AF4185-1	4	5	4	4	5	5	2	0	Misshapen, Green
AF4372-2	4	6	6	4	7	5	1	0	Knobs, Green
AF4320-7	3	6	6	4	6	4	1	0	Knobs, Misshapen
AF4320-15	3	6	6	4	6	4	2	0	Knobs, Misshapen, Green
A01025-4	4	6	4	4	7	5	1	0	Misshapen, Green
A98345-1	5	6	6	4	7	5	2	0	Misshapen, Growth cracks
A02062-1TE	5	5	3	4	7	5	1	0	Misshapen
AC99375-1RU	4	6	4	4	6	5	3	0	Misshapen, Green
CO99053-3RU	5	5	4	4	7	5	3	0	Misshapen, Green
CO99053-4RU	4	6	4	4	7	4	3	0	Misshapen, Green
CO99100-1RU	5	5	4	4	6	5	0	0	Misshapen

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

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

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

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

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

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

Table 10. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for early season (90 days of growth) potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5	
Chieftain	226	182	80	100	21	51	9	0	16
Dark Red Norland	345	288	84	159	46	37	0	0	5
Modoc	345	280	81	154	35	47	0	0	8
Red Sunset	168	146	86	80	41	45	0	0	3
B2152-17[yf]	319	238	75	131	63	12	0	0	0
BCO01306-2[pk]	320	137	43	76	40	3	0	0	20
NY144	222	104	47	57	37	10	0	0	15
NYB13-1	294	250	85	138	58	28	0	0	4
B1816-5[yf]	252	211	84	116	59	24	0	0	2
BCO01044-2[pur]	337	300	89	165	39	38	12	0	6
BNC201-1[yf]	353	293	83	162	45	38	0	0	4
B2756-7[yf]	277	224	81	123	45	36	0	0	5
Adirondack Blue[pur]	276	223	81	123	53	27	0	0	11
Adirondack Red[pk]	443	318	72	175	53	19	0	0	11
H52-1[pur]	187	107	57	59	22	25	10	0	33
H73-1	255	181	71	100	52	19	0	0	12
H85-2[yf]	185	134	72	74	72	0	0	0	0
H90-4	265	173	65	95	56	10	0	0	6
H91-1[yf]	370	221	60	121	41	19	0	0	32
H122-4	267	207	78	114	32	42	4	0	20
AO0293-2Y	265	206	78	113	52	26	0	0	6
MSR226-1RR(Raspberry)[pk]	311	201	65	111	56	9	0	0	14
MSN215-2P(Colonial Purple)	162	69	43	38	30	13	0	0	50
MSQ432-2PP[pur]	216	190	88	104	52	18	18	0	0
MSJ126-9Y	203	195	96	107	30	47	19	0	0
NDA7985-1R	390	332	85	183	37	48	0	0	9
A99331-2RY[yf]	401	200	50	110	47	3	0	0	20
AC97521-1R/Y[yf]	136	82	60	45	51	8	1	0	0

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5	
CO97222-1R[pk]	319	257	80	141	59	21	0	0	1
CO99076-6R	96	68	71	38	37	34	0	0	22
CO99256-2R	203	123	61	68	24	32	5	0	12
CO0291-5R	82	57	70	32	46	23	0	0	9
Purple Majesty[pur]	222	82	37	45	31	6	0	0	21
Passion[yf]	315	133	42	73	29	13	0	0	16
Snowbird	320	206	64	113	41	23	0	0	24
Smart[yt]	517	303	59	167	50	6	2	0	17
Goldfinger[yf]	377	110	29	60	22	7	0	0	22
RZ97-185[yf]	281	196	70	108	55	14	0	0	10
BNC243-1[pur]	334	54	16	30	13	3	0	0	30
G1-11	178	7	4	4	4	0	0	0	64
H63-1[yt]	280	237	85	131	61	24	0	0	4
Superior	251	222	88	122	24	45	20	0	6
B2538-5	298	207	69	114	39	19	12	0	24
AF4013-3[yf]	383	234	61	129	53	8	0	0	20

[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.

Non-replicated trial.

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 11. Tuber characteristics, internal and external defects for early season (90 days of growth) potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Chieftain	5	2	7	3	6	5	0	0	2nd tubers
Dark Red Norland	5	2	7	3	5	5	0	0	Green
Modoc	6	2	7	2	5	6	0	0	Green, Growth cracks
Red Sunset	6	2	8	3	5	6	0	0	Misshapen
B2152-17^{yf}	5	2	6	3	6	5	0	0	
BCO01306-2^{pk}	4	2	8	2	5	5	0	0	2nd tubers
NY144	5	2	8	3	6	5	0	0	Misshapen
NYB13-1	5	2	7	3	6	5	0	0	Misshapen
B1816-5^{yf}	5	1	6	3	6	5	0	0	Misshapen
BCO01044-2^{pur}	5	1	7	3	6	5	0	0	Misshapen
BNC201-1^{yt}	5	2	7	2	4	6	0	0	Green, Misshapen
B2756-7^{yt}	5	2	8	3	5	6	0	0	Growth cracks
Adirondack Blue^{pur}	5	1	7	3	5	5	0	0	Misshapen
Adirondack Red^{pk}	5	2	7	3	5	5	0	0	2nd tubers
H52-1^{pur}	4	1	7	4	7	5	0	0	Growth cracks
H73-1	5	2	7	2	6	6	0	0	Misshapen
H85-2^{yt}	6	6**	6	2	5	6	0	0	
H90-4	5	2	6	2	6	6	0	0	Green, Growth cracks
H91-1^{yt}	4	8**	7	3	5	5	0	0	Growth cracks
H122-4	5	3	8	3	5	5	0	0	Misshapen
AO0293-2Y	6	7	8	3	6	4	0	0	Growth cracks
MSR226-1RR(Raspberry)^{pk}	5	1	8	4	5	5	0	0	Misshapen
MSN215-2P(Colonial Purple)	5	1	7	2	5	4	0	0	Misshapen
MSQ432-2PP^{pur}	5	1	7	4	6	5	0	0	Misshapen
MSJ126-9Y	5	7	6	3	6	5	0	0	
NDA7985-1R	5	2	7	3	6	5	0	0	Misshapen, Growth cracks
A99331-2RY^{yf}	5	2**	8	2	6	5	0	0	Misshapen
AC97521-1R/Y^{yf}	5	2	7	3	6	4	0	0	Misshapen

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
CO97222-1R[pk]	6	2	6	2	6	6	0	0	
CO99076-6R	6	2	7	3	6	5	0	0	Misshapen
CO99256-2R	5	2	8	3	6	6	0	0	Green, Misshapen
CO0291-5R	6	2	7	3	5	5	0	0	Green
Purple Majesty[pur]	5	1	6	3	6	5	0	0	Misshapen
Passion[yf]	4	2	7	3	6	4	0	0	Misshapen
Snowbird	5	7	8	3	6	4	0	0	2nd tubers, Growth cracks
Smart[yf]	4	7	8	3	6	5	0	0	Misshapen, 2nd tubers, Green
Goldfinger[yt]	4	7	7	4	6	5	0	0	Misshapen, Green
RZ97-185[yt]	5	6	6	4	5	4	0	0	2nd tubers, Misshapen
BNC243-1[pur]	5	1	8	3	7	5	0	0	2nd tubers
G1-11	4	7	7	4	4	7	0	0	Misshapen
H63-1[yf]	5	6	6	2	4	4	0	0	Misshapen
Superior	4	7	6	3	4	5	0	0	Misshapen
B2538-5	3	1	7	3	4	5	0	0	Misshapen, Growth cracks
AF4013-3[yf]	5	7	8	3	6	5	0	0	2nd tubers, Misshapen

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

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

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

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

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

[2]Internal Defects: HH = hollow heart, IB = internal browning. Total number observed out 4 for non replicated trial. 0 = not observed.

