

Potato Show & Tell, 16 December 2022



Contents of this Report

- I. Paragraph descriptions of advanced selections from the Cornell Breeding Program
- II. Summary tables comparing yield and specific gravity across trial sites
- III. Results from Cornell Breeding Trials
 - i. First Stage Chipping Clone Yield Trial, Ellis Hollow
 - ii. Tablestock Yield Trial, Ellis Hollow
 - iii. First Stage Chipping Clone Yield Trial, Freeville
 - ix. Chip Color Data for 2021 crop in University Trials
 - v. Chip Color Summary for 2019-2021 in University Trials
 - vi. Common Scab Resistance Test Data
 - vii. Tuber Dormancy Data
- IV. Data from Upstate County Farm Trials
 - viii. Wayne County Muck Soil White Tablestock Yield Trial, Wolcott
 - ix. Wayne County Muck Soil Red Tablestock Yield Trial, Wolcott
 - x. Steuben County Chipstock Yield Trial, Arkport
 - xi. Wyoming County Chipstock Yield Trial, Pike

Description of Advanced Selections from Cornell Breeding Program
Based on Cornell trials in 2022 and prior years
Last updated: 2 December 2022

NY163 (L7-2) = E50-8 x E48-2 (2009). Mid-late season chipstock, determinate vines, exceptionally light chip color out of cold storage.

- In 17 Tompkins County trials over the past nine years, marketable yields averaged 101% of Atlantic.
- In trials in Wyoming and Steuben counties, yield averaged 84% of Atlantic in 2016, 112% in 2017, 84% in 2018, 88% in 2019, 72% in 2020, and 127% of Atlantic in 2021.
- On Long Island yield was 123% of Reba in 2016.
- Yield in Pennsylvania was 113% of Atlantic in 2017 (1 trial), 97% in 2019 (3 trials), and 108% in 2020 (2 trials), and 121% of Atlantic in 2021 (3 trials).
- Yield in eight northern SNAC trails averaged 94% of Snowden in 2020, 98% in 2021, and 90% of Snowden in 2022.

Tubers are round to oblong with lightly netted skin. Low levels of growth cracks and knobs have been observed. No hollow heart, brown center or internal necrosis has yet been seen in NY. Sensitivity to metribuzin applied post-emergence was seen in Michigan in 2022. Specific gravity has averaged 0.004 less than Atlantic (28 trials). Chip color from 44F storage in December, January and February (2014 crop season) averaged 3.7 compared to 4.3 for Snowden (lower is better). Chip color averaged 3.2 vs 3.8 for Snowden in 2015, and 2.3 vs 4.3 in 2016. Out of 43F storage color averaged 2.5 vs 4.4 for Snowden in 2017, 3.0 vs 4.8 in 2018, 2.3 vs 4.7 in 2019, 3.0 vs 4.3 in 2020 and 2.8 versus 5.0 in 2022. Moderate resistance to common scab. Tuber dormancy is about one week longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: as an overall package, NY163 has a lot going for it: yield close to (but probably a few percent less than) Atlantic or Snowden, specific gravity high enough to ensure it is above 1.080 on most farms, the lightest fry color of any clone we've developed to date (yes, lighter than Lamoka and Waneta), incredibly low frequency of internal defects, a small (but not too small) size profile, and reasonable resistance to common scab. Downsides to date include a report of blistered chips in 2020 in a commercial plant, and breakdown in storage in a 2021 box bin trial in Michigan. Chris Long (in MI) is encouraging growers there to consider NY163 as a replacement for Atlantic for short term storage – it's fry color excels in that niche.

NY165 (M8-5) = NY148 x F48-4 (2010) Mid-season chipstock.

- In 15 Tompkins County trials over the past eight years, marketable yields averaged 112% of Atlantic.
- In trials in Wyoming and Steuben counties, yield averaged 110% of Atlantic in 2017, 120% in 2018, 101% in 2019, 102% in 2020, and 105% of Atlantic in 2021.
- Yield on Long Island was 119% of Reba in 2018 and 122% of Atlantic in 2019.
- Yield in Pennsylvania was 104% of Atlantic in 2019 (3 trials), 98% in 2020 (4 trials), and 104% of Atlantic in 2021 (3 trials).
- Yield in eight northern SNAC trails averaged 109% of Snowden in 2021. Not in SNAC in 2022.

Tubers are round to oblong, flattened, with lightly textured skin. Low levels of pickouts (misshapes and knobs) and internal defects (hollow heart and brown center) have been observed. Specific gravity has averaged 0.007 less than Atlantic (24 trials). Chip color from 44F storage in December, January and February (2015 crop season) averaged 3.2 compared to 4.2 for Snowden (lower is better). Chip color averaged 3.5 vs 4.3 for Snowden in 2016. Out of 43F storage chip color averaged 3.0 vs 4.4 for Snowden in 2017, 3.9 vs 4.8 in 2018, 4.0 vs 4.7 in 2019, 3.3 vs 4.3 in 2020, and 3.3 vs 5.0 in 2021. Moderately resistant to common scab. Molecular markers suggest NY165 is resistant to potato virus Y. Tuber dormancy is one to two weeks longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: NY165 is a chipping clone ideal for environments, like the Northeast, where specific gravity (and attendant blackspot bruise) can get too high. It has excellent marketable yields (better than Snowden), and very good chip color out of cold storage (better than Snowden), as well as mid-season maturity. Scab resistance is better than Snowden. Possible downside: tubers are flatter than I prefer, but we haven't yet received feedback that they are too flat. Childstock Farms produced 16 acres of seed in 2022 – opportunity for large scale commercial testing in 2023.

