

EVALUATION OF 1- TO 2-YEAR-OLD 'BARTLETT' PEAR TREES ON THREE SELECTIONS OF OLD HOME X FARMINGDALE ROOTSTOCKS

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ABSTRACT

'Bartlett' on three 'Old Home x Farmingdale' (OHxF) clonal rootstocks, OHxF 69, OHxF 87, and OHxF 97, were planted on May 3, 2012 on Columbia fine sandy loam soil (0 – 1% slope) in Marysville, Yuba County, California. Trees were spaced 4' x 20', planted on a 12" berm and microsprinkler irrigated. After two growing seasons, 9% of the trees had succumbed, mainly in early spring, variously due to water relations issues or fire blight. After two years, OHxF 97 trees were significantly larger, flowered and fruited the least, and were least efficient. OHxF 69 trees tended to flower the most but tended to fruit less and had lower fruit set than OHxF 87. However, % increase in TCSA from 2012 to 2013 was less for OHxF 69 than for OHxF 87 or 97, and thus there was no difference in cropping efficiency between OHxF 69 and 87 in 2013. The trial was truncated in fall 2013, but provided valuable data on the early growth and productivity of these three rootstocks.

INTRODUCTION

Only several selections of the Old Home x Farmingdale¹ (OHxF) clonal rootstocks (Brookes® series) are commercially available in the U.S. Trees of 'Bartlett' pear on OHxF 69, 87, and 97 (grower standard) were planted in a replicated trial on Columbia fine sandy loam soil in Marysville, Yuba County on May 3, 2012. 2-year-old grafted trees were provided by Brandt's Fruit Trees, Inc., Yakima, Washington.

PROCEDURES

Trial design: RCB, 10 replicates, 3 trees/replicate, 4' x 20' spacing, trees headed to 30" at planting then trained to an "informal" perpendicular "V" supported by wire.

Cultural practices: Trees planted on approximately 12" high berms; microsprinkler irrigation; weeds managed using glyphosate (post-emergence).

2012-2013 RESULTS (Tables 1 - 3)

Final survival rate was 91% with no significant differences among rootstocks but significant rootstock x block interactions. Tree loss was variously due to early season "wet feet", weed competition, and fire blight. OHxF 97 (grower standard) trees were the largest (both trunk cross sectional area (TCSA) and height), had the least number of flower clusters and fruit, and were least efficient, i.e. had the lowest crop load (number of fruit/cm² TCSA. In 2013, In 2013, OHxF 69 trees had the most flower clusters (15),

¹The male parent of this series has now been shown to be Bartlett (Postman et al. 2013).

but OHxF 87 trees had the most fruit (6 vs. 4 for OHxF 69) and highest fruit set (77.5%). However, % increase in OHxF 69 TCSA from 2012 to 2013 was less than that of OHxF 87, thus 2013 crop load efficiency statistically equaled OHxF 87 (though was numerically less). Only OHxF 87 had noticeable suckers (0.32 average).

CONCLUSIONS AND 2014 PLANS

OHxF 97 trees were largest and the least precocious, as expected. OHxF 69 trees produced many flowers, but OHxF 87 trees set more fruit; however, final cropping efficiency was statistically equal to OHxF 87. The smaller increase in the TCSA of OHxF 69 trees may indicate that a greater sensitivity to environmental stress, or more competition between vegetative growth and 2014 fruit buds, slowed the growth rate of OHxF 69. This difference in growth resulted in statistically equal crop efficiency between OHxF 69 and OHxF 87, though OHxF 87 crop load was numerically higher.

Unfortunately, the Marysville trial was truncated after the 2013 season due to the sale and subsequent removal of the orchard. Two of the rootstocks in the trial, OHxF 69 and OHxF 87, are represented in a Bartlett systems trial planted on slightly heavier soil May 1-2, 2013 in Hopland, Mendocino County. This trial should provide a longer-term opportunity to confirm the results suggested in this short-term trial.