2** = Red with white splotchs on skin; 6** = Tan skin with purple splashs; 8** = White with purple splash skin.

Table 12. Total yield, greater than 1 7/8" yield, percent of standard, size distribution, percent pickouts, and specific gravity for spacing potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Russet Norkotah	276	186	67	100	16	32	19	0	29	1.070
Alpine Russet (A9305-10)	359	102	29	55	15	14	0	0	68	1.082
Classic Russet (A95109-1)	321	260	81	140	25	40	16	0	15	1.074
Premier Russet (A93157-LS)	299	153	51	83	27	24	0	0	41	1.090
Rio Grande Russet	369	193	52	104	24	18	10	0	42	1.084
Russet Burbank (#400)	305	39	13	21	12	1	0	0	81	1.071
Russet Norkotah #3117	199	107	54	58	29	25	0	0	39	1.065
Shepody	382	82	22	44	7	10	5	0	75	1.077
AF3001-6	565	361	64	194	4	23	22	15	35	1.074
AF3317-5	252	84	33	45	11	16	6	0	64	1.101
AF3362-1	475	313	66	168	11	36	18	0	34	1.076
AF4040-2	368	161	44	87	6	16	15	7	53	1.083
AF3011-34	402	217	54	117	13	22	19	0	43	1.086
AF4172-2	343	179	52	97	20	26	6	0	40	1.081
AF4185-1	392	193	49	104	15	16	18	0	45	1.072
AF4113-2	494	266	54	143	12	27	14	0	42	1.066
AF4116-9	371	152	41	82	4	11	26	0	59	1.064
AF4303-1	430	117	27	63	16	11	0	0	68	1.081
A01025-4	459	262	57	141	11	31	15	0	41	1.074
A98345-1	436	196	45	106	11	26	8	0	53	1.088
A02062-1TE	289	75	26	40	7	11	8	0	74	1.070
AC99375-1RU	548	167	31	90	7	15	9	0	66	1.078
CO99053-3RU	483	234	48	126	3	21	18	6	51	1.071
CO99053-4RU	512	186	36	100	18	14	4	0	58	1.071
CO99100-1RU	415	284	68	153	17	25	27	0	29	1.071
Goldfinger[yf]	578	154	27	83	17	10	0	0	62	1.076
Sifra	572	318	56	171	26	28	2	0	34	1.065
Rodeo[yf]	517	337	65	181	24	36	6	0	30	1.072

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

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

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

[4]Percentage of total that are pickouts.

Non-replicated trial. Varieties with colored flesh are indicated by [yf] for yellow.
Plots consisted of 15-ft rows with 15 seed pieces spaced 12-in. apart.

Table 13. Tuber characteristics, internal and external defects for spacing potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Russet Norkotah	5	5	3	4	6	5	3	0	Green, Misshapen
Alpine Russet (A9305-10)	4	6	6	4	7	4	0	0	Misshapen, Knobs
Classic Russet (A95109-1)	5	5	4	5	6	5	3	0	Knobs, Green
Premier Russet (A93157-LS)	4	5	4	4	5	6	4	0	Misshapen, Growth cracks, Knobs
Rio Grande Russet	5	5	3	4	7	5	3	0	Misshapen
Russet Burbank (#400)	3	6	4	5	5	4	0	0	Knobs, Misshapen
Russet Norkotah #3117	5	5	3	4	6	5	2	0	Scab, Misshapen
Shepody	4	7	7	4	7	4	0	0	Knobs, Misshapen, Green, Scab
AF3001-6	5	6	6	4	6	5	2	0	Green, Knobs, 2nd tubers, Misshapen
AF3317-5	4	5	3	4	6	5	0	0	Knobs, Misshapen, Green
AF3362-1	5	6	4	4	6	4	0	0	Misshapen, Scab
AF4040-2	3	6	6	4	6	4	1	0	Misshapen
AF3011-34	4	6	6	4	6	4	2	0	Misshapen, Scab
AF4172-2	4	6	6	4	6	4	0	0	Misshapen, Scab, Green
AF4185-1	4	5	4	4	5	5	3	0	Misshapen, Green, Growth cracks
AF4113-2	4	7	6	4	6	5	0	0	Misshapen, Growth cracks, Green
AF4116-9	5	5	4	5	7	5	1	0	Knobs, Growth cracks, Green, Misshapen
AF4303-1	4						1	0	Green, Misshapen
A01025-4	4	6	4	4	7	5	0	0	Misshapen, Green
A98345-1	4	6	6	4	7	5	1	0	Scab, Misshapen, Green
A02062-1TE	3	5	3	5	7	5	0	0	Misshapen
AC99375-1RU	3	6	4	4	6	5	3	1	Misshapen, Knobs
CO99053-3RU	4	5	4	4	7	5	4	1	Misshapen, Green
CO99053-4RU	4	6	4	4	7	4	0	0	Growth cracks
CO99100-1RU	5	5	4	4	6	5	1	0	Misshapen, Knobs
Goldfinger[yf]	3	7	7	4	6	5	2	0	Misshapen, Green, Knobs
Sifra	5	7	7	3	5	5	0	0	Green, Scab, 2nd tubers
Rodeo[yf]	4	2	7	3	6	5	0	0	Misshapen

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

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

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

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

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

[2]Internal Defects: HH = hollow heart, IB = internal browning. Total number observed out of 4 for non replicated trial. 0 = not observed.

Table 14. 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, 2011

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
Alpine Russet (A9305-10)	301	137	46	36	29	17	0	0	41	1.072
Atlantic	427	383	90	100	13	49	26	1	8	1.078
Chieftain	451	282	62	74	16	33	13	0	33	1.059
Classic Russet (A95109-1)	442	350	79	91	24	36	16	4	17	1.067
Dark Red Norland	356	326	92	85	29	58	5	0	4	1.057
JOMA	488	276	56	72	12	28	17	0	42	1.069
Katahdin	328	281	87	73	15	50	22	0	12	1.062
Kennebec	458	232	51	60	10	25	16	0	47	1.064
Modoc	421	377	90	98	37	42	11	0	4	1.064
Premier Russet (A93157-LS)	317	181	55	47	32	18	5	0	32	1.078
Red Sunset	294	256	86	67	19	57	10	0	11	1.051
Rio Grande Russet	368	245	67	64	33	21	13	0	23	1.072
Russet Burbank (#400)	437	89	20	23	9	6	6	0	78	1.072
Russet Norkotah #3117	434	285	66	74	19	21	26	0	31	1.059
Snowden	446	427	96	111	38	47	10	0	3	1.077
Superior	402	347	87	91	22	51	14	0	8	1.064
Yukon Gem[yf]	466	343	75	90	22	37	16	0	22	1.062
Yukon Gold[yf]	359	292	82	76	13	36	33	0	16	1.069
AF2574-1	500	318	64	83	17	39	8	0	33	1.070
AF2866-3	473	417	88	109	24	42	21	0	7	1.057
AF3001-6	337	156	47	41	18	22	7	0	50	1.066
AF3317-5	327	142	43	37	13	22	8	0	51	1.088
AF3362-1	427	309	71	81	14	29	28	0	26	1.069
AF4040-2	356	130	36	34	8	19	9	0	61	1.074
AF4047-2	406	304	75	79	17	39	19	0	21	1.059
AF0338-17	484	397	81	104	16	31	34	0	15	1.075
B1992-106	336	288	85	75	24	49	12	0	11	1.065
B2152-17[yf]	426	372	88	97	48	38	2	0	2	1.063

