

An Update on the 2002 NC-140 Apple Rootstock Trial, 2009 Results

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As part of the 2002 NC-140 Apple Rootstock Trial, a planting of Buckeye Gala on 11 rootstocks was established at the University of Massachusetts Cold Spring Orchard Research & Education Center in Belchertown.

Trees are growing well in this irrigated block, but fruit set was lighter than expected prior to 2007 (average yields in 2006 of only 3 kg per tree with 157-g average fruit size). In 2007, fruit set was good and the trees performed well (average yields in 2007 of 38 kg per tree with 186-g average fruit size). In 2008, fruit set was again less than expected (average yields in 2008 of 12 kg per tree with 175-g average fruit size). In 2009, trees performed well, with average yields of 57

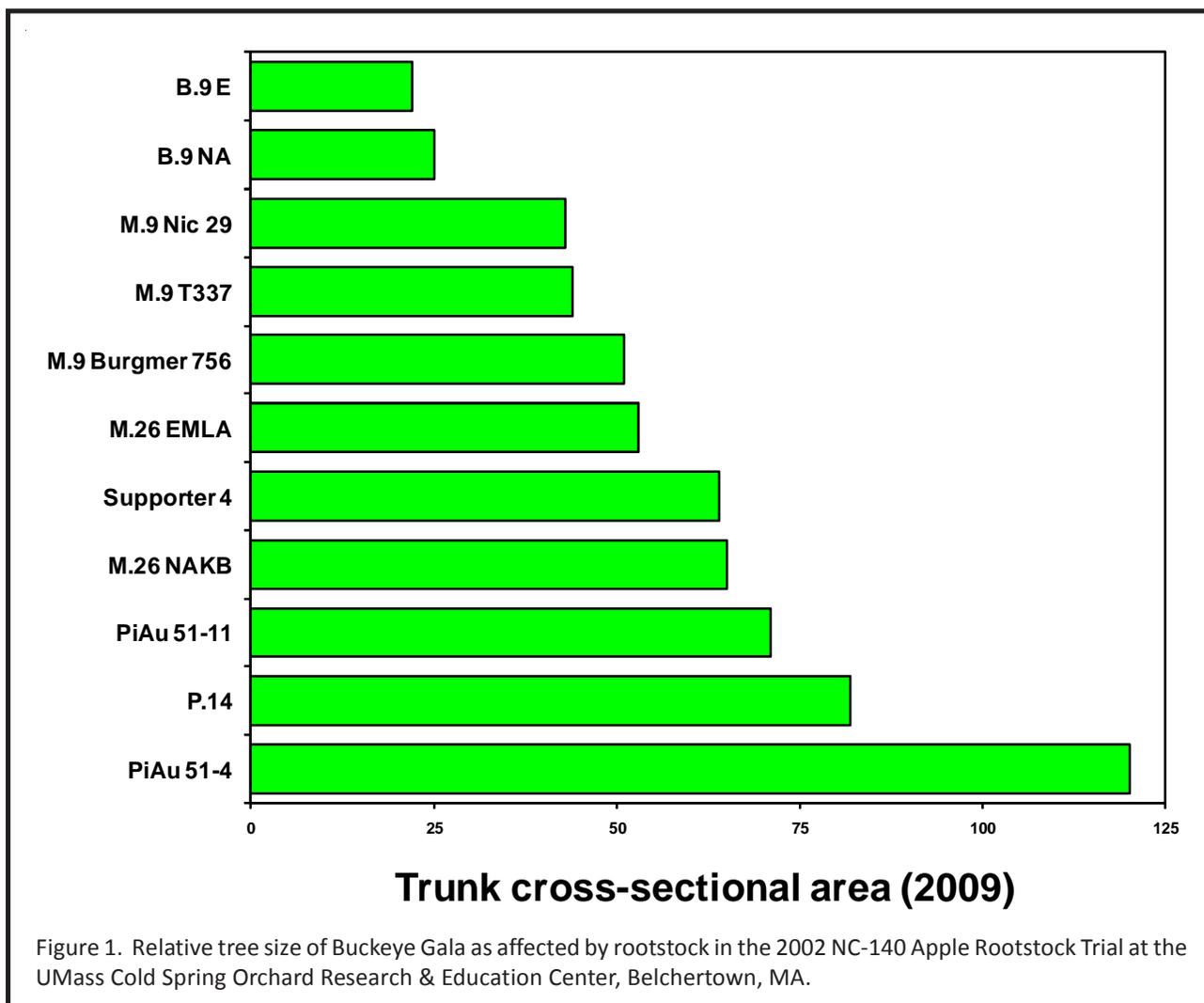
kg (about 3 bushels) per tree with 162-g average fruit size (between 96 and 120 count). Although yields suggest a biennial-bearing pattern, trees have bloomed well in the last two off seasons. The planting includes seven replications in a randomized-complete-block design. Means from 2009 (8th growing season) are included in Table 1.

