New Rootstocks for Honeycrisp – A focus on select Vineland and Cornell Selections

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When establishing new orchards, apple growers must consider the cultivar and rootstock combination one to two years prior to planting, depending on the method of propagation and availability of rootstocks. The rootstock choice is important as it has economic and orchard management consequences, and there are currently a great number of rootstocks being promoted (several on two-year or longer waiting lists). However, many are not suitable for our climate, cultivars, or orchard systems.

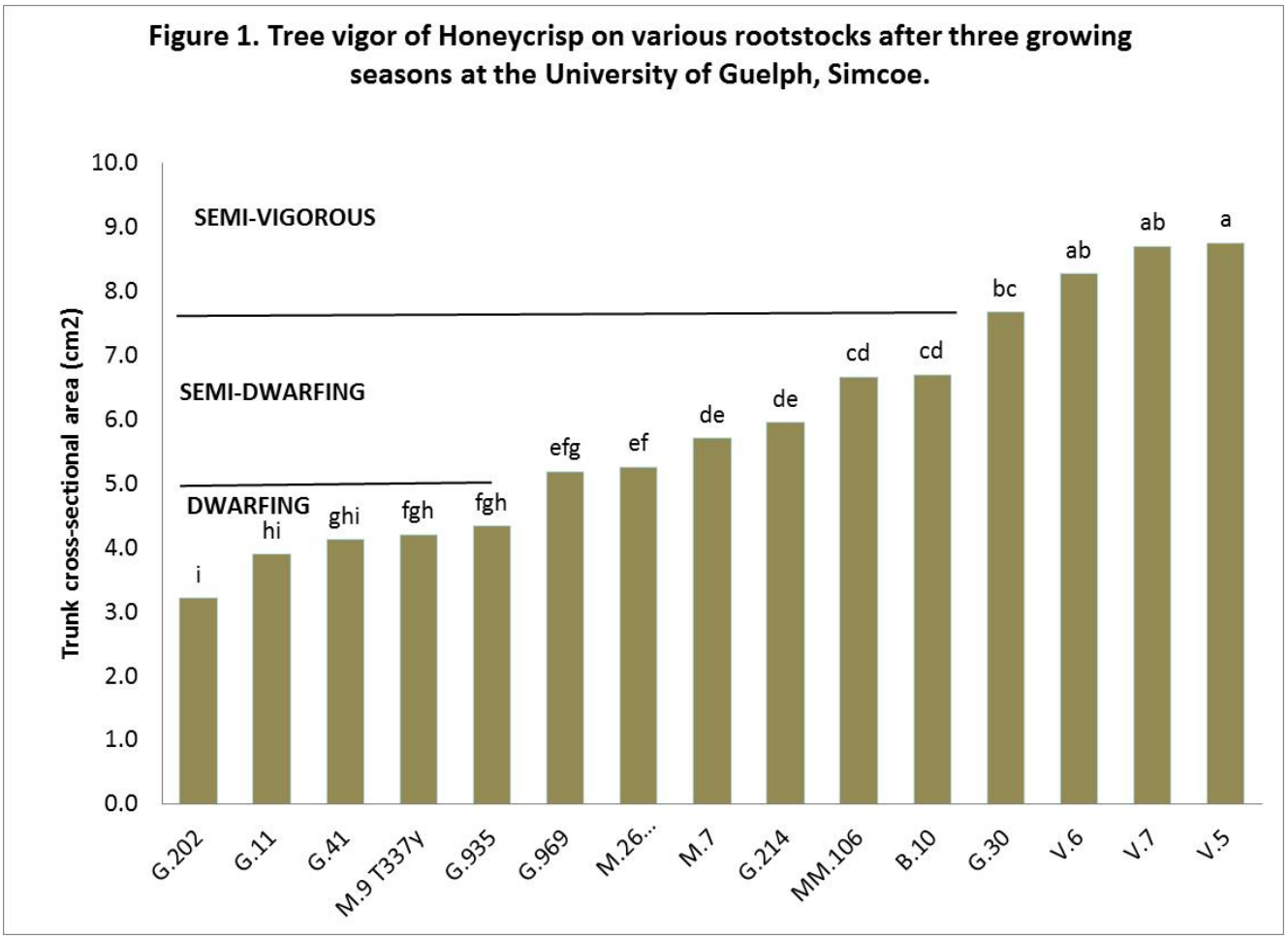
The pomology research program at the University of Guelph, Simcoe has been actively involved in long-term rootstock research to determine the size, disease and adaptability of a number of rootstocks from around the world. The information gathered from these experiments, some affiliated with the NC-140 technical committee, is extremely useful in determining the environment-genetic interactions rootstocks have on yield, precocity, tree performance, longevity, resistance to disease and winter injury, and tendency to sucker. This article will provide an update on some of our most recent results from studies conducted on Honeycrisp.

