Future Orchards Trial: Final Report

<table>
<thead>
<tr>
<th>Project title:</th>
<th>Testing rate, wetter and number of applications of GA3 plant growth regulator on young apple trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region:</td>
<td>Stanthorpe in Queensland</td>
</tr>
<tr>
<td>Contact:</td>
<td>Stephen Tancred</td>
</tr>
<tr>
<td>Projective Objective:</td>
<td>1. To confirm the efficacy of GA3 as a stimulant of vegetative growth on young apple trees.</td>
</tr>
<tr>
<td></td>
<td>2. To compare 4 rates of GA3 (100, 200, 300 and 400 ppm) as a stimulant of vegetative growth on young apple trees.</td>
</tr>
<tr>
<td></td>
<td>3. To test if wetters enhance the efficacy of GA3 as a stimulant of vegetative growth on young apple trees.</td>
</tr>
<tr>
<td></td>
<td>4. To compare the efficacy of 2, 3, 4 and 5 applications of GA3 as a stimulant of vegetative growth on young apple trees.</td>
</tr>
</tbody>
</table>

Outline/method: Refer to the Treatment list and Assessments sections

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Completion date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial defined</td>
<td>Mid-September 2015</td>
</tr>
<tr>
<td>Site selected</td>
<td>Early October 2015</td>
</tr>
<tr>
<td>Trial laid out and mapped</td>
<td>Mid October 2015</td>
</tr>
<tr>
<td>Applications commenced</td>
<td>Late October 2015</td>
</tr>
<tr>
<td>Records measurement 1</td>
<td>Early December 2015, mid-January, mid-March 2016</td>
</tr>
<tr>
<td>Field day</td>
<td>Trial inspected at Orchard Walk on 25th January 2016</td>
</tr>
<tr>
<td>Reporting</td>
<td>Final report submitted 4th August 2016</td>
</tr>
<tr>
<td>Presentation to growers</td>
<td>Final results presented to growers at Orchard Walk on 27th June 2016</td>
</tr>
</tbody>
</table>
Trial map:

Trial layout:

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N→

<table>
<thead>
<tr>
<th></th>
<th>Rep 1</th>
<th>Rep 2</th>
<th>Rep 4</th>
<th>Rep 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>T6</td>
<td>T8</td>
<td>T3</td>
<td>T2</td>
</tr>
<tr>
<td>T2</td>
<td>T1</td>
<td>T7</td>
<td>T4</td>
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<tr>
<td>T10</td>
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<td>T2</td>
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<td>T4</td>
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<tr>
<td>T9</td>
<td>T6</td>
<td>T5</td>
<td>T8</td>
<td>T1</td>
</tr>
</tbody>
</table>
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Trial site
Photographs

Trial site at first application, 02/11/15

Untreated control (L) and Pro Gibb + Maxx (R)
Treatment List:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Product</th>
<th>Rate of product</th>
<th>Grams a.i. per 100 litres</th>
<th>ppm a.i.</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Untreated control</td>
<td>-</td>
<td>20</td>
<td>200</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>ProGibb</td>
<td>50 g/100 L</td>
<td>20</td>
<td>200</td>
<td>Applied 4 times</td>
</tr>
<tr>
<td>3</td>
<td>ProGibb</td>
<td>75 g/100 L</td>
<td>30</td>
<td>300</td>
<td>Applied 4 times</td>
</tr>
<tr>
<td>4</td>
<td>ProGibb</td>
<td>100 g/100 L</td>
<td>40</td>
<td>400</td>
<td>Applied 4 times</td>
</tr>
<tr>
<td>5</td>
<td>ProGibb</td>
<td>100 g/100 L + Agral wetter</td>
<td>40</td>
<td>400</td>
<td>Applied 4 times</td>
</tr>
<tr>
<td>6</td>
<td>ProGibb</td>
<td>75 g/100 L + Maxx wetter</td>
<td>30</td>
<td>300</td>
<td>Applied 4 times</td>
</tr>
<tr>
<td>7</td>
<td>ProGibb</td>
<td>75 g/100 L + Hasten wetter</td>
<td>30</td>
<td>300</td>
<td>Applied 4 times</td>
</tr>
<tr>
<td>8</td>
<td>ProGibb</td>
<td>75 g/100 L</td>
<td>30</td>
<td>300</td>
<td>Applied 2 times</td>
</tr>
<tr>
<td>9</td>
<td>ProGibb</td>
<td>100 g/100 L</td>
<td>40</td>
<td>400</td>
<td>Applied 3 times</td>
</tr>
<tr>
<td>10</td>
<td>ProGibb</td>
<td>100 g/100 L</td>
<td>40</td>
<td>400</td>
<td>Applied 5 times</td>
</tr>
</tbody>
</table>

Variety was Pink Lady on M26 rootstocks. Trees 2 years old.
Trial was conducted in young, non-bearing apple trees.
Application was dilute to the point of run-off to the whole tree.
Buffering agent was used to ensure the pH of the solution is ~5 to 5.5
Treatments were replicated 4 times.
Product used was Sumitomo’s ProGibb SG which is 400 g/kg gibberellic acid (active ingredient).