NY168 (N40-7) = NY148 x E48-2 (2011) High gravity mid-season chipstock.

- In ten Tompkins County trials over the past seven years, marketable yields averaged 109% of Atlantic.
- Yield in Steuben and Wyoming counties averaged 73% of Atlantic in 2019, 86% in 2020, 104% in 2021, and 156% of Atlantic in 2022.

Tubers are round/compressed with moderately textured skin and occasional purple blush. Low levels of pickouts (knobs and growth cracks) and internal defects (hollow heart) have been observed. Exceptionally sensitive to metribuzin applied post-emergence in the Wisconsin 2022 SNAC trial. Specific gravity has averaged 0.002 less than Atlantic (18 trials). Chip color from 44F storage in December, January and February (2016 crop season) averaged 3.7 compared to 4.0 for Snowden (lower is better). Chip color from 43F averaged 3.8 vs 4.2 for Snowden in 2017, 3.6 vs 4.8 in 2018, 3.3 vs 4.7 in 2019, 3.3 vs 4.3 in 2020, and 4.2 vs 5.0 in 2021. Moderately susceptible to common scab. Molecular markers suggest NY168 is resistant to potato virus Y. Tuber dormancy is about three weeks longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: NY168 scab susceptibility was on full display in the Steuben County trial this year, and when looking at chip color for 2021 crop (see Table elsewhere in this report), while color was lighter than Snowden, it was not as light as many other clones we currently have. Combine these observations with NY168's erratic performance in 2022 SNAC trials, and I'm inclined to drop NY168; we have better candidates to consider.

NY171 (Q126-1) = Blue Belle x NY115 (2013). Early maturing tablestock, long white tubers with purple color around the eyes.

- In six Tompkins County trials over four years, marketable yields averaged 95% of Atlantic. In one Tompkins County trial in 2020, yield was 91% of Eva.
- Yield in Wayne County was 92% of Eva in 2019, 95% in 2020, 78% in 2021, and 66% of Eva in 2022.

Tubers are long with bright white skin and striking purple color around the eyes. Low levels of pickouts (secondary growth and growth cracks) and internal defects (hollow heart) have been observed. Specific gravity has averaged 0.015 less than Atlantic (7 trials). Tubers exhibit some after cooking darkening and slight sloughing when boiled. Intermediate reaction to common scab (not highly resistant, not highly susceptible). Tuber dormancy is three to four weeks longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: the NY171 tubers we harvested from the 2019 Wayne County muck trial were the prettiest I've ever seen from our breeding program. Bright white skin, shallow eyes, attractive purple color around the eyes; just gorgeous. The skin has not been as smooth in mineral soil trials, however. NY171 is best suited for niche market growers and home gardeners. We will stop evaluating it but will keep some seed on hand for anyone who would like to test it.

NY173 (Q38-4) = J110-12 x F31-3 (2013) Full season chipstock.

- In six Tompkins County trials over the past five years, marketable yields averaged 120% of Atlantic.
- Yield in Steuben and Wyoming counties averaged 102% of Atlantic in 2020 and 134% of Atlantic in 2021.

Tubers are round/compressed with lightly textured skin. Low levels of pickouts (secondary growth and growth cracks) and internal defects (hollow heart) have been observed. Specific gravity has averaged 0.006 less than Atlantic (10 trials). Chip color from 43F storage in December, January and February (2018 crop season) averaged 5.3 compared to 4.8 for Snowden (lower is better), 3.0 vs 4.7 in 2019, 3.7 vs 4.3 in 2020, and 3.8 vs 5.0 in 2021. Moderately resistant to common scab. Molecular markers suggest NY173 is resistant to potato virus Y. Tuber dormancy is about one week longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: a reasonable chipping clone, worth continued evaluation. Different pedigree than our other advanced chipping clones, so represents an egg from a different basket. Trials in 2021 suggest that NY173 may be more prone to tuber greening than other clones. Was not tested anywhere in 2022, as we didn't have enough seed.

NY174 (Q106-13) = NY148 x E48-2 (2013) Full season chipstock.

- In six Tompkins County trials over the past five years, marketable yields averaged 113% of Atlantic.
- Yield in Steuben and Wyoming counties averaged 135% of Atlantic in 2020. Yield in Wyoming county in 2021 was 141% of Atlantic.

Tubers are round to oblong with lightly textured skin and a moderately recessed apical eye. Low levels of pickouts (secondary growth and growth cracks) and internal defects (hollow heart, internal necrosis and brown center) have been observed. Specific gravity has averaged 0.002 less than Atlantic (9 trials). Chip color from 43F storage in January and February (2018 crop season) averaged 4.0 compared to 4.2 for Snowden (lower is better). Chip color from 43F storage in December, January, and February averaged 3.0 vs 4.7 in 2019, 3.7 vs 4.3 in 2020, and 2.7 vs 5.0 in 2021. Intermediate reaction to common scab. Molecular markers suggest NY174 is resistant to potato virus Y. Tuber dormancy is about three weeks longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: a reasonable chipping clone, worth continued evaluation. Was not tested anywhere in 2022 because of insufficient seed. Under consideration for testing in national SNAC trials in 2023.

NY175 (Q29-2) = Lady Liberty x F31-3 (2013) Chipstock.

- In six Tompkins County trials over the past five years, marketable yields averaged 125% of Atlantic.
- Yield in Steuben and Wyoming counties averaged 83% of Atlantic in 2019, 132% in 2021, and 114% of Atlantic in 2022.

