

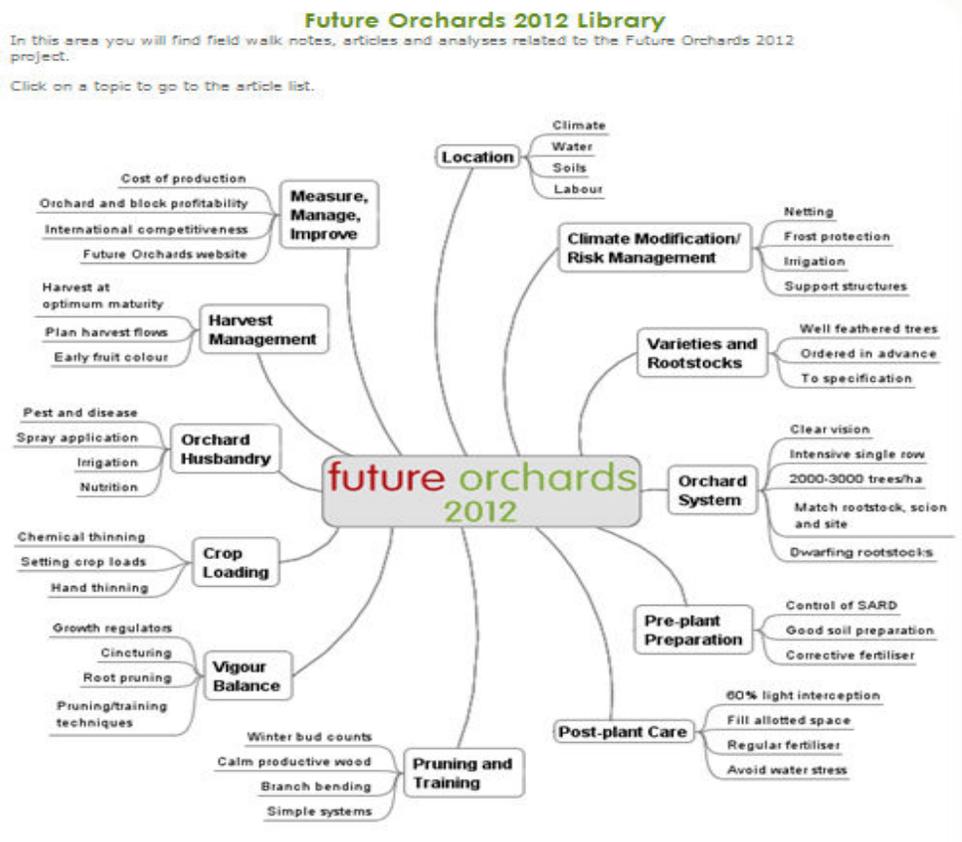
Short Term Planning

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Whether it's a ship leaving the Sydney port to sail to London, or a plane flying New York to Tokyo, both not only need to know where they are going, but along the way need checks to ensure they are on track to arrive safely at their destination. Most of us think the captains once out of port or in the air, switch off and go to sleep. Well they probably do, but while they sleep, they have very sensitive tracking equipment to keep them on course. Orcharding is no different. Now you know where you are heading, you should be monitoring to see that your progress is on course.

Tools for Monitoring.

In earlier talks, my colleagues and I have mentioned developing many facets to your orchard. Located on the APAL website is an overview of these. Today I am going to summarise the key short term tools that we use daily to track our progress.



