

FOCUS ORCHARD TRIAL UPDATE OCTOBER 2018

BATLOW AND ORANGE

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1.0 FOCUS ORCHARDS

As both Ross and Yvette highlighted in the last two Future Orchards updates we have a new group of Focus Orchards as of this season. These are summarised in the table below. The rest of this article gives a general update on the focus orchards for New South Wales as well as an update on progress for the trials in the region.

Region	Focus Orchard
Stanthorpe	Savio
Batlow	Seven Springs
Orange	Stoneleigh
Northern Victoria	Turnbull Bros
Southern Victoria	Montague Orchards (Narre Warren)
Tasmania	Hansen Orchards
South Australia	Filsell's Apples
Western Australia	RK & J Fox and Son

To view each orchard's focus blocks on OrchardNet:

- Go to www.orchardnet.co.nz
 - Username: focus
 - Password: focus

2.0 SEVEN SPRINGS (BATLOW)

Our new Focus Orchard for Batlow is Seven Springs. Having recently undergone several redevelopments across the orchard the business is in an exciting time as new blocks start to reach maturity and enter full production. High quality fruit to meet market demands is a major focus for the team and we look forward to watching their progress both in-person and via OrchardNet over the next few years.

Table 1 Seven Spring’s focus blocks. You can view more information on these blocks via OrchardNet

Block	Variety	Rootstock	Planted
Alvina Gala Block 1	Alvina Gala	M26	2014 (5 th leaf)
Fiero Fuji Block 1	Fiero Fuji	M26	2014 (5 th leaf)
Fuji Block 6	Fuji	M26	2003
Galaxy Block 4	Galaxy	M26	2006
Kanzi Block 3	Kanzi™ (Nicoter)	M26	2015
Rosy Glow Block 3	Pink Lady® (Rosy Glow)	M26	2000s



Figure 1 The Seven Springs team at the June orchard walk.

Left to right. Domenic Pisciueneri (Seven Springs), Mark Ericksen (Waima Fruit Co., NZ), Kevin Dodds (NSW DPI and Front Line Advisor), Caroline Pisciueneri (Seven Springs), Darryl Watkins (Seven Springs) and Ross Wilson (AgFirst).

3.0 STONELEIGH ORCAHRD (ORANGE)

Up in Orange the new Focus Orchard is Stoneleigh run by Ian and Prue Pearce. With several newly developed blocks at the orchard we're looking forward to seeing these trees grow. With new dam developments helping with the site's water security we're really looking forward to working with Ian and Prue on the orchard.

Table 2 Stoneleigh's focus blocks. You can view more information on these blocks via OrchardNet

Block	Variety	Rootstock	Planted
New Bravo	Bravo™ (ANABP-01)	M9	2017 (2 nd leaf)
New Kanzi	Kanzi™ (Nicoter)	M9	2017 (2 nd leaf)
Old Kanzi	Kanzi™ (Nicoter)	Bud. 9	2014 (5 th leaf)
East Trellis	Galaxy	M26	2002
Tank	Galaxy	MM116	2009
Johnsons Corner	Pink Lady® (Pink Chief)	M9	2013



Figure 2 Ian in the Johnson's Corner block.

4.0 CURRENT TRIALS

Trials in both Orange and Batlow are completed and managed by the NSW DPI team. Kevin Dodds, Future Orchards front line advisor for NSW, has been busy setting up new trials in both Batlow and Orange. A description of the new trials as well as key outcomes of the old are presented below.



4.1 Batlow – Girdling of Fuji

Fuji. It can be a bit of a dirty word around some areas of Australia. Woolly Apple Aphid, biennial-tendency and hard to thin. It has its share of problems (what variety doesn't?). In saying that; if done well Fuji can return a very nice premium in the right markets.

As part of the Future Orchards program, a new trial at Seven Springs aims to demonstrate the impact of girdling on old Fuji trees. Using the 'double-C' cut (shown below) should result in an effective means of controlling this block's vigour and encouraging good return bloom.