Tubers are round to oblong with moderately textured skin. Low levels of pickouts (growth cracks) and internal defects (hollow heart, internal necrosis and brown center) have been observed. Specific gravity has averaged 0.001 less than Atlantic (12 trials). Chip color from 43F storage in December, January, and February (2019 crop season) averaged 3.7 compared to 4.0 for Snowden (lower is better), 4.3 vs 4.3 in 2020, and 4.0 vs 5.0 in 2022. Moderately resistant to common scab. Molecular markers suggest NY175 is resistant to potato virus Y. Tuber dormancy is about one week longer than Atlantic. Susceptible to race Ro1 of the golden nematode.

Walter's assessment: A decent, but not awesome, clone. Yields have been good, gravity very good, but chip color is "only" comparable to Snowden, and it is susceptible to golden nematode. We have about 400 pounds of seed available if any grower wants to test it in 2023.

NY177 (R107-6) = NY148 x E48-2 (2014) Mid-late season chipstock.

- In four Tompkins County trials over the past four years, marketable yields averaged 116% of Atlantic.
- Yield in Wyoming county in 2021 was 124% of Atlantic. Yield in Steuben and Wyoming counties averaged 125% of Atlantic in 2022.

Tubers are round to oblong with lightly textured skin. Low levels of pickouts (growth cracks) and internal defects (internal necrosis and brown center) have been observed. Specific gravity has averaged 0.006 more than Atlantic (7 trials). Chip color from 43F storage in December, January, and February (2019 crop season) averaged 2.3 compared to 4.7 for Snowden (lower is better), 2.7 vs 4.3 in 2020, and 2.8 vs 5.0 in 2021. Moderate resistance to common scab. Molecular markers suggest NY177 is resistant to potato virus Y. Tuber dormancy is about one week longer than Atlantic. Resistant to race Ro1 of the golden nematode.

Walter's assessment: NY177 performed well in NCPT Tier 2 trials (two replicates of 15 hills in each of nine or ten states) in 2021 and 2022. The combination of yield and gravity and fry color NY177 has exhibited so far is simply outstanding. NY177 can be a little small – see, e.g., Steuben County trial data for 2022 – but it wasn't smaller than Snowden in Wyoming County this year, so I'm not sure if size truly is a problem. We'll try wider spacing in the future to see if that can increase tuber size. Since it comes from the same cross as NY168, we'll also keep an eye on sensitivity to post-emergence metribuzin. We have about 1000 pounds of seed available for on-farm trials in NY (and MI) if anyone is interested.

NY178 (R201-3) = Blue Belle x Genesee (2014) White tablestock.

- In one Tompkins County trial in 2019, marketable yield averaged 92% of Atlantic. In four Tompkins County trials from 2020-2022, yield was 102% of Eva.
- Yield in Wayne County was 118% of Eva in 2019, 93% in 2020, 80% in 2021, and 57% of Eva in 2022.

Tubers are oblong to long with lightly textured skin. Low levels of pickouts (secondary growth) and internal defects (hollow heart and brown center) have been observed. Intermediate reaction to common scab (not highly resistant, not highly susceptible). Tuber dormancy is one to two weeks longer than Atlantic. Susceptible to race Ro1 of the golden nematode.

Walter's assessment: NY178 is currently the best-looking traditional white tablestock clone we are evaluating. We have about 300 pounds of seed that we can provide to growers interested in testing NY178 for themselves. Muck trial yields have been so variable, I struggle to interpret them.

NY179 (R1-7) = Andover x Lady Liberty (2014) Chipstock.

- In four Tompkins County trials over the past four years, marketable yields averaged 110% of Atlantic.
- Yield in Steuben County in 2021 was 90% of Atlantic. Yield in Steuben and Wyoming Counties averaged 127% of Atlantic in 2022.

Tubers are round to oblong moderately textured skin; overall appearance is good. Low to modest levels of hollow heart have been observed. Specific gravity has averaged 0.006 more than Atlantic (7 trials). Chip color from 43F storage in December, January, and February (2019 crop season) averaged 3.7 compared to 4.7 for Snowden (lower is better), 4.0 vs 4.3 in 2020, and 4.2 vs 5.0 in 2021. Moderately susceptible to common scab. Total glycolalkaloids have been low (4.6 mg/100 g FW in 2020, 5.0 in 2021). Tuber dormancy is one to two weeks longer than Atlantic. Molecular markers suggest NY179 is resistant to potato virus Y. Resistant to race Ro1 of the golden nematode.

Walter's assessment: I've been ambivalent about NY179. I like its pedigree, the overall appearance, think yield is OK but not great, that gravity is good for the Northeast (not too high, not too low), but wish it had better resistance to common scab and better fry color. In NCPT Tier 2 trials in 2021 and 2022, though, my peers rather liked it; ranked #1 in 2022 and better than Snowden, Pike and Atlantic in 2021. It is probably worth noting that NCPT rankings don't consider fry color – but still – my breeding peers see something they like. We'll keep evaluating it.

NY180 (R107-11) = NY148 x E48-2 (2014) Chipstock.

- In three Tompkins County trials over the past four years, marketable yields averaged 106% of Atlantic.
- We haven't had enough seed yet to test in County trials.

Tubers are round to oblong with moderately textured skin and somewhat flattened. Low levels of pickouts (growth cracks, secondary growth) and internal defects (hollow heart) have been observed. Specific gravity has averaged equal to Atlantic (3 trials). Chip color from 43F storage in December, January, and February (2019 crop season) averaged 2.7 compared to 4.7 for Snowden (lower is better), 3.3 vs 4.3 in 2020, and 2.3 vs 5.0 in 2021. Too early to say much about resistance to common scab. Total glycolalkaloids have been moderate (12.4 mg/100 g FW in 2020, 7.2 in 2021. Over 20 mg/100 g FW is a concern). Tuber dormancy is similar to Atlantic. Molecular markers suggest NY180 is resistant to potato virus Y. Resistant to race Ro1 of the golden nematode.

