

Future Orchards Article for the Australian Fruitgrower December 2012

Focus Orchard: Update No.2

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As part of the Future Orchards project, regions are being encouraged to undertake small scale on-orchard trials and grower demonstrations to address challenges and issues faced in each region. Some of the topics being investigated by the Focus Orchard (FO) groups across Australia include reducing biennial bearing, increasing sustainable yields, better vigour management, improving fruit quality, improving pest and disease control and many more. All these will be reported on at later Future Orchard field days and information is available on the APAL website. In this article I will share the activities currently underway at the Batlow Focus Orchards.

The Batlow Community Orchard Group members (COG) are: Kevin Dodds, Front Line Advisor (FLA), Matthew McMahon, James Oag, Ralph Wilson (growers), Jesse Reader (APAL) and myself. The Batlow COG chose three topics they felt were of interest to their local growers:

- Pruning demonstrations
- Root pruning
- Grafting techniques

Pruning Demonstrations

The objective of setting up pruning demonstrations was to:

1. Build on local experience and confidence in pruning principles and methods in order to increase adoption by local growers and staff.
2. Demonstrate basic pruning principles and how adopting suitable pruning rules can add value.
3. Address tree growth and/or productivity issues on four blocks, each requiring different strategies to increase yield and improve fruit quality into the future.

Four blocks were selected and these included an older, poor performing Royal Gala block, a strongly biennial bearing Fuji block, a block of small Buckeye trees requiring more tree growth and a Rosy Glow block, that hasn't yet performed to its potential. In September 2012, all members of the COG met and established the pruning rules and objectives for each of these four blocks. Trees were marked off and the COG members set about pruning the different plots as per the pruning rules.

Follow up measurements, counts and photographs will be taken throughout the trial period for each block. Grower meetings will be held at these orchards to show block progress and demonstrate techniques used and to discuss lessons learnt. Final reports will be produced and submitted to the APAL website for all growers to access.

Improving the performance of an older Royal Gala block

Production in this block has been slowly increasing over the last three years, but it is still below the desirable level for these trees. A lack of suitable tree vigour and the loss of a dominant central leader have been identified as the key areas restricting yield that need to be addressed over time. Over the years, with the adoption of low cost pruning strategies, too many buds on coral like spurs along the main stem have been allowed to develop and these are likely to produce fruit of questionable quality. The pruning objectives were; 1) to retain sufficient bud numbers to ensure continued growth in production and shift the balance from old shaded and weak spur buds to young, better exposed, healthier buds by reducing coral like spur formations. 2) to improve tree architecture and start to re-establish a dominant leader.

The Pruning Rules were:

1. Identify the best winter buds that need to be kept.
2. Remove 6 and 12 o'clock shoots.
3. Remove or reduce most of the "coral spur wood" from the main stem.
4. Adopt long pruning laterals to simplify structure and encourage weak pendant laterals.
5. Simplify tops and select a single leader.



Royal Gala unpruned (left) showing heavy coral spur along the trunk. Pruned (right) showing reduction in old spurs which should lead to improved fruit quality.

Breaking the biennial bearing habit of a Fuji block

It is very early days, but the assumption made that the Fuji would be in a strong 'off' year has proved correct. Fewer than 28% of winter buds that had the potential to produce flower actually did produce flowers this spring.

The focus going forward is to break this biennial bearing cycle. John Wilton, in the September issue of Australian Fruit Grower, wrote a good article on managing biennial bearing and it is well worth re-reading his article. Vigour management is now the primary concern and root pruning, deficit irrigation, growth retardants and tree nutrition will all be explored this season. This block is like many around the country and will present some interesting lessons for the Batlow growers.

A fruit thinning strategy has been implemented that will encourage fruit numbers to be left in bunches of threes to increase the harvest potential yield for this year. The COG expectation is that by employing this thinning strategy, harvest yields should exceed the previous 'Off crop' without unduly affecting fruit quality. This strategy isn't without risk and will require careful attention to detail. Like all these trials and demonstrations, we will keep you posted.



Biennial Fuji trees that are in the 'off-cropping' year.

Root Pruning Demonstrations

Vigorous rootstocks, healthy soils, light cropping trees and high rainfall can cause an excess of vigour and how to manage this can become a key challenge for orchardists. The issue can be exacerbated in some seasons due to poor pollination, or frost damage resulting in insufficient crop load and a shift in the balance between crop load and tree growth.

In addition to adopting sound pruning practises, girdling, chemical growth regulators, and root pruning can be useful tools in the management of excessive vegetative growth. Root pruning has not been commonly utilised in the Batlow district in the past. However, several leading orchardists have invested in root pruning equipment recently and are beginning to use this technique as one of their vigour management tools. This demonstration aims to build local knowledge and experience in the use of root pruning for vigour management which can be extended to local growers via the Future Orchards field meetings.



