

Evaluating Potential Peach Rootstocks in the NC-140 Trial

Cling Peach Report 2013-14

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Dwarfing rootstocks could provide a significant benefit to the cling peach industry by substantially reducing labor costs without sacrificing yield. They have had a dramatic impact on the apple industry over the last few decades. Several new stone fruit dwarfing rootstocks have been developed by different breeding programs around the world in recent years. These need to be evaluated under California conditions to see how suitable they are for our climate. The NC-140 Regional Research group consists of university scientists who are interested in rootstock research for fruit crops. This is a very active group with representatives from about 40 locations across North America. They meet annually to discuss joint trials and share results from these experiments.

The most recent NC-140 peach rootstock trial was planted in 2009 at the Kearney Ag Center and in 13 other locations in the United States and Mexico. The scion variety is Redhaven and 16 rootstocks are being evaluated. So far 9 of these appear to be dwarfing or semi-dwarfing in our orchard. When comparing rootstocks among the various locations, it is interesting to note that some behave very differently from one location to another. For instance, Mirobac is quite dwarfing in California (about 50% of Lovell) but even more vigorous than Lovell in Alabama, Missouri and Utah and about equal to Lovell in most other locations. On the other hand, Atlas is very vigorous in California but somewhat dwarfing in Missouri. Finally, *P. americana* is very dwarfing in California but much less so in New York, Massachusetts and Pennsylvania. These different comparisons give us the opportunity to learn how certain rootstocks may do in other locations and/or soil types.

The trees grew well and produced a full crop in 2013, their fifth leaf. Details of 2013 are provide below in table 1, and table 2 offers a summary of the 3rd and 4th leaf yields. Two trees each of Penta and *P. americana* died prior to the 2013 crop. There was very little suckering in the orchard, only *Prunus americana* had a noticeable problem (data not shown). No trees died during the year and only two (one Krymsk 1 and one *P. americana*) showed moderate signs of incompatibility.

Based on trunk circumference measurements, the rootstocks separated into three size categories. These are listed in order of tree size in table 1. The first three are the most dwarfing. The next five are statistically identical and would be considered semi-dwarfing. The last eight are all standard sized trees. Therefore, there are eight rootstocks that are all smaller

than Lovell. Mirobac had small fruit but the other dwarfing and semi-dwarfing rootstocks all had fruit weight statistically equal to Lovell. Five of the rootstocks (Krymsk 1, Controller 5, HBOK 32, HBOK 10 and Penta) also had greater yield efficiency than Lovell. *P. americana* did not perform as well in 2012, compared to the year before, with noticeably smaller fruit. KV010-127 continued to look promising with large fruit in both 2012 and 2013. Among the more vigorous rootstocks, Atlas looks particularly interesting, and it has had the greatest yield and largest fruit of all the rootstocks in the trial.

Table 1. 2009 NC-140 Redhaven peach rootstock trial – 2013 trunk circumference, yield, fruit weight, crop load, and yield efficiency measurements. Data are means followed by standard errors.

Rootstock	Trunk Circumference (cm)	Yield (kg/tree)	Fruit Weight (g)	Crop Load (fr/tr)	Yield Efficiency (kg/cm ²)
<i>Prunus americana</i>	26.1 (2.2)	28.4 (5.2)	129 (13)	208 (36)	0.39 (0.07)
Krymsk 1	29.2 (2.0)	41.5 (6.1)	156 (5)	271 (43)	0.61 (0.05)
Controller 5	32.7 (1.0)	46.9 (5.2)	128 (7)	365 (35)	0.55 (0.05)
Mirobac	37.2 (1.6)	48.4 (5.1)	111 (4)	435 (43)	0.43 (0.03)
HBOK 32	37.7 (1.9)	72.1 (4.6)	134 (5)	536 (23)	0.65 (0.05)
Penta	37.7 (1.4)	83.0 (5.0)	149 (3)	557 (26)	0.68(0.04)
HBOK 10	39.1 (2.0)	85.1 (9.0)	133 (7)	654 (80)	0.68 (0.04)
Tetra	39.1 (1.0)	74.1 (5.3)	170 (13)	441 (32)	0.61 (0.04)
KV010-127	47.0 (2.2)	108.9 (5.6)	147 (6)	741 (16)	0.63 (0.04)
Viking	49.1 (1.0)	103.8 (5.1)	148 (5)	707 (39)	0.54 (0.03)
Krymsk 86	49.4 (1.7)	101.5 (3.1)	139 (5)	735 (24)	0.53 (0.03)
KV010-123	50.8 (2.7)	97.3 (4.5)	136 (3)	720 (35)	0.50 (0.04)
Lovell	50.8 (1.1)	93.5 (8.9)	137 (9)	678 (58)	0.45 (0.03)
Guardian	50.9 (2.2)	95.1 (7.1)	145 (6)	671 (68)	0.47 (0.04)
Atlas	51.0 (0.8)	127.6 (5.3)	153 (6)	837 (29)	0.62 (0.03)
Brights Hybrid 5	52.1 (1.5)	109.8 (6.4)	158 (9)	719 (70)	0.51 (0.03)

Table 2. 2009 NC-140 Redhaven peach rootstock trial – 2011 yield and fruit weight, and 2012 trunk circumference, yield, fruit weight and yield efficiency measurements.

Rootstock	10/12 Trunk Circ (cm)	2011 Yield (kg/tree)	2012 Yield (kg/tree)	2011 Fruit Weight (g)	2012 Fruit Weight (g)	2012 Yield Efficiency (kg/cm ²)
<i>P. americana</i>	25.9 d	20.2 j	36.2 i	221 a	188 e-f	.67 b-f
Krymsk 1	27.2 d	27.5 ij	47.8 hi	209 a-c	192 c-e	.82 a
Controller 5	29.7 d	34.0 g-i	49.6 hi	188 c-e	182 ef	.70 a-d
Mirobac	34.6 c	45.8 d-g	62.8 gh	179 e	172 f	.67 b-f
HBOK 32	35.8 c	44.2 e-g	78.9 d-g	181 e	187 d-f	.78 ab
HBOK 10	36.7 c	49.0 c-f	80.8 c-f	187 de	197 b-e	.75 a-c
Penta	36.6 c	42.1 f-h	73.2 fg	206 a-d	209 a-c	.69 a-e
Tetra	37.3 c	29.2 h-j	74.1 e-g	184 de	201 b-e	.67 b-f
KV010-127	44.4 b	58.3 a-c	96.5 bc	216 ab	213 ab	.62 d-g
Krymsk 86	46.3 ab	61.0 a-c	95.8 bc	182 e	207 a-c	.58 e-g
KV010-123	46.8 ab	62.5 a-c	98.3 b	189 c-e	200 b-e	.57 e-g
Viking	46.7 ab	57.6 a-d	95.3 b	192 c-e	203 b-d	.56 e-g
Atlas	47.9 ab	69.4 a	118.6 a	188 c-e	226 a	.66 c-f
Guardian	48.0 ab	55.5 b-e	91.6 b-e	196 b-e	202 b-d	.51 g
Lovell	48.2 ab	65.0 ab	100.0 b	175 e	197 b-e	.54 fg
Brights Hybrid 5	48.8 a	67.7 ab	100.1 b	182 e	203 b-d	.54 fg