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Future Orchards
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Update

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IN THIS ISSUE

Spring. It's all go with the coming few weeks a critical time that can set the season off on a beautiful trajectory or a less than ideal pathway.

Critical times are often busy times and there's a few key datapoints you should be ticking off for each of your blocks to make things a little bit less hectic into the future. These datapoints plus a few photos (label them by block and growth stage) can also be a good gauge for year-to-year performance and relative shift in dates, bloom intensity and uniformity.

In addition to some data collection, bloom is a great time to assess orchard potential. Return bloom is a good indicator of the success/failure of last year's strategies and will give a very good indicator as to how aggressive chemical thinning strategies will need to be (or likely labour demands for hand thinning).

Remember: It's not too late to get plans in place for all of your blocks. In some regions your original plans may already need to be adapted to reflect water availability this season.

Good luck for the next month and here's hoping your spray decisions get the intended results.

- 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.



Reminders: critical data for the season ahead



Cropload: key intervention points



Chemical thinning: "science" not "art"

Reminders: Critical data for the season ahead

Green-tip date

When it comes to dormancy breakers knowing the date of bud break is important. Some notes about consistency within the tree (e.g. bottom and top in sync, tops 5 days later etc.) can help to fine-tune future application timings.



Green-tip stage (approaching tight cluster)

Full-bloom date

This is the point where bloom is "most showy" ie. Majority of flowers fully open but minimal petal fall.

A good indicator of the season ahead. Running early? Running late? "About normal"? May also be critical when looking at seasonal issues relative to spray diary and for fruit sizing comparisons to previous years



Beehives per hectare

Particularly important if you're worried about pollination or tweaking your strategy

Tree cross-sectional area

Useful for crop loading and as a gauge for tree growth (large growth between seasons could suggest that crop load was lower than optimal; minimal growth in young trees may suggest that crop loads were heavy)

Take a diameter measurement approx. 20cm above graft union with a caliper (average of two measurements particularly if trunk is a bit oval)

- Divide by two (gets you the radius)
- Work out the area of a circle

$$A = \pi r^2$$

π is pi (can approximate to 3.14)

General notes

Spread bloom?

Quality of flower; are there any biennial bearing issues. Tree-to-tree or top/bottom?

Dormancy breaker results

If areas of the block were flowering at different times; are there microclimates to manage within your blocks?

Weather events that may have influenced disease incidence

Date of russet appearance (hopefully none!)

Growth regulator usage and desired outcome/reason for usage e.g. GA_{4/7} for russet control coming into cold weather window

Metrics:

Year	X 2019	X 2018	X 2017	X 2016	X 2015	X 2014	X 2013
TCA				33.2	22.5	20.4	18.9
TRV					16000		
% of Full Canopy	100	100	90	90	80	85	85
Branches		21	18	22			18
Beehives per ha			1.50	1.50	1.50		
Green Tip Date	28/08/18	24/08/17	07/09/16	02/09/15	04/09/14	28/08/13	27/08/12
Full Bloom Date		25/09/17	10/10/16	06/10/15	08/10/14	27/09/13	01/10/12
Harvest Date		12/03/18	21/03/17	29/03/16	20/03/15	10/03/14	15/03/13
BCA		66.000					
Buds required per fruit	2.30	2.20	2.20	2.00	2.00	2.00	2.00
Buds on monitor prune	562	482	378	450	365	279	300
Buds post prune						365	300
Fruit Pre Thin							
Fruit Post Thin		225	275	235	210	130	180
Fruit Weight (g)		165	170	177	175	190	165
Pickout %		85	85	80	85	85	85
Harvest Bin Weight (kg)		435	436	445	420	420	420
Default Bin Weight edit		400 - company default will apply if block specific bin weight (above)					
Class 1 Packout %		85	80	85	85	85	80
Class 2 Packout %		3					
Dry Matter		15.19	14.39	14.85	14.09	15.47	15.04
Winter Estimate: Gross Kg Picked		136850	144900	144900	120750	112700	112000
Winter Estimate: Packout (%)		85	85	90	85	90	85
Winter Estimate: Fruit Weight (g)		170	177	180	175	165	165

Getting the crop load strategy right: What are the intervention points?

Thinning (or setting crop load) is a lot more than the chemical thinning process and is a combination of a number of orchard tasks. These are outlined below.

Pruning - buds and balance

Fundamentally, winter pruning is the first “attack” on crop load and assists with balancing floral and vegetative growth within the canopy.

Where a balance more weighted toward vegetative growth is desired; fewer floral buds should be retained within the canopy (assuming adequate fruiting sites for target crop loads). Conversely, where trees are more vegetative than ideal a greater number of floral sites are ideally kept.

This balance varies by variety, block, tree age, tree status and intended result/balance

OrchardNet: Winter pruning report, metrics, notes

Primary thinning - flowers

This can be chemically-based or manual (e.g. flower thinning by hand or via mechanical means). Each floral site will typically produce 1 king plus 4-5 lateral flowers. Depending on crop load strategy/risk profile, nothing may be done at this stage to increase inter-fruit competition for secondary chemical thinners

OrchardNet: Chemical thinning plan, notes

Secondary thinning - small fruitlets

Following pollination, we will end up with a number of set fruit per tree will typically be more than desired/targeted. In general, an ideal fruiting scenario is to have well-placed fruit situated in singles across the canopy and to achieve this rapidly (and cost-effectively) chemical thinners are used to help reduce the number of fruit at each fruiting site, ideally to one but in reality typically 1-4 fruit per site.

OrchardNet: Chemical thinning plan, notes

Hand-thinning

Once chemical thinning intervention is no longer effective it is necessary to employ hand-thinning to achieve target crop loads. This is a manual process and if crop loading interventions to this point are poor, extremely costly.

