ACKNOWLEDGEMENTS

The ongoing creation, maintenance and monitoring of these orchard blocks is made possible due to the ongoing participation of the Focus Orchard growers across Australia and the Front-Line Advisors who support them. Special thanks to the team at Seven Springs (Darryl, Caroline and Dom), Stoneleigh (Ian and Prue Pearce) and NSW DPI (Kevin Dodds and Jessica Fearnley) for their assistance with data used in this article.

ORANGE – STONELEIGH ORCHARD

Season update

Orange has been under drought conditions throughout the last season (Figure 1) with water management a critical component of production. With poor rainfall over the preceding season, dam levels started the season at low levels for most growers inclusive of the Orange focus orchard ‘Stoneleigh’.

As a result of these conditions fruit size has been a significant challenge across the region with the need to reduce (or stop) irrigation of a number of blocks a requirement for many growers due to the significant rainfall deficit and very limited water supplies following the previous year’s rainfall conditions.
Stoneleigh’s water management 2020

Coming into the 2020 growing season with the need for early irrigation cycles, water management was high on the agenda throughout the growing season. With a poor rainfall outlook, decreasing bore yields and restricted access to creek flows, dam levels continued to lower with no replenishment likely across the growing season.

As Stoneleigh is a mixed operation with both apples and cherries, a focus was put onto the cherries to maximise their profitability given their shorter season length (which proved to be a good decision despite leaving the apple blocks with less available irrigation water). Whilst water demand reduced in the cherries postharvest the risk of running out of water and losing significant tree numbers was still apparent across the apple blocks.

With no improvements in rainfall to mid-December, the reality was that water use needed to be reduced further. In mid-December the decision to turn off two blocks was made; but how?

Blocks were evaluated based on their potential for production and packout both in this season and future seasons
  ● What was in?
    ○ Higher performing trellis blocks
    ○ Young plantings
  ● What was out?
    ○ freestanding Royal Gala and Galaxy block
      i. poor production and mixed packout results in previous years
    ○ Galaxy block on M793
      i. relatively poor production and mixed packouts
      ii. Seemed particularly stressed at the time of decision

In electing to turn off these two blocks; 15% of orchard planted area no longer required irrigation. Whilst a big help, significant deficit irrigation was still the reality across the farm with small fruit size and reduced fruit quality the end result.

Looking to the future:
  ● Dams are being topped up while possible from creek license
  ● Considering drilling an additional bore to increase reliability of the current low yielding secondary bore
  ● All micro sprinklers across the farm will be replaced with drip tube
    ○ given the dry and windy conditions across the 2019/20 season evaporative losses and less effective wetting depth associated with these micro sprinklers was an issue
  ● Blocks that were turned off are likely to be bulldozed and fallowed
 Whilst the 2020 growing season was a challenging one in Orange, Stoneleigh’s decision-making still saw some good results across the rest of the farm in prioritised blocks. This block profile highlights the results for their oldest Kanzi planting (estimated fruit size and packout).

**Variety:** Nicoter (Kanzi)
**Rootstock:** M26
**Row spacing:** 3.5m
**Tree spacing:** 1.1m
**Trees/ha:** 2597
**Age:** Planted winter 2014

**Results to date**

Despite a difficult growing season, this Kanzi block produced 57.8t/ha of fruit. With fruit yet to be packed an estimate of fruit size and packout (42%) is presented in Figure 2 at a 150g average size (~82 count).

This block has historically struggled with bitter pit and stem end russet/microcracking issues which are expected to be antagonised by the hot and dry conditions this season (hot and dry weather results in lower calcium uptake).

*Figure 2* Stoneleigh’s 2014 Kanzi results in OrchardNet’s thinning report.
The plan for the ‘2014 Kanzi’ block in 2021

After a disappointing result for the 2020 harvest season, it will be critical to focus on improving the class 1 packout within this block to improve its profitability.