Walter's assessment: At this point, it is clear that NY180 (like siblings NY174 and NY177) has excellent fry color and high specific gravity. We haven't had enough seed to meaningfully test yield yet. We have enough seed for our trials in 2023, and about 600 pounds extra for anyone else who would like to evaluate it.

NY181 (S18-4) = NY156 x F31-3 (2015) Chipstock.

- In three Tompkins County trials over the past three years, marketable yields averaged 112% of Atlantic.
- Not yet tested in County trials.

Tubers are round to oblong with textured skin and overall attractive appearance. Low levels of pickouts (growth cracks) and internal defects (hollow heart) have been observed. Specific gravity has averaged 0.003 greater than Atlantic (3 trials). Chip color from 43F storage in December, January, and February (2020 crop season) averaged 3.0 compared to 4.3 for Snowden (lower is better) and 3.1 vs 5.0 in 2021. Too early to say much about resistance to common scab. Total glycoalkaloids have been moderate (12.1 mg/100 g FW vs Snowden at 14.7 in 2021. Over 20 mg/100 g FW is a concern). Tuber dormancy is about one to two weeks less than Atlantic. Molecular markers suggest NY181 is resistant to potato virus Y. Resistant to race Ro1 of the golden nematode.

Walter's assessment: Promising so far. Along with NY179, tied for first in NCPT Tier 2 in 2022.

The link for anyone interested in NCPT and SNAC trial data: <https://potatoesusa.medius.re/>

Whatever happened to ...? Brief updates on clones with paragraph descriptions in our 2021 report, but not in 2022.

NY160. Small pink-skinned clone, dropped because it was insufficiently small and didn't yield.

NY176. Chipping clone, with best combination of yield, gravity and chip color we've ever seen; dropped for high glycoalkaloids. R.I.P.

2022 Summary of Yield Trials

Marketable yield larger than 1 7/8" (including green tubers).

Performance given as % of check variety.

	Ellis Hollow	County		
	Tablestock Trial	Wayne Wolcott	Steuben Arkport	Wyoming Pike
Atlantic	100		100	100
Snowden				101
Eva	110	100		
NY164 (red)	85	61		
NY165				
NY168			123	188
NY171	100	64		
NY175			97	130
NY177			90	161
NY178	108	59		
NY179			108	147
R213-2	91	83		

2022 Summary of Specific Gravities

Entries show differences (in units of 0.001) from Atlantic

	Ellis Hollow	County	
	Observation	Steuben	Wyoming
	Plot	Arkport	Pike
Atlantic	1.085	1.074	1.093
Snowden	-6		-8
Lamoka	-10		
NY163	0		
NY168	-9	+1	-4
NY174	-6		
NY175	+2	+2	-2
NY177	+5	+8	+2
NY179	-6	-5	-8
NY180	+5		
NY181	+3		

2022 First Stage Chipping Clone Yield Trial, Ellis Hollow

Plots 2 rows x 15', hills spaced at 8.2"

3 Replicates (unless indicated otherwise in parentheses)

Planted May 10, harvested September 20. Vine kill applied September 3.

	cwt/acre		%	pickout		% internal defects			appear. score	specific gravity
	>1 7/8"	>2 1/2"	>2 1/2"	cwt/A	type	HHT	IN	BC		
Andover	275	195	71	12	gc, 2g	0	0	0	3.7	1.080
Atlantic	322	265	82	11	gc, 2g	0	17	3	3.5	1.085
Brodie	369	300	81	5	k, 2g	0	3	0	3.4	1.068
Lady Liberty	322	163	51	0	-	0	3	0	3.5	1.075
Lamoka	292	201	69	6	gc, k	0	0	0	3.3	1.075
Pike	295	183	62	1	k	0	17	0	3.2	1.076
Salem (2)	314	240	76	19	gc, 2g	0	0	0	3.5	1.064
U5-4	257	189	73	4	2g	0	3	0	3.4	1.073
U5-13	218	101	46	5	gc	0	30	0	3.3	1.078
U15-1	199	61	31	1	k	0	0	0	3.3	1.085
U15-8	328	157	48	4	2g, k	0	0	0	3.2	1.074
U16-3	247	70	28	0	-	0	0	0	3.5	1.083
U16-4	215	126	58	11	k	7	0	3	3.2	1.071
U17-18	224	136	61	7	gc	0	0	0	3.3	1.075
U18-2	254	151	59	0	-	0	0	0	3.7	1.080
U20-10	303	202	67	2	gc	0	0	0	3.4	1.084
U21-2	281	179	64	3	2g, gc	0	0	0	3.4	1.081
U34-1	331	244	74	2	gc, 2g	0	0	0	3.0	1.075
U34-2	230	180	78	14	k	0	3	0	3.2	1.067
U34-3	277	141	51	4	k	0	0	0	3.2	1.078
U34-5	316	178	56	2	gc	3	0	3	3.4	1.076
U34-6	296	180	61	3	gc, k	0	0	0	3.4	1.080
U35-2	208	57	28	3	k	0	0	0	3.3	1.083
U35-5	290	115	40	1	k	0	3	0	3.4	1.082
U44-1	242	149	62	3	2g	0	10	0	3.5	1.075
U44-7	336	226	67	1	gc	0	0	0	3.2	1.082

