Focus Orchard Trial Update November 2017
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To achieve our 2017 theme of ‘future trees’ we have talked about new ways we can accomplish this goal. Future varieties, future rootstocks and future production systems are all important spokes in the wheel that have been discussed at length at field days, in articles and grower presentations. Equally important, is the on-orchard research that helps showcase some of relevant, innovative and constructive ideas into commercial reality.

In this article we will revisit some of the ongoing and completed on-orchard trials in South Australia, Western Australia and Tasmania. Full trial progress and final reports are available on the APAL website under Future Orchards archive library.

Trial update
Evaluating the value of SNAP trees, South West WA

Picture: On left: Craig Hornblow (Agfirst) SNAP pruning in March 2017. On Right: photo of a trial tree
The Focus Orchard (Fontanini orchard) in West Australia is where SNAP (Simple, Narrow, Accessible and Productive) pruning and management policies are being used on a mature cordon planting system (multiple stems grown on a single trunk)

Leading up to harvest the apples monitored on the SNAP pruned trees were 2.5 millimetres larger than the standard practice. In January the SNAP pruned trees had 3 stems thinned to singles, 3 to doubles and 3 to triples.

Yield estimates across each of the three treatments were created. With 55 apples per stem average in the singles this would be about 34 tonnes per hectare, 147 apples per stem average in the fruit thinned to doubles (90 t/ha) and 185 apples per stem average in the fruit thinned to triples (124 t/ha)

Although only in its first year, the benefits of SNAP systems are already being seen in this trial
Snap trees can be more productive than conventional trees with an estimated 20% labour savings achieved at harvest time (once canopy density is achieved). Aggressive summer pruning produced a higher pack-out and more high-grade fruit than non-summer pruned trees (may be a trial affect due to mild summer temperatures experienced this past season).

One of the most exciting findings from the first year of the SNAP project was the indication that SNAP trees could be more productive. Profitability is heavily linked to yield and management capacity. The simple addition of more stems per hectare increases the opportunity to maximise yield. The simplicity of the SNAP system and rules when combined with proper training and application is proving at this early stage to be a major success. It is expected this winter to continue the previous year’s pruning rules by cutting out the 2 longest branches and keep targeting narrower trees with shorter fruiting wood. This could be a game changer for Future Orchards in WA.

More importantly these results have been produced from older Rosy Glow and Fuji trees and re-working them to fit the notion of the SNAP system. This shows that SNAP pruning methods aren’t just adoptable on dwarf newly planted blocks, but existing traditional wide plantings as well. Future canopy’s in future orchards will need to be Simple, Narrow, Accessible and Productive. Understanding how to deliver on these systems is proving easier than first thought. We have more work to back this up again this year and certainly the top end crop loads won’t be as aggressive, but we aim to still shoot higher than traditional expectations.

**Young tree growth project, Adelaide Hills, South Australia**
The young tree growth project at Joel Brockhoff’s orchard in South Australia finished its 4th leaf growing phase in 2017. With more yield and height data, it is interesting to compare the six different strategies that were used on the Aztec Fuji block. The treatments were pruning trees back to a whip (removing all side branches) with no heading cuts at planting. The other three treatments involved whipping the trees as well as heading (cutting the tree tops back by about 30-50cm) at planting and planting as provided by the nursery.

This trial had a two-pronged approach. The first was optimizing growth in netted orchard systems and in turn increasing productivity. The second was reducing variability in a young planting. Variability is a cross industry, market and varietal issue. In a lot of cases it is a mechanism to decrease performance and is a source of risk.

As Fuji has been traditionally difficult to gain sufficient leader growth in South Australia this was an important measuring characteristic. With an aim of getting all treatments to 4m as soon as
possible, after the 4th leaf none of them are quite there. With the closest treatments being one the whipped non-headed treatments.