Production

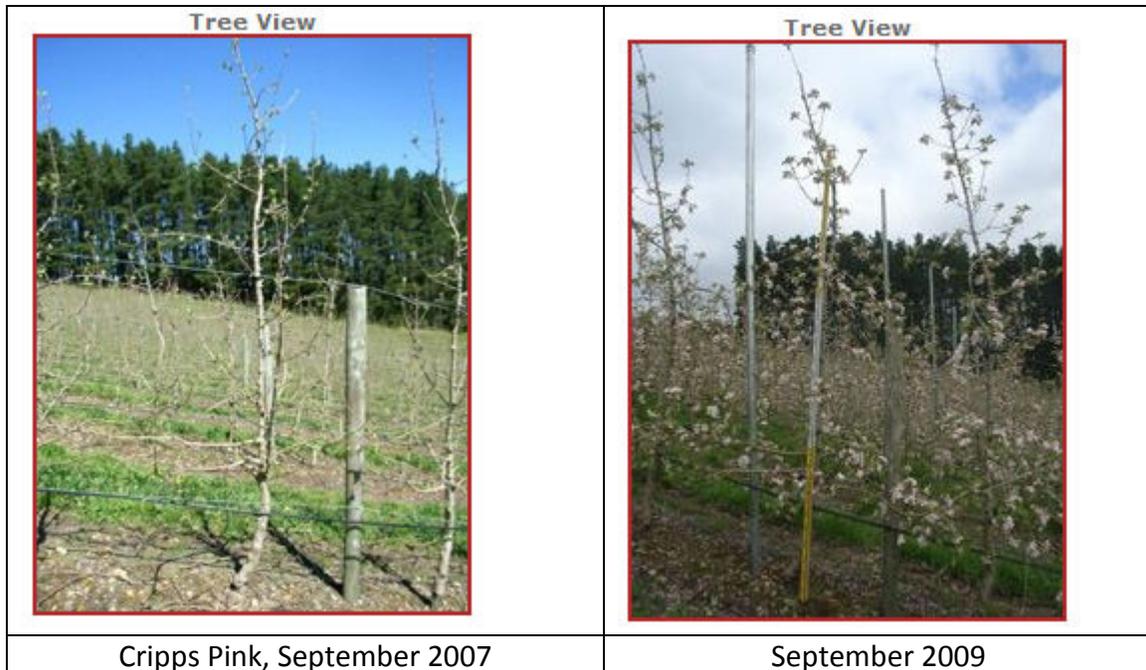
This is probably the most important, because at the end of the day, increased production goes a long way to improving the profitability of most orchards. However, production increases must be the right kind. There isn't much future in increasing the production of class 2 that is below the cost of harvesting, as is the case for some varieties. Production increases must be of the right variety and quality. Often quality can suffer if production is pushed too far. Also avoid biennial bearing by pushing production too far in any one year.

Previously we have talked about increasing the tree volume for many blocks.

Tree View	Tree View
 A photograph of a young Cripps Pink orchard tree in an outdoor setting. The tree is relatively small and has several bright red apples hanging from its branches. The background shows other trees and a cloudy sky.	 A photograph of a Cripps Pink orchard tree in a greenhouse or covered walkway. The tree is significantly larger and more densely packed with fruit than the 2004 tree. It is heavily laden with bright red apples. The structure of the walkway is visible in the background.
Cripps Pink planted 2004, photo April 2008	Cripps Pink, planted 2005, photo April 2009

Most growers are now pushing trees harder and it has been very pleasing to see many growers have not only increased fertiliser and water inputs, but also changed their pruning style often by adopting long pruning and backing off from over pruning and cutting too much wood from the trees.





Many blocks now have the tree volume and light penetration to hang a decent crop of fruit, and can now realistically aim for 50-60t/ha of quality fruit every year. The next step is to translate your targeted fruit yield into fruit numbers per tree. To do that we need some simple maths.

Bud and fruitlet monitoring

Once you know how many fruit per tree at your tree spacing will give the targeted yield and quality desired, now the hard work begins. Like the captains of the ship and airplane, you have to start tracking your progress.

Example of bud numbers and production targets per tree.

Variety & Block	Tree No.	Nett Ha	Winter Buds	Buds per Fruit	Est. Picked fruit	Audit	Est. Fruit Size	Bins	T/HA
Jazz A	2138	1.0	248	1.5	165	242	105	102	60
Jazz B	5559	2.1	270	1.5	180	290	110	291	78
Pink Lady	2647	1.0	324	1.8	180	330	100	101	86
Fuji	5804	2.8	259	1.4	185	265	90	487	76

Bud Monitoring at pruning time is where the *"in the paddock management"* starts to kick in. Monitoring bud numbers is critical to tracking that your intended yield at harvest



time is going to be achievable or not. Bud counting involves counting the number of buds on a tree that are likely to produce the desired quality of fruit. Bud counting as you prune ensures fewer shocks at the end. We have discussed previously how to undertake bud counting, so I won't go into it again here. Refer to June 2007 FO2012 notes for more information. We will talk more about it when outside at the pruning discussion.

Achieving the correct number of buds at pruning time provides flexibility with thinning strategies. Too few a winter buds means more doubles and possibly trebles at thinning time. This in turn can create lower packouts due to fruit not being evenly spaced on the trees.

Also I encourage pruning staff to count the trees they have pruned so that they get a better understanding of what a fruitful bud looks like and where the fruit are likely to be hanging in the trees. Another benefit of having the pruners count winter buds, is checking becomes easier.

