

THE MOST PROMISING CLONES IN THE CORNELL POTATO BREEDING PROGRAM

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The Cornell potato breeding program seeks to serve the potato industry of NY and PA and neighboring states by developing new varieties that are adapted to the local environment and meet the evolving needs of growers, processors and consumers alike. The emphasis is to combine resistance to the golden nematode and scab with other attributes (e.g., yield, appearance, freedom from internal defects) needed in a successful variety. Primary market niches targeted by the program include round white varieties with resistance to low temperature sweetening and high dry matter for the chipping industry and round white and red-skinned cultivars for fresh market use.

Descriptions of our five most promising advanced clones follow below. Comments on the performance of these clones or any previously released Cornell varieties, or on desired attributes of future varieties are always welcome.

Table and chipping: NY140 (Y36-4) = NY121 x NY115 (1998). Late season, dual purpose chip and tablestock. High yields of large tubers, lightly textured skin. Resistant to race Ro1 of the golden nematode and moderately resistant to race Ro2.

- Marketable yields in Tompkins County NY over the past nine years have averaged 116% of Atlantic (23 trials).
- Yields in Steuben and Wyoming County NY trials averaged 111% of Atlantic in 2006, 119% in 2007, 117% in 2008, 119% in 2009, 102% in 2010, and 106% of Atlantic in 2011. Six year average: 113%.
- Yield in Wayne County NY was 129% of Atlantic in 2008 and 123% of Atlantic in 2009.
- Yields on Long Island were 108% of Norwis in 2004. Yields were 103% of Reba in 2005, 116% in 2006, 91% in 2007, 105% in 2008, 128% in 2009, 139% in 2010, and 126% of Reba in 2011.
- In PA yields averaged 106% of Atlantic in 2005 (3 trials), 124% in 2007 (4 trials), 119% in 2008 (2 trials), 104% in 2009 (3 trials), and 112% of Atlantic in 2010 (3 trials).
- Yield in North Carolina averaged 117% of Atlantic in 2009 (3 trials) and 96% of Atlantic in 2010 (2 trials).

A low frequency of pickouts due to knobs, misshapes and growth cracks. Some internal defects, most commonly hollow heart and internal necrosis, have been observed. Tuber size is

unmistakably large, averaging 6.5 ounces per tuber (16 trials). Even at 6 inch spacing, tuber size remains large (2009 and 2010 trials). Specific gravity has averaged 0.012 less than Atlantic (29 trials). This will limit the locations where it could be grown for chips. Chip quality has generally been very good: over the past seven years it has averaged 3.7, comparable to Snowden, which averaged 3.6 in the same trials (lower is better). Susceptible to common scab, comparable to Katahdin. Tubers remain white after boiling, and do not slough significantly. Tuber dormancy is about six weeks longer than Atlantic. Nice vines, white flowers, few fruit. Exhibited moderate resistance to late blight as well as early blight in PA trials in 2007 - 2009. Good resistance to blackspot bruise. Resistant to races Ro1 and Ro2 of the golden nematode.

White table: NY141 (Y41-67) = R6-4 x NY115 (1998). Early to mid season tablestock, attractive tubers.

- Marketable yields in Tompkins County NY over the past nine years have averaged 99% of Atlantic (24 trials).
- Yield in Wayne County NY was 107% of Atlantic in 2008, 106% in 2009, and 78% in 2011.
- Yields on Long Island were 82% of Norwis in 2004. Yields were 95% of Reba in 2005, 100% in 2006, 81% in 2007, 111% in 2008, 110% in 2009, 118% in 2010, and 110% of Reba in 2011.
- Yield in PA in 2005 was 107% of Atlantic in 2005 (1 trial), 92% in 2007 (4 trials), 79% in 2008 (2 trials), 94% in 2009 (3 trials), and 115% of Atlantic in 2010 (3 trials).

Typically 2 to 3% of tubers have knobs. A low frequency of internal defects, mostly brown center, have also been observed. Has set an average of 6.7 tubers per foot, with an average weight of 6.3 ounces (11 trials). Early yield, assessed at the end of July in Ithaca NY, has been good: 112% of Superior in 2010, 110% of Atlantic in 2009, 101% of Superior in 2006, and 122% of Superior in 2005. Specific gravity has averaged 0.011 less than Atlantic (25 trials). Does not chip. Good resistance to common scab. Tubers remain white after boiling, and do not slough significantly. Tuber dormancy is about two weeks longer than Atlantic. Nice vines, white flowers, some fruit. Very good resistance to blackspot bruise. Resistant to race Ro1 of the golden nematode.

Chipping: NY148 (E106-4) = NY128 x Marcy (2003). Late season, high gravity, chipstock.

- In ten Tompkins County NY trials over the past four years, marketable yields averaged 113% of Atlantic.
- In trials in Wyoming and Steuben NY Counties, yield averaged 112% of Atlantic in 2009, 81% in 2010, and 108% of Atlantic in 2011.

- Yield on Long Island was 98% of Reba in 2010 and 106% in 2011.

In general, few pickouts or internal defects have been observed – but in 2010, two-thirds of tubers exhibited internal necrosis in one yield trial (Harford NY). Tuber size is similar to Snowden, averaging 4.8 ounces per tuber (6 trials). Scurfy tuber skin. Specific gravity is high and has averaged only 0.002 less than Atlantic (17 trials). In 2008, chip color from December, January and February averaged 3.5, not as good as Snowden at 2.3 in the same trials. In 2009, chip color averaged 3.8, better than Snowden at 4.5. In 2010 chip color averaged 3.3 compared to Snowden at 2.5. Has exhibited moderate resistance to common scab to date. Tubers darken slightly after boiling, and slough moderately. Tuber dormancy is comparable to Atlantic. Many white flowers. Resistant to race Ro1 of the golden nematode.

Yellow table: NY149 (F11-1) = Yukon Gold x Keuka Gold (2004). Mid-late season yellow-fleshed tablestock, with slightly-textured skin and pink eyes.

- In seven Tompkins County NY trials over the past three years, marketable yields averaged 84% of Atlantic.
- Wayne County NY (muck soil) yield was 67% of Atlantic in 2011.
- Yield on Long Island was 83% of Yukon Gold in 2011.
- Yield in PA was 118% of Atlantic in 2011 (1 trial).

Tuber flesh color comparable to Yukon Gold, but tuber size is smaller. A low level of pickouts, mostly misshapes, have been observed. Generally free of internal defects. Specific gravity has averaged 0.011 less than Atlantic (7 trials). Moderately resistant to common scab. Tubers do not darken, and only exhibit slight sloughing, after boiling. Tuber dormancy is about 1 week longer than Atlantic. Resistant to race Ro1 of the golden nematode.

White table: NY150 (F52-1) = NY121 x Jacqueline Lee (2004). Niche-market, early season tablestock. Produces many small tubers with bright white skin.

- In seven Tompkins County NY trials over the past three years, yields of tubers between 1 and 1.875 inches averaged 179 cwt/acre, while yields of tubers between 1.875 and 2.5 inches in diameter averaged 147 cwt. acre. In the same trials yield of tubers greater than 2.5 inches averaged only 16 cwt/acre. For comparison, marketable yield of Atlantic (>1.875 inches) in the same trials averaged 368 cwt/acre.

Few pickouts (mostly misshapes) or internal defects have been observed. Specific gravity has averaged 0.011 less than Atlantic (7 trials). Intermediate reaction to common scab. Tubers do not darken or slough appreciably after boiling. Tuber dormancy is about 2 weeks longer than Atlantic. Resistant to race Ro1 of the golden nematode.