2022 Tablestock Trial, Ellis Hollow

Plots 2 rows x 15', hills spaced at 8.2"

3 replicates (unless indicated otherwise in parentheses)

Planted May 10, harvested September 21. Vine kill applied September 3.

	cwt/acre		%	pickout		% internal defects			appear.	specific
	>1 7/8"	>2 1/2"	>2 1/2"	cwt/A	type	HHT	IN	BC	score	gravity
Atlantic	299	243	81	21	gc	3	30	0	3.4	1.086
Eva	328	265	81	4	k	0	3	3	3.6	1.072
Chieftain	304	186	61	6	gc, 2g	0	7	0	3.5	1.067
Norland	260	156	60	4	gc, k	0	0	0	3.5	1.064
Yukon Gold	278	236	85	21	gc, 2g	0	7	0	3.3	1.070
NY160	168	73	43	1	2g	0	0	0	3.5	1.072
NY164	255	153	60	6	k, gc	0	3	0	3.4	1.068
NY171	298	199	67	3	2g, k	0	0	0	3.5	1.071
NY178	323	227	70	12	2g, gc	0	3	0	3.6	1.061
R213-2	273	121	44	2	2g	0	0	0	3.4	1.069
T59-1	174	50	28	4	2g, k	0	0	0	3.5	1.064
T61-4	132	17	13	1	2g	0	0	0	3.7	1.076
T104-2	313	209	67	3	2g	0	0	0	3.2	1.076
T105-2	298	204	69	1	gc	0	0	0	3.1	1.075
T105-6	262	92	35	5	2g, k	0	0	0	3.5	1.076
U53-1	182	60	33	6	gc, k	0	3	0	3.5	1.067
U54-1	42	1	3	1	2g	0	0	0	3.4	1.062
U71-1	203	97	48	0	-	0	0	0	3.6	1.065
U101-5	227	162	72	6	gc	0	0	0	3.7	1.078
U104-3	295	127	43	57	2g	3	7	0	3.1	1.071
U104-5	288	168	58	16	k, gc	0	0	0	3.3	1.074

First Year Chip Clone Yield Trial, Freeville NY, 2022. Page 1 of 2.

Plots 2 rows x 15', hills spaced at 8.2"

3 Replicates

Planted May 13, harvested October 11. Vine kill applied September 9.

Genotype Variety or Clone	Total Yield Cwt/A	Mkt. Yield		Size Distribution ¹ (% of total yield)					Size Distrib. (%)		Spec. Grav.
		Cwt/A	% of Std.	1	2	3	4	5	1-7/8" to 4"	2-1/2" to 4 "	
Atlantic	346	322	100	3	18	65	15	0	97	80	1.081
Lady Liberty	475	437	136	5	32	56	6	0	94	62	1.078
Lamoka	408	370	115	3	35	58	5	0	97	63	1.076
Snowden	378	337	105	4	30	59	6	0	96	65	1.079
U5-4	306	282	88	3	35	59	2	0	97	62	1.077
U5-7	188	157	49	14	69	17	0	0	86	17	1.079
U5-13	305	274	85	8	39	51	2	0	92	53	1.083
U15-1	320	252	78	18	62	19	1	0	82	20	1.082
U15-8	448	397	123	6	36	53	5	0	94	58	1.081
U16-3	352	314	97	11	52	37	0	0	89	37	1.082
U16-4	379	316	98	4	20	61	15	0	96	76	1.075
U17-18	319	290	90	5	36	55	4	0	95	59	1.079
U18-2	350	309	96	8	46	44	2	0	92	46	1.082
U20-10	356	323	100	5	34	54	7	0	95	61	1.083
U21-2	351	327	101	5	34	57	4	0	95	61	1.083
U34-1	399	377	117	3	21	61	15	0	97	76	1.082
U34-2	330	299	93	2	16	55	27	1	98	82	1.075
U34-3	400	368	114	4	27	64	5	0	96	69	1.085
U34-5	450	399	124	3	28	58	11	0	97	69	1.079
U34-6	518	471	146	4	30	57	8	0	96	66	1.090
U35-2	412	361	112	11	56	34	0	0	89	34	1.083
U35-5	348	324	101	5	35	57	4	0	95	61	1.077
U44-1	393	343	106	5	34	55	7	0	95	62	1.082
U44-7	349	335	104	2	23	64	10	0	98	74	1.084

Tuber size classes:

1 = under 1.875 inches diameter, 2 = 1.875 to 2.5, 3 = 2.5 to 3.25, 4 = 3.25 to 4, 5 = over 4 inches diameter

First Year Chip Clone Yield Trial, Freeville NY, 2022. Page 2 of 2.

