2009 Peach Trial Report – 2011

Cooperative Regional Project NC-140
"Improving Economic and Environmental Sustainability in Tree-Fruit Production through Changes in Rootstock Use"

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2009 NC-140 Peach Rootstock Trial - All Locations

A. Progress of Work and Principal Accomplishments

A test planting of 18 *Prunus* rootstock cultivars and selections budded with 'Redhaven' peach was planted at 16 locations in North America in 2009. Second-year (2010) performance of 12 rootstocks from 15 locations is summarized (Table 1). Overall, every rootstock except Viking (87%) had >91% survival after two years. Tree TCSA on Viking, Atlas, BH-5, Mirobac, Guardian® and Krymsk®86 rootstocks were similar to trees on Lovell. TCSA of trees on KV010123 and KV010127 was 17% smaller than on Lovell; whereas TCSA of HBOK 10 and HBOK 32 trees were more reduced at ~65% of Lovell. Krymsk®1 trees were only 46% the size of trees on Lovell.

Second-year performance of all 18 rootstocks at each location (16) is summarized in Tables 2-4. Tree growth varied largely across locations (Table 2). Growth was best at CA followed by MO, NY (Geneva), SC, AL and GA. In contrast, growth was very limited at sites in NY, CO, UT and MX with all 4 locations located in cold areas and the latter 3 having calcareous soil conditions.

Survival was excellent in AL, CA, CO, GA, MA, NC, NY (Geneva), PA, SC and UT and fair to very good at the other sites (Table 3). Mirobac and Guardian® tended to sucker slightly more than the other rootstocks but *Prunus americana* was by far the worst for suckering after 2 years (data not shown). Bloom date was not recorded at many locations. From the sites that reported, the differences were less than one day except for SC and MO. In SC, 'Redhaven' on *Prunus americana* and Fortuna bloomed 2 days later than Lovell and in MO, trees on HBOK 10 and HBOK 32 bloomed ~2 days later than Lovell (data not shown).

Yield data were optional for 2010, and CA and NY (Geneva) were the only sites to take these data. No statistics were run, but fruit size was excellent though crop loads were very low (Table 4).

Table 1. Second-year performance of Redhaven on 12 rootstocks at 15 locations as part of Cooperative Regional Project NC-140.

Rootstock cultivar	Survival [Z] (%) Fall 2010		TCSA (cm^2) Fall 2010		No. of rootsuckers Fall 2010	
Viking	87.2	b	35.8	a	0.1	cd
Atlas	91.6	ab	34.5	a	0.1	cd
BH-5	91.5	ab	36.6	a	0.3	bcd
Mirobac	96.6	a	37.0	a	0.5	ab
Guardian®	97.5	a	34.3	a	0.6	a
Lovell	97.5	a	34.7	a	0.3	bcd
KV010123	95.7	a	28.7	b	0.4	abc
KV010127	97.4	a	28.8	b	0.5	ab
Krymsk®86 (Kuban 86)	95.7	a	33.5	ab	0.1	cd
HBOK 10	96.6	a	22.7	c	0.0	d
HBOK 32	91.7	ab	22.7	c	0.1	cd
Krymsk®1 (VVA-1)	93.3	ab	16.1	d	0.3	bcd

[Z] Mean separation within columns by Duncan's multiple range test ($P = 0.05$)

Table 2. Trunk cross-sectional area (cm^2) by location of Redhaven on various rootstocks after two growing seasons in the 2009 NC-140 Peach Rootstock Trial.[Z]

	Alabama		California		Colorado		Georgia		Illinois		Kentucky		Massachusetts		Missouri	
Rootstock cultivar																
Viking	42.4	bc	69.1	ab	12.5	abc	41.3	c	22.7	abc	24.8	ab	32.0	abc	62.1	abc
Atlas	39.9	bc	69.6	ab	14.6	a	46.5	abc	16.5	bcd	23.6	abc	30.5	bc	45.9	c
BH-5	46.5	ab	80.1	a	13.1	ab	46.8	abc	22.0	a-d	24.9	ab	29.4	bc	47.5	c
Mirobac	53.8	a	50.3	cd	8.3	efg	49.9	a	24.7	ab	27.7	a	29.5	bc	69.6	a
Guardian®	51.4	a	73.2	ab	12.2	a-d	49.1	ab	15.7	cd	22.4	abc	36.1	a	51.4	abc
Lovell	34.7	cd	82.8	a	10.3	b-e	46.8	abc	28.6	a	20.6	bcd	31.8	abc	56.1	abc
KV010123	26.7	def	74.5	ab	6.1	fg	42.8	bc	15.7	cd	17.9	cde	26.6	cd	67.6	a
KV010127	26.8	def	63.1	bc	10.5	b-e	48.9	ab	20.3	a-d	20.2	bcd	28.6	bc	50.3	abc
Krymsk®86 (Kuban 86)	35.2	cd	69.7	ab	11.0	a-e	49.7	a	19.3	bcd	25.4	ab	28.4	bc	66.4	ab
Empyrean®2 (Penta)	30.7	de	50.3	cd	11.1	a-e	24.1	ef	---		---		32.5	ab	55.7	abc
Empyrean®3 (Tetra)	---		---		---		---		---		---		---		---	
Imperial California	---		---		9.1	c-f	27.7	de	---		---		---		---	
HBOK 10	9.2	h	48.6	cd	8.8	def	23.5	ef	21.3	a-d	15.5	de	28.2	bc	46.2	c
HBOK 32	14.5	gh	39.5	de	8.5	def	20.9	fg	20.7	a-d	17.3	cde	29.6	bc	42.9	c
Prunus americana	---		25.0	e	6.8	fg	18.9	fg	20.5	a-d	18.9	bcd	23.1	d	---	
Fortuna	---		---		11.9	a-d	---		---		---		---		---	
Krymsk®1 (VVA-1)	24.8	ef	32.6	e	6.3	fg	14.7	g	13.7	de	12.1	e	17.3	e	22.0	d
Controller 5 (K146-43)	20.5	fg	32.8	e	5.5	g	33.0	d	7.5	e	16.8	cde	7.7	f	42.6	c