Variety/Line	Yield (cwt/A)[1]		%	% of	% by size class[3]				%PO[4]	Specific
	Total	>1 7/8"	US#1	Standard[2]	2	3	4	5		Gravity
BCO01306-2[pk]	442	348	79	91	42	34	3	0	11	1.068
BNC182-5	467	413	88	108	24	46	17	0	6	1.079
NY138 (Waneta)	443	394	89	103	9	38	42	0	9	1.072
NY139 (Lamoka)	366	319	87	83	30	41	16	0	10	1.071
NY143 (NYB38-40)	270	226	86	59	37	33	16	0	9	1.056
NY144	566	404	72	105	42	25	5	0	15	1.059
NY145 (NYD40-35)	331	277	83	72	49	29	0	5	2	1.076
NYB13-1	588	492	83	128	37	43	3	0	13	1.049
NYE106-4	479	434	91	113	21	46	23	0	5	1.077
LSD	84	88	14		12	14	13	3	13	

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

[2]Percentage of the standard, 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 3 replicates.

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

Russets were planted 10-in. apart with 12 seed pieces per 10-ft plot, all other varieties were spaced 8-in. apart with 15 seed pieces per 10-ft plot.

Table 15. Tuber characteristics, internal and external defects for NE1031 potato evaluation trial in Rock Springs, Plant Pathology Farm, 2011

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
Alpine Russet (A9305-10)	4	6	6	4	7	4	0	0	2nd tubers, Green, Misshapen
Classic Russet (A95109-1)	5	5	4	5	6	5	2	0	Knobs, Green
Atlantic	5	6	5	2	4	6	2	0	Green, Growth cracks
Chieftain	5	2	7	3	6	5	0	0	2nd tubers, Green, Growth cracks
Dark Red Norland	5	2	7	3	5	5	0	0	Growth cracks
JOMA	3	7	7	3	5	5	1	0	Knobs, Growth cracks,, Green, Scab
Katahdin	4	7	7	3	5	5	2	0	Green, Misshapen
Kennebec	3	7	7	3	5	5	1	0	Green, Growth cracks, Knobs
Modoc	6	2	7	2	5	6	1	0	Growth cracks
Premier Russet (A93157-LS)	5	5	4	4	5	6	3	0	Knobs, Growth cracks,, Green
Red Sunset	5	2	8	3	5	6	1	1	Green
Rio Grande Russet	4	5	3	4	7	5	4	0	Knobs, Green, Growth cracks
Russet Burbank (#400)	4	6	4	5	5	4	3	0	Misshapen, Knobs
Russet Norkotah #3117	5	5	3	4	6	5	2	0	Misshapen, Knobs
Snowden	5	6	5	2	5	6	3	0	Green
Superior	5	7	6	3	4	5	0	0	Green
Yukon Gem[yf]	5	7	7	3	7	5	2	0	Misshapen, Green
Yukon Gold[yf]	5	6	7	2	5	5	3	0	Knobs, Green
AF2574-1	4	6	6	2	5	5	0	0	2nd tubers, Green
AF2866-3	4	6	7	3	5	5	0	0	Growth cracks, Green
AF3001-6	4	6	6	4	6	5	1	0	Knobs, Green, Growth cracks
AF3317-5	4	5	3	4	6	5	2	0	Misshapen, Green
AF3362-1	5	6	4	4	6	4	0	0	Misshapen
AF4040-2	4	6	6	4	6	4	1	0	Misshapen, Growth cracks, Green
AF4047-2	4	6	6	3	4	4	2	0	Growth cracks
AF0338-17	5	6	6	3	5	5	2	0	Green, Growth cracks
B1992-106	5	6	5	3	6	5	2	1	Green
B2152-17[yf]	5	2	6	3	6	5	0	0	Green

Variety/Line	Tuber Characteristics[1]						Internal Defects[2]		Resons for Pickouts
	TA	C	TX	Sh	TED	TCS	HH	IB	
BCO01306-2[pk]	5	2	8	2	5	5	1	0	2nd tubers, Green
BNC182-5	5	6	5	2	6	6	2	0	Green
NY138 (Waneta)	5	7	7	3	7	5	2	0	Green, Growth cracks
NY139 (Lamoka)	5	7	6	3	6	5	0	0	Green, Growth cracks
NY143 (NYB38-40)	4	7	6	3	6	5	0	0	Green
NY144	5	2	8	3	6	5	0	0	Green, Misshapen
NY145 (NYD40-35)	5	7	7	2	6	5	1	0	Growth cracks, Green
NYB13-1	5	2	7	3	6	5	0	0	Misshapen
NYE106-4	4	7	5	2	5	6	1	0	Green

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

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

Table 16: Management of Evaluation Trials, 2011

Northampton County

Planting Date:	11 May
Harvest Date:	18 Oct
Previous Crop:	Soybeans
Fertilizer Rate/A:	At planting: 650 lbs/A 13-13-13 (N-P-K)
Herbicide:	Matrix
Fungicide:	Manzate
Insecticide:	Admire Pro, Radiant, Dimethoate
Vine Kill:	N/A
Rainfall (inches):	May (3.75), June (3.35), July (5.55), August (14.40)
Irrigation:	N/A

Rock Springs

Planting Date:	31 May
Harvest Date:	19, 24, 26 Oct and 3 Nov
Previous Crop:	Wheat followed by mustard green manure
Fertilizer Rate/A:	Pre-plant: 160 lb/A 0-0-60 (N-P-K); at planting: 988 lb/A 10-10-10 (N-P-K)
Herbicide:	Eptam, Dual II Magnum, Sencor 75DF, Matrix
Fungicide:	9 applications including Gavel 75DF, Manzate ProStik, Tanos, Bravo WS
Insecticide:	Mocap EC, Regent, Admire Pro, Baythroid XL, Coragen, Assail
Vine Kill:	13 and 19 Sep
Rainfall (inches):	May (5.52). June (2.62), July (2.18), August (5.60), September (8.82)
Irrigation (inches):	7 July (1.80), 13 July (1.20), 21 July (2.00)

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

X.S. Qu and B.J. Christ
Department of Plant Pathology
The Pennsylvania State University
University Park, PA 16802

Evaluation of potato cultivars and breeding lines for resistance to late blight, 2011.

In two experiments, seventy-three 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 wheat. Potatoes were planted on 21 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. At planting, 700 lb/A of 20-10-10 (N-P-K) was banded in-the-row. Liquid N fertilizer was applied at 33.0 lb/A on 1 Aug while hilling. Precipitation was 2.62, 2.18, 5.60, and 8.82 in. for Jun, Jul, Aug, and Sep, respectively. On 15 Aug, spreader rows were inoculated with a mixture of four isolates of *Phytophthora infestans*, at a concentration of 9.86×10^4 sporangia/ml, to promote a uniform spread of the pathogen to all treatment plots. Overhead irrigation was applied at 1.20 in. on 6 Jul, 1.00 in. on 14 Jul, and 1.60 in. on 22 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 2, 12, 18 and 23 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, Yukon Gem, AF3317-15, AF2574-1, Classic Russet, NY145, NYE106-4, Alpine Russet, Joma, Rio Grande Russet, Snowden, Premier Russet, and Russet Burbank were considered resistant to moderately resistant. In experiment #2, B0718-3 was the resistant check; therefore, lines AWN86514-2, MSQ176-5, AF3317-15, B0692-4, A00286-3Y, AF4191-2, AF4122-3, MSR061-1, and AC99375-1RU were considered resistant to moderately resistant.