OrchardNet: Thinning report, metrics, notes

Company:
Property:
Production Site:
Block:

Winter Pruning Report Season Ending 2020



Blockname	Ssn Type	Gross Kg/ha	Class1 Kg/ha	Class1 P/O %	Fruit Weight (g)	Harvested Fruit /Tree	TCA Harvested /TCA	Target Fruit	Actual Fruit	Target Buds/Tree (monitor)	Actual Buds/Tree	Pre-prune	Actual
A	2020	Est 100,000	85,000	85	170	198	-	2.0	-	397	-	-	-
		Act	-	-	-	-	-	-	-	-	-	-	-
	2019	Act 115,000	97,750	85	160	242	30.2	8.0	2.0	1.5	397	359	-
2018	Act 73,528	51,470	70	170	146	-	-	2.0	-	-	-	-	

Company:
Property:
Production Site:
Block:

Thinning Report Season Ending 2020



Blockname	Ssn Type	Gross Kg/ha	Class1 Kg/ha	Class1 P/O %	Fruit Weight (g)	Harvested Fruit /Tree	TCA Harvested /TCA	Tree Fruit Pickout %	Target Fruit/Tree post-thin	Actual Fruit/Tree pre-thin	Actual Fruit/Tree post-thin	
A	<u>Ruby Pink</u>											
	2020	Est 100,000	85,000	85	170	198	31.0	6.4	90	220	-	-
		Act	-	-	-	-	31.0	-	-	-	-	-
2019	Act 115,000	97,750	85	160	242	30.2	8.0	122	269	319	198	
2018	Act 73,528	51,470	70	170	146	-	-	-	162	-	-	

Pre-harvest grooming

This stage is often-neglected but can lead to excellent results at harvest. Where “field-grading” is completed prior to harvest, more fruit of desired quality is put into bins allowing efficient harvesting with high packout results. Removing sunburnt, over mature, rot-affected and russetted fruit allows pickers to focus on filling bins with high quality fruit rather than sorting poor quality fruit.

OrchardNet: notes, production actual and associated benchmarking reports once block is harvested and packed

Chemical thinning; science not “art”

People often talk about chemical thinning being “more art than science”. My response to this is in question form; would you prefer to take the “creative” or the “scientific” approach? Using your knowledge, adjusting decisions based on previous results/experience (observation/measurement) and responding to factors on the day of application (formulation/modification) to predict a desired result (hypothesis) ...sounds awfully close to the scientific method

Get the data in place

If you don’t have the data to look at individual block history and determine what chemical thinning strategy, the results from it and the run-on effects (high hand-thinning bill, improved fruit size, poor fruit size, poor return bloom) it’s not too late to start.

In order to make a well-informed decision it is vital that you have a full dataset.

A list of your chemical thinning applications detailing:

- Chemical types used and their rates
- Water rates
- timing/date of application
- crop stage
- area of canopy targeted
- weather conditions
- other factors that influenced your decisions
 - e.g. warm nights, dry conditions, soil waterlogged

Couple this with a detailed set of notes of your satisfaction of the flower/fruitlet response to each spray (actual data is better than “good”. Consider counting fruiting sites before/after and numbers of fruitlets before/after) and you have a very powerful tool to refine chemical thinning strategies at the block level and minimise the chance of repeating a less-than-ideal result.

OrchardNet has a built-in chemical thinning planning and recording tool that allows this data to be captured to an individual block level. For more information on this see:

<https://apal.org.au/wp-content/uploads/2019/09/BDG-Newsletter-Sep-2018-NF-Updated.pdf>

Using your data to adjust your chemical thinning plan

Once you have a record of your previous strategy; seasonal reviews allow for adjustments to be made to optimise your intended outcome.

Seasonal reviews provide a good opportunity to evaluate success of crop load strategies for individual blocks and modify/alter as necessary.

Where previous chemical thinning strategies have provided good results for your business’ risk profile, target spend and desired result there is little need to change.

At a base level; “if it ain’t broke, don’t fix it”.

Some tweaking of rates to account for seasonal conditions (e.g. warm weather, waterlogged soil, weak bloom) may be necessary but with a full dataset of chemical thinning strategies, conditions and results these small tweaks can be estimated and, once the season is complete, confirmed to provide a better or poorer result.

Where past season results are less than optimal a considered approach is the best course of action. Do rates need to be increased/decreased? Could another block’s strategy be applied to the problem block? What other factors might be influencing the result?

By collecting a quality dataset each year, your process (what did/didn’t work, what factors influence the result) is recorded and over time you will be able to shift from “art” to “science” in your chemical thinning approach and ensure continual optimization of your strategies.

**Chemical Thinning Plan
Season Ending 2019**



Crop Stage	Date Applied	Product	Rate/100 l	Rate/ha	Water Rate	Total Water	Nozzle Config	Notes
Example Block 1								
Full bloom + 2	28/09/18	Ethephon(48%)	75 mL	675 mL	900 l/ha	630	Bottom 2 off	
		Regulaid	150 mL	1350 mL				
Open flower 1 yr wood		ATS	1500 mL	9000 mL	600 l/ha	420	Top Half	
		Growett	100 mL	600 mL				
3-15 mm fruitlets		BA(2%)	700 mL	5600 mL	800 l/ha	560	All On	
		Regulaid	250 mL	2000 mL				
		Buff-IT	50 mL	400 mL				
Example block 2								
Full bloom + 2		NAA(10%)	16 mL	160 mL	1000 l/ha	700	Bottom 2 off	
		Regulaid	250 mL	2500 mL				
Open flower 1 yr wood		ATS	1500 mL	7500 mL	500 l/ha	350	Top Half	

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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