Table 2. Trunk cross-sectional area (cm2) by location of Redhaven on various rootstocks after two growing seasons in the 2009 NC-140 Peach Rootstock Trial (continued).z

Rootstock cultivar	Mexico		North Carolina		New York (Geneva)		New York (Hudson Valley)		Pennsylvania		South Carolina		Utah (Kaysville)		Utah (South Shore)	
Viking	---		31.1	cde	54.3	ab	14.7	ab	32.2	a	44.8	bcd	27.4	ab	13.1	a
Atlas	---		31.9	bcd	56.5	ab	17.6	a	31.5	a	44.5	bcd	25.2	abc	13.8	a
BH-5	22.7	a	38.8	ab	57.3	ab	9.7	b-e	28.7	abc	47.7	ab	27.9	a	16.7	a
Mirobac	---		41.8	a	56.8	ab	9.1	b-e	29.8	ab	52.3	a	20.7	cd	13.3	a
Guardian®	18.3	ab	25.9	c-f	55.0	ab	14.2	abc	28.0	a-d	45.5	bc	23.4	a-d	8.6	b
Lovell	19.6	ab	32.6	bc	57.5	ab	12.2	a-d	27.0	a-d	44.4	bcd	22.5	a-d	6.1	bc
KV010123	14.0	bc	23.4	ef	22.4	gh	8.3	b-e	23.4	cd	39.4	d	21.4	bcd	5.4	bc
KV010127	17.1	ab	24.2	def	32.4	efg	11.4	a-e	23.1	bcd	40.9	cd	20.2	cd	5.9	bc
Krymsk®86 (Kuban 86)	15.8	abc	26.3	c-f	45.8	bcd	6.6	cde	25.2	bcd	40.9	cd	21.9	a-d	9.1	b
Empyrean®2 (Penta)	17.6	ab	24.4	def	41.7	cde	3.9	e	22.8	cd	32.1	e	17.1	de	7.3	b
Empyrean®3 (Tetra)	---		---		---		---		---		27.5	efg	---		---	
Imperial California	---		14.1	gh	30.6	fg	7.2	b-e	22.6	d	26.8	e-h	16.9	de	---	
HBOK 10	11.5	bc	12.0	h	48.7	abc	10.0	a-e	23.2	cd	27.4	efg	18.0	de	5.5	bc
HBOK 32	18.8	ab	11.5	h	59.1	a	10.0	a-e	24.4	cd	22.8	ghi	17.6		5.6	bc
Prunus americana	---		15.6	gh	36.5	def	11.4	a-e	24.8	bcd	21.3	hi	12.6	ef	8.4	b
Fortuna	---		15.5	gh	56.4	ab	12.4	a-d	27.7	a-d	29.6	ef	---		---	
Krymsk®1 (VVA-1)	13.4	bc	12.0	h	26.2	fgh	4.6	de	12.9	e	20.3	i	12.0	ef	7.8	b
Controller 5 (K146-43)	7.9	c	20.9	fg	18.5	h	---		15.4	e	25.1	f-i	7.5	f	3.1	c

[z] Mean separation within columns by Duncan's multiple range test (P= 0.05)

Table 3. Tree survival (%) by location of Redhaven on various rootstocks after two growing seasons as part of the 2009 NC-140 Peach Rootstock Trial.[Z]