The benefits of a well-timed girdle include:

- Reduced tree vigour
- Increased fruit size
- Advanced fruit maturity
- Increased fruit Brix (sugar)
- Better return bloom

Concerns for its implementation here include:

- Woolly apple aphid (will love the nice open wound from the girdle)
 - need to have WAA under control
- Girdle severity
 - too deep will stress the tree excessively (or in extreme cases tree death)



Figure 3 A 'double C' girdle on an older tree (Image: Kevin Dodds). The diagram demonstrates what the cut looks like (cut is to the cambium layer)

4.2 Orange Early tree structure – pole vs feather

To pole or not to pole? At Stoneleigh, on the 2nd leaf Kanzi focus block, this was the question posed in the June 2018 orchard walk series. Visiting New Zealand grower, Mark Ericksen, sat with many growers on the pole side of the equation whilst Ross Wilson considered feather selection to be a good tactic for the block

To settle the debate the NSW DPI team has set up a trial as part of the Future Orchards trial. The two styles being demonstrated are:

- Pole
 - with a decent stub
- Feather
 - Branch removal if >50% of trunk diameter
 - ‘Balance’ the tree with a nice branch whorl

Whilst the rest of the block has been poled it will be interesting to see the difference in fruiting potential at the 2019 June orchard walks. With some decent lower branches being established in the feathered treatment there’s bound to be plenty of spurs develop this year to potentially crop the following.

A set of measurements post-termination will help determine the impact on tree growth of the two different styles. The block will be revisited as part of the 2019 winter Future Orchard walks and everyone will be able to discuss the results.



Figure 4 Feathered and poled trees on the young M9 Kanzi trees at Stoneleigh. Stephen Gottschall NSW DPI Technical Assistant (Orange Agricultural Institute) is shown next to one of the poled trees.

5.0 PREVIOUS TRIALS

5.1 Soil moisture monitoring demonstration

In both Orange and Batlow demonstrations of real-time soil moisture monitoring systems took place. Between the two regions, neutron probes, capacitance probes and gypsum blocks were all evaluated. Each system has a range of advantages/disadvantages but in general having some form of soil moisture monitoring within the orchard can help to minimise the guesswork of irrigation scheduling.

If you would like to read more information on soil moisture monitoring options, I suggest reading the “Apple and Pear Guidelines for Irrigation Management” page 22 to get an idea of the types of systems available as well as an analysis of the benefits and issues with each system type.

You can find it here:

http://apal.org.au/wp-content/uploads/2013/04/Apple_pear_guidelines_Irrigation_Management.pdf