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Table 1: Effect of rootstock on survival of 1-year-old (2nd leaf) Bartlett pear trees planted May 3, 2012, Marysville, Yuba County, California, 2013.

	2012 (n=90)	2013 Survival (percent planted trees) ³		
		3/25	6/10	11/24
ROOTSTOCK¹				
OHxF 97	100	100	93	90
OHxF 87	97	97	90	90
OHxF 69	97	97	90	90
ANOVA²				
Rootstock (P-value)	NS .82	NS (0.61)	NS (0.86)	NS (1.0)
Block (P-value)	NS .74	NS (0.55)	** (0.01)	*** (<0.001)
Rootstock x Block (P-value)	N .42	NS (0.42)	** (0.01)	** (0.01)

¹ Within columns, rootstock and cultivar treatment means significantly different, Tukey HSD test, P<0.05.

² **, *** Indicate significance at P_≤ 0.01 and 0.001. NS indicates not significant.

³ n=90

Table 2: Effect of rootstock on number of flower clusters, number of fruit, fruit set, TCSA, crop load, and tree height of 1-year-old (2nd leaf) pear trees planted May 2, 2012, Marysville, Yuba County, California, 2012-2013.

	Flower Clusters	No. Fruit	Fruit Set	TCSA			Crop Load	Tree Height	
	(no./tree)	(no./tree)	(%/100 fruit)	(cm ²)	(cm ²)	% increase	(no./cm ²)	(cm)	(cm)
	3/25/13	6/10/13	6/10/13	2012	2013	2012-2013	7/5/13	2012	2013
ROOTSTOCK¹	(n=82)	(n=82)	(n=82)	(n=89)	(n=81)	(n=82)	(n=82)	(n=89)	(n=81)
OHxF 97	8.0 b	1.9 b	16.3 b	2.1 a	7.0 a	66 a	0.3 b	165 ab	244 a
OHxF 87	14.4 ab	6.3 a	77.5 a	1.7 b	5.1 b	64 ab	1.2 a	144 b	211 b
OHxF 69	15.0 a	4.2 ab	28.7 b	2.1 a	5.3 b	52 b	0.8 a	169 a	202 b
ANOVA²									
Rootstock (P-value)	* (0.02)	*** (0.001)	** (<0.01)	** (<0.01)	** (<0.01)	* (0.05)	*** (<0.001)	* (0.02)	** (<0.01)
Block (P-value)	** (0.01)	** (<0.01)	NS (0.15)	NS (0.19)	* (0.02)	NS (0.62)	** (<0.01)	NS (0.50)	* (0.04)
Rootstock x Block (P-value)	NS (0.46)	NS (0.44)	NS (0.16)	NS (0.45)	* (0.04)	NS (0.40)	NS (0.47)	NS (0.36)	* (0.02)

¹ Within columns, rootstock and cultivar treatment means significantly different, Tukey HSD test, P<0.05 (P<0.1 for % Inc.).

² *, **, *** Indicates significance at P≤0.05, 0.01 and 0.001. NS indicates not significant.

Table 3: Effect of rootstock on root suckers of 1-year-old (2nd leaf) pear trees planted May 3, 2012, Marysville, Yuba County, California, 2012-2013.

	Root Suckers (no./tree)		Total
	2012	2013	
ROOTSTOCK ¹	(n=83)	(n=81)	
OHxF 97	0.0 b	0.0	0.0
OHxF 87	0.1 ab	0.32	0.4
OHxF 69	0.2 a	0.03	0.2
ANOVA ²			
Rootstock (P-value)	NS (0.10)	NS (0.14)	
Block (P-value)	NS (0.58)	NS (0.56)	
Rootstock x Block (P-value)	NS (0.23)	NS (0.71)	

¹ Within columns, rootstock and cultivar treatment means significantly different, Tukey HSD test, P<0.05.

² ** Indicates significance at P≤0.01. NS indicates not significant.

³ Root sucker data normalized using SQRT(root sucker + 1) for P-value only.