Rootstock Influence on Redhaven Peach Performance

An Update on the Massachusetts Planting of the 2009 NC-140 Peach Rootstock Trial

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In 2009, a planting was established at the UMass Cold Spring Orchard Research and Education Center as part of the 2009 NC-140 Peach Rootstock Trial. Fifteen rootstocks were involved in the experiment, including six based on peach only, two on plum only, and seven that were plum, peach, cherry, and/or almond hybrids (Table 1). Of the peach only rootstocks, one (Guardian) was from USDA/Clemson University, two (HBOK 10 and HBOK 32) were from the University of California Davis, two (KV010-123 and KV010-127) were from USDA Kearneysville, and one was the standard Lovell. The plums were from Bailey's Nursery (*Prunus americana*) and Instituto Sperimentale per la Frutticoltura in Italy (Penta). The three plum hybrids were from the University of California Davis (Controller 5) and the Krymsk Breeding & Research Station in Russia (Krymsk 1 and Krymsk 86). The two almond hybrids were from Bright's Nursery in California (Bright's Hybrid #5) and Agromillora Catalana in Spain (Mirobac). The two peach/almond/plum hybrids (Atlas and Viking) were from Zaiger's Genetics in California.

The trial was planted on May 6, 2009 with eight replications of each rootstock. Trees were spaced 13.1'x16.4' and were trained as open centers. The data

Table 1. Rootstocks included in the 2009 NC-140 Peach Rootstock Trial planted at the UMass Cold Spring Orchard Research & Education Center. All trees are Redhaven and were planted on May 6 with eight replications.

Rootstock	Genetics	Source	Origin	Projected vigor (relative to Lovell)	Measured vigor (relative to Lovell)
Lovel	Peach	California (1882 selection drying cultivar)	USA -- CA	100%	100%
Guardian	Peach	USDA/Clemson University	USA -- SC	100%	115%
HBOK 10	Peach	University of California Davis	USA -- CA	65%	84%
HBOK 32	Peach	University of California Davis	USA -- CA	65%	81%
KV010-123	Peach	Ralph Scorza, USDA Kearneysville	USA -- WV	?	89%
KV010-127	Peach	Ralph Scorza, USDA Kearneysville	USA -- WV	?	91%
Prunus americana	American Plum	Bailey's Nurseries	USA -- MN	70%	46%
Penta	European Plum	Istituto Sperimentale per la Frutticoltura	Italy	110%	86%
Controller 5	Japanese Plum x Peach	University of California Davis	USA -- CA	65%	35%
Krymsk 86	Myrobolan Plum x Peach	Krymsk Breeding & Research Station	Russia	100%	96%
Krymsk 1	Nanking Cherry x Myrobolan Plum	Krymsk Breeding & Research Station	Russia	60%	41%
Bright's Hybrid #5	Almond x Peach	Bright's Nursery	USA -- CA	100%	83%
Mirobac	Myrobolan Plum x Almond	Agromillora Catalana	Spain	?	84%
Atlas	Peach x Almond x Flowering Plum	Zaiger's Genetics	USA -- CA	110%	98%
Viking	Peach x Almond x Flowering Plum	Zaiger's Genetics	USA -- CA	110%	94%

