

Focus Orchard Case Study: Biennial Bearing

Orchard: Oakleigh, Adelaide Hills, South Australia

Orchardist: Rob Green

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Objective

To even out the Fuji production year to year. Historically the performance has been swinging from 50 t/ha in an on crop to 15 t/ha in an off crop.

Method

Rob has two similar blocks of Fuji (Blks 11 and 12). They were both planted in 1995 on MM106 rootstock at the semi intensive spacing of 4.5 * 2.0m. In the 2011~12 growing season both blocks were in the "On Crop". Rob used a base program of good pruning, chemical thinning, and early hand thinning across both blocks, but also used additional methods of plant manipulation on Block 11. This was to try and identify good biennial bearing tools going forward. The additional tools were root pruning, and the use of growth regulators post bloom, Ethrel and NAA. These treatments came from Steve McCartney's address to Future Orchards March 2012.

Methods used on each block

2011/12

Block 11

- Single side root prune mid winter
- 1 Regalis at 5cm shoot at 1.0 kg/ha
- Chemical Thinning: 2 x Ethrel720 at 450mls/ha on the 4/10 and again on the 13/10. Followed by BA @ 9l/ha on the 19/10.
- 1 x Ethrel720 applications at 150mls/ha 5/11.
- 3 x NAA(2%) at 175 mls/ha on the 6/12, 13/12, 20/12

Block 12

- No rootprune

- Regalis as above
- Ethrel as above
- 1* NAA only

2012/13

Block 11

- Double side root prune @ green tip
- 1 Regalis at 5cm shoot at 0.5 kg/ha, 2nd Regalis on 27/10 @ 1.0 kg/ha
- Chemical Thinning : 2 x Ethrel720 at 450mls/ha on the 9/10 and again on the 16/10. Followed by BA @ 7.5l/ha on the 22/10.
- 3 x Ethrel720 applications: 200mls/ha 9/11, 200mls/ha 20/12, 150mls/ha 28/11.
- 3 x NAA(2%) : 175 mls/ha 9/12, 250mls/ha 20/12, 270 mls/ha 8/1

Block 12

- No rootprune
- Regalis as above
- Ethrel as above
- No NAA

Results

Block 11 came back with a good level of bloom (see Figure 1) resulting in another great crop in 2013 at 53 t/ha up slightly on 2012 (Fig 3).

Conversely Block 12 had a light flower (Fig 2) resulting in an off crop of 36 t/ha (Fig 3) albeit a better result than had been the case in the last off crop.

The Class 1 recovery in both blocks is estimated to be the same at 75%.





Figure 1 Block 11 had good return bloom spring 2012



Figure 2 Block 12 had average to poor return bloom spring 2012

Summary

The conclusions we have drawn from this result are:

The good base horticultural principals of good pruning, aggressive chemical thinning, and early hand thinning can significantly to minimize biennial bearing. These should be a given.

The additional treatments of post bloom Ethrel, summer NAA and root pruning appear to be effective at making further improvements. It is difficult to draw a conclusion as to whether the growth regulators or the root pruning did the job. Based on other horticultural research and experience, we suspect it was probably all three. We will continue to monitor these two blocks and the FO trial that has been laid down, however this on orchard applied trial tends to be suggesting that there are a few new treatments that could have a real place controlling biennial bearing into the future.

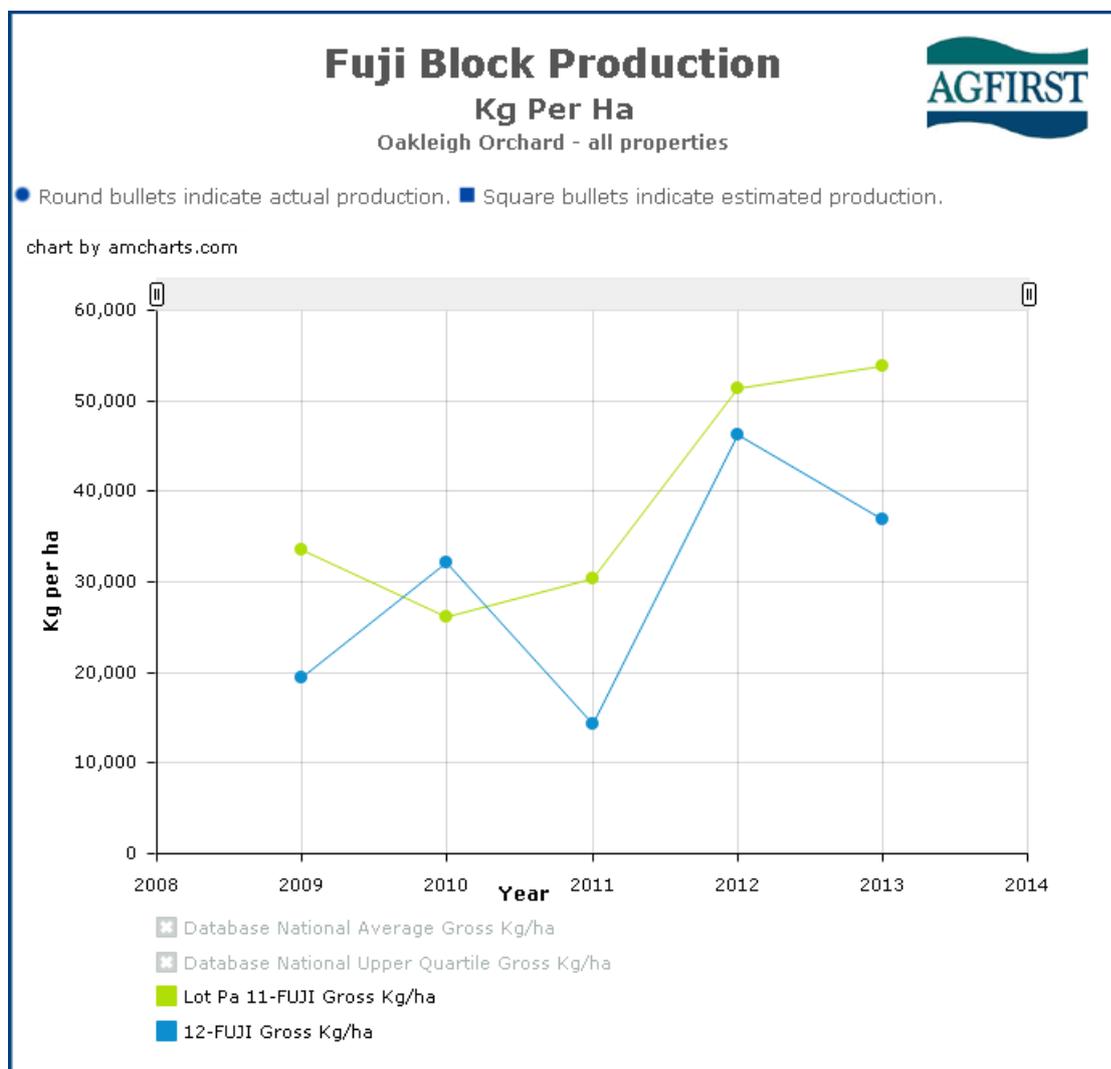


Figure 3 Gross Yield Profile for Fuji Block 11 and 12