Genotype Variety or Clone	Tuber Attributes			External Tuber Defects (%)					Int. Tuber Defects (%)			
	Tuber Shape	Skin Text.	Tuber Appear.	Total Defects	Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Brn. Center	Vasc. Disc.	Int. Nec.
Atlantic	3.0	5.0	6.3	5	3	1	1	0	3	0	0	0
Lady Liberty	3.0	5.0	6.3	2	2	0	0	0	0	0	7	0
Lamoka	3.7	6.0	6.3	7	5	1	1	0	0	0	17	0
Snowden	3.0	5.0	5.0	7	6	0	0	0	3	0	13	0
U5-4	3.0	5.0	7.0	5	4	1	0	0	0	0	0	7
U5-7	3.0	6.0	6.0	3	3	0	0	0	0	0	7	0
U5-13	3.0	5.0	6.0	2	2	1	0	0	0	0	0	20
U15-1	3.0	5.0	7.0	4	4	0	0	0	0	0	0	0
U15-8	3.0	5.0	6.3	6	6	0	0	0	0	0	10	0
U16-3	3.0	5.0	6.7	0	0	0	0	0	10	0	0	0
U16-4	3.3	6.0	6.0	13	10	3	0	0	33	0	0	0
U17-18	2.0	5.0	6.0	5	5	0	0	0	0	0	0	3
U18-2	2.7	5.0	7.0	4	3	1	0	0	0	0	3	0
U20-10	2.0	5.0	6.3	4	4	0	0	0	7	3	0	0
U21-2	2.7	5.0	7.0	2	1	0	0	0	0	0	0	0
U34-1	3.0	5.0	4.7	3	3	0	0	0	7	0	0	7
U34-2	3.0	7.0	4.3	7	6	0	1	1	0	0	0	0
U34-3	4.0	6.0	7.0	4	3	1	0	0	3	0	3	0
U34-5	3.0	6.7	7.0	8	8	0	0	0	3	0	20	0
U34-6	3.0	7.0	6.7	5	5	0	0	0	3	0	0	0
U35-2	3.0	5.0	6.3	2	2	0	0	0	0	0	0	0
U35-5	3.0	6.0	6.7	3	2	1	0	0	0	0	0	0
U44-1	3.0	5.0	6.7	9	9	0	0	0	0	0	0	3
U44-7	3.0	5.0	5.3	2	2	0	0	0	10	0	0	0

Tuber shape 1 = round, 2 = mostly round, 3 = round to oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong to long, 7 = long

Skin texture 5 = netted, 6 = slight net, 7 = medium smooth, 8 = smooth, 9 = very smooth

Tuber appearance 5 = fair, 6 = OK, 7 = good, 8 = nice

2021 Crop Season Chip Color Scores - University Trials

43F Storage

Average of two locations (Ellis Hollow and Freeville)

	VISUAL SCORES			
	DEC	JAN	FEB	Average 3 MONTHS
SNOWDEN	5.0	5.5	4.5	5.0
LAMOKA	3.5	3.5	3.5	3.5
NY163	2.5	3.5	2.5	2.8
NY165	3.0	3.5	3.5	3.3
NY168	4.5	4.0	4.0	4.2
NY173	4.0	4.0	3.5	3.8
NY174	2.5	2.5	3.0	2.7
NY175	4.5	4.0	3.5	4.0
NY177	3.0	3.0	2.5	2.8
NY179 (R1-7)	3.5	5.0	4.0	4.2
NY180 (R107-11) (EH only)	2.0	3.0	2.0	2.3
NY181 (S18-4)	3.5	3.0	2.5	3.0

VISUAL CHIP SCALE: 1 - 10

1 = best

4 = marginal

5 and over = not acceptable

Samples were not reconditioned before chipping

Average Chip Color over Three Years - University Trials

Out of 43F storage: 2019 - 2021 crop seasons.

No reconditioning

	VISUAL SCORES			
	DEC	JAN	FEB	AVG
Snowden	5.0	4.5	4.5	4.7
Lamoka	3.2	3.2	3.2	3.2
NY163	2.5	2.8	2.8	2.7
NY165	3.7	3.5	3.5	3.6
NY168	3.8	3.3	3.3	3.5
NY173	3.7	3.3	3.5	3.5
NY174	3.2	3.2	3.0	3.1
NY175	4.2	4.0	3.8	4.0
NY177	2.7	2.7	2.5	2.6
NY179 (R1-7)	3.5	4.3	4.0	3.9
NY180 (R107-11)	2.3	3.3	3.0	2.9
NY181 (S18-4) (2020-2021 only)	3.3	3.2	2.8	3.1

VISUAL CHIP SCALE: 1 - 10

1 = best

4 = marginal

5 and over = not acceptable

Scab Score Summary

Tubers evaluated at harvest from scab-infested plots in Ellis Hollow (EH) and Varna (V)

0 = free of scab, 5 = very susceptible

LOCATION:	2021	2019	2018	2017	2015	2014	2013	2012	2011	2010	2009	2009	08	08
	EH	EH	EH	EH	EH	EH	EH	V	EH	EH	V	EH	V	EH
Brodie						4.7	4.5			4.7	2.7	3.3	3.0	3.7
Chieftain			2.7	3.3	3.0	3.5	4.0		3.3	5.0	1.0	3.0		3.5
Chippewa	3.7			5.0	5.0	4.7	4.5	3.0		5.0	4.3	5.0	4.7	5.0
Katahdin	3.0	2.3	3.7	4.4	4.7	4.7	4.0	2.3	4.0	4.8	3.7	4.3	4.3	4.0
Lamoka	2.3	1.3		2.7		2.8				2.3	1.3	2.7	2.3	2.3
Lady Liberty			2.0		2.3	2.2	2.0	2.0	2.8					
Nordonna				3.3	2.3	3.7							1.0	1.5
Pike		1.2	2.0	3.3	2.7	2.4		2.7		1.7	1.3	1.7	1.5	2.0
Reba										4.0	2.0	3.0		
Snowden										5.0	1.7	4.0		3.0
Superior			2.3	3.0	3.0	3.5	2.5	2.3	2.8	2.3	2.0	2.7	1.7	2.0
Upstate Abundance					2.7	3.0	3.0	2.5	3.7	2.3				
Waneta										2.3	2.0	1.0	1.3	2.3
NY163 (chip)	1.7	2.0	2.0	3.0	2.0	2.8								
NY165 (chip)	1.7	1.0	2.0	2.3	2.0									
NY168 (chip)	2.7	2.7	3.2	3.8										
NY171 (white/purp)	2.7	1.3	2.3											
NY172 (chip)	2.0	1.3	2.0											
NY173 (chip)	1.3	1.0	2.7											
NY174 (chip)	2.0	2.3	2.7											
NY175 (chip)	1.7	1.7	2.0											
NY176 (chip)	3.3	1.7												
NY177 (chip)	2.7	1.6												
NY178 (white)	2.3	1.7												
NY179 (chip)	1.7	1.0												
NY180 (chip)	2.3	2.0												
NY181 (chip)	2.7													

Scab pressure was low in our 2019 and 2021 trials. No scab trial in 2020. Scab trial failed - almost no scab at all - in 2022.