Cultivar/Line	AUDPC[z]	Cultivar/Line	AUDPC	Cultivar/Line	AUDPC
Experiment #1		Experiment #1 (continued)		Experiment #2 (continued)	
Yukon Gem	21.2 m[y]	Atlantic	302.5 efg	AF4303-1	114.3 l-o
AF3317-15	29.0 m	Russet Norkotah	313.3 efg	LBR7	118.5 l-n
AF2574-1	63.7 lm	BCO01306-2	315.7 efg	A99433-5Y	132.7 klm
Classic Russet	82.8 klm	Chieftain	316.7 efg	AF2574-1	133.5 klm
NY145	83.5 klm	Katahdin	342.3 d-g	BNC202-3	154.8 jkl
NYE106-4	83.5 klm	NY143	377.5 def	A01010-1	161.0 i-l
Alpine Russet	84.3 klm	Yukon Gold	416.5 cde	LBR1R2R3R4	161.8 i-l
Joma	92.3 j-m	Superior	425.0 cde	CO00291-5R	166.8 i-l
Rio Grande Russet	111.8 i-m	Modoc	477.0 cd	A99326-1PY	182.7 h-l
Snowden	128.5 h-m	B2152-17	538.3 c	A00293-2Y	193.5 g-k
Kennebec	136.8 h-m	Red Sunset	690.0 b	Alpine Russet	197.7 g-k
Premier Russet	139.3 h-m	Dark Red Norland	1088.3 a	Clearwater Russet	205.2 f-j
Russet Burbank	158.5 h-m			LBR5	216.8 e-j
AF2866-3	202.3 g-l	Experiment #2		ATC00293-1W/Y	229.3 e-i
AF0338-17	205.0 g-k	AWN86514-2	5.7 q	LBR9	244.3 e-h
AF3001-6	207.7 g-k	B0718-3	19.0 pq	B1992-106	261.5 efg
Waneta	207.8 g-k	MSQ176-5	25.7 pq	A02060-3TE	270.2 def
NYB13-1	218.7 g-k	AF3317-15	30.2 pq	A99331-2RY	276.0 de
Lamoka	226.2 g-j	B0692-4	47.7 opq	A01025-4	330.7 cd
AF4040-2	230.8 g-j	A00286-3Y	51.5 n-q	B2676-2	351.2 c
AF4047-2	230.8 g-j	AF4191-2	56.5 n-q	A01143-3C	354.8 c
B1992-106	232.3 g-j	AF4122-3	58.3 n-q	B2756-7	440.8 b
BNC182-5	235.8 ghi	MSR061-1	66.0 m-q	CO01399-10P/Y	453.7 b
AF3362-1	239.5 f-i	AC99375-1RU	66.8 m-q	CO00405-1RF	497.8 ab
NY144	255.8 fgh	AF4329-7	81.8 m-p	BNC201-1	557.5 a

[z] AUDPC = Area under the disease progress curve was calculated from 2 to 23 Sep according to the formula : $\sum^{n}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the *i*th observation, t_i = time (days) since the previous rating at the *i*th observation, and n = total number of observations).

[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*

X.S. Qu and B.J. Christ
Department of Plant Pathology
The Pennsylvania State University
University Park, PA 16802

Evaluation of potato cultivars and breeding lines for resistance to early blight, 2011.

Thirty-seven 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 988 lb/A of 10-10-10 (N-P-K) banded in-the-row at planting. Precipitation was 2.62, 2.18, 5.60, and 8.82 in. for Jun, Jul, Aug, and Sep, respectively. Overhead irrigation was applied at 1.45 in. on 7 Jul and 1.2 in. on 14 Jul. On 8 Aug, spreader rows were inoculated with a conidial mixture of three isolates of *Alternaria solani*, at a concentration of 1.28×10^5 conidia/ml, to promote a uniform spread of the pathogen to all treatment plots. For each plot, the percentage of diseased foliage was visually assessed on 18 and 27 Aug, and 3 and 12 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).

Twelve cultivars/lines were classified as moderately resistant, and they included: Premier Russet, Russet Burbank, AF3317-15, BNC182-5, AF3001-6, NYE106-4, B1992-106, Alpine Russet, Rio Grande Russet, Kennebec, Snowden, and Yukon Gem.

Cultivar/Line	AUDPC[z]	Cultivar/Line	AUDPC
Premier Russet	46.0 q[y]	NYB13-1	430.5 g-l
Russet Burbank	91.7 pq	BCO01306-2	453.8 f-k
AF3317-15	100.7 opq	Superior	494.5 f-j
BNC182-5	107.0 opq	NYB38-40	497.8 f-j
AF3001-6	114.5 opq	Atlantic	527.2 f-j
NYE106-4	120.5 opq	Chieftain	528.7 f-j
B1992-106	129.5 opq	AF4047-2	545.3 f-i
Alpine Russet	135.5 opq	AF2866-3	555.3 f-i
Rio Grande Russet	156.2 n-q	AF3362-1	567.2 f-i
Kennebec	172.8 n-q	Waneta	599.5 fgh
Snowden	172.8 n-q	Russet Norkotah	601.3 fg
Yukon Gem	220.5 m-q	Yukon Gold	607.0 fg
NY144	244.7 l-p	AF4040-2	646.5 ef
JOMA	284.5 k-o	NY145	811.3 de
Lamoka	284.5 k-o	Modoc	982.8 cd
Classic Russet	337.5 j-n	B2152-17	1020.5 c
Katahdin	381.0 i-m	Red Sunset	1253.3 b
AF2574-1	407.0 h-m	Dark Red Norland	1481.7 a
AF0338-17	420.3 g-l		

[z] AUDPC = area under the disease progress curve was calculated from 18 Aug to 12 Sep according to the formula : $\sum^{n}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the *i*th observation, t_i = time (days) since the previous rating at the *i*th observation, and n = total number of observations).

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

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

X.S. Qu and B.J. Christ
Department of Plant Pathology
The Pennsylvania State University
University Park, PA 16802

Evaluation of potato cultivars and breeding lines for resistance to powdery scab, 2011.

