# Two New NC-140 Apple Trials: Vineland and Geneva Rootstocks with Honeycrisp and Fuji at Rutgers Snyder Farm

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Two new apple rootstock plantings were established at the Rutgers Snyder Research and Extension Farm, Pittstown, Hunterdon County, NJ. These plantings are part of the NC-140 Regional Rootstock Research Project (http://nc140.org). Objective 1 is "To evaluate the influence of rootstocks on temperate-zone fruit tree characteristics grown under varying environments using sustainable management systems." In this case, the growth and productivity of Honeycrisp and Fuji apple trees on Vineland and Geneva apple rootstocks are being evaluated. The 2014 trials are located in 18 states and Canadian Provinces.

This Vineland-Geneva planting is being coordinated by Dr. John Cline, University of Guelph, Ontario, Canada. Vineland rootstocks were bred as open-pollinated hybrids of Kerr crabapple and M.9 rootstock at the Vineland Experiment station in

From Left to Right- Win Cowgill, Rutgers, Art Grimes, Master Gardener and Dave Johnson, Master Gardner plant the 2014 NC140 Honeycrisp trial with a Phil Brown transplanter at the Rutgers Snyder Farm. Ed Dager, Snyder Farm Supervisor operated the tractor. Photo Credit: Rebecca Magron.

Table 1. Characteristics of Fuji trees on various rootstocks in the 2014 NC-140 Apple Rootstock Trial in year one. Rutgers Snyder Farm, Pittstown, NJ.

| Rootstock | Spring trunk cross-sectional area ($cm^2$) | Branches (no.) | Height of graft union (cm) | Fall trunk cross-sectional area ($cm^2$) | Fall-Spring change in trunk cross-sectional area ($cm^2$) |
|---|---|---|---|---|---|
| **G.11** | 1.4 bcd | 12.3 a | 11.9 a | 2.6 bcd | 1.2 a |
| **G.202** | 0.8 d | 2.7 c | 8.1 abcd | 1.7 d | 0.9 a |
| **G.214** | 1.4 cd | 4.6 bc | 10.5 abc | 2.4 cd | 1.0 a |
| **G.30** | 2.5 a | 11.3 a | 11.4 ab | 3.8 a | 1.5 a |
| **G.935** | 1.9 abc | 8.1 ab | 10.3 abcd | 3.3 abc | 1.4 a |
| **M.26EMLA** | 1.4 cd | 2.5 c | 11.6 ab | 2.5 cd | 1.1 a |
| **M.9T337** | 1.3 cd | 11.5 a | 9.5 abcd | 2.6 bcd | 1.4 a |
| **V.1** | 2.1 ab | 8.5 ab | 10.0 abcd | 3.8 a | 1.7 a |
| **V.5** | 2.2 a | 12.8 a | 6.8 d | 3.8 a | 1.5 a |
| **V.6** | 2.4 a | 12.0 a | 8.9 abcd | 3.8 a | 1.4 a |
| **V.7** | 1.8 abc | 9.9 a | 7.5 cd | 3.5 ab | 1.7 a |

Means within columns not followed by a common letter are statistically different at odds of 20 to 1.

Table 2. Characteristics of Honeycrisp trees on various rootstocks in the 2014 NC-140 Apple Rootstock Trial in year one. Rutgers Snyder Farm, Pittstown, NJ.

