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IN THIS ISSUE

Last issue I outlined why it's worth "farming by numbers"; simply put if you're not monitoring what's going on how can you manage what needs to happen?

If you missed it, you can find it my last newsletter here: <http://apal.org.au/wp-content/uploads/2018-July-BDG-Newsletter-July-2018-NF-1.pdf>

Building on this concept I start this newsletter running through some key metrics that have passed and are coming up that are well worth formally recording. This can help with both this year's and future year's decisions.

Key cropload decisions are rapidly approaching and I'd encourage you to have a plan in place (both for setting and managing your cropload)

I've included some notes on planning your chemical thinning and with a new tool in the market (Brevis - active ingredient metamitron) I'd carefully plan any changes that you are making to your chemical thinning strategy this year. Recording and monitoring your chemical thinning responses are a key part of

finetuning your spray program for next year.

With what seems to be a very dry year upon most growing regions I've also included some links to some content on irrigation management including water budgeting and monitoring on the Future Orchards Library.

Here's hoping your season has started off on the right foot.

- Nic

If you've forgotten your OrchardNet login then go to the website and click the 'Lost your password?' link.

<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. Please contact your local FLA or a member of the AgFirst team (see details on the last page of this newsletter) if you would like to give it a go.

**Critical data - some things to record**



**Planning your chemical thinning**



Some links to irrigation resources...

# Critical datapoints to record

In the last newsletter I highlighted why collecting data is important for assisting with your management decisions. Here I outline some of the key upcoming (and just passed) data that I think is worth keeping on hand for each of your blocks.

All of these datapoints can be housed in OrchardNet’s “metrics” category or in the “nutrition centre”.

## Green-tip date

When utilising dormancy breakers (eg. Erger, Waiken, Dormex, urea+oil) knowing when natural bud break occurs can help you finetune and achieve the response you want. Dependent on timing you can potentially delay, bring forward or entirely split bloom for some of these products.

## Full bloom date

when looking at labour demands and seasonal variation this checkpoint provides a good indicator of season progression. When combined with the date of your first pick on a block you can also start to estimate approximate harvest dates and look at your seasonal variation

## Beehives per hectare

Especially if you’re worried about pollination

## Tree cross sectional area (TCA)

Sampling young trees for their cross-sectional area can assist with your croploding and thinning decisions.

To calculate:

- 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  
 $A = \pi r^2$

$\pi$  is pi (can approximate to 3.14)

Then you can apply a factor to estimate how many apples you want to hang on the tree. I’d suggest this would be in the range of 4-10/TCA dependent on variety, growth goals and a myriad of other factors for each block (especially in a dry year).

## Metrics:

Year	X	X	X	X	X	X	X
	2019	2018	2017	2016	2015	2014	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

**Nutrition data**

Make sure you're keeping track of your soil, leaf and any other nutrient tests you're taking.

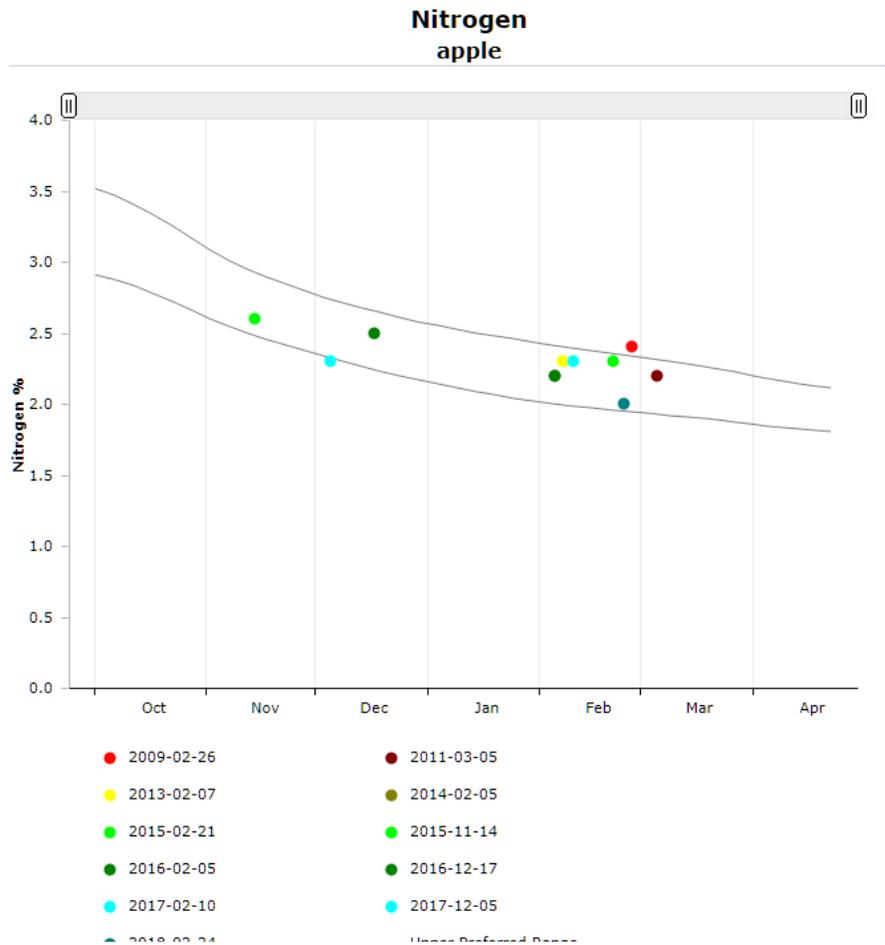
If you enter you soil/leaf tests (you can apply a single test result to multiple blocks) OrchardNet has the ability to give you some indicative values for each relative nutrient.