After the 2009 growing season, trees with the largest trunk cross-sectional area (TCA) were on PiAu51-4, followed in decreasing size by those on P.14, PiAu51-11, M.26 NAKB, Supporter 4, M.26 EMLA, M.9 Burgmer 756, M.9 NAKBT337, M.9 Nic 29, B.9 (North America), and B.9 (Europe) (Table 1 and Figure 1). Clearly, P.14 and PiAu 51-11 could be consid-

Table 1. Trunk cross-sectional area, suckering, yield, yield efficiency, and fruit weight in 2009 of Gala trees on several rootstocks in the Massachusetts planting of the 2002 NC-140 Apple Rootstock Trial.^z

Rootstock	Trunk cross-sectional area (cm ²)	Root suckers (no./tree, 2002-09)	Yield per tree (kg)		Yield efficiency (kg/cm ² TCA)		Fruit weight (g)	
			2009	Cumulative (2004-09)	2009	Cumulative (2004-09)	2009	Average (2004-09)
B.9 (Europe)	22 f	11 b	24 d	65 d	1.1 abc	2.9 ab	167 a	156 b
B.9 (North America)	25 ef	8 b	33 cd	81 cd	1.3 a	3.2 a	174 a	165 ab
M.26 EMLA	53 cd	3 b	56 b	122 abc	1.1 abc	2.3 bcd	163 a	170 ab
M.26 NAKB	65 bcd	3 b	67 b	149 a	1.0bcd	2.4 bc	162 a	173 ab
M.9 Burgmer 756	51 cd	8 b	69 ab	138 ab	1.3 a	2.7 ab	173 a	170 ab
M.9 Nic 29	43 def	30 a	53 bc	113 abc	1.2 ab	2.6 ab	168 a	175 a
M.9 NAKBT337	44 de	11 b	56 b	118 abc	1.3 a	2.7 ab	177 a	178 a
P.14	82 b	3 b	71 ab	137 ab	0.9 cd	1.6 de	153 a	172 ab
PiAu51-11	71 bc	10 b	56 b	105 bcd	0.9 cd	1.6 de	151 a	169 ab
PiAu51-4	120 a	10 b	90 a	152 a	0.7 d	1.3 e	143 a	165 ab
Supporter 4	64 bcd	3 b	55 bc	111 abc	0.9 cd	1.8 cd	151 a	170 ab

^z Means within columns not followed by a common letter are significantly different at odds of 19 to 1 (Tukey's HSD, $P = 0.05$).



ered semidwarfs, and PiAu 51-4 could be considered semi-standard in size. Supporter 4 is a large dwarf.

Cumulative (2002-09) root suckering was significantly greater from M.9 Nic 29 than from all other rootstocks (Table 1). It is interesting to note how much greater it is than the other strains of M.9, with nearly four times the suckering of M.9 Burgmer 756 and nearly three times that of M.9 NAKBT337.

Greatest yields in 2009 and cumulatively (2004-08) were harvested from trees on PiAu 51-4 (Table 1). Cumulative yields from trees on M.26 NAKB were also high. Lowest yields in 2009 and cumulatively were from trees on the two strains of B.9.

Yield efficiency adjust yield based on tree size, giving some estimate of how the tree might perform on a per-acre basis. Generally, yield efficiency is inversely related to tree size, with small trees being

much more efficient than large trees. In 2009, yield efficiency was greatest for trees on B.9 (North America), M.9 Burgmer 756, and M.9 NAKBT337 and least for trees on PiAu51-4 (Table 1). Cumulatively (2004-09), B.9 (North America) resulted in the greatest yield efficiency, while PiAu51-4 resulted in the lowest (Table 1, Figure 2).