To achieve this a few key areas will be focused on for the next year:

- Establishing an optimal cropload for this block’s tree size and age (Figure 3)
- Focus on calcium uptake and nutrient balance
- Detailed pruning to target bud counts
- A relatively aggressive chemical thinning program and early hand thinning to aid fruit size development

With water levels in dams significantly better than this time last year it is expected that an increase production and packout should be achieved in the coming year.

Figure 3 Stoneleigh’s 2014 Kanzi results in OrchardNet’s gross production by tree age report. The value for 7th leaf is the 2020 target value (65t/ha)
Season update
As highlighted in the news and in APAL’s newsletters, the Batlow region was impacted by bushfire during the last summer. Whilst considerable area was undamaged, a number of growers lost significant numbers of trees as well as the impact on crops of no power or access to replace and turn on irrigation systems.

For further information on the bushfire impacts and the plans moving forward see the APAL website (the “Build Back Better: Apple Industry Bushfire Recovery Plan” highlights key data across the three regions affected this year), NSW DPI and localised media releases.

Figure 4 Visualisation of orchards in the Batlow area. Brown/red colouration roughly corresponds to burnt area. Town is highlighted in red
Block profile: ‘Block 3 Rosy Glow’

Figure 5 Fire damage to the edge of Block 3 Rosy Glow

Variety: Rosy Glow (Pink Lady)
Rootstock: M26
Row spacing: 4.0m
Tree spacing: 2.5m
Trees/ha: 1000

A tale of two halves

This block of Rosy Glow has historically struggled significantly to get high yields despite being on a dwarfing rootstock and at full canopy. Why?

To answer this question a block walk can tell a lot of answers. This block has a slope with the lower portion of the block traditionally having poor fruitset and as a result higher vigour, poorer fruit quality and consequently, fruit is often not picked in this area. This may be related to a combination of slope, shading and soil moisture levels.
In order to combat this ‘zoning’ of tree types within blocks a few key strategies were adopted:

- The block was split into two zones
  - Bottom of hill
  - Top of hill
- Chemical thinning strategies are different in each zone
  - No primary thinner applied in lower zone (halfway mark of block was marked with tape on trellis poles)
- Option to further manage zones separately
  - Summer prune bottom half at different timing
  - Apply root pruning in bottom half only

As of the time of writing we’re still waiting to confirm the 2020 results of this block but will be one to watch on OrchardNet (you can login using the user: focus and password: focus to view Seven Springs).
2019/20 Trial Updates – Batlow and Orange

Trials in both Orange and Batlow are managed by the NSW DPI team in conjunction with the Focus Orchardists in NSW.

In addition to the below trials, the 2020 season saw trials included:

- Woolly apple aphid study (Batlow)
- Croploading in drought conditions (Orange, Stanthorpe)
- Primary thinning methods in Pink Lady (Goulburn Valley)
- Young tree growth (Adelaide Hills)
- Pruning timing of Fuji (Adelaide Hills)
- Leader management in Pink Lady (Adelaide Hills)
- Minimising heat stress/sunburn in Gala (Harcourt)
- Predicting lenticel damage in Kanzi (Nicoter) (Western Australia)
- Water use, growth rate and taste of apples (Western Australia)
- Harvista treatment on Gala (Tasmania)
- Stem clipping of Envy (Scilate) - review (Tasmania)

For further information on Future Orchards trial results, navigate to the Future Orchards Library on the APAL website.

Orange - Effect of nitrogen application timing on Gala fruit quality

Trial information and data compiled by Jessica Fearnley (NSW DPI)

With a very dry season predicted for Orange and some difficulty getting young tree growth, a trial was established to evaluate the effect of mulching on young tree growth.