Assessments:

- Shoot growth was measured 3 times during the growing season; 11th December, 19th January and 20th June.
- Measurements taken were the length and number of 1 year old shoots on each tree. Data for the leader shoot was measured separately.
- Observations were made on any phytotoxicity on leaves in the week after application (especially for treatments 6, 7 and 8).
- Photographs of main features of results were taken.
- Observations on return bloom will be made in October 2016

Results summary

1. GA3 stimulated vegetative growth on young apple trees.
2. GA3 had efficacy when applied at 200, 300 and 400 ppm as a stimulant of vegetative growth on young apple trees.
3. When GA3 was mixed with Agral or Maxx wetter there was a trend for greater stimulation of vegetative growth on young apple trees, than when GA3 was applied without a wetter.
4. When GA3 was applied 3, 4 and 5 times during the season the stimulation of vegetative growth on young apple trees was similar. Stimulation was greater when applied 3, 4 or 5 times than when it was applied twice.
Implications

It is important to note that GA3 is not registered for use on apple trees with the APVMA. Hence this work is only a guide to future use of this product, after registration.

What did we learn? GA3 will be a useful tool to increase number and length of shoots in young apple trees, which will speed up the attainment of full tree canopies. It is important to fill canopies as much as possible before cropping commences when using dwarfing rootstocks.

How will this impact on the business? It will shorten the time to reach full canopy and hence full production.

What will we change? Growers will have more confidence when planting dwarfing rootstocks that they can attain high yields.

What are the road blocks/obstacles to change? The product needs to be registered with the APVMA before it can be used by growers.
Rate trial

**Pink Lady shoots (cm), Stanthorpe Q. 19th Jan 2016**

- Untreated control
- ProGibb 50 g, 4 times
- ProGibb 75 g, 4 times
- ProGibb 100 g, 4 times

**Pink Lady shoots, Stanthorpe Q. 19th Jan 2016**

- Untreated control
- ProGibb 50 g, 4 times
- ProGibb 75 g, 4 times
- ProGibb 100 g, 4 times

**Pink Lady shoots (cm), Stanthorpe Q. 19th Jan 2016**

- Untreated control
- ProGibb 50 g, 4 times
- ProGibb 75 g, 4 times
- ProGibb 100 g, 4 times
Wetter trial

Pink Lady shoots (cm), Stanthorpe Q. 19th Jan 2016

- Untreated control
- ProGibb 75 g, 4 times
- ProGibb 75 g + Agran 4 times
- ProGibb 75 g + Maxx, 4 times
- ProGibb 75 g + Hastings, 4 times

No of shoots, Stanthorpe Q. 19th Jan 2016

- Untreated control
- ProGibb 75 g, 4 times
- ProGibb 75 g + Agran 4 times
- ProGibb 75 g + Maxx, 4 times
- ProGibb 75 g + Hastings, 4 times

Pink Lady shoots (cm), Stanthorpe Q. 19th Jan 2016

- Untreated control
- ProGibb 75 g, 4 times
- ProGibb 75 g + Agran 4 times
- ProGibb 75 g + Maxx, 4 times
- ProGibb 75 g + Hastings, 4 times
No. of applications trial

**Pink Lady shoots (cm), Stanthorpe Q. 19th Jan 2016**

- Untreated control
- ProGibb 100 g, 2 times
- ProGibb 100 g, 3 times
- ProGibb 100 g, 4 times
- ProGibb 100 g, 5 times

**Pink Lady shoots, Stanthorpe Q. 19th Jan 2016**

- Untreated control
- ProGibb 100 g, 2 times
- ProGibb 100 g, 3 times
- ProGibb 100 g, 4 times
- ProGibb 100 g, 5 times

**Pink Lady shoots (cm), Stanthorpe Q. 19th Jan 2016**

- Untreated control
- ProGibb 100 g, 2 times
- ProGibb 100 g, 3 times
- ProGibb 100 g, 4 times
- ProGibb 100 g, 5 times
RATE TRIAL

Pink Lady shoots (cm), Stanthorpe Q. 20 June 2016

- Untreated control
- ProGibb 50 g, 4 times
- ProGibb 75 g, 4 times
- ProGibb 100 g, 4 times

Leader length

Pink Lady shoots, Stanthorpe Q. 20 June 2016

- Untreated control
- ProGibb 50 g, 4 times
- ProGibb 75 g, 4 times
- ProGibb 100 g, 4 times

Total shoot length
NUMBER OF APPLICATIONS TRIAL

Pink Lady shoots (cm), Stanthorpe Q. 20 June 2016

- Untreated control
- ProGibb 100 g, 2 times
- ProGibb 100 g, 3 times
- ProGibb 100 g, 4 times
- ProGibb 100 g, 5 times

Leader length

Pink Lady shoots, Stanthorpe Q. 20 June 2016

- Untreated control
- ProGibb 100 g, 2 times
- ProGibb 100 g, 3 times
- ProGibb 100 g, 4 times
- ProGibb 100 g, 5 times

Total shoot length
WETTER TRIAL

Pink Lady shoots (cm), Stanthorpe Q. 20 June 2016

- Untreated control
- ProGibb 75 g, 4 times
- ProGibb 75 g + Agral 4 times
- ProGibb 75 g + Maxx, 4 times
- ProGibb 75 g + Hasten, 4 times

Pink Lady shoots, Stanthorpe Q. 20 June 2016

- Untreated control
- ProGibb 75 g, 4 times
- ProGibb 75 g + Agral 4 times
- ProGibb 75 g + Maxx, 4 times
- ProGibb 75 g + Hasten, 4 times

Leader length
Total shoot length