

Focus Orchard shows how to improve orchard return by \$18,000/ha

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In the February 2013 issue of Australian Fruitgrower, Steve wrote about trials based around the Batlow Community Orchard Group. These trials involved adopting simple pruning rules, root pruning and grafting. In this article, we will report on these trials and another trial carried out by Stanthorpe Future Orchard group and how you can set about doing your own on orchard trial.

Can simple pruning rules improve Royal Gala performance?

A block of older 'Royal Gala' trees that had been achieving around 28 tonnes per hectare for some time was chosen for this trial in Batlow, New South Wales. Could anything be done to increase the return from this block? The trees were inundated with masses of poor quality spurs, with the aim being to use these surplus spurs fruit to slow the trees down. A major clean-up was in order and plots were chosen to see how these trees would respond to simple pruning rules.

To ensure sufficient buds were left after this major clean out, very few structural cuts were made. Bud counts were completed during pruning and the simple pruned trees averaged 458 buds/tree, compared to 716 buds/tree in the routine pruned trees. The simple pruning rules were focused on removing surplus fruit buds that often produce inferior quality fruit. As the trees develop more fruiting area/ canopy, the focus will move towards some structural pruning cuts but not this year.

At harvest, the routine pruned trees were carrying slightly more fruit (56 tonnes/ha) compared to the simple pruned trees (51 tonnes/ha). However, differences in fruit quality, size and marketable yield just before harvest were starting to show some clear differences. Apart from the pruning, both treatments were otherwise managed the same.

Both the simple and routine pruned trees had similar yields to previous years, although the average block yield of 28 tonne/ha was all that had been picked most years. It is thought that although the trees in past years carried good crop loads, it was most likely not of a good enough quality to be harvested and was often left behind on the tree.

Harvest results

As part of the Focus orchard program, the local Front Line Advisor, Kevin Dodds (NSW DPI) organised a grower meeting shortly before harvest which highlighted "seeing is believing". The colour difference was significantly better and more consistent across the simple pruned trees than the routine pruned trees. A video was produced by Kevin to illustrate this and can be found on the APAL Futures website titled 'Crop Review Webinar' (<http://www.apal.org.au/members-portal.cfm>). It clearly shows the differences in the trials before and after harvest. It's well worth a look at to learn more about how to improve your orchard's income.

Only one pick was carried out in this block and an estimated 80-90 per cent of the total crop was harvested from the simple pruned plot compared to approximately 50 per cent in the routine pruned plot. The routine pruned block yield was again around 28 tonne/ha which was similar to its long term average.

The simple pruned plots had significantly higher packouts, larger fruit size and more tonnes per hectare compared to the routine pruned block. All these led to an improved orchard net return of \$18,000 per hectare. The packed yield in the simple pruned trees was 43 tonne/ha compared to 28 tonne/ha in the routine pruned trees. Fruit from the simple pruned trees attracted an in-market price premium because of the fruit's enhanced quality (high colour, fruit size and firmness).

I had a chance to look at these trees recently and I was impressed at how quiet these simple pruned trees were. Pruning this winter would be a continuation of what was started last year and these trees are already set to produce another substantial crop again next year. This trial will carry on next season, but already the Batlow Community Orchard Group and local growers are amazed at how such a small change in management could have such a major effect on the block's performance. These trees had been earmarked for removal over the next few years but this trial has changed that plan markedly and is now on hold. This trial has shown that a small change in the way we prune can make a pronounced difference to the orchard gate returns.

Root pruning demonstrations

Root pruning is becoming more utilised by growers to control vigour, especially over the past few seasons which have been wetter at times than previous years. The objective of this trial was to gain some practical hands-on knowledge and experience in the area of root pruning which can be extended to local growers via the Future Orchards field meetings.

Two blocks of high density plantings were root pruned on 26 September 2012. One block was 'Red Fuji' on M26 and the other 'Cripps Pink' on M9. Both blocks were 12 years old.

Three treatments were imposed; a control (not root pruned), a single side root prune and root pruned on both sides of the tree. The root pruner was set up with the blade angle at 30° from vertical, to a depth into the ground of 346 millimetres. The blade entry point was 473mm from the trunk (where the tip of the blade was 300mm from root crown). The tractor travelled at 5.0 km/hour.

Shoot length and per cent termination

As reported in the February issue of *Australian Fruitgrower*, shoot length and percentage termination carried out in December 2012 indicate shoots were shorter and terminated earlier in the root pruned plots compared with the control plots. Shoot length reduction and percentage termination in December was greatest in the double root pruned plot for both varieties.

Compared with the control (un-pruned), both side root pruning in the 'Red Fuji' resulted in a 26 per cent reduction in shoot number and total length and a 22 per cent reduction in average shoot length. As expected, root pruning on both sides of the tree resulted in a 9 per cent reduction in shoot numbers, 15 per cent reduction in shoot length and 20 per cent reduction in average shoot length compared to the single side root pruned trees. Root pruning on both sides of the tree is more aggressive than single side root pruning.