Thirty-eight potato cultivars and advanced breeding lines were planted in a naturally infested field in Potter Co., PA on 9 Jun. The soil type was a Mardin silt loam. The previous crop was strawberries. 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) at planting. Precipitation was 3.07, 2.43, 5.06, and 4.23 in. for Jun, Jul, Aug, and Sep, 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 12 Sep. Tubers were harvested on 25 Oct. 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 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 (%)
Rio Grande Russet	0.0 c[z]	BCO01306-2	3.7 bc
Snowden	0.0 c	AF2574-1	3.7 bc
AF4047-2	0.0 c	AF4040-2	3.7 bc
NY143	0.0 c	Classic Russet	4.0 bc
Premier Russet	0.8 c	Lamoka	4.1 bc
AF3362-1	1.0 bc	NYB13-1	4.3 bc
NY145	1.1 bc	Atlantic	4.4 bc
Yukon Gem	1.4 bc	B2152-17	5.0 bc
Superior	1.4 bc	Russet Burbank	6.3 abc
Waneta	1.6 bc	Shepody	6.5 abc
B1992-106	1.6 bc	Yukon Gold	6.8 abc
Russet Norkotah	1.7 bc	AF2866-3	7.3 abc
BNC182-5	2.2 bc	NYE106-4	7.4 abc
AF3001-6	2.3 bc	NY144	7.6 abc
Alpine Russet	2.4 bc	Katahdin	9.0 abc
AF0338-17	2.5 bc	Red Sunset	11.1 abc
AF3317-15	2.8 bc	Joma	12.8 ab
Chieftain	3.1 bc	Kennebec	17.5 a
Dark Red Norland	3.4 bc	Modoc	18.1 a

[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*

X.S. Qu, M.W. Peck, and B.J. Christ
Department of Plant Pathology
The Pennsylvania State University
University Park, PA 16802

Evaluation of fungicides for control of potato late blight, 2011.

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 wheat. Potatoes were planted on 23 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 700 lb/A of 20-10-10 (N-P-K) banded in-the-row at planting. Liquid N fertilizer was applied at 33.0 lb/A on 1 Aug while hilling. Precipitation was 2.62, 2.18, 5.60, and 8.82 in. for Jun, Jul, Aug, and Sep, respectively. Spreader rows were inoculated with the late blight pathogen on 15 Aug. A mixture of four isolates of *Phytophthora infestans*, with a concentration of 9.86×10^4 sporangia/ml, was used to promote a uniform spread of the pathogen to all treatment plots. Overhead irrigation was applied at 1.20 in. on 6 Jul, 1.00 in. on 14 Jul, and 1.60 in. on 22 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 uniformly 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 2, 12, 18, 23 and 28 Sep and the assessments were used to calculate the area under the disease progress curve (AUDPC). Disease 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 significantly suppressed season-long foliar late blight compared to the untreated control. Treatments with Bravo Weather Stik, Gavel, GWN-4700 + GWN-9941, GWN-4700 + GWN-9938 and Bravo Weather Stik alternated with Zampro had the lowest levels of foliar late blight.

Treatment and rate of product per acre (application timing[z])	AUDPC[y]
Untreated Control	580.5 a[x]
Bravo Weather Stik 6SC 1.5 pt (A, B, C, D, E, F)	87.5 efg
GAVEL 75DF 2.0 lb (A, B, C, D, E, F)	82.3 efg
GWN-4700 80WP 3.4 oz + GWN-9941 6SC 21.3 oz (A, B, C, D, E, F)	59.8 fg
GWN-4700 80WP 2.7 oz + GWN-9938 4.2SC 41.0 oz (A, B, C, D, E, F)	63.0 fg
GWN-4700 80WP 3.4 oz + GWN-10043 90DF 17.8 oz (A, B, C, D, E, F)	98.9 def
GAVEL 75DF 2.0 lb (A, C, E) *alt*. GWN-9938 4.2SC 64.0 oz (B, D, F)	150.9 c
Bravo Weather Stik 6SC 1.5 pt (A, C, E) *alt*. Zampro 11.0 fl oz (B, D, F)	53.0 g
Bravo Weather Stik 6SC 1.5 pt (A, C, E) *alt*. Manzate 2.0 lb (B, D, F)	118.6 cde
Regalia 1.0 qt + Tanos 50W 2.75 oz (A, B, C, D, E, F)	135.9 cd
Regalia 1.0 qt + Kocide 3000 1.75 lb (A, B, C, D, E, F)	252.6 b

[z] Dates of fungicide applications were as follows: A =Aug 10; B = Aug 17; C = Aug 24; D = Aug 31; E = Sep 12; F = Sep 21; we did not spray for the week of Sep 5-9 because of rain every day that week.

[y] AUDPC = Area under disease progress curve was calculated from 2 to 28 Sep according to the formula : $\sum^{n}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the *i*th observation, t_i = time (days) since the previous rating at the *i*th observation, and n = total number of observations).

[x] 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*

X.S. Qu, M.W. Peck, and B.J. Christ
Department of Plant Pathology
The Pennsylvania State University
University Park, PA 16802

Evaluation of fungicides for control of potato early blight, 2011.

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 2 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 988 lb/A of 10-10-10 banded in-the-row at planting. Precipitation was 2.62, 2.18, 5.60, and 8.82 in. for Jun, Jul, Aug, and Sep, respectively. Overhead irrigation was applied at 1.45 in. on 7 Jul and 1.2 in. on 14 Jul. Spreader rows were inoculated on 8 Aug. A mixture of three isolates of *Alternaria solani*, with a concentration of 1.28×10^5 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 uniformly sprayed. On 18 and 27 Aug and 3, 12, 19 and 26 Sep each plot was visually assessed for the percentage of diseased foliage caused by early blight. The six visual assessments of early blight infection were used to calculate the area under disease progress curve (AUDPC). Disease 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, except for CX-10440 at the rate of 3.75 oz/A.

Treatment and rate of product per acre (application timing[z])	AUDPC[y]
Untreated Control	922.6 a[x]
Bravo Weather Stik 6SC 1.5 pt (A, B, C, D, E, F, G)	442.9 cd
Cabrio Plus 2.0 lb (A, B, C, D, E, F, G)	212.9 de
Cabrio Plus 2.9 lb (A, B, C, D, E, F, G)	118.1 e
CX-10440, Polyoxin D 5% SC 7.5 oz (A, C, E, G)	556.3 bc
CX-10440, Polyoxin D 5% SC 3.75 oz (A, C, E, G)	755.9 ab
Bravo Weather Stik 6SC 1.5 pt (A, C, E, G) Luna Tranquility 11.2 oz (B, D, F) Reason 500SC 5.5 oz (C) Scala 60SC 7.0 oz (G)	165.3 e
Bravo Weather Stik 6SC 1.5 pt (A, C, E, G) Luna Tranquility 8.0 oz (B, D, F) Reason 500SC 5.5 oz (C) Scala 60SC 7.0 oz (G)	139.3 e
Priaxor 500SC 4.0 fl oz (A, B, C, D, E, F, G)	200.3 de
Priaxor 500SC 6.0 fl oz (A, B, C, D, E, F, G)	235.8 de
Endura 70WG 3.5 oz (A, B, C, D, E, F, G)	367.6 cde
Headline SC 6.0 fl oz (A, B, C, D, E, F, G)	299.5 cde

[z] Dates of fungicide applications were as follows: A = Aug 4; B = Aug 11; C = Aug 18; D = Aug 26; E = Sep 2; F = Sep 12; G = Sep 20; we did not spray for the week of Sep 5-9 because of rain every day that week.

[y] AUDPC = Area under disease progress curve was calculated from 18 Aug to 26 Sep according to the formula : $\sum^{n}_{i=1}[(R_{i+1} + R_i)/2]\,[t_{i+1} - t_i]$, where R = disease severity rating (% of leaf surface affected) at the *i*th observation, t_i = time (days) since the previous rating at the *i*th observation, and n = total number of observations).

[x] 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, 2011----------March 28, 2012

Pennsylvania Regional Potato Germplasm Evaluation Program, 2011

Barbara J. Christ, Michael W. Peck, and Xinshun Qu
Department of Plant Pathology

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

Regional trials were established in three counties across Pennsylvania: Northampton, Erie and the Russell E. Larson Agricultural Research Center at Rock Springs, Centre Co. Please see the Progress Report from December 2011 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 5-7), and the culinary quality results (Table 8). 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 5-7 for details.

