Summary of the Batlow Future Orchards Trials & Demos 2012-14

Kevin Dodds – Development Officer (Temperate Fruits) – 24th June 2014
What was the focus of our demo’s / trials?

SIMPLE PRUNING RULES PLOTS – JILBA ORCHARD
Simple Pruning Rules.....continued

Rules:

1. Where’s My Buds?

2. Remove Weak Coral spurs from shaded inner canopy.

3. Line Prune laterals for long pendant habit.

4. Back to single leader.

5. No other big cuts (initially).

Objective: To prove that a simple set of pruning rules work.
• Simple Pruning Rules…..continued

Result:

1. Fewer fruit but harvestable yield improved.
2. Fewer Picks.
3. More uniform fruit size.
5. More settled trees.
A simple set of pruning rules do work…even on big old N.Spy Gala trees
•Simple Pruning Rules…..continued

We tried to do the same in Red Fuji in 2012/13…….BUT the buds tricked us. Where we thought there were clear fruiting buds, there were in-fact NONE.
2013-14 We tried to repeat the 2012-13 Gala result in the both the Gala and Fuji. BUT we had……
So we decided to try some post-frost root pruning to control the impending vegetative growth. Applied 22\textsuperscript{nd} November 2013

The results of which were, unfortunately in-conclusive. Root Pruning alone was not enough to keep things under control.
What did we learn?

SEASON 1 (2012-13) Simple Pruning Rules

- Simple pruning rules work! Taking this approach at pruning time can significantly improve the out-turn of your crop.

- Pruning rules do work for old style seedling and semi-dwarf blocks…like these Royal Gala.

- Know your potential crop load before you start Winter pruning. If you don’t, how can you effectively plan your pruning?

- Don’t trust Fuji buds….you cannot assume they are fruitful.

- There are clear fruit size and quality gains to be had by applying some simple pruning rules.
What did we learn?

SEASON 2 (2013-14) **Frost and Controlling Vegetative Growth**

- Frost Mitigation is essential to prevent everything going out of balance.

- Pre-season investments in pruning, training etc could be for nought, if Frost Risk not addressed.

- Proper Design and Testing of Frost Protection Systems (FPS) is vital.

- Post-Frost root pruning demonstrated that this tool may not be effective as a stand alone treatment to control vegetative growth following crop loss.

- In situations of no return bloom or severe crop loss due to frost, plan to employ a suite of tools to “keep control” of the trees. (ie, root pruning, girdling, chemical growth regulators)
What was the focus of our demo’s / trials?

ROOT PRUNING DEMONSTRATION – MT VIEW “EHMSENS”

Two varieties: Pink Lady (M9)  
Red Fuji (M26)

Yr1 Three Treatments:  
Control, 1 Side, 2 Sides

Yr2 Five Treatments:  
Control, Re-Rip of 1st Yr plots, + 1 Side Alt to Yr1 & 2 Sides (ripped as 1 Side in Yr1)
## Root Pruner Settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade Angle</td>
<td>30° at top</td>
</tr>
<tr>
<td>Length of blade inserted</td>
<td>346mm</td>
</tr>
<tr>
<td>Blade tip to trunk distance</td>
<td>300mm</td>
</tr>
<tr>
<td>Blade soil entry point to trunk distance</td>
<td>473mm</td>
</tr>
<tr>
<td>Travel Speed</td>
<td>5km/hr</td>
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</table>

![Image of root pruner in action]
How did the trees respond?

UN ROOT PRUNED

1 SIDE

2 SIDES

Red Fuji – March 2013
How did the trees respond?

Pink Lady – April 2013

UN ROOT PRUNED 1 SIDE 2 SIDES
Impacts on shoot number and length
Red Fuji (Nov 2012) and Shoot Termination in Pink Lady (Dec 2012)

<table>
<thead>
<tr>
<th>Shoot No.</th>
<th>Routine Un Root Pruned</th>
<th>Single</th>
<th>% Change from Routine</th>
<th>Double</th>
<th>% Change from Routine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoots were up to 26 % fewer and shorter (Fuji) and terminated much earlier (Pink Lady). Up to 75% of shoots terminated by 3rd December.</td>
<td>Shoot No.</td>
<td>Single</td>
<td>% Change from Routine</td>
<td>Double</td>
<td>% Change from Routine</td>
</tr>
<tr>
<td>Total Length (mm)</td>
<td>183</td>
<td>149</td>
<td>-18.6</td>
<td>136</td>
<td>-25.7</td>
</tr>
<tr>
<td>Average Length (mm)</td>
<td>2399</td>
<td>2085</td>
<td>-13.1</td>
<td>1773</td>
<td>-26.1</td>
</tr>
<tr>
<td>Shoots were up to 26 % fewer and shorter (Fuji) and terminated much earlier (Pink Lady). Up to 75% of shoots terminated by 3rd December.</td>
<td>Average Length (mm)</td>
<td>43.6</td>
<td>-2.4</td>
<td>34.1</td>
<td>-21.8</td>
</tr>
</tbody>
</table>

Figure 1 Percentage shoot termination vs shoots still growing by treatment in Pink Lady in early December 2012

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NSW Government
Department of Primary Industries
Effect on Colour

Routine (No Root Pruning)  Double Sided Root Pruning
Effects on Colour

Routine (No Root Pruning)  Double Sided Root Pruning
Observations on Return Bloom

• Plots re-established 23rd September 2013 at early to mid-pink stage.
• Flower counts made to determine any impacts on return bloom
CONTROL UNPRUNED – PINK LADY, RETURN BLOOM
DOUBLE SIDE – PINK LADY, RETURN BLOOM
Observations on Return Bloom

Return Bloom (Red Fuji) as a function of root pruning treatment in previous Spring.

- Control unpruned
- Single Side
- Both Sides

Average flower clusters per tree
Demo design and pitfalls for 2013-14

- Poor Flowering in Red Fuji and Frost impacted on this seasons trial
- Red Fuji presented with a Strong Off-Year
- Red Fuji & Pink Lady were both heavily impacted by the frost on 18th October 2013.
- These factors meant that fruit assessments were not conducted in 2013-14.
- Leaving only shoot counts and measurements for comparison.
There was no clear correlation between root pruning treatment and shoot numbers in 2013-14
Results varied between varieties and treatments, however, all root pruning treatments had a calming effect on tree growth compared with the controls.
What did we learn?

SEASON 1 (2012-13) Root Pruning Demonstration

- Fewer, shorter shoots that terminate earlier.
- More open canopy = Improved fruit colour (& stronger buds for next season??).
- Need to adjust thinning regime according to level of stress and crop load.
- Significant reduction in Summer and Winter pruning loads.
- Effective tool for managing canopy vigour.
What did we learn?

SEASON 2 (2013-14) Root Pruning Demonstration

- Root pruning had a Positive Impact on return bloom.
- The more aggressive the root pruning the stronger the return bloom (Based on 1 year of data).
- All root pruning treatments had a degree of calming on the tree when compared with the un-root pruned control.
- Root pruning alone may not be sufficient where you have a light crop (ie, off year, poor pollination or frost)
- A higher number of shorter shoots = more fruit.