

Harding Horticulture

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Introduction

Set on the limestone coast of Western Australia approximately 1 hour north of Perth in Neergabby (West Gingin), Harding Horticulture's low-chill peach and nectarine orchard occupies approximately five acres within a 40 acre property. Backing to the south onto the high conservation classed Gingin Brook; the property is slightly undulating and is bounded on the east by a cattle hobby farm, on the north by a citrus orchard and by a turf farm on the west.



As new entrants to the low-chill stonefruit growing scene, we found one of the most challenging aspects was obtaining contemporary and relevant information on growing low-chill stonefruit. Taking over the property as an existing business just prior to harvest in 2003, the learning curve was steep. Stonefruit is grown, picked, graded & packed on the property and since the 2004 harvest transported by us, to market.

Since the first harvest, we have brought the orchard into 21st century by improving infrastructure and introducing equipment, implementing nutrient management and harvest procedures, tracking yields and obtaining food safety certification. Business planning plays a major role in looking to the future. The business plan incorporates the adoption of more

cost effective growing methodologies, planting of different varieties of nectarines to capture the early market and expansion into the apricot market.

Compared to the low-chill industry in the eastern States, the Western Australian low-chill industry is fairly small however larger growers in the industry are to starting to put in massive plantings north of Perth. There would be less than a dozen stonefruit growers in the Gingin Region of various sizes.

The First Season

In hindsight, the ignorance of being a new grower during the first season was a blessing. We didn't know what we didn't know and as such, that made our first season easier, as we couldn't see the mistakes we were making.

Harding Horticulture was created when we took over the existing orchard of mature peach and nectarine trees in October 2003. The intent was to use this season as a learning experience so that we wouldn't be send the business bankrupt in the event the season was a disaster. Fortunately the previous owners were extremely helpful in passing on what they knew, and we spent time working in the orchard prior to the take over. An experienced ex-grower (Mr Rob Keaughran) was also working part-time on the property and his time and knowledge since purchasing the orchard, proved to be an invaluable resource. Rob taught us the basics - how to pick, grade & pack. The basics may seem like 'common sense' but one thing you learn very early working in the mining industry, is that there is no such thing as common sense. Common sense is a 'sense of what is common' and that differs for each person depending on their background, education and work/life experience. Learning when a piece of fruit is ready to be picked, how it should be picked and transported to the packing shed in order to alleviate any damage, how to grade and pack and present it for market, may seem basic but they are the fundamental essentials of maximising yield and profit. Making fruit trays up was another interesting but necessary lesson. As the orchard is approximately a 200 kilometre return journey from the supplier, all trays are bought in a knock-down state – transporting thousands of machine-erected trays is not economically feasible.

Finding an agent to market the fruit was easier than we thought. Contrary to all the horror stories we had been told, we found most of the agents generally helpful, open, honest and trustworthy. This was demonstrated in the first delivery where the number of trays had been mis-counted such that if the market agent had chosen to, we would have been out of pocket by quite a few dollars.

Challenges & Solutions

After the first season, we sat down and had a review to identify what worked, what didn't and what problems we'd had. The main issues identified were:

Challenge: Transport

The only transport available was a twelve pallet tautliner (air conditioned) with an eight pallet trailer (not air conditioned). The truck did a run on Mondays, Wednesdays and Saturdays and the truck would pick up from the property if there were four or more pallets of fruit to go to market. Three or less and we had to take the fruit approximately four

kilometres down the road to a vegetable grower who acted as a common receival point for a variety of growers in the area. This was problematic for a few of reasons.

- Depending on how many pallets of produce had to go on any given day, our fruit had the potential to be left in the grower's coolroom if the truck was overloaded.
- The waiting time for being unloaded was dependent upon the availability of the forklift driver, who else required unloading and whether or not the forklift was operational. Meanwhile the fruit sat on the trailer waiting which didn't help maintain a good cool chain.
- The cost for each delivery fluctuated with the number of pallets going to market. There was a minimum cost for the truck run which was divided amongst the growers, then once that amount was reached, a price per pallet was charged. This meant that you could spend a hundred dollars sending one pallet or five pallets, to market.
- The timing of fruit pick up was dependent upon the owner driver's personal activities. The fruit generally had to be ready for a 4.30pm pickup however this could become as early 2.30pm which impacted on how much fruit was ready to go to market.
- Space in the coolroom and the packing shed became tight with pickups on only three days of the week particularly in the peak of the season, when we operate on a seven day a week basis.

Solution

In the spring of 2004, we purchased our own truck.



A three tonne Toyota Dyna, with a six pallet tray and tautliner canopy. Not exactly the latest model, and it is a bit tired, but given the working year is limited to approximately six weeks, it does the job. And you know the saying, “nothing could be finer.....” The Canning Vale market is a solid 1 ½ hour drive one-way, so we take the fruit to market in the morning. The benefits of doing so are:

- The markets are open and we can get the market agents to unload for us thus alleviating the need to report to security, unlock the coolroom and unload ourselves.
- We get to see our produce on the floor and how much is there compared to what our sales dockets are saying.
- It provides an opportunity to check out what and who else is on the market and to talk with our market agents.
- Overall turnaround time for delivery to market is reduced.

Challenge - Crop Wastage

The wastage from split stone and damaged fruit from our first season was almost 50%. Whilst size was good packing out to mainly size 28’s to 23’s in peaches, and 32’s and 25’s in nectarines, a lot of fruit needed to be discarded due to bruising and the split stone. Given the isolation of the property there was little opportunity for farm gate sales and most of the damaged fruit needed to be discarded anyway being both bruised and split stone.

