

# Effect of pruning time and severity on the growth of Chandler and Lara trees in Tasmania, Australia

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## Introduction

- The walnut industry in Australia is rapidly expanding the plantings of lateral-bearing cultivars; however, the growth of young lateral-bearing trees may be sub-optimal in the cool-temperate climate of Tasmania, Australia.
- Strong vegetative growth of young trees can be encouraged by the timing and method of annual pruning.
- “Head-pruning” is common and involves removal of the terminal half of the shoot (Ramos et al., 1998).
- “Tip-pruning” involves removal of only one quarter of the shoot. Furthermore, the removal of potential growing points, such as necked and lateral buds, that compete for resources with the apical bud might have potential to enhance apical shoot growth.
- The objective of this study was to examine whether tip-pruning and bud removal maximise the growth of lateral-bearing cultivars in Tasmania.

## Materials and Methods

- Two randomised two-factor split-plot trials, with twenty trees per main plot and five trees per sub-plot, were conducted over three growing years in Lara and Chandler.
- Main-plot treatments in 2005–06 and 2006–07, were 1) dormant prune, and 2) bud-swell prune. In 2007–08 all trees were dormant pruned.
- Sub-plot treatments from 2005–06 to 2007–08 were a-c) tip-pruned with removal of necked and lateral buds 2–3 weeks after the onset of shoot growth at 0 cm (no removal), 10 cm or 30 cm below the apical bud, and d) head prune.
- Tree height, shoot extension and stem circumference were assessed prior to, during, and the end of each growing year, defined as the period from when vegetative growth began to when trees entered dormancy after the growing season.

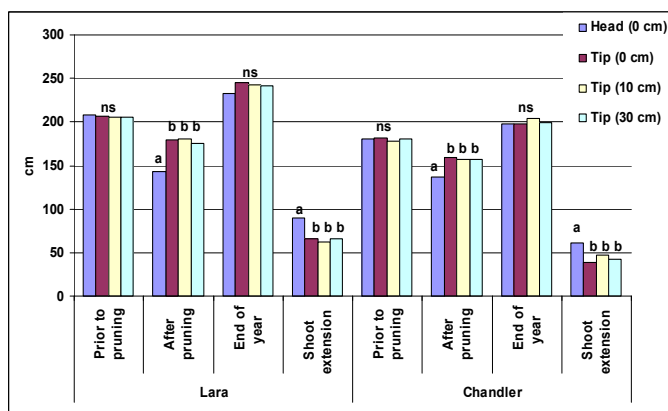
## Findings

- Severe frosts and drought confounded the results for 2006–07 (data not presented).
- Mean tree height and stem circumference of dormant pruned Lara trees increased by 38 cm and 3.3 cm respectively in 2005–06; significantly greater growth than in bud-swell pruned trees (Table 1).
- Head-pruned trees were significantly shorter than tip-pruned trees immediately after pruning; however, significantly greater shoot extension with head-pruning meant that there was no significant difference between treatments at the end of the growing year in 2005–06 (Figure 1) and in 2007–08 (data not presented).
- The removal of necked and lateral buds below the apical bud did not increase shoot growth in comparison to their non-removal in 2005–06 (Figure 1) and in 2007–08 (data not presented).

**Table 1.** Mean tree height and stem circumference, and the mean increase in height and circumference, in 2005–06

Treatment	Height (cm) <sup>A</sup>			Circumference (cm) <sup>A</sup>		
	Prior to pruning	End of year	Increase	Prior to pruning	End of year	Increase
<i>Lara</i>						
Dormant	207.2 a	245.2 a	38.0 a	7.3 b	10.6 a	3.3 a
Bud-swell	205.6 a	235.8 b	30.2 b	7.4 a	10.2 b	2.8 b
<i>Chandler</i>						
Dormant	179.4 a	202.2 a	11.1 a	6.9 a	9.6 a	2.7 a
Bud-swell	181.1 a	197.4 a	8.6 a	6.9 a	9.6 a	2.7 a

<sup>A</sup> Within each column, figures accompanied by the same letter form a group of means within which there are no statistically significant differences at  $P = 0.05$ .



**Figure 1.** The mean heights and shoot extension of Lara and Chandler trees in 2005–06 after head-pruning (Head), and after tip-pruning (Tip) with the removal of necked and lateral buds for 0 cm, 10 cm or 30 cm below the apical bud.

## Summary

- Differences in tree growth between different times of pruning were minimal in this study; however, increased tree growth in dormant pruned Lara in 2005–06, in comparison to bud-swell pruned Lara, suggest a potential benefit for pruning during dormancy in Tasmania.
- The removal of necked and lateral buds in tip-pruned trees had no impact on shoot extension relative to trees where buds were not removed. Future work could explore the effect of this treatment when applied to head-pruned trees, given their relatively vigorous shoot growth.
- Research into factors that affect tree growth in Tasmania is ongoing.

### Acknowledgments

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### References

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