Fruit size in 2009 was good for trees on all rootstocks, averaging from 143 to 177g, with no significant differences among trees on the different rootstocks. Average fruit size over the fruiting life of the planting (2004-09) was largest from trees on M.9 NAKBT337 and those on M.9 Nic 29 and smallest from trees on B.9 (Europe).

This trial will continue for two more years. At this point, there appears to be little value to either PiAu rootstock, Supporter 4, or P.14.

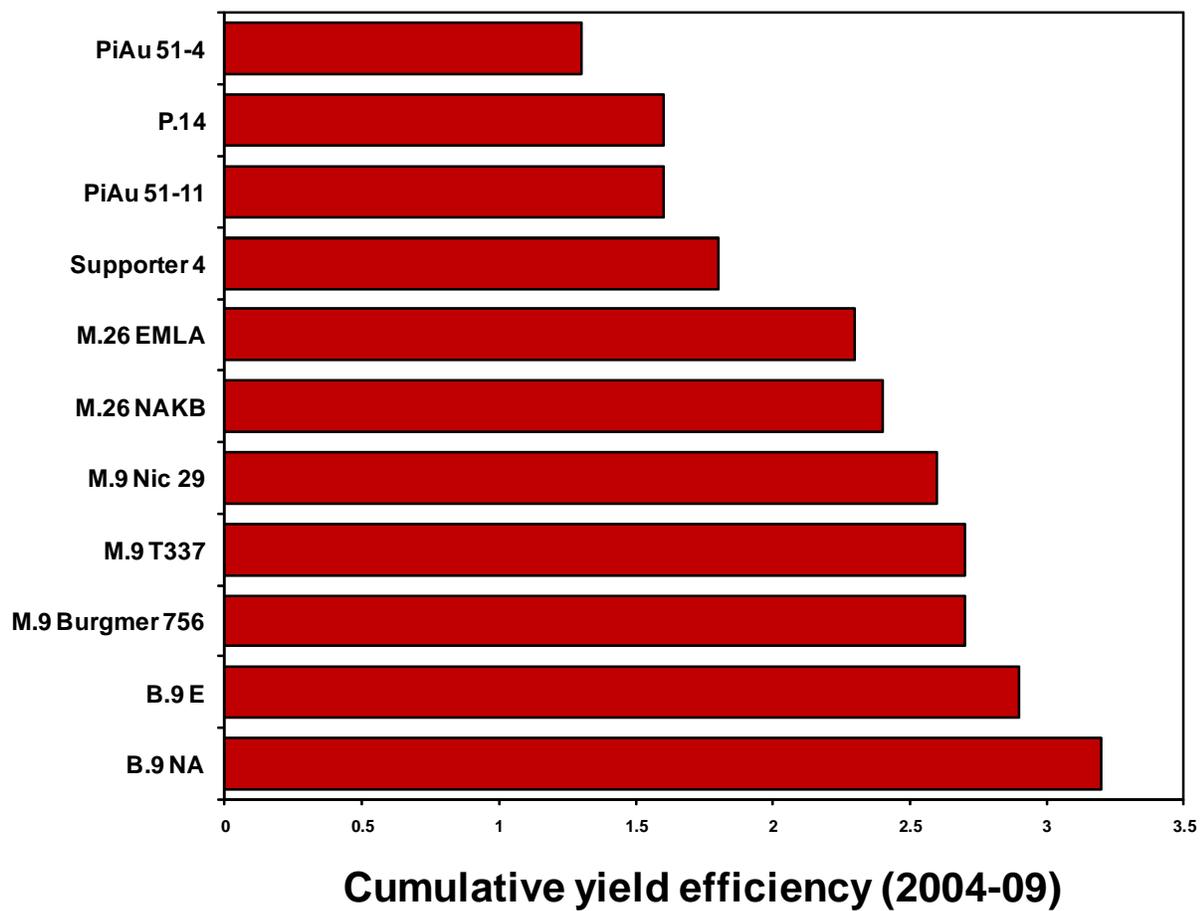


Figure 2. Relative yield efficiency of Buckeye Gala as affected by rootstock in the 2002 NC-140 Apple Rootstock Trial at the UMass Cold Spring Orchard Research & Education Center, Belchertown, MA.

