Future Orchards

Future Orchards Business Development Group Update

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December already!

Fruit is now becoming increasingly visible and hand thinning is well and truly underway.

This newsletter touches on some of the thought processes for hand-thinning prioritisation as well as a gentle reminder on fruit sizing (I would suggest that you should have started but it's never too late) as well as the methodology depending on the questions you're trying to answer.

Being >60 days after full bloom now the heaviest and blocks with high biennial bearing risk should ideally have had their croploads reduced significantly by now; even if that means returning later to get down to target croploads. A double pass strategy can be an effective way to minimise biennial bearing risk across the whole, particularly where labour supply may be limited.

As hand thinning continues it is the ideal time to be working on your crop estimate for the year. This will start to inform how harvest 2020 is going to look, whether you need to order more bins and whether additional staff may be required.

Good luck for the rest of your hand-thinning and here's hoping the Christmas and New Year's period is a happy one (and not all work!)

Cheers,

Nic

OrchardNet has a variety of in-built tools to allow for production planning. A combination of accurate tree counts, areas, block production targets and other factors can be combined to give target bud and fruit numbers per tree.

http://www.orchardnet.co.nz

Don't have an OrchardNet account?

As part of the Future Orchards project OrchardNet is provided to Australian growers for free (up to 1200 blocks total). Please contact your local FLA or a member of AgFirst (see details on the last page of this newsletter) if you would like to give it a go.

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Prioritisation and planning

With Christmas just around the corner and hand-thinning still underway it is crucial to prioritise remaining key blocks in a timely fashion to maximise crop potential, both this year and into the future.

The foundation - Pre-hand thin counts

Typical strategies rely on counting ~3 tree per hectare to achieve an average fruit count.

For the additional effort, fruitlet cluster counting can provide added value but requires additional effort (time per count doubles)

See: https://apal.org.au/wp-content/uploads/2019/09/19BDG-Newsletter-November-2018-NF.pdf

Do not forget that even though an average count may suggest no thinning is required, there are likely to be a proportion of trees that are heavy. This is why it's important to evaluate both average fruit numbers, but more importantly the variability within them.

Where variability between trees is high the number of trees counted per hectare needs to increase to provide better outcomes. This might be 3 trees per hectare of each tree "category" e.g. small, medium, large. Highly variable are a significant challenge for cropload optimisation.

Got the data? Use the data

Whilst certain blocks are easy targets for hand-thinning, some are more subtle when it comes to prioritising when they are thinned.

Generally, gut feel dictates that the best places to start will be:

- Blocks in a biennial swing in the "on" year
- Young trees
- "Issue blocks" e.g. low vigour
- Challenging varieties e.g. Fuji

Block	Pre-thin % of target	Thinned to			
		Singles	Doubles	Doubles top	Doubles bottom
A1 Fuji	291%	113%	185%	124%	174%
B1 Fuji	131%	105%	155%	117%	138%
C1 Fuji	164%	100%	144%	116%	128%
E1 Kanzi	139%	98%	128%	109%	117%
F1 Jazz	153%	101%	141%	112%	130%
G1 Galaxy	124%	105%	122%	104%	118%
H1 Rosy Glow	300%	246%	296%	257%	285%

Where to next?

Things to consider:

- % of optimal cropload
- Biennial bearing risk
- Desired size
- Desired tree growth
- Size of blocks
- Available staff
- Potential value of fruit

The result of a series of counts relative to target are presented in the table above.

Looking down this list (which has been colour coded) there are some major issues and a reasonable hand-thinning job based on pre-thin % of target.

Block H1 and A1 are three times what was determined to be the optimal cropload. **RED FLAG**

The theoretical result of thinning to singles would also suggest that block H1 was quite badly under pruned (not enough spur removal) given tree growth was desired on this young block.

All other blocks appear to have adequate sites to allow fruit to be left in singles (a nice easy instruction to thinning crews).

Following a bit of ground-truthing in the field, the final suggested priority list was:

- H1 Rosy Glow
- A1 Fuji
- C2 Fuji
- B1 Fuji
- F1 Jazz
- E1 Kanzi
- G1 Galaxy

All Fuji blocks require shoot ripping prior to speed up thinning crews which will occur whilst H1 Rosy Glow is thinned.

Crew A starts in H whilst crew B starts shoot ripping Fuji, moving A > C > B being chased by A. Completion of these sees both teams moving to Kanzi before finishing in Galaxy.

By having clear roadmap of priorities on paper, time of transitions between blocks can be planned in advance and "dead time" minimised by the entire team.

Fruit sizing – Growth rate versus size profile

Fruit size monitoring can be an important decision support tool when it comes to optimising fruit size and reacting in a timely manner. Whilst absolute fruit size can be a good comparative tool, the fruit growth rate (mm per week) can provide much deeper insights into performance. When ti comes to lifting size think; water, cropload (re-thin), nutrition, manipulation (e.g. Retain™ or Harvista™)

Fruit sizing basics

There are fundamentally two questions being asked by most growers when fruit sizing:

1. What will be my final fruit size be?
2. Is my fruit size on-track for my target size?

Whilst the second question is typically a straight comparison to previous years (or other reference curves) the first can be a bit misleading dependent on seasonal differences.

Generally speaking, fruit size measurements are compared between years relative to the number of days after full bloom (DAFB) with most fruit's having a relatively consistent seasonal length from bloom to harvest.