Results

Yield results and listings of noteworthy varieties/lines were provided in the December 2011 progress report. This year's chipping results vary more than chipping results of past years due to the wet weather conditions during harvest.

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

There were a few noteworthy lines from the short term storage chipping in December: At Erie, Lamoka, B2727-2 and AF4157-6 had the best color; Atlantic, Snowden and Reba had acceptable color. At Northampton, Waneta had acceptable color.

From the results of the 3 week reconditioning the noteworthy lines are: At Erie, B2727-2 had the best color; Snowden, Waneta, Lamoka, NY140 and AF4157-6 had acceptable color. At Northampton, Lamoka had acceptable color. At Rock Springs, H15-5 had the best color; Snowden and Waneta had acceptable color.

From the results of the 6 week reconditioning the noteworthy lines are: At Erie, Atlantic, Snowden, Reba, Waneta, Lamoka, NY140, B2727-2 and AF4157-6 had acceptable color. At Northampton, Waneta, NY140 and B2727-2 had acceptable color. At Rock Springs, Waneta had the best color; Snowden, Lamoka, NY145, G20-31 and H15-6 had acceptable color.

From the results of the chipping directly from 45°F the noteworthy lines are: At Erie, Lamoka and B2727-2 had the best color; Atlantic, Snowden and AF4157-6 had acceptable color. At Rock Springs, NY145 had the best color; Snowden had acceptable color.

French fry Tests (Tables 5-7)
From the Northampton County location, A98345-1 had the best French good French fry color; and at Rock Springs, AF3001-6 and A02062-1TE had the best color.

Tablestock Tests (Table 8)
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 123 lines tested for culinary characteristics, 9 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, 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 Northampton County, Garry Hunsickers Farm, 2011 - 2012.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Feb.[3]	Feb.[4]
Atlantic	1.085	6	6	7	7
Snowden	1.079	6	5	5	6
Reba	1.071	6	6	6	7
Yukon Gold[YF]	1.074	8	8	9	9
Superior	1.066	8	9	8	8
Waneta (NY138)	1.071	4	5	4	5
Lamoka (NY139)	1.076	6	4	5	6
NY140	1.077	5	6	4	6
NY141	1.071	7	7	7	8
NY149[YF]	1.069	7	8	6	8
AF4013-3	1.075	6	6	6	7
AF4222-4	1.073	7	7	6	7
B1992-106	1.073	8	8	7	7
B2727-2	1.085	5	5	4	5
ATCO0293-1w/y[YF]	1.061	8	8	7	8
Sylvana[YF]	1.060	10	8	7	9
Sifra	1.064	10	10	9	10
Goldfinger[YF]	1.071	7	7	7	8
Lehigh[YF]	1.072	8	7	7	8
Joma	1.071	7	7	6	7
BNC182-5	1.083	7	7	7	7
H4-1	1.066	8	8	7	8
MSN105-1	1.081	8	8	7	10
Smart[YF]	1.067	7	9	7	9

[1] Dec. = Stored at 55^0F from November 30, 2011 and chipped on December 12, 2011
[2] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to chipping on January 31, 2012.
[3] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to chipping on February 21, 2012.
[4] Feb. = Stored at 45^0F from December 8, 2011 and chipped on February 15, 2012.

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, 2011 - 2012.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Feb.[3]	Feb.[4]
Atlantic	1.081	4	5	4	4
Snowden	1.075	4	4	4	4
Reba	1.071	4	5	4	6
Yukon Gem[YF]	1.067	5	6	5	6
Lehigh[YF]	1.077	5	6	5	6
Waneta (NY138)	1.073	5	4	4	5
Lamoka (NY139)	1.078	3	4	4	3
NY140	1.075	5	4	4	4
NY141	1.075	5	6	6	6
NY149[YF]	1.073	7	8	6	7
B2727-2	1.085	3	3	4	3
AF4157-6	1.077	3	4	4	4
RZ97-185[YF]	1.075	6	6	5	6
Sylvana	1.061	7	8	7	8
Goldfinger[YF]	1.078	6	8	7	7
CO00412-5W/Y[YF]	1.078	6	7	6	6

[1] Dec. = Stored at 55^0F from November 30, 2011 and chipped on December 12, 2011
[2] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to chipping on January 31, 2012.
[3] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to chipping on February 20, 2012.
[4] Feb. = Stored at 45^0F from December 8, 2011 and chipped on February 16, 2012.

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, 2011 - 2012.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Feb.[3]	Feb.[4]
Atlantic	1.078	7	8	7	7
JOMA	1.069	10	10	8	8
Katahdin	1.062	10	9	8	10
Kennebec	1.064	10	8	7	8
Snowden	1.077	6	4	4	4
Superior	1.064	10	10	9	8
Yukon Gem[YF]	1.062	7	7	6	7
Yukon Gold[YF]	1.069	9	10	10	10
AF2574-1	1.070	10	10	10	9
AF2866-3	1.057	10	10	10	9
AF4047-2	1.059	7	7	7	6
AF0338-17	1.075	8	8	8	7
B1992-106	1.065	8	8	7	8
BNC182-5	1.079	8	6	7	7
Waneta (NY138)	1.072	6	4	3	6
Lamoka (NY139)	1.071	6	5	4	5
NY143 (NYB38-40)	1.056	7	6	7	7
NY145 (NYD40-35)	1.076	5	5	4	3
NYE106-4	1.077	7	6	5	6
AF4013-3[YF]	1.074	7	7	7	7
AF4125-1	1.069	7	5	6	7
AF4130-7	1.079	8	7	7	7
AF4157-6	1.075	6	5	5	6
AF4222-4	1.068	8	8	8	8
BNC202-3[YF]	1.073	7	7	7	6
BNC202-7[YF]	1.080	8	7	6	6
B2727-2	1.081	6	5	6	6
B2731-11	1.072	6	6	6	6
B2738-3	1.058	9	8	7	8
B2781-3[YF]	1.073	8	8	7	7
Lehigh[YF]	1.071	7	7	6	8
Reba	1.062	7	7	5	7
NY140	1.066	7	7	5	5
NY141	1.069	8	8	7	8
NY149[YF]	1.068	9	8	7	8
G1-11	1.055	10	10	9	10
G4-2	1.058	10	10	10	10
G20-31	1.068	6	5	4	5
G20-41	1.075	6	7	6	6
G73-1	1.056	10	9	8	10
G87-3	1.077	6	5	6	6
H4-1	1.063	8	7	6	7
H6-3	1.071	6	6	6	5
H15-5	1.069	6	3	5	5
H15-6	1.075	6	5	4	5
H15-9	1.066	6	5	5	5
H15-17	1.057	7	7	5	6
H23-16	1.076	7	6	6	6
H25-2	1.080	7	7	5	6
H25-4	1.074	7	5	6	6

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Feb.[3]	Feb.[4]
H25-5	1.074	7	7	5	6
H63-1	1.079	8	8	7	7
MSL211-3	1.063	10	10	8	9
MSJ126-9Y[YF]	1.068	7	6	6	7
A00293-2Y[YF]	1.068	9	8	7	8
ATCO0293-1W/Y[YF]	1.048	8	9	9	9
CO00412-5W/Y[YF]	1.076	8	7	6	7
Snowbird	1.065	8	8	7	7
Sifra	1.063	10	10	10	10
Sylvana[YF]	1.057	8	7	8	9
Smart[YF]	1.066	8	8	7	10
Goldfinger[YF]	1.073	8	7	8	9
RZ97-185[YF]	1.072	8	7	7	9

[1] Dec. = Stored at 55^0F from November 30, 2011 and chipped on December 13 & 14, 2011
[2] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to chipping on February 3 & 4, 2012.
[3] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to chipping on February 20 & 21, 2012.
[4] Feb. = Stored at 45^0F from December 8, 2011 and chipped on February 14 & 15, 2012.

