

“No Heading” Training Trials in Contra Costa County

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Contra Costa County

Chandler Trial (good vigor)

Cooperator: Mark Maggiore, Maggiore Ranch
Planted: Spring 2011, ¾” dormant stock
Rootstock: Own rooted & Paradox
Variety: Chandler
Soil: Brentwood Clay Loam
Irrigation: Full coverage micro-sprinklers
Spacing: 18’ x 24’
Vigor: good – leaders reached 8-10’ the 1st year
Design:

- 2 rows of trees that were HEADED annually compared with
- 2 rows of trees that were left UNHEADED after the one heading at planting. Any pruning (minimal) done on the un-headed trees consisted of an occasional thinning cut to remove branches entirely if they were too low, in the drive row, or broken.

Progress to date:

- More branches were initiated on the UNHEADED leaders (2nd leaf) and the branches were better spaced, sized, balanced than on the headed leaders, regardless of rootstock.
- The HEADED trees tended to be larger (have greater trunk diameters and more light interception) than the unheaded trees. These differences were not always significant and were more pronounced on Paradox than on own rooted trees.
- The UNHEADED trees used less water (had less negative water potential readings) than the headed trees in 2015 (the first year we measured this).
- The UNHEADED trees had 1.7 times the yield of the headed trees at 1st harvest in year 5.

Rootstock Pruning Treatment	After 2 nd leaf (2012)		After 3 rd leaf	After 4 th leaf (2014)		After 5 th leaf (2015)		
	No. of scaffolds	Trunk Diameter (cm)	Trunk Diameter (cm)	Trunk Diameter (cm)	Light Intercept (% PAR)	Trunk Diameter (cm)	Light Intercept (% PAR)	Yield (lb/acre)
Paradox								
Headed	12 b	7.2	11.3	14.0		17.2 a	71.2 a	
Unheaded	18 a	7.2	10.7	13.2		15.6 b	51.7 b	
	*	NS	NS	NS		*	*	
Own Rooted								
Headed	11 b	7.2	11.9	14.4		16.1	60.7 a	
Unheaded	14 a	7.5	11.7	14.2		16.0	55.7 b	
	*	NS	NS	NS		NS	*	
Combined								
Headed					55.8 a		66.1 a	978.5
Unheaded					48.2 b		53.8 b	1624.0

Howard Trial (lower vigor)

- Cooperator:** Jason Tennant, Houston Orchards
Planted: Spring 2011, ¾" dormant stock
Rootstock: Own rooted
Variety: Howard
Soil: Brentwood Clay Loam
Irrigation: Full coverage, solid set sprinklers
Spacing: 25' X 25'
Vigor: Lower – leaders on the trial trees only reached 5' the 1st year
Design:
- 13 trees that were HEADED annually paired and compared with
 - 13 trees that were left UNHEADED after a single heading at planting. Any pruning (minimal) done on the UH trees consisted of an occasional thinning cut to remove branches entirely if they were too low, in the drive row, or broken.

Progress to date:

- A similar number and balance of branches were initiated on the leader (2nd leaf) in both treatments demonstrating that even less vigorous trees can have sufficient scaffold development without heading.
- The UNHEADED trees tend to be larger (have greater trunk diameters and more light interception) than the headed trees. This is the opposite of the pattern in the more vigorous Chandler trial.
- The UNHEADED trees had 4.7 times the yield of the headed trees at their 1st harvest in 2014 and 2.6 times the yield of the headed trees in their 2nd harvest in 2015.
- The UNHEADED trees had statistically less limb breakage (0.5 branches/tree) than the headed trees (1.2 branches/tree) in 2014 (the only year we measured this).

Pruning Treatment	After 2 nd leaf (2012)		After 3 rd leaf	After 4 th leaf (2014)			After 5 th leaf (2015)		
	No. of scaffolds	Trunk Diameter (cm)	Trunk Diameter (cm)	Trunk Diameter (cm)	Light Intercept (% PAR)	Yield (lb/acre)	Trunk Diameter (cm)	Light Intercept (% PAR)	Yield (lb/acre)
Headed	10.5	6.2	9.9	13.1 b	48.8 b	133 b	15.5 b	44.1	744 b
Unheaded	9.4	6.4	10.1	13.9 a	55.8 a	620 a	16.7 a	48.3	1954 a
	NS	NS	NS	*	*	*	*	NS	*

The Bottom Line:

Summary: There were differences in the number of scaffold branches initiated and growth response based on variety, vigor, and rootstock. However, structural development in both trials was satisfactory and the UNHEADED trees in both trials had earlier production and lower pruning costs.

To be determined: Will the UNHEADED trees -

- Fill in their wider tree spacing (or stall out due to early production)?
- Develop a strong structure that will support the crop load?
- Maximize yield during the mature life of the orchard (years 8-30+) as they do not need severe pruning (hedging) which removes a significant amount of crop.

Precautions: The 1st year leader is vulnerable to conditions which could reduce bud break and negatively impact tree development (sunburn, cold damage, excess water, white paint). If leaders don't push normally in spring, they can be delay headed in May/June to force bud break.