Comparing McIntosh Apple Trees on Several Geneva and Supporter Rootstocks: An Update on the 1999 NC-140 Dwarf Apple Rootstock Trial

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Evaluating new and potential useful apple rootstocks has been part of the spectrum of activity at the University of Massachusetts/Massachusetts State College/Massachusetts Agricultural College for many years. More than 30 years ago, that work was organized in North America under the USDA/state Agricultural Experiment Stations multi-state project NC-140. We have been part of NC-140 since its inception. NC-140 has several objectives, but they can be summarized as defining fruit tree rootstocks which enhance the economic and environmental sustainability of commercial tree-fruit production. Several trials whose Massachusetts resuls are reported in this issue of *Fruit Notes* are currently underway.

As part of the 1999 NC-140 Dwarf Apple Rootstock Trial, a planting of McIntosh on 11 rootstocks was established at the University of Massachusetts Cold Spring Orchard Research & Education Center in Belchertown, Massachusetts. Trees in this trial have performed well (average 2008 yield of 2.7 bushels per tree with 183g average fruit size). The planting included six replications in a randomized-complete-block design. Means from 2008 (10th and final growing season) are reported here.

At the end of the 2008 season, largest trees were on CG.4013, and the smallest were on M.9 NAKBT337, Supporter 1, Supporter 2, and Supporter 3 (Table 1). Trees on G.16 were smaller, but not significantly, than those on M.26 EMLA, and trees on CG5179, G.202, and G.41 were larger, but not significantly, than those on M.26 EMLA. Cumulative suckering (1999-2008) was greatest from CG.4013 and

Table 1. Trunk cross-sectional area, tree height, canopy spread, and root suckering in 2008 of McIntosh trees on several rootstocks in the Massachusetts planting of the 1999 NC-140 Dwarf Apple Rootstock Trial.[z]

Rootstock	Trunk cross-sectional area (cm^2)	Tree height (m)	Average canopy spread (m)	Root suckers (no./tree, 1999-2008)
G.41	64 bc	3.4 bc	3.6 abcd	4.6 c
CG.4013	110 a	4.0 a	4.2 a	22.8 ab
CG.5179	72 b	3.8 ab	3.9 ab	25.8 a
G.202	76 b	3.8 ab	3.8 abc	4.0 c
G.16N	52 bcd	3.0 cd	3.4 bcd	0.0 c
G.16T	51 bcd	3.2 bc	3.4 bcd	2.8 c
M.26 EMLA	57 bcd	3.4 bc	3.7 abc	0.0 c
M.9 NAKBT337	39 cd	2.5 d	3.2 bcd	11.3 bc
Supporter 1	37 d	3.0 cd	2.9 d	1.7 c
Supporter 2	43 cd	3.0 cd	3.2 cd	1.8 c
Supporter 3	47 cd	3.4 bc	2.9 d	7.5 c

[z] Means within columns not followed by a common letter are significantly different at odds of 19 to 1.

Table 2. Yield, yield efficiency, and fruit weight in 2008 of McIntosh trees on several rootstocks in the Massachusetts planting of the 1999 NC-140 Dwarf Apple Rootstock Trial.[z]

	Yield per tree (kg)		Yield efficiency (kg/cm^2 TCA)		Fruit weight (g)	
Rootstock	2008	Cumulative (2001-08)	2008	Cumulative (2001-08)	2008	Average (2001-08)
G.41	57 abc	239 bcd	0.9 a	3.7 ab	183 a	171 ab
CG.4013	77 a	364 a	0.7 a	3.4 ab	187 a	168 ab
CG.5179	70 ab	301 ab	1.0 a	4.3 ab	171 a	162 ab
G.202	62 abc	296 abc	0.8 a	3.9 ab	193 a	169 ab
G.16N	46 abc	166 d	0.9 a	3.2 b	187 a	167 ab
G.16T	41 abc	202 bcd	0.8 a	4.0 ab	197 a	163 ab
M.26 EMLA	53 abc	210 bcd	0.9 a	3.7 ab	175 a	166 ab
M.9 NAKBT337	39 bc	146 d	1.0 a	3.7 ab	183 a	174 a
Supporter 1	34 c	173 d	1.0 a	4.7 a	183 a	165 ab
Supporter 2	43 abc	199 cd	1.0 a	4.7 a	169 a	153 b
Supporter 3	38 bc	217 bcd	0.8 a	4.6 ab	182 a	161 ab

[z] Means within columns not followed by a common letter are significantly different at odds of 19 to 1.

CG.5179 and least from G.16N and M.26 EMLA.

All trees yielded well in 2008, and few differences in yield per tree existed (Table 2). Trees on CG.4013 yielded more than those on M.9 NAKBT337, Supporter 1, and Supporter 3. All other trees yielded intermediate to the two groups. Cumulatively (2001-08), trees on CG.4013 yielded the most. Trees on CG.5179 and G.202 were the next greatest yielding, followed by those on G.41, Supporter 3, M.26 EMLA, G.16T, and Supporter 2. Lowest yields were harvested from trees on G.16N, M.9 NAKBT337, and Supporter 1.

In 2008, rootstock did not affect yield efficiency, but cumulatively (2001-08), trees on Supporter 1 and Supporter 2 were significantly more yield efficient than those on G.16N (Table 2). All other combinations had intermediate efficiency and were not significantly different from the least or most yield efficient.

In 2008, rootstock did not affect average fruit weight. Over the fruiting life of the trial (2001-08), fruit were from trees on M.9 NAKBT337 were larger than those from trees on Supporter 2, with all other rootstocks resulting in intermediate fruit size.

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