One of the historic reasons this goal may have been hard to achieve in South Australia is the presence of readily formed basal branches which ‘choke’ the weak leader. On the control treatment which mirrored the existing way of planting this was exactly the case. The control treatment had:

- The Lowest number of total growth points (branches, sprigs and spurs)
- The lowest leader height in 2016 and 2017, despite not being the lowest at planting
- The lowest number of branches

Figure 2 Joel Brockhoff assessing harvest
As previously stated this all comes down to the influence the dominant lower limbs have over the leader which are a result from the non-pruning at planting. Already these interim results could indicate how we can better manage certain varieties in future orchards moving forward.

Other interim trial results showed that non-headed trees tend to have more branches and less small growth (sprigs and spurs) than the headed treatments. This resulted in better commercially structured trees that may be suitable for future orchard systems or SNAP orchard (previously discussed). The trial will continue for two more seasons.

**Observations of Erger™ use in South Australia, Adelaide Hills**

It is often part of Focus orchard trials to evaluate new chemistry in commercial environments to understand the best ways to maximize its affect. Erger™ is a recently released product that is reputed to promote uniform floral bud break from dormancy. Erger™ is reported to both advance and condense flowering, depending on the application time. It may provide another tool for growers to use in this area.

![Graph 1: Erger Trial - % of Buds at or beyond Green tip - September/October 2016](image)

*Picture: Results from Erger trial showing results of treatments over time*

All Erger™ treatments on the commercial Open V trellis orchard of Alvina Gala in an Adelaide Hills experienced an advancement and compressed flower development when compared to the control (Pink line).
The trial showed promising results that Erger could advance and condense flowering. Although little benefits were seen in fruit maturity or size, this was still a great result.

What is important moving forward in this trial is to understand how the best window to apply the product. Erger treatments advanced the green tip and full bloom dates relative to the control treatment (no Erger application) except for the last application in late August. Further confidence around the best date of applications, repeatability of these results and achieving the same results in adverse weather conditions appear to be the next stage of this trial.

**Maximising growth in young pedestrian orchard plantings, Tasmania**

We often talk about the 3 P’s of Harvest performance; Perfection, Production and People. These points impact the 3 P’s which are a focus of the in the Future Orchard program; Production, Packout and Price. Looking forward, we may need to consider adding a fourth ‘P’ which could help us achieve both objectives, one which stands for pedestrian!

A new pedestrian orchard block of Alvina Gala trees (M9 rootstock) was planted at Millers Orchards, in October 2015. Tree were planted as unfeathered whips, headed and grown as dual leader trees.

The main purpose of a pedestrian orchard is to have trees which are short enough that orchard tasks such as pruning, training and picking can be completed by people on the ground. It is hoped that efficiencies can be achieved through eliminating ladders and work platforms without compromising yield in any way through a decrease in height (canopy area)

This trial also aimed at increasing evenness between leaders by direct heading vs delayed heading. There was no effect of the heading treatment on leader evenness.

The grower has provided some useful pointers as to what he learnt through managing a developing pedestrian orchard.

- The primary focus should be developing dual leader height without getting caught up in the ‘finesse’ of leader spacing.
- The angle of the leaders was important to ensure one leader does not dominate in growth. This is a source of in orchard variation.
- An appropriate trellising system to support the developing canopy is critical.

Initial finding in the second year of this trial have already lead to the grower ‘tweaking’ management techniques leading into next year. Some different pruning techniques, utilizing Regalis, and a review of the fertilizer plan to have an increased balanced nutrition program are all on the cards.
Another interesting conclusion was that trees grown as dual leaders in the nursery are on track to reach tree height targets one year earlier than trees grown as un-feathered whips and headed at planting. This is most likely due to the quicker establishment time. Achieving the desired goal of future trees will be everyone’s responsibility, with nurseries as well having to develop trees which will best fit or plans with pedestrian orchards moving forward.

With single leader trees recorded higher leader growth than multi leader year 1 pedestrian orchard plantings it may be too early to make direct compressions. What we learn most from trial is that we need to understand how a system preforms at maturity before jumping to conclusions.

Figure 2 Orchard Walk at Millers orchard June 2017 discussing the new pedestrian block

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