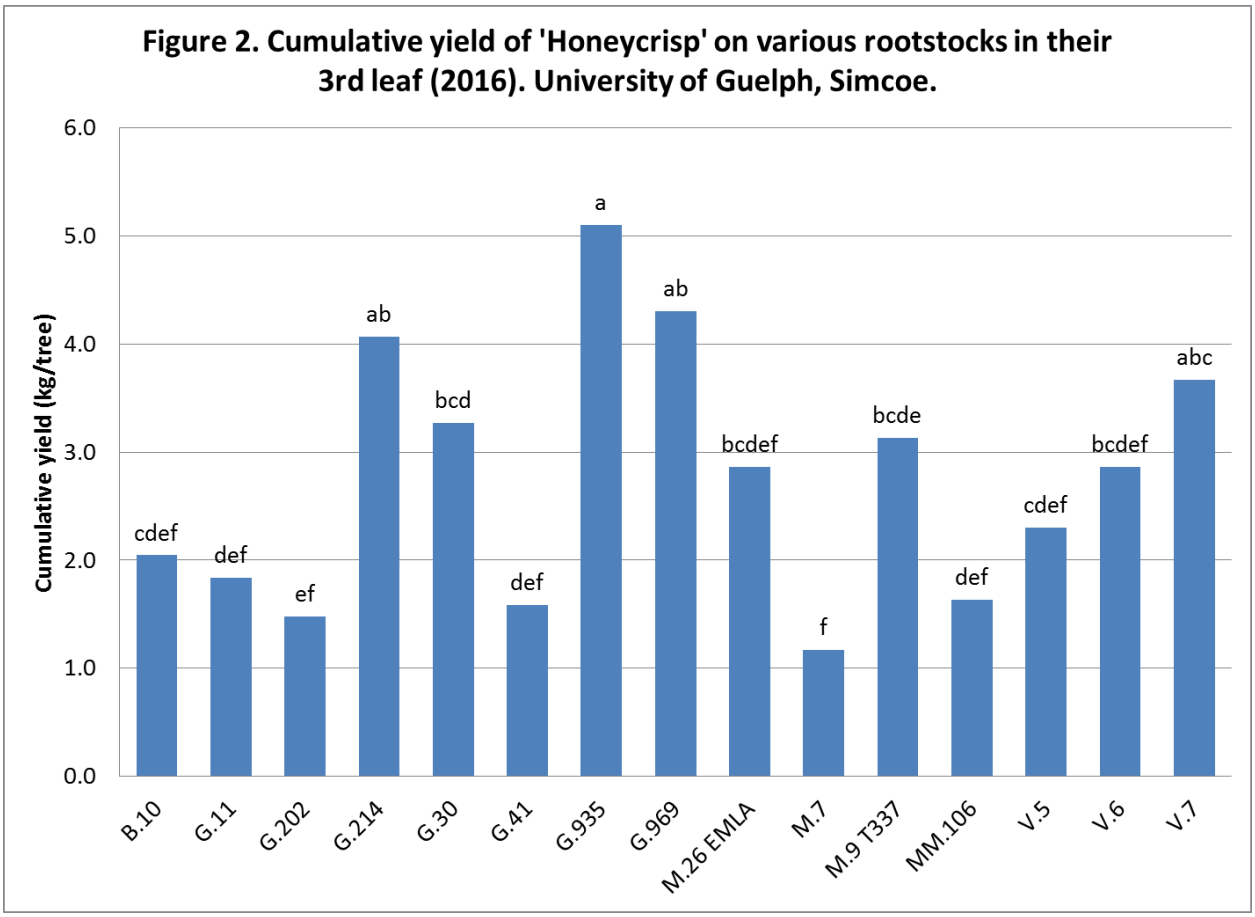
Methods

Ten Honeycrisp trees on 16 different rootstock (B.10, G.11, G.202, G.214, G.30, G.41, G.5890, G.935, G.969, M.26 EMLA, M.7, MM.106, M.9 T337, V.5, V.6, and V.7) were planted in the spring of 2014 at the University of Guelph, Simcoe Horticultural Experiment Station. Tree were planted using a ‘tall spindle’ system at a 1.2 x 3.6 m spacing (2342 trees/ha). Trees are trickle irrigated with 2 L/hr pressure compensating emitters and scheduled to delivery approximately 25 mm of water per week. Trees are planted using a completely randomized design with single trees serving as experimental units. Pollinizer trees were placed uniformly through each planting. At planting, initial trunk diameter was measured 30cm above the graft union as well as the number of side branches >10 cm. Annually, the following are being recorded: trunk circumference in the fall of each year to gauge tree vigor, tree status at the end of each growing season, the number of root suckers per tree, total number and weight of fruit harvested.

Trees established well, however initial tree size varied by rootstock as some trees were better feathered and had more extensive root systems than others. At planting, there were significantly more branches on V.5, V.6, and V.7 as well as G.214. This may be more a function of nursery propagation technique (tissue culture vs. stool bed rootstock) than rootstock directly.

Figure 3. Honeycrisp rootstock planting in their third leaf (August 2016). Trees are trickle irrigated and supported by wire trellis, spaced 3.7 x 1.2 m (4 x 12 ft). University of Guelph, Simcoe [Photo J. Cline]





Results

Vigor: Honeycrisp/V.5, V.7, and V.6 had the greatest trunk circumference while G.202, G.11 and G.41 had the smallest trunk circumference. Honeycrisp/G.41 had the highest relative growth rate since planting, indicating they were growing the fastest. M.26, M.7, MM.106, G.969 and B.10 had intermediate vigor (Figure 1).

