Scientific Breeding Gives New Jersey the Rutgers 250 Tomato

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The tomato for fresh market and processing is one of New Jersey’s most important vegetable crops. In 2014, New Jersey produced 2,900 acres for fresh market and 1,220 acres for processing, which was 9% of the total vegetable acreage in the state, with a total value of $41,000,000. New Jersey is currently 9th in the U.S. in terms of total tomato acreage.

The most popular fresh market varieties over the past ten years have been ‘Primo Red’, ‘Red Deuce’, ‘Rocky Top’, ‘FL47’, ‘Mountain Fresh Plus’, ‘Scarlet Red’, ‘BHN589’, and many others. Most of these varieties have served tomato growers well, however farmers are always looking for new varieties that offer better characteristics in the market.

The breeding of better varieties and the selection of improved strains of existing varieties has had an important place in the research program of the New Jersey Agricultural Experiment Station since 1926. The objects in mind at the time the tomato breeding work was started were to produce a smoother, less rigid early tomato to replace the top varieties and also one that could function well in processing. Since 1926, the industry has changed dramatically, and all tomatoes for processing are machine-harvested, mandating entirely different varieties. The current program was undertaken to re-examine and redevelop the genetic background of the ‘Rutgers’ variety specifically for fresh markets with better color, fruit firmness, yield, and flavor.

The ‘Rutgers 250’ variety was developed by selections from a cross made in 2011 between the ‘Marglobe’ and ‘JTD’ varieties. As in 1934 for the development of the original ‘Rutgers’, the parental seed lots were obtained from the Campbell Soup Company by Rutgers Professor Jack Rabin. In 2012, the best 14 F2 plants were selected from a population of 225 grown at the Rutgers Snyder Research and Extension Farm (Snyder Farm) in Pittstown, NJ based on compact/semi-determinate plant habit, overall yield, fruit color, firmness, and flavor. During winter 2012-2013, the 14 F3 selections were advanced to F4 in a greenhouse without selection. From 14 F4 families, the top 5 were selected, designated TRW3001, TRW3002, and TRW3004, and again advanced to F5 in a greenhouse over the next winter. In summer 2014, the top 3 F6 were selected, designated TRW3001, TRW3002, and TRW3004, and again advanced to F7 in a greenhouse.

A Northeast Sustainable Agriculture Research and Education Partnership Grant was successfully obtained in 2014 that funded a program of intense evaluation of the 3 F7 selections across the state. Replicated performance trials were conducted during summer 2015 at the Rutgers Snyder Farm in Pitt-
stown, NJ and Rutgers Agricultural Research and Extension Center, Bridgeton, NJ. Trials were also conducted by two commercial growers in Hunterdon and Monmouth Counties, and two RU Master Gardener groups in Middlesex and Ocean Counties. These trials provided valuable information on field performance of the 3 F7 selections as compared to three home gardener controls (‘BHN589’, ‘Celebrity’, and ‘Rutgers NJAES’). Additionally, the six trial entries were evaluated in six separate blind-en consumer taste panels held in Middlesex, Atlantic, Hunterdon, Cumberland, and Salem Counties.

Following all of the summer 2015 testing, the resulting data were analyzed and distilled into relative rankings. In early November, 2015, a group of faculty and staff from Rutgers Cooperative Extension/NJAES met to review the results and nominate one of the 3 F7 selections to be advanced to ‘Rutgers 250’ as an F8 open-pollinated population. Two of the selections performed similarly, but one (TRW3002) was chosen because it had slightly higher consumer acceptance scores.

‘Rutgers 250’ is relatively uniform and a semi-determinate, mid-late variety that bears abundant deep-globe, firm, deep red fruits over a 3-4 week harvest season. The fruit exhibit relatively high levels of titratable acids and soluble solids (sugars), comparable to the high-flavor variety ‘BHN589’. The variety was selected for freedom from diseases in the 2012-2015 performance trials, but was not specifically bred with major disease resistance genes (Verticillium, Fusarium, etc.). ‘Rutgers 250’ was developed as a home gardener variety, but it exhibits adequate fruit firmness for small scale commercial production for direct markets such as roadside stands and farmer’s markets.

‘Rutgers 250’ is an open-pollinated population, as was the predecessor 1934 ‘Rutgers’ variety. Therefore, the variety may be selected and further improved by home gardeners, small growers, and seed companies.

For the 2016 production season, seeds of ‘Rutgers 250’ will be made available to home gardeners and producers of transplants for home gardeners through the web site: www.njgarm-fresh.rutgers.edu/jerseytomato.html. Seeds will be offered starting on or about February 10, 2016 in small quantities for direct sowing by home gardeners, and also in larger quantities for retail and some wholesale transplant producers. All seeds were produced by T. Orton on Rutgers University research farms, and will be available in very limited quantities for the 2016 season; larger quantities will be available starting in the 2017 season.

The authors wish to thank the following individuals and organizations that were instrumental for the success for this project: Cindy Rovins, Jack Rabin, Dorothy Hall (CSC emeritus), William Bangs (CSC emeritus), Ed Dagar, Edward Castellari, William Hlubik, William Sciarrappa, Dr. Wesley Kline, Richard VanVranken, Michelle Infante-Casella, Dr. Bradley Hillman, and the NESARE Grants Program for financial support.