

Future Orchards Trial: Final Report

Project title:	Comparison of flower removal strategies in young trees for growth response.
Region:	Southern Victoria
Contact:	Jabbar Khan and Angus Crawford
Projective Objective:	To compare flower fruitlet removal strategies for their growth response in young apple trees and to compare time required for each method of removal.

Outline/method/ (what you did):	<p>Location: Fankhauser Apples, Drouin Victoria</p> <p>Demonstration trial design: The trial was set up as an un-replicated design in two different Jazz apple blocks. Block 2 was at third leaf with developed branching at approximately 60% target height. Block 3 was second leaf whipped (all side branches were removed in winter) Jazz apple trees. Plot size was three panels per treatment where 8 trees were randomly selected for detailed measurement of the main leader length.</p> <p>Treatments:</p> <ol style="list-style-type: none"> 1- Hand thinning: Hand thinning of the flower/fruitlets was completed after Full Bloom on 17 October 2016. Flowers were removed mainly using scissors cutting the stems and by hand. 2- Hand held string thinner for flower removal was also completed on 17 October 2016. 3- Chemical thinning: Chemical thinning program by the grower was multiple application of ATS (ammonium thiosulphate) during the bloom period. <p>Assessments:</p> <ol style="list-style-type: none"> 1- On eight tagged trees, the leader growth was assessed on monthly basis. 2- Photographs and videos were taken throughout the monitoring. 3- Time taken to thin each tree was measured.
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Results Summary

New modern intensive apple plantings require significant investment per hectare where one of the major advantages are these orchards are reaching full production much sooner than before. Time to production is one of the most significant factors for increasing productivity overall where in the first five years of planting orchard systems should achieve a cumulative gross yield of 200 tonnes per hectare.

In young trees flowers are removed so that more plant resources are directed into tree growth. Earlier more effective removal of flowers will ensure resources are not wasted in unnecessary fruit growth. The basis of this trial is to compare three main techniques in removing flowers mainly for their potential impact on main leader growth but we also looked at the time taken to complete each task.

Prior to this trial some observations have been made which suggest that the hand held string thinner can result in a dramatic favourable growth pattern compared with other treatments. This was of particular interest as well as factoring in the amount of time taken where the string thinner was expected to be faster than hand flower thinning.

Three techniques used were hand removal using scissors, hand held string thinning and chemical thinning. There are two different tree sizes selected, Jazz apple block 2 branched tree in third leaf and Jazz apple block 3 in second leaf. Hand and Darwin thinning technique to remove flowers in full bloom date at 17/10/2016 compare to chemical thinning program was multiple application of ATS during the bloom stage of apple tree.



Photos 17 Oct 2017: Hand thinning left and string thinning above. Trees at treatment time below.



Time taken to apply Hand Thinning versus String Thinning:

Total eight trees were selected from each treatment in both blocks and time taken to remove the flowers under each hand versus string treatment was measured. It is clearly faster to apply chemical thinners so time taken to chemically thin was not measured.

Block 3 Jazz:

Treatment	Block/tree type	Average time per tree
Hand thinning	Second leaf whip tree	45 seconds
String thinning	Second leaf whip tree	45 seconds

Block 2 Jazz:

Treatment	Block/tree type	Average time per tree
Hand thinning	Third leaf feathered tree	60 seconds
String thinning	Third leaf feathered tree	90 seconds

In Block 3 the time taken to apply string and hand thinning was similar.

In Block 2 the hand thinning was measured to be faster than string thinning.

Growth Comparison

Block 2 third leaf feathered trees



Hand thin row



String thinner



Chemical thinning

	Hand (cm)	String (cm)	Chemical (cm)
3 Nov 16 (21 DAFB)	5.2	7.8	6.3
8 Dec 16 (56 DAFB)	23.7	27.5	24.5
5 Jan 17 (84 DAFB)	40.5	42.1	40.5
2 Feb 17 (112 DAFB)	42.4	44.4	44.4
2 Mar 17 (140 DAFB)	44.6	48.3	52.8

