Focus Orchard Case Study: Is 100 t/ha of high quality fruit possible?

Orchard: Oakleigh, Adelaide Hills, South Australia
Orchardist: Rob Green
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Objective

To be able to match world’s best practice of 100 t/ha of high quality Pink Lady year in year out.

Background

Rob grows fruit on the Adelaide Hills which is renowned for high fruit quality, however yield a key driver of success can be low by international standards. The “Hills” have some real challenges for apple production, the main ones being very hot summer temperatures, low levels of rainfall, less than ideal water storage and flocks of birds that love apples just as they ripen. Many growers would accept these limitations and with it accept low Class 1 yields. Well not Rob, he’s always up for a challenge.

Results

In the 2013 season, Rob has two blocks of Rosy Glow (Blocks 17 and 2) that have just picked 92 and 85 t/ha respectively (Fig 1, 2 & 3). Not only are the yields very impressive but the fruit quality was also top class. Class 1 recovery according to FLA Paul James is expected to be 90% and fruit size averaged 75 mm at harvest so should average 180 g. Following the 2013 season, Rob is convinced the magical 100t without sacrificing quality is possible.
Rosy Glow Block Production
Kg Per Ha
Oakleigh Orchard - Focus Orchard Blocks - all blocks

- Round bullets indicate actual production.
- Square bullets indicate estimated production.

Figure 1 Block 2 and 17 Rosy Glow production

Figure 2 Block 17 just prior to 2013 harvest
Methods

- To achieve 100 t/ha of high quality fruit will require horticultural class in all areas. So what does Rob believe contributed to his fantastic 2013 result?
- Good high tree density on a dwarf rootstock (3.5 * 1.0 m on M26 rootstock)
- Hail net was installed Dec 2010, which is one of the main contributions. Yield off the 2 blocks has steadily climbed from 50 t/ha in 2011 to 90 t/ha in 2013. There are direct and indirect benefits of the net.
- Apart from less hail, sunburn and bird damage, one secondary benefit is the additional support structure allowing tree height to increase. The post prune TRV in 2012 was lifted to over 8200 m$^3$ per ha. Tree height is now equal to row width.
- The netting with its high capital cost set up disciplines to make sure the canopy underneath the net was maximised. In Rob’s words, ‘you try a little harder’.
- The increased structure allowed the trees to be kept very straight and very uniform.
- Good bud strength was developed through good water and nutritional programmes.
- Calm, pendant fruiting units. Rob has carried out a fair degree of branch bending in the last few years. He has invested in branch tying to train the fruiting units into a pendant position (figure 4).
• Low vigour control with lots of darts in the tree of approximately 20cm length. Vigour control achieved through a combination of Root Pruning, Regalis, and post bloom Ethrel applications.

• Appropriate chemical thinning. In 2012/13, only one late application of carbaryl to the top half of the tree was required – this was very effective, resulting in minimal hand thinning inputs. Getting crop load to target early is a key to achieving high yield but also quality.

• Minimal thinning inputs of only 100 hours per hectare. Thinning was only needed in the tops. No thinning was carried out in the bottom six foot of the tree. Rob believes this part of the canopy still has opportunities to increase. The fallout of carbaryl from the top application was still over thinning the bottoms. Could be further improvements here with better directional spraying with a tower sprayer.

• Weekly fruit growth and soil moisture monitoring was undertaken with appropriate action where required. The fruit achieved 74.5mm average fruit diameter just prior to harvest.

• Extenday™ reflective mulch was applied 3 weeks out from harvest. Rob believes the benefit of the Extenday™ this year was amazing.

• The 92 t/ha was able to be picked to colour and long store maturity spec in one pick (Figure 5). With high storage ability and a high C1 packout, the block profitability will be very impressive.
When I sent my note of congratulations to Rob, I received a very poignant reply:

“Still a bit shocked myself. Didn’t look like a 90t crop and makes me think that there’s a bit more to come. The driest summer that I have had to combat, made it a year to look back and say that I have learnt something.
“Apple growers carry too much baggage, we are so much better off when we find solutions instead of excuses.
“Many thanks to APAL and the AgFirst team for the Future Orchards program and helping to remove the blinkers.”