	Alabama		California		Colorado		Georgia		Illinois		Kentucky		Massachusetts		Missouri	
Rootstock cultivar																
Viking	100	a	100	a	50	b	75	b	100	a	75	a	100	a	50	b
Atlas	100	a	100	a	88	a	100	a	63	b	100	a	100	a	63	ab
BH-5	100	a	100	a	100	a	100	a	88	ab	50	b	100	a	75	ab
Mirobac	100	a	100	a	88	a	100	a	88	ab	100	a	100	a	100	a
Guardian®	100	a	100	a	88	a	100	a	88	ab	100	a	100	a	88	ab
Lovell	100	a	100	a	100	a	100	a	100	a	100	a	100	a	88	ab
KV010123	100	a	100	a	88	a	100	a	75	b	88	a	100	a	88	ab
KV010127	100	a	100	a	100	a	100	a	100	a	100	a	100	a	100	a
Krymsk®86 (Kuban 86)	100	a	100	a	88	a	100	a	63	b	100	a	100	a	100	a
Empyrean®2 (Penta)	100	a	75	b	88	a	100	a	---		---		100	a	83	ab
Empyrean®3 (Tetra)	---		---		---		---		---		---		---		---	
Imperial California	---		---		100	a	100	a	---		---		---		---	
HBOK 10	100	a	100	a	100	a	100	a	88	ab	100	a	100	a	63	ab
HBOK 32	88	b	100	a	100	a	88	ab	88	ab	88	a	100	a	50	b
Prunus americana	---		75	b	100	a	88	ab	100	a	100	a	100	a	---	
Fortuna	---		---		88	a	---		---		---		---		---	
Krymsk®1 (VVA-1)	100	a	100	a	88	a	100	a	88	ab	100	a	100	a	63	ab
Controller 5 (K146-43)	100	a	100	a	100	a	100	a	88	ab	100	a	100	a	100	a

Table 3. Tree survival (%) by location of Redhaven on various rootstocks after two growing seasons as part of the 2009 NC-140 Peach Rootstock Trial (continued).z

Rootstock cultivar	Mexico		North Carolina		New York (Geneva)		New York (Hudson Valley)		Pennsylvania		South Carolina		Utah (Kaysville)		Utah (South Shore)	
Viking	---		100	a	100	a	100	a	88	b	100	a	88	b	88	b
Atlas	---		100	a	100	a	86	ab	88	b	100	a	88	b	100	a
BH-5	25	b	75	ab	100	a	100	a	100	a	100	a	88	b	100	a
Mirobac	---		100	a	100	a	71	b	100	a	100	a	100	a	100	a
Guardian®	88	a	100	a	100	a	100	a	100	a	100	a	100	a	100	a
Lovell	100	a	88	ab	100	a	83	ab	100	a	100	a	100	a	100	a
KV010123	100	a	100	a	100	a	100	a	100	a	100	a	100	a	100	a
KV010127	75	a	100	a	83	b	86	ab	88	b	100	a	100	a	100	a
Krymsk®86 (Kuban 86)	75	a	100	a	100	a	80	ab	100	a	100	a	100	a	100	a
Empyrean®2 (Penta)	75	a	100	a	100	a	83	ab	100	a	100	a	100	a	100	a
Empyrean®3 (Tetra)	---		---		---		---		---		100	a	---		---	
Imperial California	---		100	a	100	a	71	b	88	b	100	a	100	a	---	
HBOK 10	75	a	100	a	100	a	100	a	100	a	100	a	100	a	100	a
HBOK 32	88	a	100	a	88	ab	88	ab	100	a	100	a	100	a	100	a
Prunus americana	---		75	ab	100	a	80	ab	100	a	100	a	100	a	100	a
Fortuna	---		100	a	100	a	67	b	100	a	88	b	---		---	
Krymsk®1 (VVA-1)	25	b	63	b	100	a	100	a	100	a	100	a	100	a	100	a
Controller 5 (K146-43)	63	ab	88	ab	100	a	---		100	a	100	a	100	a	100	a

z Mean separation within columns by Duncan's multiple range test (P= 0.05)

Table 4. 2010 yield of Redhaven on 17 rootstocks in California and New York.				
	Mean fruit weight (g)	Total fruit yield (kg)	Mean fruit weight (g)	Total fruit yield (kg)
Rootstock cultivar	CA	CA	NY-G	NY-G
Viking	190	10.2	203	1.3
Atlas	191	10.9	208	0.7
BH-5	207	12.6	220	1.2
Mirobac	188	7.3	178	0.4
Guardian®	190	10.5	196	1.2
Lovell	185	11.0	-	0.0
KV010123	217	14.0	170	2.4
KV010127	214	15.0	175	1.9
Krymsk®86 (Kuban 86)	207	9.8	205	0.7
Empyrean®2 (Penta)	184	7.3	238	1.1
Empyrean®3 (Tetra)	-	-	-	-
Imperial California	-	-	162	0.7
HBOK 10	199	8.7	192	1.9
HBOK 32	171	5.4	179	1.5
Prunus americana	213	3.9	227	0.6
Fortuna	-	-	185	1.3
Krymsk®1 (VVA-1)	170	7.6	231	1.0
Controller 5 (K146-43)	204	9.0	212	1.9