![Figure 7 Pine mulch in one of the treated areas](image)

Treatments
The treatments in this trial were three separate programs used:
1. No mulch
2. Prescribed rate (48m³/ha) of pine mulch
3. Double prescribed rate (96m³/ha) of pine mulch

Measurements
The measurements to assess the effect of mulch on the young Bravo (ANABP-01) trees were:
- Trunk cross sectional area (initial and at different time points)
- Tree height (to determine change in height/extension growth)

Results to date (trial still ongoing)

This trial is still ongoing but a selection of results are presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Initial and interim measurements for the treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Average initial TCA cm²</td>
</tr>
<tr>
<td>No mulch</td>
<td>20.2</td>
</tr>
<tr>
<td>Mulch @ 48 m³/ha</td>
<td>20.0</td>
</tr>
<tr>
<td>Mulch @ 96 m³/ha</td>
<td>17.8</td>
</tr>
</tbody>
</table>

Observations
To date the below observations have been made:
- Moisture retention appears to be better under the mulch
- Visually there hasn’t been much difference between the treatments
- The crop on this block was minimal

Other comments
- Given the current results there are a few key factors identified as potential factors for these results:
  - The use of pine mulch has resulted in plant available nitrogen being ‘locked up’ as microorganism populations work to break down this organic material
    - Topdressing with nitrogen (or using compost) to offset this effect of the wood mulch may have minimised this effect
  - Long term plant available nitrogen levels would be expected to increase as the mulch breaks down further
- In addition to this, this block has been challenged since planting and has relatively high variability. This is likely to have been caused by:
  - Potential for specific apple replant disease (SARD) issues in this block
    - Tree size is variable and have struggled since planting with no fumigation used
  - Compost into tree line at planting may have impacted root growth

Will be an interesting one to see the results into the next season.

Batlow - Effect of nitrogen application timing on Gala fruit quality

Trial information and data compiled by Kevin Dodds (NSW DPI)

Treatments
Applying the ‘right’ amount of nitrogen is critical in ensuring the optimal balance between tree health, growth and fruit quality. To demonstrate the effect of nitrogen application timing and rate on fruit quality (and return bloom - results to come), a small application trial was run in Batlow on two Gala strains, Galaxy and Alvina.

The treatments in this trial were three separate programs used:
1. No nitrogen applied
2. Spring program
   a. November/December = 40 units N
3. Spring + summer program
   a. November/December = 50 units N
   b. January/February = additional 50 units N (total 100)

Table 2 Details of nitrogen application dates, timings and rate applied in the Batlow nitrogen uptake trial.

<table>
<thead>
<tr>
<th>Date of application</th>
<th>Block 4 Gala (g of CaNo3 applied in 10L/Tree)</th>
<th>Block 1 Alvina (g of CaNo3 applied in 4L/Tree)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 Units</td>
<td>100 Units</td>
</tr>
<tr>
<td>6th November 2019</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>18th November 2019</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>4th December 2019</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>19th December 2019</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>Missed due to fire</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>29th January 2020</td>
<td></td>
<td>160*</td>
</tr>
<tr>
<td>12th February 2020</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>26th February 2020</td>
<td></td>
<td>80</td>
</tr>
</tbody>
</table>

* Double rate applied to make-up for missed application due to fire.
Results

**Figure 8** Leaf ammonium N results from the three different treatment areas.

**Figure 9** Foreground colour of sampled fruit (Alvina Gala) from the three different treatment areas.
**Galaxy Gala Colour Comparison at Harvest**

<table>
<thead>
<tr>
<th>Units of N</th>
<th>Treatment Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>100</td>
<td>Nov-Feb</td>
</tr>
<tr>
<td>Zero</td>
<td>Control</td>
</tr>
</tbody>
</table>

Figure 10 Foreground colour of sampled fruit (Galaxy Gala) from the three different treatment areas

**Conclusions**

- Ammonium N status lowest where no nitrogen was applied (Figure 8)
  - Total leaf N status differences were inconclusive
- There was a visual difference in the fruit colour of Alvina Gala (Figure 9)
  - Zero nitrogen applied = more intense foreground colour

Keep an eye on all Focus Orchard block progress through OrchardNet using the focus orchard login (username: focus password: focus) and trial updates on the APAL website.