You can then run a 'nutrition report'. As with the other reports in the database enter click "View block reports" and then scroll down to "Nutrition – Leaf Analysis" or "Nutrition – soil analysis" depending on which you want to evaluate.

You'll get a graph similar to the one pictured for leaf results (each colour is a n individual test from the past).

I find this way of looking at historical tests to be quite useful (much easier than rifling through a bunch of individual sheets).

**Leaf Nutrition**



**Nutrition - Leaf Tests:**

add a year: [2019](#) [2018](#) [2017](#) [2016](#) [2015](#) [2014](#) [2013](#) [2012](#) [2011](#) [2010](#) [2009](#) [2008](#) [2007](#)

Year	<a href="#">2018</a>	<a href="#">2018</a>	<a href="#">2017</a>	<a href="#">2017</a>	<a href="#">2016</a>	<a href="#">2016</a>	<a href="#">2015</a>	<a href="#">2014</a>	<a href="#">2013</a>	<a href="#">2011</a>	<a href="#">2009</a>
Collection Date	24/02/18	05/12/17	10/02/17	17/12/16	05/02/16	14/11/15	21/02/15	05/02/14	07/02/13	05/03/11	26/02/09
Nitrogen?	2.00	2.30	2.30	2.50	2.20	2.60	2.30	2.20	2.30	2.20	2.40
Phosphorous?	0.41	0.32	0.35	0.31	0.22	0.25	0.26	0.27	0.19	0.14	0.13
Potassium?	2.00	2.10	1.70	2.00	1.50	1.60	1.60	1.90	1.30	1.10	1.30
Sulphur?	0.26	0.21	0.17	0.16	0.15	0.21	0.18	0.15	0.15	0.15	0.15
Calcium?	1.73	1.66	1.72	1.28	1.56	0.93	1.40	1.68	1.52	1.67	1.33
Magnesium?	0.26	0.27	0.24	0.27	0.29	0.19	0.25	0.22	0.29	0.25	0.13
Sodium?	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Iron?	60	88	73	92	59	50	68	62	80	97	88
Manganese?	220	153	103	260	122	24	105	78	146	82	91
Zinc?	200	440	68	84	65	280	46	48	68	22	16
Copper?	5	7	6	7	6	8	6	6	6	8	7
Boron?	33	31	32	26	31	21	29	30	28	28	31

# Planning (and recording) your chemical thinning strategy

Chemical thinning is undoubtedly one of the more stressful times of year. Getting the cropload down early can mean great things for both this year and next as well as big savings in hand thinning costs. Overdoing it can cause many headaches.