| Rootstock | Spring trunk cross-sectional area (cm2) | Branches (no.) | Height of Graft Union (cm) | Fall trunk cross-sectional area ($cm^2$) | Fall-Spring change in trunk cross-sectional area ($cm^2$) |
|---|---|---|---|---|---|
| **B.10** | 1.67 bc | 11.0 cd | 9.6 b | 3.32 bcde | 1.65 bc |
| **G.11** | 1.07 ef | 5.6 ef | 14.2 a | 2.93 de | 1.87 abc |
| **G.202** | 1.01 f | 5.0 f | 12.1 ab | 2.71 de | 1.71 abc |
| **G.214** | 1.53 cd | 19.8 a | 12.3 ab | 3.14 de | 1.60 c |
| **G.30** | 2.19 a | 21.1 a | 12.5 ab | 4.82 a | 2.64 ab |
| **G.41** | 0.94 f | 5.3 ef | 12.6 ab | 2.54 e | 1.60 c |
| **G.935** | 0.99 f | 5.5 ef | 15.0 a | 2.62 e | 1.63 c |
| **G.969** | 1.35 cde | 12.2 bcd | 13.3 ab | 3.71 bcd | 2.36 abc |
| **M.26EMLA** | 1.39 cde | 7.6 def | 13.5 a | 3.33 bcde | 1.93 abc |
| **M.9T337** | 1.21 def | 7.9 def | 13.3 ab | 3.24 cde | 2.02 abc |
| **V.1** | 2.27 a | 10.6 cd | 11.4 ab | 4.33 ab | 2.06 abc |
| **V.5** | 1.43 cd | 10.4 cde | 11.6 ab | 3.48 bcde | 2.04 abc |
| **V.6** | 2.04 ab | 17.4 ab | 12.3 ab | 4.36 abc | 2.32 abc |
| **V.7** | 1.55 cd | 13.5 bc | 11.4 ab | 4.34 abc | 2.77 a |

Means within columns not followed by a common letter are statistically different at odds of 20 to 1.

Vineland, Ontario. They include V.1, V.2, V.3, V.4, V.5, V.6, and V.7. V.1 is already commercially available and is similar in vigor to M.26. V.3 is more dwarfing but is not yet commercially available. V.4 will not be commercialized, as may be the case for V.2 also. V.5, V.6, and V.7 are largely untested, although it is known V.5 and V.6 are dwarfing, while V.7 is a semi-dwarf. Vineland rootstocks are purported to be very cold-hardy and display field-resistance to fire blight. V.1 and V.3 have been tested in previous NC-140 plantings and have performed well.

Geneva rootstocks are better known and more widely available, although supply has been constrained to date. For more information on the commercially available Cornell-Geneva rootstocks, see: http://www.cctec.cornell.edu/plants/GENEVA-Apple-Rootstocks-Comparison-Chart-120911.pdf

The two 2014 NC-140 Vineland and Geneva apple rootstock planting with Honeycrisp and Fuji were planted April 23, 2014, at the Rutgers Snyder Farm. Both trials have V.1, V.5, V.6, V.7 and various Geneva stocks with M.9 NAKBT337 and M.26 ELMA as the controls. See the data tables for the complete list.

Trees were supplied by Willow Drive Nursery. Tree spacing is 1 x 4 m. The experimental design is a randomized complete block. Trees were trained and supported as a tall-spindle-apple. Drip irrigation was installed shortly after planting. Tree growth was excellent on the Honeycrisp trial, but the Fuji trees sat still until late July. This seemed to be the case across the other planting sites in North America. The Fuji trees supplied were very large and had very few roots. Our consensus was the trees had to make new roots before top growth could occur. In year two, the Fuji trees are off and running.

Shortly after planting in April, measurements were made of trunk circumference at 30 cm above the graft union, number of side branches greater than10 cm long, and tree height. In October after tree growth had ceased, measurements were made of trunk circumference at 30 cm above the graft union, height of graft union above soil, number of side branches greater than10 cm long, and tree height.

## *Results*

At the end of the 2014 growing season, the largest trees as measured by trunk cross-sectional area (TCA) were on G.30, V.1, V.5, and V.6 all with a TCA of 3.8 $cm^2$ (1.5 $inches^2$). The smallest trees were on G.202 at 1.7 $cm^2$ ( 0.7 $inches^2$).

There was lot of variability in the number of feathers on each tree; V.5, V.6, G.11, M.9 NAKBT337, and G.30, in order, had the most, V.5 with 12.8 feathers. G.202 had the fewest with 2.7.

At the end of the 2014 growing season, the largest trees as measured by TCA were on G.30 followed by V.6, V.7, and V.1. The smallest trees were on G.41, G.935, and G.11.

The Honeycrisp trees had more feathers overall and grew better in 2014. G.30 had the largest number of feathers with 2,1 and G.202 had the smallest with 5.

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