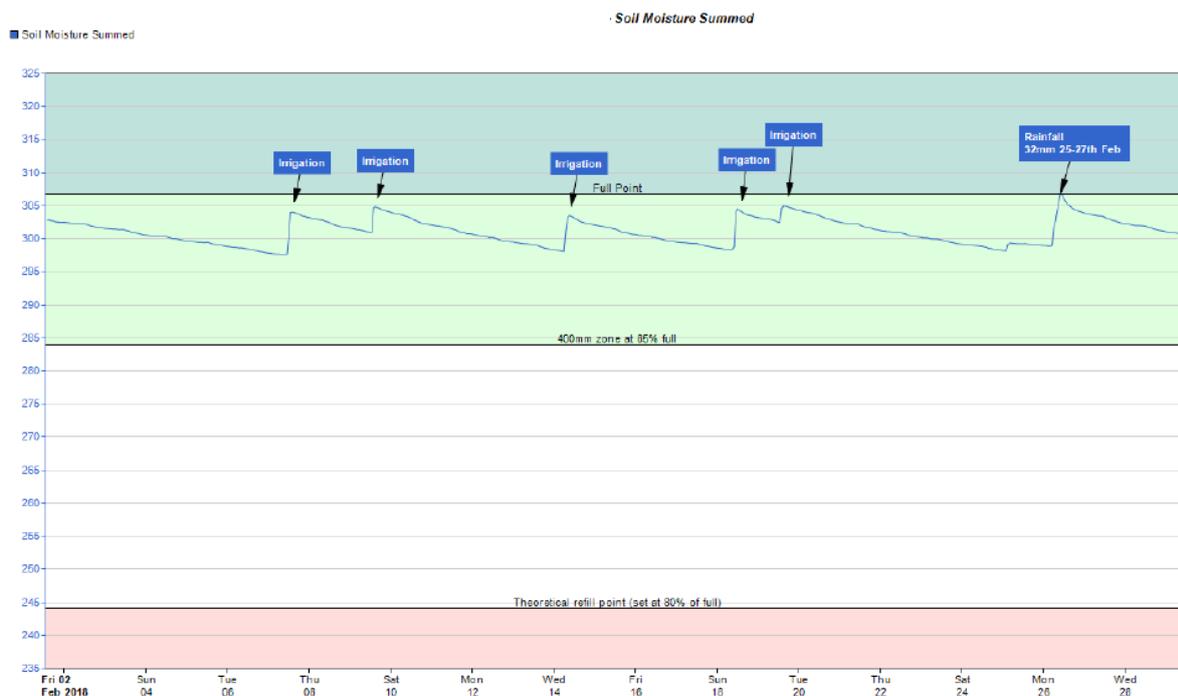


Figure 5 Readings from the capacitance probe utilised in one of the demonstration sites for February 2018. Each labelled point represents an irrigation or rainfall event. This graph is a combination of soil moisture readings in the top 40cm of the soil.

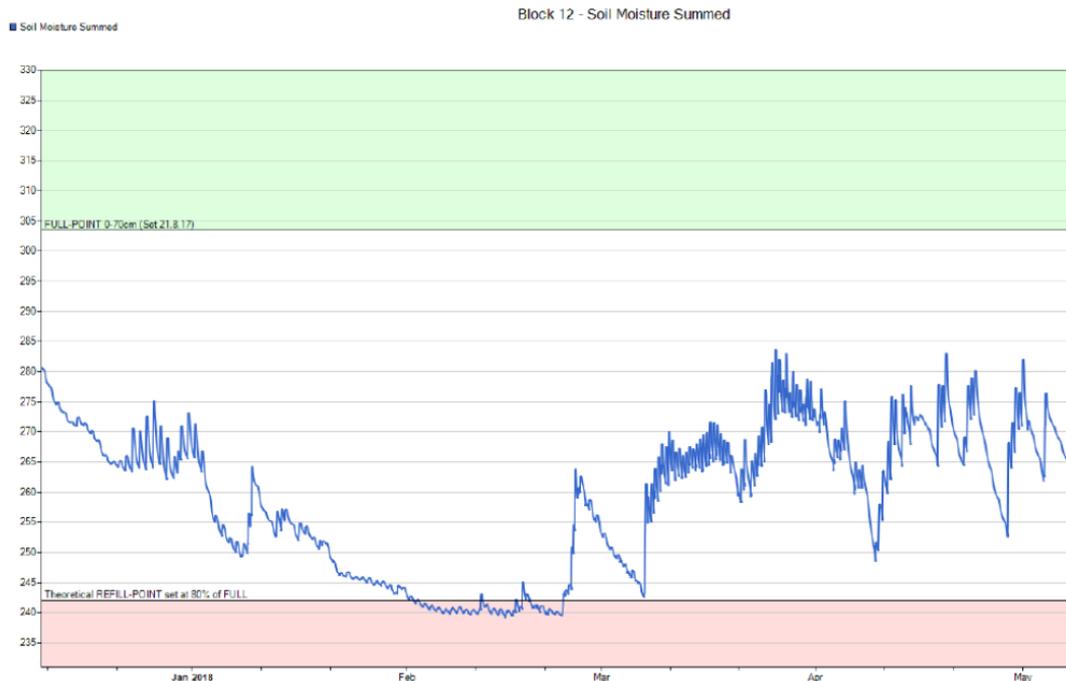


Figure 6 A season overview for another block generated from capacitance probe readings. The blue line represents soil moisture whilst the red the 80% full (refill) point as determined for this soil type. In late February this soil got too dry due to irrigation system issues.