Auditing the people counting the buds is another check that you are "on-course". Do not assume that because you are told the targeted numbers of buds are being left in is happening. I strike this most winter days and I still count for myself at least one tree or branch to verify that what I am being told is indeed correct. Often discrepancies occur and the sooner they are found the better.

It is also a quick way to get pruners to prune harder if required as they soon get sick of counting excessive buds numbers. I have seen many pruners and still do for that matter, see the best fruiting wood cut from the trees and either nothing or low quality annual buds left behind. Having an understanding of buds and bud quality is desirable for all involved in pruning. Make sure you are monitoring and you will have fewer surprises later on.

What should have become evident to most growers since this program started is we encourage the production of grey weak wood that points at the ground and is very fruitful and requires minimal intervention from the grower.

We suggest the pruning supervisor keeps a notebook with the bud counts and tree identification. That way any issues can be investigated later in the season. This notebook should be summarised into a master file back in the office. A simple excel spread sheet is all that's required. We use more advanced systems for recording such as those on www.hortwatch.com.

Another useful tip that I am pleased to see many growers have adopted is the placement of a tags in the tree and bud number are written on the tag with a permanent marker pen. Later on fruit numbers after thinning can be written on the tag. Trees tags/tape are excellent for keeping the information at hand and in the paddock.



Next the thinning strategy which goes hand in hand with the winter bud counts. It is easier to provide accurate chemical thinning recommendations when tree bud number and the targeted fruit target numbers at harvest are known. For instance if using ATS and a tree has 400 winter buds and the desired crop load is only 200 fruit at harvest, providing the pollination weather has been good, ATS application can commence once 50% of the king fruit have set (or ancillary fruit depending on your preference). Most chemical thinning failures with a tool like ATS occur because the timing is wrong. Either too early as not enough flowers have set or too late as too many flower have set. I have seen some amazing results with ATS and interesting enough, the best results are on the orchards that understand this concept and regularly count winter buds and flowering set. Likewise the worst results are from orchardists that haven't understood bud counting. They usually do once it's too late.

From bud monitoring we move into fruitlet monitoring (thinning to the targeted fruit number per tree to achieve the targeted yield at harvest). One example I recall was the monitor block group that for the first time set up different crop loads across a handful of orchards. Simply this involved marking off trees and thinning to set tonnage per hectare, increasing in 10 tonne increments from their normal crop of 40t/ha up to 80t/ha for those blocks that had the tree row volume to achieve this. Thinning strategies were adjusted to set the targeted crop load. I was surprised at the time that many of the participating growers never knew what crop load they were starting to thin too, simply they thinned their trees the way they had in previous years and the final crop was what it was at harvest (unplanned for by them at thinning time). They were basically not steering the ship but flying blind. We all know what happens when you fly blind. You have a habit of running into things.

I know things have changed now!