Pre-harvest fruit size

The diameters of 100 fruit were measured pre-harvest for each treatment and variety. The 'Red Fuji' was one week away from harvest and the 'Cripps Pink' still had another two to three weeks remaining until harvest. Often it could be expected that trees root pruned on both sides might have smaller fruit compared to the other less aggressive treatments. Sometimes aggressive root pruning (both sides) can assist with setting the earlier flowers, which have the potential to grow larger fruit. This may explain why the Red Fuji had an increase in fruit size for trees root pruned on both sides compared to the other treatments, when crop load was the same.

The visual difference in canopy density between plots was very obvious. It is clear that the more aggressive root pruning treatment gave a more open canopy with shorter shoot length and better fruit colour at harvest. This reduced shoot growth should assist with the production of more fruit buds next season. This trial will also be continued.

Grafting

Grafting is often viewed as a low cost way to redevelop an orchard to a more profitable variety. The biggest cost in grafting is graft failure and therefore a trial was initiated in the Batlow to assess which techniques may provide the best result for them. Two popular techniques were trialled (crown or notch grafting) with two minor variations (stapled or taped/wrapped) on 'Cripps Pink' M26 trees.

Results

The survival rate of each treatment was measured in the middle of February. The wrapped treatments in both grafts methods survived at 100% and the stapled scions had a higher mortality rate at 10-30 per cent. Although stapling may be faster and cheaper, wrapping provides the grafts with extra benefits that assist survival rate of the scions.

The crown grafts produced on average 67.6mm of scion shoot growth and the notch grafts only 35.2mm shoot growth. Both stapled treatments grew around 50 per cent shorter shoot growth than the wrapped scions.

What has to be remembered with these results is that the notch grafted trees produced a crop of apples in the same year as the grafting whereas the crown grafted trees did not produce any fruit, except for that left on the sap draw/side branch.

Experience with crown grafting in Adelaide Hills several years ago highlighted better grafting survival when sap draws/side branches were left on until early until early summer. Increased grafting failures occurred when sap draws were not used however the scions that did take had significantly more shoot extension. Again, the biggest cost in grafting is from failure.

How to do your own Focus Orchard trials

The field trials in the Focus Orchards were put together to improve the knowledge around local issues and then to share that knowledge with the others.

To increase your knowledge and understanding, (new chemical thinner, planting density, pruning style etc.) in your local conditions, having a go at your own trials is important. Be prepared to share and discuss that knowledge with others in the business. Maybe you need to prove a new strategy to your father or boss. Simple observational trials can assist you to do this. For instance, the age old question of "what spacing should I plant a new block at"? To help answer this, if you plant trees most years, how about planting 20 trees a bit closer at varying spacing's? This will provide you with the answer and it is a simple trial that will remain for the life of the block. I have a few growers that regularly do this and the observations are so enlightening. These trials are "so simple, low cost and can have an amazing impact". So have a go!

To help you put down your own observational trial we have included a table that was used for a Regalis™ trial in Stanthorpe as part of the Futures orchard program. With any new strategy, it often takes a little structure and this table should help you with that.

Field trial key points	Stanthorpe Focus Orchard example
<p>Simple objective: Write your objective here and don't try to answer too many questions at once. (Many field trials fail because the trials try to answer several questions at once).</p>	<p>Objective: How critical is the timing of the first Regalis?</p>
<p>Only a few treatments: as above, if the trials are too complex the data struggles to be collected and the effort is wasted and you're less likely to try again. This year timing and the next, rate.</p>	<p>Treatments: Applied the same rate of Regalis at four different times from open cluster, pick, 4-6 cm and 10-12 cm.</p>
<p>Measure: be clear when, what and how you will measure the results. Sometimes observations are ok but usually when you see a visual difference it's more than 20%, just a few measurement add a lot.</p>	<p>Measure: Shoot length measured in the 3rd week in October. Measure 50 random shoots in each treated area.</p>
<p>Always have an appropriate Control: the control is what you are going to compare things against, it is usually your standard practice or no treatment. Please don't use end trees or outside rows they can easily be influenced by extra spray, sunlight, bee activity etc.</p>	<p>Control: In this case we had no application and standard practice to compare against. The treatments were within the block.</p>
<p>Observations and Management Change: review the results and then ask yourself 'so what should I do differently now'?</p>	<p>Result: There were no large differences in shoot length between trees sprayed with Regalis at 3 early stages (open cluster, pink, full bloom) and the correct stage (60% petal fall/shoots 4-6cm). The average reduction was 26%. When Regalis was applied 13 days after full bloom, when shoots were 10-12 cm long, the reduction was only 4% <i>Don't apply Late, if you have to vary timing (e.g. due to weather) be a little earlier.</i></p>

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