### To record this data in OrchardNet

- Navigate to the relevant block  
(for help setting up blocks contact your local FLA or a member of the AgFirst team; contact details on the last page)
- Add the current year (2019) if you haven't already **"Block season details"**
- Scroll down to **"Chemical thinning"**
- Click **2019** next to "add a year"  
You will get a popup similar to the picture to the right
- Enter the spray plan for each individual spray run (ie. 3 ATS passes = 3 individual sprays) and the zones to target, water rate and growth stage.
- Add the rest of your individual planned sprays

### To print out this information

- Click **Orchardnet Home** in the top left corner
- Click this icon in the middle of your screen



- Scroll down to "Chemical thinning plan. Select show report
- You will then your spray instructions in a printable format by growth stage for each block.
- Once you've applied a spray; go back to the relevant individual block and select that spray (eg. the 2019 ATS spray below is highlighted with red)
- Updated the "date applied" and click enter

After putting in applied dates for each chemical the "chemical thinning report will colour completed sprays as green rather than red. (see next page)

### Chemical Thinning 2019

Product	Rate	Dilute Label Rate
-----Thinner-----		
ATS	<input type="text"/> mL/100 l	1250-1500 mL/100 l
BA( 2%)	<input type="text" value="700"/> mL/100 l	600-900 mL/100 l
BA(12%)	<input type="text"/> mL/100 l	120-180 mL/100 l
Carbaryl	<input type="text"/> mL/100 l	80-160 mL/100 l
Ethephon(48%)	<input type="text"/> mL/100 l	21-42 mL/100 l
Ethephon(72%)	<input type="text"/> mL/100 l	14-28 mL/100 l
Lime Sulphur(20%)	<input type="text"/> mL/100 l	500-3000 mL/100 l
Metamitron (70%)	<input type="text"/> g/100 l	25-37 g/100 l
Metamitron(15%)	<input type="text"/> g/100 l	110 - 220 g/100 l
NAA(10%)	<input type="text" value="10"/> mL/100 l	5-10 mL/100 l
NAA(2%)	<input type="text"/> mL/100 l	25-50 mL/100 l
Thiram(40%)	<input type="text"/> mL/100 l	150 mL/100 l
-----Surfactant-----		
Folion	<input type="text"/> mL/100 l	62-250 mL/100 l
Growett	<input type="text"/> mL/100 l	10-100 mL/100 l
Regulaid	<input type="text" value="250"/> mL/100 l	62.5-375 mL/100 l
Spray-Aid	<input type="text"/> mL/100 l	65-250 mL/100 l
-----Acidifier-----		
Buff-IT	<input type="text" value="50"/> mL/100 l	50-100 mL/100 l
LI700	<input type="text"/> mL/100 l	60-120 mL/100 l
Water Rate	<input type="text" value="1000"/> / ha	
Nozzle Config	<input type="text" value="Bottom 2 off"/>	
Crop Stage	<input type="text" value="8-15mm Fruitlet"/>	
Full Canopy	<input type="text" value="100"/> %	
Full Bloom	<input type="text"/> (dd/mm/yyyy)	
Date Applied	<input type="text"/> (dd/mm/yyyy)	
Notes	<input type="text"/>	<input type="button" value="Enter"/>

	X 2019	X 2019	X 2018	X 2018
ATS		1500 mL		1500 mL
BA( 2%)	600 mL		600 mL	
Carbaryl	300 mL		300 mL	
NAA(10%)	10 mL		10 mL	
Growett		100 mL		100 mL
Regulaid	250 mL		250 mL	
Water Rate	400 l/ha	400 l/ha	400 l/ha	400 l/ha
Date Applied			25/10/17	13/10/17
Nozzle Config	All On	All On	All On	All On
Crop Stage	8-15mm Fruitlet	Full Bloom	8-15mm Fruitlet	Full Bloom
Thinning Notes			As soon as happy you won't kill bees	ASAP Aiming to thin all fruit off

An example “Chemical thinning report” from OrchardNet once you have your chemical thinning plan in.

As you update each completed spray it will go green. A simple way to ensure your plan is being followed (and sprays aren’t being missed) and a great tool to look at next year to see what did and didn’t work. OrchardNet will copy this year’s plan to next year and then it’s just a matter of finetuning/updating individual blocks

