Future Orchards Trial: Final Report

Project title:	**Lenswood Time of Pruning Final Trial Report 2019**
Region:	**South Australia**
Contact:	**Paul James 0419 826 956**
Projective Objective:	Ascertain the best time to prune young Fuji trees to optimise tree growth benefits.

Outline/method	In 2017 a block of young 5th leaf (4yo) young Aztec Fuji (x M.26) trees was used to conduct a trial looking at the impact on young tree growth of 4 different winter/spring pruning times.
	The pruning times were Post leaf fall, Mid-Winter, Green tip, and Full bloom. 4 groups of 10 trees were selected and pruned at the appropriate times. In 2018 the same trial trees were split into groups of 5 trees and the reverse pruning times were applied to 1 group of 5 trees. The other group of 5 trees were pruned at the same time as the previous year. This process provided 8 treatments showing the impacts of 2 year's "time of pruning" on the same trees.
	Pruning was undertaken on the 10th of June, July, August and September 2018.
	Harvest was undertaken in March /April 2019 by Mr Paul James with fruit weights and numbers recorded for each tree in the trial.
	Due to issues at harvest time no field day was held however presentations on the trial will be made to Future Orchards Field days in 2019.

Results Summary (measurements and observations, photos, photos of control area if applicable)

All pruning of the trial trees was undertaken by Mr Paul James with the trees being pruned to similar branch and bud numbers (details not reported). Two picks were required for most trees, although a few trees required a third pick to complete the harvest (heavy crop). A proportion of trees were "off crop" and only required 1 pick per tree which was of concern as they were an indication of Biennial bearing.

Biennial bearing was a factor we were hoping to minimise but because of this it has been decided to continue the trial for another year with the same time of pruning as for 2018 to be used.

The yield results obtained from the 2019 harvest were

2017 treatment	2018 treatment	Yield (Kg/tree)	Yield t/ha**	Average fruit weight (gms)	Ave No fruit/ tree
Post leaf fall (early)	Post leaf fall (early)	19.20	54.9	183.3	106.6
Post leaf fall (early)	Full bloom	23.16	66.2	195.2	118.8
Mid Winter	Mid Winter	21.18	60.5	191.0	113.0
Mid Winter	Green tip	20.80	59.4	197.5	105.8
Green Tip	Mid Winter	20.80	59.4	199.8	104.2
Green Tip	Green Tip	16.72	47.8	193.9	86.8
Full bloom	Post leaf fall (early)	14.90	42.6	179.8	83.2
Full Bloom	Full Bloom	24.46	69.9	180.0	137.6

The results for 2019 show that the 2 Full bloom treatments resulted in the highest yields per tree (and calculated tonnes per hectare) for this season. The full bloom/Full bloom treatment had the highest individual yields. However; the data presented is for just the one season and if you take into account the average number of fruit/tree the biennial bearing factor becomes more obvious.

Overall there was a 32% variation in yields between the highest and lowest yielding combinations suggesting we need to look at the trial further

The following table shows the cumulative yield results for the 2 seasons

Cumulative yields from 2017 & 2018.

2017 treatment	2018 treatment	Yield (Kg/tree) 2018	Yield (kg /tree) 2019	Total fruit Weight Kg / tree	Total fruit Weight t/ha
Post leaf fall (early)	Post leaf fall (early)	11.24	19.20	30.44	86.97
Post leaf fall (early)	Full bloom	15.00	23.16	38.16	109.8
Mid Winter	Mid Winter	14.54	21.18	35.72	102.1
Mid Winter	Green tip	5.82	20.80	26.62	75.05
Green Tip	Mid Winter	4.66	20.8	25.46	72.74
Green Tip	Green Tip	12.80	16.72	29.52	84.34
Full bloom	Post leaf fall (early)	11.62	14.90	26.52	75.77
Full Bloom	Full Bloom	4.52	24.46	28.98	82.80

Please note that whilst in 2018 there were only 4 treatments the table above shows 8 different yield results. This due to the yield data for each tree in each treatment being recorded individually. When the second year treatments were implemented each of the 4 treatments of 10 trees each were split into 8 groups of 5 trees to allow for the adjusted treatments. The actual weights of each group of 10 trees was then recalculated for the trees in each individual treatment. This recalculation has shown the issue impact of biennial bearing on individual trees in the trial.

These results clearly show that although the trees were pruned to similar bud numbers in each season that the biennial bearing issue is very obvious, particularly in the 2017 treatments/2018 yields. Because of this factor it is very difficult to develop any conclusions from the results currently.

Because the trees are relatively young in their early cropping years the trial will be repeated again in 2019/2020 using the 2018 treatments on the same trees.

Implications for Growers

The yield difference between the best and worst treatments of approximately 33% (37 tonne/ha - calculated) could result in a very significant financial benefit for a grower for just a very simple adjustment in pruning management. At a nominal value of $1.50 /kg this 37,000 kg difference is approximately a $55,500 difference.

However, this difference is based on a small demonstration trial. Further work is required to test the pruning practice.