The trial compares non root pruned trees with single sided and double sided root prune trees to a depth of 470mm with a 30 degree angled knife at 500mm from the trunk on a block of Pink Lady M9 trees.

The Boreco root pruning machine used in the Batlow root pruning trial.

A grower presentation explaining the demonstration was made at the Futures Orchard walk in November 2012.

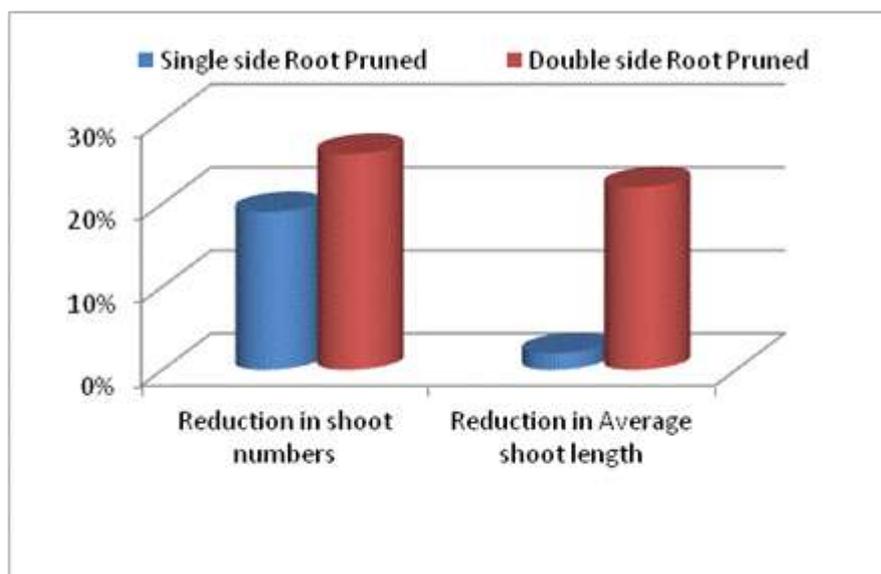


Table 1. The reduction in shoot numbers and shoot length from single and double side root pruned trees in Batlow.

An assessment in the middle of November has already thrown up some interesting features of this root pruning trial. The single sided and double side root pruned trees have 19% and 26% less shoot numbers respectively compared to the non-root pruned trees. This early result should lead to a reduction in labour costs for shoot ripping and summer pruning. Shoot length was also reduced for the single side and double side root pruned trees by 2% and 22% respectively compared to the non-root pruned trees.



Batlow growers in November discussing the early visual differences between the root pruning treatments.

Another expected result was the non-root pruned trees had larger, denser leaf canopy with a deeper green colouration. The double sided root pruned trees had yellower leaves and a more open canopy with terminated shoots. The Batlow FO group will follow these treatments throughout the season and into next season to monitor differences and impacts on fruit quality, tree health and return bloom etc.

Early leaf test results have shown very little nutritional differences between the treatments to date. One nutrient difference that may surprise some growers is a decline in leaf calcium in the root pruned trees even though tree vigour has been reduced. This can be explained because root pruning, particularly on both sides of the tree, will have removed a significant area of healthy white root tips, therefore leaving less root surface area to uptake early calcium into the tree. Although this early result is discouraging, we expect the fruit calcium levels to be higher in the root-pruned treatment as the root pruned tree has less growing tips to act as calcium sinks. As with most tree manipulations we need to find the right balance of pros and cons and this is exactly what the trial is designed to identify.

Grafting

Following the June 2012 Orchard Walk at Muralappi Orchard, Batlow, there was considerable interest in providing more information and practical demonstrations of grafting techniques for re-working orchards. Given the difficult financial times the industry is facing, re-working is an increasingly attractive option for growers needing to change underperforming varieties.

This in-orchard demonstration includes assessing two popular grafting techniques, ‘step grafting’ versus ‘crown bark grafting’ on Pink Lady M26 rootstock. The objective is to demonstrate the techniques and associated advantages and disadvantages of these grafting techniques as a method of re-working established apple orchards.



Crown bark grafted trees with the scion secured with tape (left) and staple (right).

The crown bark graft is commonly used in Batlow. The yellow grafting sealant is a PVC paint product called “Doc Farewells Grafting Sealant” and was imported by a local Batlow grower. Grafting and follow up graft aftercare and early tree training are being implemented by the Future Orchards FLA for Batlow.



Step grafting was also trialled (above) and satisfactory early growth (right) has developed by mid-November.

Further tree training and graft assessment is planned in late January and February with initial training of new scion growth to a U-shaped twin leader tree format. Bleeder branches will then be removed. In autumn measurements and more photos will be taken.

In conclusion, the Batlow COG is taking on some interesting and challenging objectives that are already starting to pay off for the Batlow growers.