Tuber Dormancy Relative to Atlantic

Replicate 10 tuber samples from each clone were stored in the dark at room temperature.
 The number of weeks that each clone sprouted earlier (-) or later (+) than Atlantic is shown.
 Atlantic typically breaks dormancy in late October to mid November

Dormancy is considered broken when half or more of the sample has 1/4" long sprouts.

	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Round whites:											
Andover						0		1		3	3
Algonquin							4	0	4	3	2
Atlantic		0	0	0	0	0	0	0	0	0	0
Brodie			0					4	5	7	6
Eva				8		5		6		7	8
Lady Liberty			0	3		4	5	2	4	3	5
Lamoka			0	3	1	1		0		3	0
Reba			2		3	2		2		4	
Snowden			0	2	2	2	0	0		2	2
Upstate Abundance						0	3	3	3	2	2
Waneta			4	8		7	9	6		10	7
Yukon Gold				2	1	1	2				0
NY163	-2	0	0	2	1	2	1				
NY165	0	2	0	3	2	1					
NY168	4	2	3	6	4	0					
NY171	5	3	2	4							
NY173	1	1	0	2							
NY174	6		2	2							
NY175	2	2	0	0							
NY177	0	1									
NY178	2	1									
NY179 (R1-7)	1	2									
NY180 (R107-11)	0	-1									
NY181 (S18-4)	-3	0									
R15-4	1	1									
Reds and purples:											
Chieftain	0	1	0	2		0		0	0	2	1
Norland DR			-2	-2		-2		-4		-1	
Nordonna			0	0		-2		-2	0	2	0
Red Maria								1	3	3	4
NY160		0						-2			
NY164	-2		-2	1	-2	-1					

Upstate New York Table 1. Yield, marketable yield, percentage of yield by grade size distribution, mean tuber number per foot and weight, percentage of defects, and specific gravity for Wayne County white-skinned variety trial grown near Wolcott, New York - 2022.

Variety or Clone	Total Yield	Mkt. Yield		Size Distribution ¹ (% of total yield)				Mean Tuber		Percent External Tuber Defects				Percent Internal Tuber Defects				Spec. Grav.
	Cwt/A	Cwt/A	% of Std.	1	2	3	4	#/ft	wt(oz)	SUN	KNB	GC	ROT	HH	BC	VD	NEC	
Atlantic	274	166	63	9	68	22	0	8.1	3.8	29	1	0	0	20	0	0	0	1.077
Eva	313	262	100	5	73	22	0	7.3	4.6	13	0	0	0	0	0	0	0	1.069
Genesee	231	116	44	10	72	17	1	8.4	3.0	38	0	0	0	0	0	0	0	1.061
Yukon Gold	241	119	45	9	61	30	0	7.5	3.5	41	0	2	0	20	0	0	0	1.074
NY171	238	144	55	20	76	4	0	9.5	2.7	21	0	0	0	0	0	0	0	1.065
NY178	206	102	39	16	76	7	0	6.7	3.3	37	1	0	0	5	5	0	0	1.058
R213-2	311	223	85	21	77	2	0	14.3	2.4	9	0	0	0	0	0	0	0	1.063
T61-4	180	71	27	40	59	1	0	12.0	1.6	21	0	0	0	0	0	0	0	1.070
T105-2	243	147	56	16	68	16	0	6.8	4.0	23	0	0	0	0	0	0	0	1.066
T105-6	384	30	11	20	77	3	0	15.7	2.7	8	0	0	0	0	0	0	0	1.074
Average:	262	138	53	17	71	13	0	9.6	3.2	24	0	0	0	5	1	0	0	1.067
Maximum:	384	262	100	40	77	30	1	15.7	4.6	41	1	2	0	20	5	0	0	1.077
Minimum:	180	30	11	5	59	1	0	6.7	1.6	8	0	0	0	0	0	0	0	1.058

¹Tuber size classes:

1 = under 2" dia., 2 = 2" to 3" dia., 3 = 3" to 4" dia., and 4 = over 4" dia.

Plant Date: June 15

Harvest Date: October 6

Upstate New York Table 2. Yield, marketable yield, percentage of yield by grade size distribution, mean tuber number per foot and weight, percentage of defects, and specific gravity for Wayne County red and purple-skinned variety trial grown near Wolcott, New York - 2022.

