Field Evaluation of Almond Rootstocks

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Evaluation of Alternative Rootstocks for the Westside of the North San Joaquin Valley

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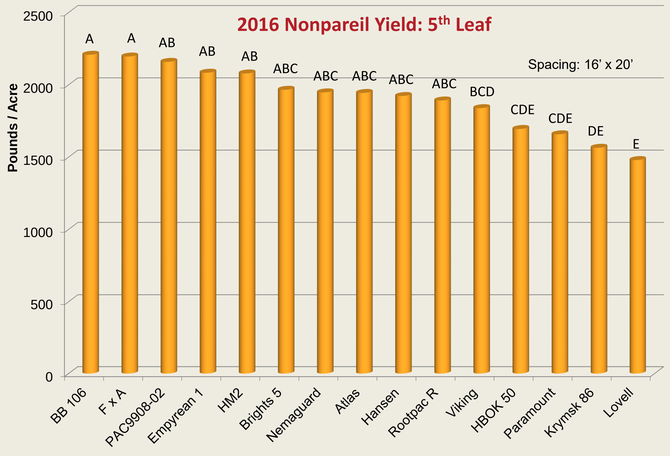
Rootstocks and their Genetic Background

- Lovell peach (P. persica)
- Nemaguard peach (P. persica)
- Empyrean 1 peach hybrid (P. persica x P. davidiana)
- HBOK 50 peach hybrid (Harrow blood x Okinawa)
- Hansen Peach x almond hybrid (P. dulcis x P. persica)
- Brights 5 P x A hybrid (P. dulcis x P. persica)
- BB 06 P x A hybrid (P. dulcis x P. persica)
- Paramount P x A hybrid (P. dulcis x P. persica)
- Flordaguard x Alnem (peach x bitter almond)
- PAC9908-02 (P x A hybrid) x (peach)
- Hansen x Monegro 2 (P x A) x (P x A)
- Viking (hybrid of peach, almond, plum & apricot)
- Atlas (hybrid of peach, almond, plum & apricot)
- Krymsk 86 (plum x peach)
- Rootpac R (almond x plum)

Trial specifics:

- **Planted December 2011**
- **Planted in Westley area near Hwy 33 in Western Stanislaus County**
- **Soil type is Zacharias clay loam (pH 7.6) irrigated with blend of high pH ground water and district water tainted with significant levels of salt from tail water runoff.**

Soil & Water Chemistry	
Soil	Water
pH 7.4 – 7.8	EC: 1.86
EC 2.96 dS/m	Adjusted SAR: 8.80
Na 12.1 meq / l	Chloride: 8.90 meq / l
Cl 14.1 meq / l	Boron: 0.84 mg / l
Boron 0.5 ppm	



Yield bars with the same letters are not statistically different (P ≤ 0.05)

Rootstock Influence on Leaf Sodium & Chloride Concentration (July) and Hull Boron (Harvest)			
	Leaf Chloride (%)	Leaf Sodium (%)	Hull Boron (ppm)
Krymsk 86	0.77 a	0.03 ab	100 cd
Lovell	0.72 a	0.05 ab	125 a
Nemaguard	0.57 b	0.04 ab	114 b
PAC 9908-02	0.45 bc	0.04 ab	75 h
Atlas	0.42 c	0.05 ab	123 a
Cadaman	0.38 c	0.02 b	107 bc
Empyrean 1	0.38 cd	0.05 ab	89 ef
HBOK 50	0.31 cde	0.06 a	108 bc
Viking	0.30 cde	0.05 ab	74 h
F x A	0.29 cde	0.03 ab	80 fgh
BB 106	0.19 de	0.02 b	76 h
GF 677	0.18 de	0.05 ab	78 gh
Brights 5	0.18 de	0.04 ab	76 h
Rootpac R	0.17 de	0.04 ab	93 de
HM2	0.16 e	0.05 ab	82 fgh
Hansen	0.15 e	0.03 ab	86 efg
Critical Level	**0.30**	**0.25**	**300**

Lovell & Krymsk 86 had the highest leaf chloride levels, while Nemaguard, PAC9908-02, Atlas, Cadaman and Empyrean 1 also had leaf Cl exceeding the critical level. While all rootstocks had hull boron well below toxic levels, Lovell and Atlas had the highest hull B while most of the peach x almond hybrids and Viking had the lowest hull B.

Trunk Circumference of 5th Leaf Trees (cm)		Trunk angle (degrees)
Flordaguard x Alnem	55.5 a	82 ab
PAC9908-02	55.4 a	85 a
Empyrean 1	55.1 a	75 cde
Hansen x Monegro	53.5 ab	69 e
Rootpac R	53.3 ab	81 abc
BB 106	53.0 ab	76 bcd
Hansen 536	52.1 b	84 a
HBOK 50	50.0 c	74 cde
Viking	47.9 cd	84 a
Nemaguard	47.7 d	82 ab
Atlas	47.6 d	80 abcd
Cadaman	47.5 d	73 de
Brights 5	47.2 d	81 abc
GF 677	47.1 d	79 abcd
Lovell	46.2 d	81 abc
Krymsk 86	45.4 d	85 a

- Most of the largest trees are peach x almond hybrids but Empyrean 1 and Rootpac R are of comparable size.(P<0.05).
- Rootstocks exhibiting the best anchorage are Krymsk 86, PAC9908-02, Viking and Hansen.
- Hansen x Monegro (HM2) has shown unacceptably poor anchorage in this trial while Cadaman, HBOK 50 and Empyrean 1 are of concern.

Tree anchorage is measured with a large protractor. HM2 (Hansen x Monegro) has exhibited very poor anchorage in this trial

Chloride levels in leaf tissue of Krymsk 86, Lovell & Nemaguard are beginning to increase to concerning levels.

Rootpac R tends to have a few more suckers than Nemaguard but significantly fewer than Marianna 26-24