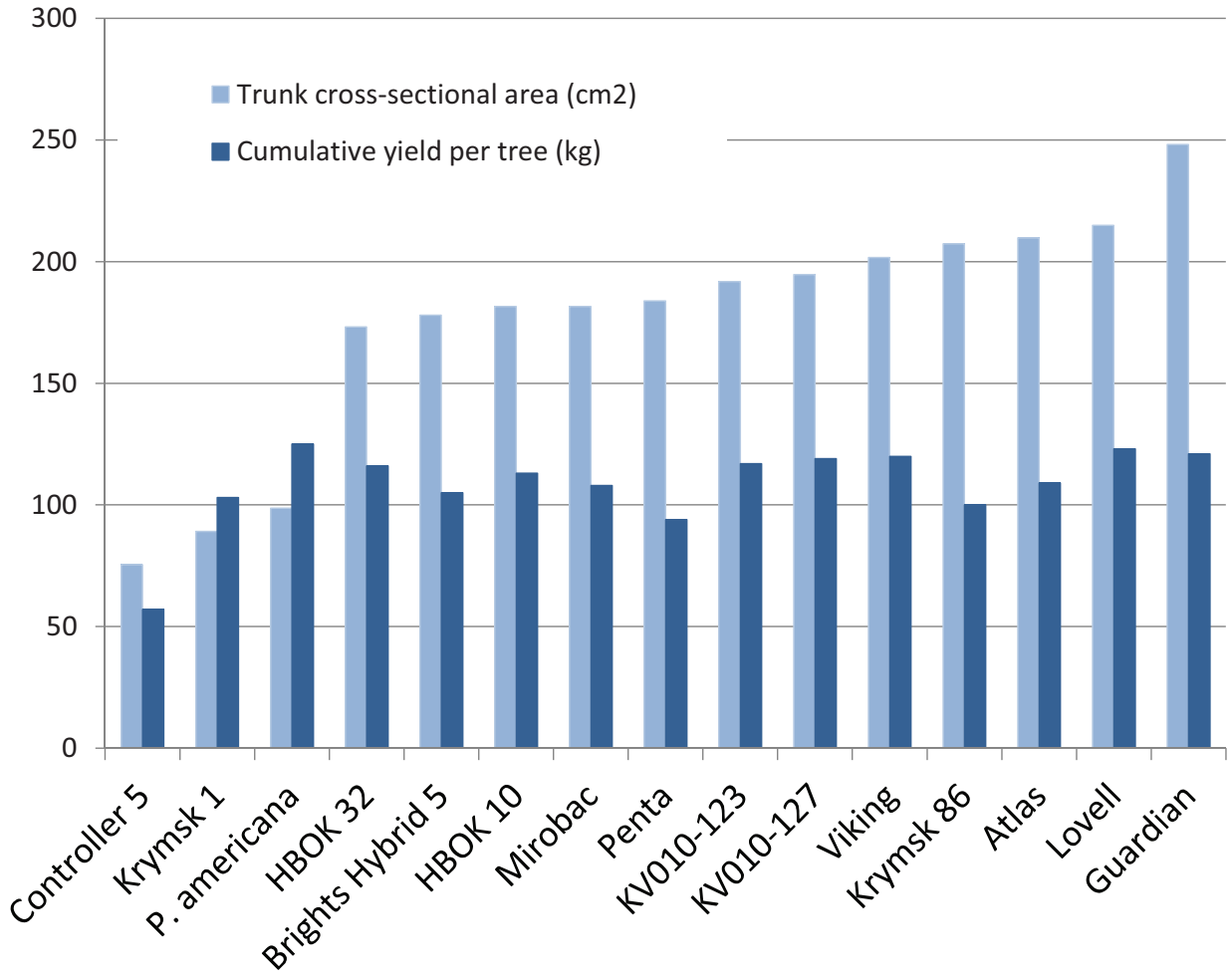

Figure 1. Trunk size and cumulative yield in 2016 of Redhaven peach trees in the 2009 NC-140 Peach Rootstock Trial.

presented in this article were collected through 2016 (the eighth growing season). It should be noted that a winter freeze eliminated the 2016 bloom.

Table 2 presents the cumulative data from this trial. Largest trees were on Guardian, and the smallest trees were on *Prunus americana*, Krymsk 1, and Controller 5. Root suckering was very low and similar for most of the rootstocks, except *Prunus americana*, which developed excessive numbers of root suckers. Cumulative yield (2011-15) was similar for all rootstocks, except Controller 5, which yielded significantly less. Cumulative yield efficiency (2011-15) was greatest for trees on *Prunus americana* and Krymsk 1 and lowest for trees on Atlas, Bright's Hybrid #5, Guardian, Krymsk 86, Lovell and Penta. Average fruit size (2011-15) was not affected by rootstock.

Figure 1 looks more closely at performance by arraying the rootstocks from the least vigorous Controller 5 on the left to the most vigorous Guardian on the right. Cumulative yield per tree is also presented. This graphical presentation makes it clear that trees on Guardian are the largest, and those on Controller 5, Krymsk 1, and *Prunus americana* are the smallest. Trees on the other 11 rootstocks are very similar. It is interesting to note that cumulative yield per tree is very similar across all rootstocks, except Controller 5 (which yielded less per tree).

The two rootstocks which stand out are Krymsk 1 and *Prunus americana*, which result in trees that are about one half the trunk cross-sectional area of the larger trees but with similarly high yields. *Prunus americana* stands out also in its ability to produce root suckers at such a level that makes it commercially unacceptable.

Table 2. Trunk size, root suckering, and canopy spread in 2016 of Redhaven peach trees in the 2009 NC-140 Peach Rootstock Trial at the UMass Cold Spring Orchard Research & Education Center, Belchertown, MA. Note that winter temperatures killed all flower buds for 2016, so cumulative yield and fruit size are based only on data through 2015. All values are least-squares means, adjusted for missing subclasses.

Rootstock	Trunk cross-sectional area (2016, cm^2)	Root suckers (no./tree, 2009-16)	Canopy spread (2016, cm)	Cumulative yield per tree (2011-15, kg)	Cumulative yield efficiency (2011-15, kg/cm^2)	Average fruit weight (2011-15, g)
Atlas	210 ab	0.1 b	464 ab	109 a	0.62 d	188 a
Brights Hybrid 5	178 b	0.0 b	441 abc	105 a	0.66 d	181 a
Controller 5	75 c	0.0 b	369 de	57 b	1.02 bc	172 a
Guardian	248 a	0.6 b	487 a	121 a	0.59 d	190 a
HBOK 10	182 b	0.5 b	422 bc	113 a	0.83 cd	182 a
HBOK 32	173 b	0.9 b	433 bc	116 a	0.81 cd	179 a
KV010-123	192 b	0.0 b	459 abc	117 a	0.78 cd	181 a
KV010-127	195 b	1.5 b	466 ab	119 a	0.71 cd	184 a
Krymsk 1	89 c	7.1 b	345 e	103 a	1.32 ab	186 a
Krymsk 86	207 ab	0.0 b	459 abc	100 a	0.59 d	180 a
Lovell	215 ab	0.0 b	449 abc	123 a	0.67 d	186 a
Mirobac	182 b	4.9 b	444 abc	108 a	0.74 cd	176 a
Prunus americana	99 c	187.0 a	412 cd	125 a	1.50 a	188 a
Penta	184 b	15.0 b	411 cd	94 a	0.60 d	186 a
Viking	202 ab	0.6 b	454 abc	120 a	0.72 cd	184 a

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