Table 3 Reported outcomes for the Batlow demonstration trial

Probe Type	Positives	Negatives
Agrotek Capacitance Probe	<ul style="list-style-type: none"> • Robust • Reliable (ie, no breakdowns) • Good reporting (information readily available via emails and online) • Frequent data points valuable information for decision making. Good trend info. • Facility to add comments to the online graph (ie rainfall and irrigation run times useful) • Temperature readings could be useful for timing soil fumigation 	<ul style="list-style-type: none"> • Unit of measure unclear and can't be related to known plant impact standard (like kPa can)
Neutron Probe	<ul style="list-style-type: none"> • Accurate Volumetric Soil Moisture data • OK for long-term trend data 	<ul style="list-style-type: none"> • Time consuming • Costly (labour) to run • Value of data limited by frequency of readings
Plexus Gypsum Block System	<ul style="list-style-type: none"> • kPa readings relatable to plant impact standards. This is appealing to managers who have worked with gypsum blocks previously • Frequent readings gives good data resolution 	<ul style="list-style-type: none"> • Variability in gypsum block performance • Anomalies in the data collected due to problems with gypsum block reliability in performance / behaviour • Requires close monitoring of data to identify and fix problems

5.2 Batlow – Managing burr knots in young apple orchards

The last trial in the Batlow region aimed to assess the impact of a burr knots and options for their control. Burr knots are a relatively common disorder seen on certain varieties and rootstocks particularly under certain conditions.

Whilst generally left to their own devices, burr knots can promote disease and pest entry into the tree as well as potentially weakening the tree’s vigour and acting as a weak point for tree breakage. This trial aimed to establish if there were any other negative impacts of burr knots, particularly on tree growth, as well as test some options for their removal and control.

Treatment details and results are shown below in Tables 4 and 5.

Table 4 Treatments from the trial and initial tree measurements

Treatment panel	Avg Tree Height (m)	Avg Trunk Diameter Below Graft (mm)	Avg Trunk Diameter Above Graft (mm)	Avg No. of discrete Burr Knots/ tree	Avg Max Stem Occlusion by Burr Knots (%)
Burrs left + 1% NAA spray + Greenseal	2.3	33.1	22.2	2.7	42.0
Burrs removed + 1% NAA spray + Greenseal	2.3	29.9	22.7	3.8	53.5
Burrs removed + Greenseal	2.4	33.2	25.4	4.4	38.5
Greenseal only	2.3	35.8	24.1	4.6	44.0
Untreated control	2.4	33.8	22.7	2.7	31.2
Average across treatments	2.3	33.2	23.4	3.6	41.2 (range 5 – 95%)

The initial tree measurements (Table 4) appeared to show no direct correlation between burr knotting and tree characteristics (trunk diameter or visual size). Following this initial round of tree measurements, treatments were applied across the trial for revisiting later in the season.

Table 5 Trial results

Treatment panel	Avg tree height gain(m)	Crop load (fruit/tree)	Avg. Maximum stem occlusion (%)
Burrs left + 1% NAA spray + Greenseal	0.38	22.2	42
Burrs removed + 1% NAA spray + Greenseal	0.29	19.1	53.5
Burrs removed + Greenseal	0.305	23.4	38.5
Greenseal only	0.495	17.7	44
Untreated control	0.37	17.6	31.2

Whilst NAA was observed to reduce burr knot activity (similar to the response we see when cuts are painted with NAA) no discernible outcomes were determined from this trial.

The questions remains as to if burr knots are worth managing; and if so, how do we best do it?

6.0 ACKNOWLEDGEMENTS

The ongoing creation, maintenance and monitoring of these trials is made possible due to the ongoing participation of the Focus Orchard growers across Australia and the FLAs who support them to make it happen. The Community Orchard Groups (COG) also play an important role in identifying possible orchards and trial ideas and helping make them happen.

Thanks to the NSW DPI team for their work in collecting the trial data for both the Orange and Batlow regions.