What will my final fruit size be?

A crucial question when it comes to meeting market demands.

This is where it is important to understand how representative samples are within your block. Taking weekly measurments 5 fruit on a single branch of one tree is unlikely to provide a highly accurate fruit size estiamte given natural variation within the canopy and variability across the block. In this example (Figure 1) actual fruit size, despite tracking over a 182g reference curve, was only 167g per fruit.

Additonal sampling (rather than ~20 fruit per block) can provide a greater insight. 100 fruit randomly selected at key checkpoints throughout the season typically provides a more robust estimate. Do not forget that fruit size may vary considerably more than what is easily accessible at chest height.

Is my fruit size on-track?

Weekly monitoring of the same pieces of fruit can provide you with accurate fruit growth measurements and insights into issues within each block. Rapid reductions in growth rate suggest tree stress; often linked to cropload or stress events (e.g. missed irrigation as in Figure 2).

Weekly measurements of the same fruit **and review of this data** can help to detect issues before visual symptoms occur within the block.

For more information on fruit sizing see the OrchardNet manual p.88 (left hand pane once you have logged in) and https://apal.org.au/wp-content/uploads/2019/09/15BDG-Newsletter-April-2018-updated.pdf

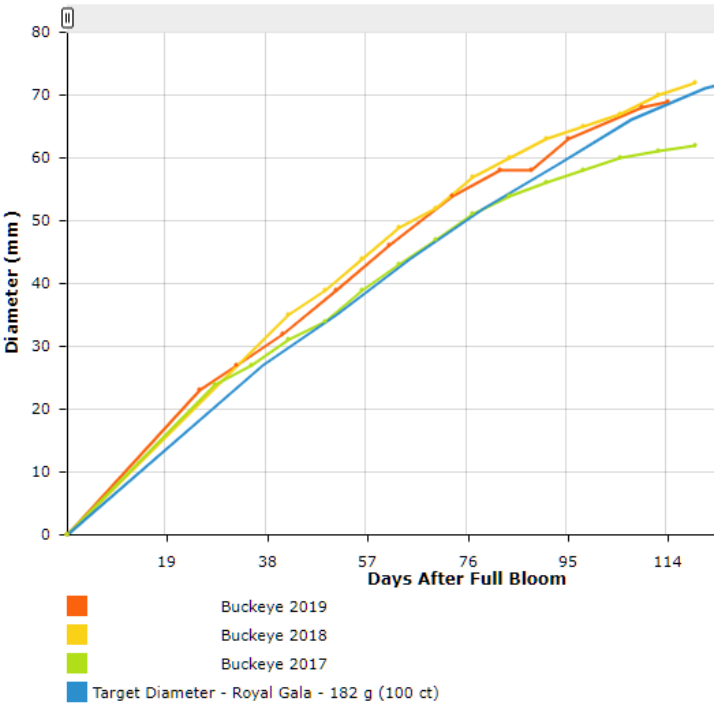

Figure 1 *Fruit sizing graph in OrchardNet. Note the sizing performance relative to the blue reference curve for each year.*

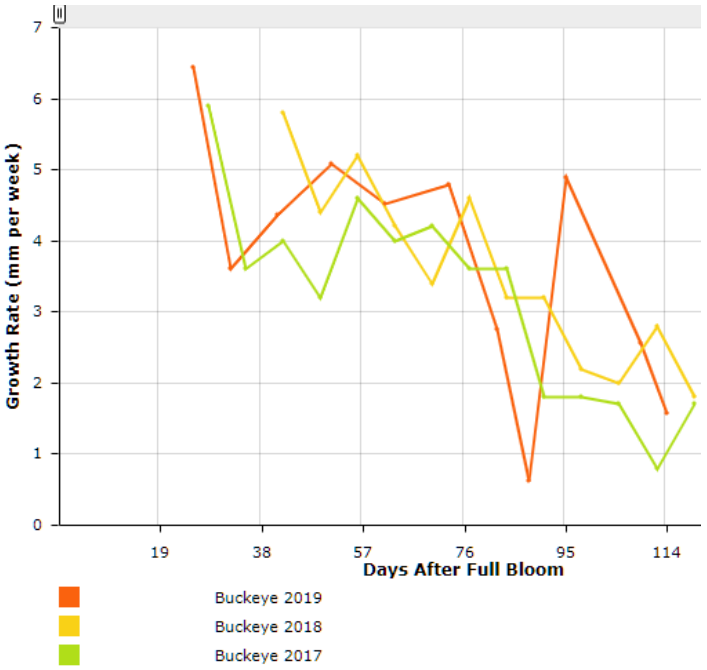

Figure 2 *Fruit growth rate between successive measurement dates. This example is done weekly. The severe drop at ~90 days after full bloom corresponds to a missed irrigation cycle and extreme heat. Recovery was driven by irrigation and additional nutrition in this case.*

Interested in trying OrchardNet within your business?

OrchardNet takes some perseverance and may require a different way of thinking to what you're used to.

If you're not too sure how-to login to OrchardNet, enter data, add blocks or you just need a few extra pointers don't be afraid to get in contact with your local Front-Line Advisor (FLA), the OrchardNet Administrator (adrian.stone@agfirst.co.nz) or a member of the AgFirst team.

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