Variety or Clone	Total	Mkt. Yield		Size Distribution ¹				Mean Tuber		Percent External				Percent Internal				Spec. Grav.
	Yield	Cwt/A	% of Std.	(% of total yield)				#/ft	wt(oz)	Tuber Defects				Tuber Defects				
	Cwt/A			1	2	3	4			SUN	KNB	GC	ROT	HH	BC	VD	NEC	
Chieftain (1rep)	279	173	136	4	69	27	0	6.8	4.5	28	0	6	0	0	0	0	0	1.069
Norland	225	127	100	22	74	5	0	9.4	2.7	21	0	1	0	0	0	0	0	1.063
NY160	197	99	78	35	65	0	0	14.8	1.6	16	0	0	0	0	0	0	0	1.067
NY164	238	137	108	21	73	6	0	10.3	2.5	20	1	0	0	0	0	0	0	1.059
T59-1	117	57	45	41	59	1	0	6.6	1.9	11	0	0	0	0	0	0	0	1.056
Average:	211	119	94	24	68	8	0	9.6	2.6	19	0	1	0	0	0	0	0	1.063
Maximum:	279	173	136	41	74	27	0	14.8	4.5	28	1	6	0	0	0	0	0	1.069
Minimum:	117	57	45	4	59	0	0	6.6	1.6	11	0	0	0	0	0	0	0	1.056

¹Tuber size classes:
Plant Date: June 15

1 = under 2" dia., 2 = 2" to 3" dia., 3 = 3" to 4" dia., and 4 = over 4" dia.

Harvest Date: October 6

Upstate New York Grower Table 3. Yield, marketable yield, percentage of yield by grade size distribution, mean tuber number per foot and weight, percentage of defects, and specific gravity for Steuben County chipping variety trial grown near Arkport, New York - 2022.

Variety or Clone	Total Yield	Mkt. Yield		Size Distribution ¹				Mean Tuber		Percent External Tuber Defects				Percent Internal Tuber Defects				Spec. Grav.
	Cwt/A	Cwt/A	% of Std.	1	2	3	4	#/ft	wt(oz)	SUN	KNB	GC	ROT	HH	BC	VD	NEC	
Atlantic	190	178	100	5	60	34	0	4.3	4.8	1	0	0	0	10	5	5	3	1.074
NY168	247	222	125	7	60	31	3	5.8	4.8	0	0	0	0	0	3	0	10	1.075
NY175	189	170	96	8	68	24	0	4.6	4.7	2	1	0	0	3	3	0	0	1.076
NY177	188	160	90	14	72	13	0	5.9	3.6	1	0	0	0	0	0	0	3	1.082
R1-7	211	194	109	8	69	24	0	5.2	4.5	0	0	0	0	3	0	0	0	1.069
S37-2	154	139	78	7	66	26	1	3.5	4.8	1	1	0	0	0	5	0	25	1.078
Average:	197	177	99	8	66	25	1	4.9	4.5	1	0	0	0	3	3	1	7	1.076
Maximum:	247	222	125	14	72	34	3	5.9	4.8	2	1	0	0	10	5	5	25	1.082
Minimum:	154	139	78	5	60	13	0	3.5	3.6	0	0	0	0	0	0	0	0	1.069

¹Tuber size classes:

1 = under 2" dia., 2 = 2" to 3" dia., 3 = 3" to 4" dia., and 4 = over 4" dia.

Plant Date: June 14

Harvest Date: October 21

Fertilizer: 136N-272P-136K lbs/acre at planting

Values in table are mean of four replicate plots

Other: 7 oz Quadris/acre and 2.67 oz Platinum/acre

Spacing: 36 inch bed width by 8 inch within row spacing.

Upstate New York Grower Table 4. Yield, marketable yield, percentage of yield by grade size distribution, mean tuber number per foot and weight, percentage of defects, and specific gravity for Wyoming County chipping variety trial grown near Pike, New York - 2022.

Variety or Clone	Total Yield	Mkt. Yield		Size Distribution ¹ (% of total yield)				Mean Tuber		Percent External Tuber Defects				Percent Internal Tuber Defects				Spec. Grav.
	Cwt/A	Cwt/A	% of Std.	1	2	3	4	#/ft	wt(oz)	SUN	KNB	GC	ROT	HH	BC	VD	NEC	
Atlantic	191	165	100	12	78	10	0	5.4	3.7	1	0	0	0	0	0	3	0	1.093
Snowden	201	166	101	19	72	9	0	6.1	3.4	1	0	0	0	5	0	10	0	1.085
NY168	342	311	189	7	77	15	0	8.0	4.5	1	0	0	0	0	3	3	0	1.089
NY175	258	213	129	16	79	5	0	7.5	3.6	2	0	0	0	0	0	3	0	1.091
NY177	317	263	160	16	76	8	0	8.8	3.7	2	0	0	0	0	0	0	0	1.095
R1-7	282	239	145	14	77	8	0	7.7	3.8	1	0	0	0	0	0	0	0	1.085
Average:	265	226	137	14	77	9	0	7.2	3.8	1	0	0	0	1	0	3	0	1.090
Maximum:	342	311	189	19	79	15	0	8.8	4.5	2	0	0	0	5	3	10	0	1.095
Minimum:	191	165	100	7	72	5	0	5.4	3.4	1	0	0	0	0	0	0	0	1.085

¹Tuber size classes:

1 = under 2" dia., 2 = 2" to 3" dia., 3 = 3" to 4" dia., and 4 = over 4" dia.

Plant Date: May 31

Vinekill Dates: September 20 and September 27

Harvest Date: October 24

Fertilizer: 180N-102P-115K-6.7Mg-37.5Ca lbs/acre at planting

Vinekill: 1 pt/acre Reglone and surfactant (2x)

Other: 9 oz Aframe in furrow/acre

Spacing: 34 inch bed width by 8 inch within row spacing.

Water: 10.45" rain fall plus 7.15" supplemental irrigation

Each clone was evaluated in four replicate plots.

A distant view of some of our plots on Mt. Pleasant