Fruit Size Monitoring

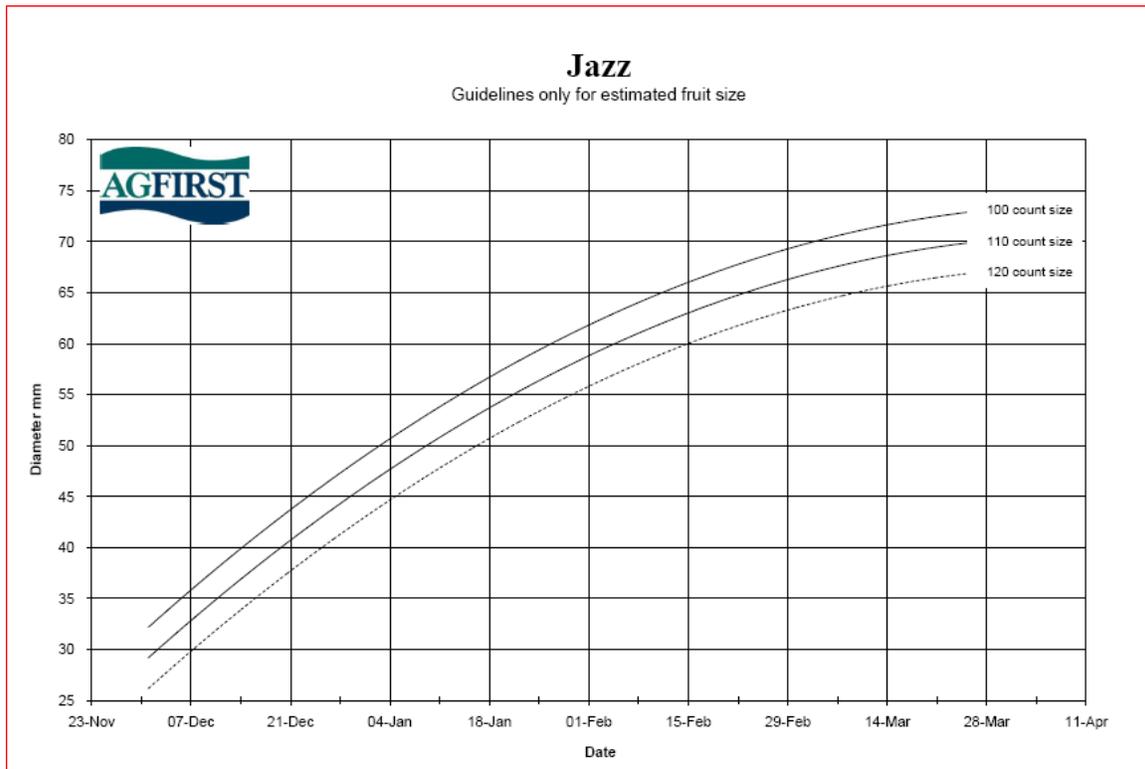
Additional monitoring tools include fruit size measuring. Fruit size at harvest is important when targeting higher yields. Producing fruit that doesn't match the preferred market size profile can be very unprofitable. Fruit size measuring involves tagging 20 fruit in a block, say 4 fruit from 5 trees and measuring the diameter with callipers weekly or at least fortnightly once fruit drop has finished right up to harvest. Not all blocks need to be done but we recommend at least one block per variety as a minimum. We would also increase measuring for those varieties that the market pays a premium for size. Again put more effort in where the return will justify it.

With at least one block from each variety being measured for fruit size, when walking other unmeasured blocks, have your callipers handy and measure a few average size



apples and compare that to the average fruit size from the monitored block. If bigger or smaller, you have the tools available to influence fruit size as the season progresses.

These involve delaying or moving hand thinning forward, increase nutrition, thin the trees harder and sometimes manipulating irrigation can increase or decrease fruit size. Root ripping and tree cincturing can also be utilised, depending on the objective.



Example of a Jazz Fruit Growth Curve for Nelson NZ.

Plot fruit average diameter on graph to track fruit size development.

Other monitoring especially hand thinning and at harvesting time should also be undertaken. Check frequently that thinners are leaving the targeted number of quality fruit on the trees. At harvesting time, this is often where all your hard work for the year can be undone. Monitoring pickers is critical on every orchard. Don't leave it to chance. A 5% increase in packout can have a major effect on cost reduction.

If you store fruit why not aim to increase the packout by careful picking and therefore decrease your post harvest costs by spreading them over more cartons. This also spreads your fixed costs and overheads further which decreases your production costs.

Finally, why not monitor your packhouse. It's our observation that packhouse perform better when another set of eyes watches over them.



Production Costs

When we first started this project back in 2007, we were all intrigued at how fixed growers were on saving costs, at the detriment of production. By now, what should have become apparent is that having a fixation on costs can be detrimental to your overall business wellbeing. However we shouldn't turn a blind eye to costs.

Increasing production can decrease the per unit or per kilogram cost. However costs can blow out if you are not careful. One method is to utilise the information provided from this industries Futures Orchard 2012 Financial Benchmarking analysis and compare your costs against the model. Better still if you participate in future surveys, this will give you even more information.

A word of caution though, make sure you study all categories as sometimes a high per hectare cost is good, especially if it is linked to high production. If for some reason this isn't the case and your costs are higher per hectare and per kg, there are ways to rectify. The first method we suggest is to seek advice from someone suitably qualified to help you. Usually this doesn't happen down at the pub or local watering hole as numbers get inflated. Look for other growers willing to share information (e.g., monitor block growers) or growers you feel comfortable with and can trust. Even your accountant or bank manager may be able to provide some advice. Don't be afraid to pay for advice as the people giving it are usually better qualified and more experienced to give the right kind of advice.

Costs we often focus on involve labour, chemicals and packing costs. The better your records the better your analysis can be.