### Chemical Thinning Plan Season Ending 2019



Crop Stage	Date Applied	Product	Rate/100 l	Rate/ha	Water Rate	Total Water	Nozzle Config	Notes
<b>Example Block 1</b>								
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				
8-15 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				
<b>Example block 2</b>								
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	
		Growett	100 mL	500 mL				
8-15 mm fruitlets		BA( 2%)	800 mL	6400 mL	800 l/ha	560	Bottom 3 off	
		NAA(10%)	12 mL	96 mL				
		Regulaid	250 mL	2000 mL				
		Buff-IT	50 mL	400 mL				
<b>Example block 3</b>								
Full bloom + 2		NAA(10%)	18 mL	162 mL	900 l/ha	324	Bottom 2 off	
		Regulaid	250 mL	2250 mL				
		Buff-IT	50 mL	450 mL				
8-15 mm fruitlets		BA( 2%)	800 mL	6400 mL	800 l/ha	288	Bottom 3 off	
		NAA(10%)	12 mL	96 mL				
		Regulaid	250 mL	2000 mL				
		Buff-IT	50 mL	400 mL				
<b>Example block 4</b>								
Full bloom + 2		Ethephon(48%)	75 mL	675 mL	900 l/ha	891	Bottom 2 off	
		Regulaid	200 mL	1800 mL				
Pink flower 1 yr wood		NAA(10%)	16 mL	96 mL	600 l/ha	594	Top Half	
		Regulaid	250 mL	1500 mL				
8-15 mm fruitlets		BA( 2%)	900 mL	8100 mL	900 l/ha	891	Bottom 1 off	
		NAA(10%)	13 mL	117 mL				
		Regulaid	250 mL	2250 mL				
		Buff-IT	50 mL	450 mL				
<b>Example block 5</b>								
8-15 mm fruitlets		BA( 2%)	600 mL	3600 mL	600 l/ha	1026	Whole Tree	
		Regulaid	250 mL	1500 mL				
<b>Example block 6</b>								
Full bloom + 2		Ethephon(48%)	70 mL	700 mL	1000 l/ha	1010	Bottom 2 off	
		Regulaid	200 mL	2000 mL				
Pink flower 1 yr wood		NAA(10%)	16 mL	96 mL	600 l/ha	606	Top Half	
		Regulaid	250 mL	1500 mL				
		Buff-IT	50 mL	300 mL				
8-15 mm fruitlets		BA( 2%)	900 mL	9000 mL	1000 l/ha	1010	Bottom 1 off	
		NAA(10%)	13 mL	130 mL				
		Regulaid	250 mL	2500 mL				
		Buff-IT	50 mL	500 mL				

# Irrigation Planning and Monitoring

With most regions looking to be in for a dry year it's a good time to think about your irrigation plan for this year.

## Planning

Given the current situation for many growers I thought I'd highlight some of the resources that may be of assistance with making an irrigation plan for this year.

I would highly recommend going through these and looking at other irrigation information; this is especially important if you've made any orchard changes (e.g. redevelopment, expansion) since your last major dry year and haven't reevaluated irrigation capacities.

"Guidelines For Irrigation Management For Apple and Pear Growers".

You can find it here:

[http://apal.org.au/wp-content/uploads/2013/04/Apple\\_pear\\_guidelines\\_Irrigation\\_Management.pdf](http://apal.org.au/wp-content/uploads/2013/04/Apple_pear_guidelines_Irrigation_Management.pdf)

Future Orchards Library under the "water" heading. Some great tools and articles on irrigation management

<http://apal.org.au/industry-info/future-orchards/archive-library/#water>

**For those growers utilising evaporative cooling do not forget to factor this in to your preharvest demands.**

The above resources will be able to help you calculate your theoretical water requirements and if you are unlikely to meet them some information on other irrigation strategies (eg. RDI)

## Monitoring

There are several soil moisture monitoring tools within the market that fit into a few broad categories:

- Volumetric
  - eg. neutron probe, capacitance sensor
  - Di-electric
- Tensiometers
- Solid state
  - eg. gypsum blocks
- Other measurement types
  - eg. dendrometers (how much the tree swell/shrinks), remote sensing

Each has its advantages, disadvantages and a huge variation in costs and accuracy. I would recommend that you consider at least getting something in your orchard if you don't already; by the time you're seeing symptoms of water stress (and that includes waterlogging) the damage has already started.

In addition to soil moisture monitoring, fruit size can be a good indication of whether things may have gotten a bit too dry. Weekly monitoring will allow you to calculate growth rate (find my article on fruit size monitoring here:

<http://apal.org.au/wp-content/uploads/15BDG-Newsletter-April-2018-updated.pdf>

## 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](mailto:adrian.stone@agfirst.co.nz)) or a member of the AgFirst team.

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