Table 1: Average growth per plot; DAFB = days after full bloom

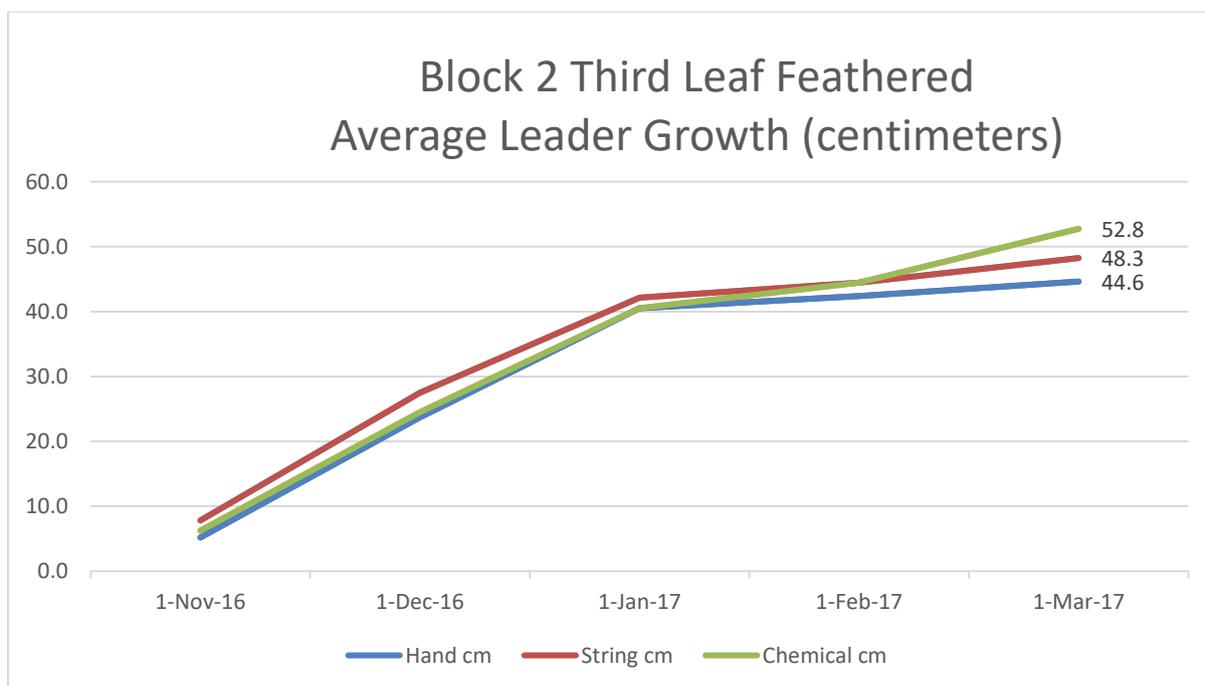


Figure 1: Average leader growth measured in centimetres for the season.

In summary these results for block 2 show no major differences in leader growth. In the last March measurement the chemical thinning measurement appeared to have more growth but due to the trend in the graph presented above this is unlikely to have been the result of the treatments at this late stage.

Block 3 second leaf whipped trees



Hand thin row



String thinner



Chemical thinning

	Hand (cm)	String (cm)	Chemical (cm)
3 Nov 16 (21 DAFB)	7.1	6.4	6.6
8 Dec 16 (56 DAFB)	26.6	28.8	29.0
5 Jan 17 (84 DAFB)	54.4	55.5	56.3
2 Feb 17 (112 DAFB)	60.1	59.6	60.5
2 Mar 17 (140 DAFB)	66.6	65.5	66.0

Table 2: Average growth per plot; DAFB = days after full bloom

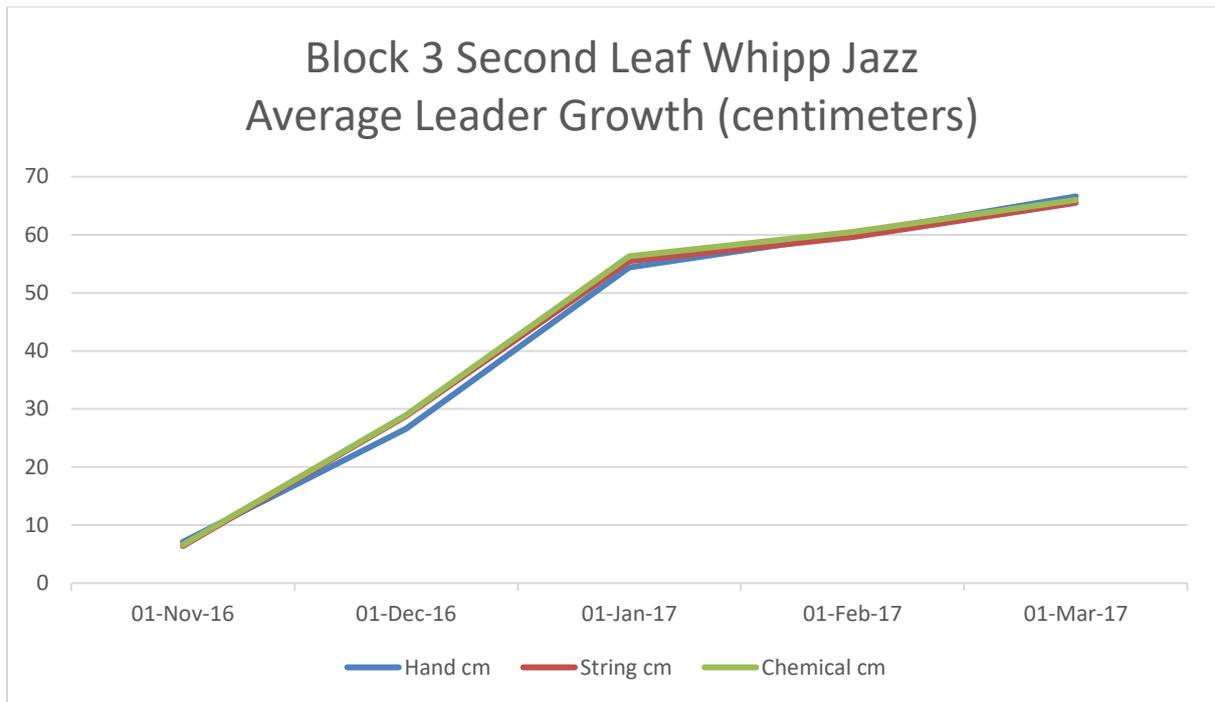


Figure 2: Average leader growth measured in centimetres for the season.

In summary for block 3 there was no difference observed in leader growth.

Implications

The results from the trial suggest that the method adopted to removing flowers may not be as important so long as it's done. No untreated control was added to the treatment as this was seen as out of the scope of the trial.

All treatments essentially resulted in the full removal of flowers which would be the main explanation for the little differences observed.