Grower Case Study of main costs by hectares and kilograms of fruit

	/Ha Grower 1	/Ha Grower 2	/Kg Grower 1	/Kg Grower 2
Wages costs				
Pruning	\$ 2,514	\$ 5,212	\$ 0.077	\$ 0.084
Thinning	\$ 1,760	\$ 3,547	\$ 0.054	\$ 0.057
Harvesting	\$ 3,520	\$ 9,485	\$ 0.108	\$ 0.153
Other Wages	\$ 7,213	\$ 17,111	\$ 0.222	\$ 0.275
Total	\$ 15,008	\$ 35,355	\$ 0.462	\$ 0.567
Post Harvest costs				
Packing	\$ 6,045	\$ 10,719	\$ 0.186	\$ 0.173
Packaging	\$ 5,079	\$ 7,129	\$ 0.156	\$ 0.115
Coolstorage	\$ 1,549	\$ 3,737	\$ 0.048	\$ 0.060
Total (incl other costs)	\$ 14,919	\$ 21,585	\$ 0.459	\$ 0.348
Operating costs				
Sprays & chemicals	\$ 2,852	\$ 4,982	\$ 0.088	\$ 0.080
Fertiliser	\$ 429	\$ 1,067	\$ 0.013	\$ 0.017
Production				
Gross Yield	32,500	62,000		

In the table above I have highlighted two growers that are from the same state and grow not too far from each other (by Australian terms). Grower 1 has lower costs per hectare across most areas and many would think he is in a better financial position than grower 2. However the differences narrow somewhat when the costs are compared per kilogram (note lower spray and post harvest costs for grower 2). Some of this may be economies of scale, particularly the post harvest costs, although both growers pack their own fruit. The last line shows the reason why many of grower 2 cost are closer to grower 1 costs. Production per hectare is almost double for grower 2. He has further fruit to spread his costs across.

Which position would you rather be in? Grower 1, with lower production costs and lower yield or Grower 2 whom has high production costs and higher yield. I favour Grower 2 because often it is easier to reduce costs quicker than increase yield. The trick will be to decrease costs without decreasing yield or quality. How can this be done?

First look at the wage costs. Start by breaking wage costs down into the number of hours spent per block and variety for the key tasks, pruning, thinning and picking. Record these as you go along. This information can be transferred into a spreadsheet and analysed.



In the table above, grower two knows pruning should be closer to \$2500 per hectare than \$5000. To achieve this, he should implement some contract scheme for pruning (and indeed thinning and harvesting). By comparing the costs with grower one and knowing what you spent last year, you have plenty of margin to cut costs. A word of caution. Contract work is only as good as the supervision so factor in some time and money for ensuring adequate supervision. Don't overlook this. Also remember each block and variety will require different contract rates so be sure to work these out accurately. You can always increase the rate once staff have started a job, but they don't take kindly to having rates decreased part way through. Preparation before hand is paramount to ensure smooth running of contract work. Generally, most staff enjoy contract work providing the rates are fair.

This information on hours spent per task can be added into bud monitoring template you started by adding a few more columns. If you are not competent at using a computer, then employ someone else to do this for you or seek the services of a professional that can assist you. It would not take Grower 2 very long to recoup this service fee for this recoding task.

In the case of grower 2 having higher harvesting costs, a one third reduction would be all that is needed. Do not try to drive these costs down too low as good staff will often walk if there is nothing in it for them. Then fruit quality from poor picking can cost more than the wages saved. Besides paying slightly above the odds is worthwhile providing the job is done on time and the best possible class one recovery is achieved.

In the other cost category, this spending is often higher for orchards undertaking a lot of development, so I would expect grower 2 to be able to reduce these costs as development slows.

Income

Last but not least, monitoring your income or cash flow is very important in difficult times. Its no coincidence that the better growers know not only all the main costs, but also where the bulk of the money comes from. Remember the old 80:20 rule. Keep a close eye on the important things especially.

When we undertook the Financial Analysis survey in 2009, it became apparent many growers didn't keep accurate daily or weekly records of sales and income by variety. It is important not to leave this up to your marketer. You are responsible for this and you should take charge of it. Keep a close eye on it. Over time and even over a few years trends will occur that if you have been watching carefully may make you a lot more money than what you have been doing in the past e.g., timing when fruit are sold into the market.



We will be interested to resurvey those growers that took part in the first financial analyse survey again later this year, and I am sure that the majority of them will have improved this part of their business.

More strength can be given to your monitoring by combining your income with your costs by block and variety. Over several years, a clear picture will crystallise as to what blocks and varieties are performing for you and which ones need the chop.

To conclude, the better the information you have on your business, the better placed you are to make the right decisions. If you want a one stop program that can pretty much help you with this entire monitoring and recoding, visit www.hortwatch.com.