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, 2011 - 2012.

Variety/ Line	Specific Gravity	Chip Color			
		Dec.[1]	Feb.[2]	Feb.[3]	Feb.[4]
Atlantic	1.078	7	8	7	7
JOMA	1.069	10	10	8	8
Katahdin	1.062	10	9	8	10
Kennebec	1.064	10	8	7	8
Snowden	1.077	6	4	4	4
Superior	1.064	10	10	9	8
Yukon Gem[YF]	1.062	7	7	6	7
Yukon Gold[YF]	1.069	9	10	10	10
AF2574-1	1.070	10	10	10	9
AF2866-3	1.057	10	10	10	9
AF4047-2	1.059	7	7	7	6
AF0338-17	1.075	8	8	8	7
B1992-106	1.065	8	8	7	8
BNC182-5	1.079	8	6	7	7
Waneta (NY138)	1.072	6	4	3	6
Lamoka (NY139)	1.071	6	5	4	5
NY143 (NYB38-40)	1.056	7	6	7	7
NY145 (NYD40-35)	1.076	5	5	4	3
NYE106-4	1.077	7	6	5	6

[1] Dec. = Stored at 55^0F from November 30, 2011 and chipped on December 13 & 14, 2011
[2] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to chipping on February 3 & 4, 2012.
[3] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to chipping on February 20 & 21, 2012.
[4] Feb. = Stored at 45^0F from December 8, 2011 and chipped on February 14 & 15, 2012.

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 Northampton County, Garry Hunsickers Farm, 2011.

Variety/ Line	Yield (cwt/A)[1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec[5]	Jan.[6]	Feb.[7]
Atlantic	443	395	100	8	1.085	-	-	-
Russet Norkotah*	460	339	86	24	1.069	2	2	1
AF3011-34*	344	306	78	6	1.073	1	1	1
A98345-1*	309	222	56	26	1.074	0	0	0

[1] Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.
[2] Percentage of the standard, Atlantic for >1 7/8" yield.
[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from November 30, 2011 and fried on December 14, 2011.
[6] Jan. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to frying on January 30, 2012.
[7] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to frying on February 23, 2012.

Replicated trials are the average of 3 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 at Rock Springs Plant Pathology Farm, 2011.

Variety/ Line	Yield (cwt/A)[1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec[5]	Jan.[6]	Feb.[7]
Alpine Russet (A9305-10)	301	137	48	41	1.072	1	1	1
Classic Russet (A95109-1)	442	350	123	17	1.067	2	2	2
Premier Russet (A93157-LS)	317	181	64	32	1.078	1	1	0
Rio Grande Russet	368	245	86	23	1.072	1	2	1
Russet Burbank (#400)	437	89	31	78	1.072	2	2	2
Russet Norkotah #3117	434	285	100	31	1.059	2	3	3
AF3001-6	337	156	55	50	1.066	1	0	0
AF3317-15	327	142	50	51	1.088	1	1	0
AF3362-1	427	309	108	26	1.069	2	2	2
AF4040-2	356	130	46	61	1.074	2	1	1
AF3011-34	326	205	72	32	1.074	3	3	2
AF4172-2	298	204	72	25	1.075	2	2	1
AF4185-1	398	245	86	32	1.062	3	2	1
AF4372-2	230	100	35	43	1.066	2	1	1
AF4320-7	306	135	47	46	1.074	1	1	1
AF4320-15	370	70	25	77	1.073	1	1	1
A01025-4	392	249	87	33	1.074	1	1	1
A98345-1	354	217	76	32	1.077	1	1	1
A02062-1TE	301	141	49	50	1.067	1	0	0
AC99375-1RU	364	186	65	43	1.063	3	2	2
CO99053-3RU	348	212	75	33	1.068	1	1	1
CO99053-4RU	386	236	83	33	1.067	1	2	1
CO99100-1RU	323	202	71	28	1.068	2	1	0

[1] Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.
[2] Percentage of the standard, Atlantic for >1 7/8" yield.
[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from November 30, 2011 and fried on December 14, 2011.
[6] Jan. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to frying on January 30, 2012.
[7] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to frying on February 23, 2012.

Table 7. Total and marketable yield, specific gravity, and French fry color for russet skinned or long white NE1031 potato evaluation trial at Rock Springs Plant Pathology Farm, 2011.

Variety/ Line	Yield (cwt/A)[1] Total	>1 7/8"	% of Standard[2]	Percent[3] Pickouts	Specific Gravity	French Fry Color[4] Dec[5]	Jan.[6]	Feb.[7]
Alpine Russet (A9305-10**)**	301	137	48	41	1.072	1	1	1
Classic Russet (A95109-1)	442	350	123	17	1.067	2	2	2
Premier Russet (A93157-LS)	317	181	64	32	1.078	1	1	0
Rio Grande Russet	368	245	86	23	1.072	1	2	1
Russet Burbank (#400)	437	89	31	78	1.072	2	2	2
Russet Norkotah #3117	434	285	100	31	1.059	2	3	3
AF3001-6	337	156	55	50	1.066	1	0	0
AF3317-15	327	142	50	51	1.088	1	1	0
AF3362-1	427	309	108	26	1.069	2	2	2
AF4040-2	356	130	46	61	1.074	2	1	1

[1] Yield Total = all yield including pickouts. Yield >1 7/8" = categories 2, 3, 4 and 5 excluding pickouts.
[2] Percentage of the standard, Atlantic for >1 7/8" yield.
[3] Percentage of total that are pickouts.
[4] French Fry Color: USDA Scale Color Standers for Frozen Fried Potatoes with 000 = lightest, 4 = darkest.
[5] Dec. = Stored at 55^0F from November 30, 2011 and fried on December 14, 2011.
[6] Jan. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F three weeks prior to frying on January 30, 2012.
[7] Feb. = Stored at 45^0F from December 8, 2011 than transferred to 55^0F six weeks prior to frying on February 23, 2012.

Table 8. Baking, boiling, microwaving results of tablestock test for Germplasm evaluation trial in Rock Springs, Plant Pathology Farm, 2011.