Yield: G.935 had the highest crop load and yield at harvest followed by G.969 (Figure 2). Trees on G.202, G.41, and M.7 have produced the fewest number and cumulative yield to date.

Suckering: rootstock suckering has been minimal on Honeycrisp

Tree mortality: At the end of the 2014 growing season, the year of planting, tree mortality was 20% for G.41, 10% for G.935, and 12% for V.7. There was no mortality on any of the other rootstocks.

Other notes: in August, 2016 several Honeycrisp trees on G.202 showed signs of stress with pale yellow leaves and a wilted appearance. Trees were trickle irrigated Honeycrisp trees on the other rootstocks appeared normal

Summary

Apple producers have a wide selection of rootstocks from which to choose. The decision of rootstock selection should be based on a number of factors including growing availability of virus certified trees (rootstock and scion) growing region (hardiness zone), soil fertility, orchard

system, cultivar, tree spacing, replant disease and prevalence of disease. Specific replant disease (SRD) is ‘silent’ malady that many are recognizing affects tree performance and production more than once thought. Planting a more vigorous rootstock with proven performance in SRD sites is a good strategy with few soil fumigants now available. Our preliminary results indicate G.935 to be very precocious rootstocks in the M.9 size category. V.5, V.6, and V.7 appear to be more vigorous and slightly less yield efficient, but offer cold hardiness and resistance to fireblight (rootstock not scion resistance). M.9 and M.26 remain productive size-controlling stocks with several positive attributes, however their primary weakness is a high susceptibility to fire blight and lack of cold hardiness. In addition, M.26 is prone to fungi in the genus *Phytophthora* that cause root death and decay.

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