Variety/	Boil[1]			Bake[2]		Microwave[3]	
Line	Color[4]	Texture[5]	Sloughing[6]	Color	Texture	Color	Texture
Atlantic	1	2		1	2	1	2
JOMA	1	3		1	1	1	2
Katahdin	1	3		1	2	1	2
Kennebec	1	2		1	2	1	3
Snowden	1	2		1	2	1	2
Superior	1	3		1	1	1	2
Yukon Gem[YF]	3	3		3	2	3	2
Yukon Gold[YF]	3	2		3	1	3	2
AF2574-1	1	3		1	3	1	3
AF2866-3	1	3		1	3	1	4
AF4047-2	1	3		1	2	1	2
AF0338-17	1	3		1	2	1	2
B1992-106	1	3		1	3	1	2
BNC182-5	1	2		1	2	1	2
Waneta (NY138)	1	3		1	3	1	3
Lamoka (NY139)	1	3		1	2	1	2
NY143 (NYB38-40)	1	3		1	3	1	3
NY145 (NYD40-35)	1	2		1	3	1	3
NYE106-4	2	3		1	2	1	2
AF4013-3[YF]	3	3		3	1	3	2
AF4125-1	1	3		1	2	1	3
AF4130-7	1	4		1	1	1	2
AF4157-6	1	2		1	1	1	1
AF4222-4	1	3		1	1	1	2
BNC202-3[YF]	3	3		3	3	3	2
BNC202-7[YF]	3	2		3	1	3	2
B2727-2	1	2		1	2	1	2
B2731-11	1	3		1	2	1	2
B2738-3	1	3		1	2	1	3
B2781-3[YF]	2	3		3	3	3	2
Lehigh[YF]	3	3		3	2	3	2
Reba	1	3		1	3	1	3
NY140	1	2		1	2	1	2
NY141	1	3		1	3	1	2
NY149[YF]	3	2		3	1	3	1
G1-11	3	3		3	3	3	3
G4-2	1	3		1	3	1	3
G20-31	1	3		1	3	1	3
G20-41	1	3		1	2	1	2
G73-1	1	4		1	3	1	4
G87-3	1	3		1	2	1	1
H4-1	1	3		1	2	1	3
H6-3	1	2		1	1	1	1
H15-5	1	2		1	2	1	2
H15-6	1	2		1	2	1	3
H15-9	1	2		1	2	1	2
H15-17	1	3		1	3	1	2
H23-16	1	2		1	2	1	2
H25-2	1	2		1	3	1	2
H25-4	1	3		1	2	1	2

Variety/	Boil[1]			Bake[2]		Microwave[3]	
Line	Color[4]	Texture[5]	Sloughing[6]	Color	Texture	Color	Texture
H25-5	1	2		1	3	1	3
H63-1	3	3		3	3	3	2
MSL211-3	1	3		1	3	1	2
MSJ126-9Y[YF]	2	2		2	3	3	3
A00293-2Y[YF]	3	3		3	3	3	3
ATCO0293-1W/Y[YF]	3	3		3	2	3	2
CO00412-5W/Y[YF]	3	3		3	2	3	1
Snowbird	1	3		1	3	1	3
Sifra	2	3		1	2	1	3
Sylvana[YF]	3	3		3	2	3	3
Smart[YF]	3	3		3	2	3	2
Goldfinger[YF]	3	3		3	3	3	2
RZ97-185[YF]	3	3		3	2	3	2
Reds							
Chieftain	1	3		1	3	1	3
Dark Red Norland	1	3		1	3	1	3
Modoc	1	3		1	3	1	2
Red Sunset	1	3		1	3	1	3
B2152-17[YF]	3	2		3	3	3	3
BCO01306-2[Pk]	Pk	2		Pk	3	Pk	3
NY144	1	3		1	3	1	3
NYB13-1	1	3		1	3	1	3
B2538-5	1	2		1	1	1	1
B2676-2	1	3		2	2	1	2
B1816-5[YF]	3	3		3	2	3	2
BCO01044-2[Pur]	Pur	3		Pur	3	Pur	2
BNC201-1[YF]	2	3		2	2	1	2
B2756-7[YF]	3	2		3	3	3	2
Adirondack Blue[Pur]	Pur	2		Pur	2	Pur	3
Adirondack Red[Pk]	Pk	2		Pk	3	Pk	3
H52-1[Pur]	Pur	2		Pur	3	Pur	2
H73-1	1	3		1	3	1	2
H85-2[YF]	3	3	1	3	2	3	2
H90-4	1	2		1	3	1	2
H91-1[YF]	3	3		3	2	3	3
H122-4	1	3		1	2	1	3
Blackberry[Pur]	Pur	3		Pur	3	Pur	3
MSR226-1RR[Pk]	Pk	3		Pk	3	Pk	3
MSN215-2P	1	2		1	2	1	2
MSQ432-2PP[Pur]	Pur	3		Pur	2	Pur	3
Spartan Splash[YF]	3	2		3	2	3	3
NDA7985-1R	1	3		1	3	1	3
A99331-2RY[YF]	3	2		3	3	3	3
AC97521-1R/Y[YF]	3	3		3	3	3	3
CO97222-1R[Rd]	Rd	3	1	Rd	3	Rd	3
CO99076-6R	1	3		1	3	1	3
CO99256-2R	1	3		1	3	1	2
CO0291-5R	1	3		1	3	1	2
Purple Majesty[Pur]	Pur	3		Pur	3	Pur	3
Rodeo[YF]	3	3		2	3	3	2
Passion[YF]	3	3		3	3	3	3

Variety/ Line	Boil[1] Color[4]	Texture[5]	Sloughing[6]	Bake[2] Color	Texture	Microwave[3] Color	Texture
Russets							
Alpine Russet (A9305-10)	1	3		1	3	1	3
Classic Russet (A95109-1)	1	3		1	3	1	2
Premier Russet (A93157-LS)	1	3	1	1	2	1	2
Rio Grande Russet	1	2	1	1	2	1	2
Russet Burbank (#400)	1	3		1	2	1	2
Russet Norkotah #3117	1	3		1	2	1	1
AF3001-6	1	3		1	3	1	2
AF3317-15	1	2		1	2	1	1
AF3362-1	1	3		1	2	1	3
AF4040-2	1	3		1	2	1	2
AF3011-34	1	3		1	1	1	2
AF4172-2	1	3		1	2	1	3
AF4185-1	1	3		1	2	1	3
AF4372-2	1	3		1	2	1	3
AF4320-7	1	2	1	1	2	1	2
AF4320-15	1	3		1	2	1	2
A01025-4	1	3		1	2	1	2
A98345-1	1	3		1	2	1	1
A02062-1TE	1	3		1	3	1	2
AC99375-1RU	1	3	1	1	1	1	1
CO99053-3RU	1	3		1	3	1	2
CO99053-4RU	1	3		1	1	1	2
CO99100-1RU	1	3		1	3	1	2

Tested: January 23 thru 27, 2012 and February 6 thru 9, 2012.
[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
	BNC202-3	Yukon Gold	A00293-2Y
	BNC202-7	Yukon Gem	CO00412-5W/Y
	NY141	AF4013-3	Smart
	BNC201-1(red skin)	B2781-3	Goldfinger
	B2152-17(red skin)	Lehigh	RZ97-185
		NY149	H85-2(white splashed - purple skin)
		G1-11	H91-1(white splashed - purple skin)
		H63-1	AC97521-1R/Y (red skin)
		MSJ126-9Y	
		ATCO0293-1W/Y	
		Sylvana	
		B1816-5(purple skin)	
		B2756-7(red skin)	
		Spartan Splash (white splashed - purple skin)	
		A99331-2R/Y (white splotches - red skin)	
		Rodeo (red skin)	
		Passion (red skin)	

Red Flesh Varieties
MSR226-1RR
CO97222-1R
Adirondack Red
BCO01306-2

Rated in order of darkest to lightest in flesh color

Purple Flesh Varieties
H52-1
Purple Majesty
Blackberry
Adirondack Blue
BCO01044-2

Rated in order of darkest to lightest in flesh color

MSQ432-2PP: a purple skin with a unusual purple and cream color flesh.