Solution

Buying the property with the crop the fertiliser history was limited to the verbal information provided to us by the previous owners. We understood nutrition would be a contributing factor as well as watering, but not the extent it impacted on growing the crop for the next season. The internet was a useful resource for identifying sources of information including the Low-Chill Stonefruit Information Kit from the Queensland Department of Primary Industry.

Obtaining information in Western Australia has been difficult. State Government resources in relation to growing low chill stonefruit has proven practically non-existent, which is probably directly attributable to the size (or lack of size) of the industry in this State.

Information on nutritional needs has therefore been gleaned through a number of sources including:

- Fertilising low-chill stonefruit¹ (courtesy of Phillip Wilk).
- Leaf and soil testing & analysis.
- Fertiliser companies & agents (Agrichem, SJB, Wesfarmers).
- Australian Soil Fertility Manual², and

¹ Slack, J.M., Huett, D.O., George, A., ‘Fertilising low-chill stonefruit’, NSW Agriculture & HRDC 1996

- Meeting and talking with local growers (including those growing medium & high chill stonefruit).



Creating a nutrient management plan was instrumental in reducing waste and maximising yield. Previously, only broadcast and band applications of pelletised fertiliser had been made. We introduced foliar applications and installed a fertigation system. The property is predominantly sand over sandy loam and as such, the potential loss of nutrients through leaching is high.

The fertigation system has allowed a little bit of something to be regularly injected thus reducing leaching (and therefore costs) and enabling the trees to grow and or store nutrients at a steady pace. The fertigation system utilises an ex-chicken farm AR dosing pump; the tanks are a combination of concrete watering troughs and a stainless steel ex-mine lab tank with agitators. The total cost of putting the fertigation system was less than eight hundred dollars, cheap but very effective. We would recommend all growers consider some form of fertigation system if one is not already installed.



Challenge: The Picking Process

Managing when and how much to pick, given the extent of fruit ripeness and the impact of weather conditions was a valuable lesson. The crops of early peaches (Florida Star & Early Grand) in one block of the

² Glendinning, J.S., (Editor), Australian Soil Fertility Manual, CSIRO Publishing, 2000.

orchard were basically lost due to two days of 40 degree heat and two nights of 30 degree heat. (It didn't help that in the 2003 season, these two varieties ripened simultaneously whereas in subsequent seasons the bulk of the Florida Star's have been finished prior to the Early Grand's coming on). Obtaining the weather forecast for the week ahead became a mandatory item.

Timeliness of collecting the fruit and bringing it into the coolroom is a critical component of maximising the yield as the polystyrene boxes the fruit is picked into, can begin to build up heat. Combined with the fruit pieces taking on the ambient air temperature, the potential for bruising fruit during transport from the orchard was high. It is an approximately 500 metre trip from the furthest point in the orchard to the packing shed.

Another important input to the picking is the labour requirement. The orchard is planted out for vase tree method of growing at five metre spacings with two and half metres between trees. The trees are between seven and eleven years of age (in 2006), thus the ability to manipulate them is reduced. The vase configuration and height of the fruit trees necessitates the use of ladders for picking which is labour intensive.



The fruit is picked into polystyrene trays, one layer high therefore the height, agility and fitness of the picker is paramount to the economics of picking the fruit. Having the correct number of pickers at the right time can be difficult to assess, particularly as it can take time to obtain people. We directly employ backpackers and augment numbers with extra people from the local labour hire company as required. Obtaining labour is not particularly difficult, managing when the labour is required, can be. Labour is currently the single most expensive item in our budget.

Solution

Is there any such thing as a solution for knowing when to pick? It's the sixty-four thousand dollar question asked by all growers. What we learnt was that we had to do at least a daily, if not twice daily inspection of the orchard to monitor fruit ripening. This is in addition to have a look around whenever we are collecting fruit trays or moving around the orchard for other reasons and included cutting open and tasting the fruit. Obtaining and constantly reviewing weather forecasts coupled with picking fruit slightly less ripe in subsequent seasons has helped to reduce losses. Temperature during picking time is also critical. On hot days picking starts at five o'clock in the morning (daybreak) and finishes around 12 noon, depending on the heat. On cooler days, picking may continue throughout the day.

Wastage has been reduced to 20% with minimal split stone through nutrient and water management. Providing our own transport to market has reduced congestion in the packing shed and coolroom, enabling all fruit brought in from the field to be placed directly into the coolroom for forced-fan cooling.



We have purchased two Squirrels that have made picking the highest trees quicker and have increased productivity during pruning and thinning seasons. The height of the trees, (varying between two and four metres in height), have generally been reduced to encourage growth lower in the tree. At least a metre of growth is scheduled to be taken off the Early Grand peach trees this year as it is too labour intensive to pick at four metre heights with ladders. The Squirrels are reserved for picking nectarines as they are a higher value crop.

Challenge: Packing and Grading

The fruit is packed into trays in one layer phlix's. Trays are 75 millimetres or 90 millimetres high. All fruit is hand graded and packed. The dilemma with packing and grading was training and speed. Training to ensure only good fruit is packed, but training so that good fruit isn't wasted. Getting the fruit packed and out to market was a challenge in the first season as we didn't have a proper concept of the sheer quantity of fruit that would be picked, nor were there sufficient packing tables set up. Whilst only 50% of the fruit in the first season went to market, it still all had to be graded and either packed or discarded. The flow of fruit within the packing shed between fruit that had been packed, fruit due to be packed and fruit coming in warm from the orchard, proved inadequate. At times there was a three day lag between picking and packing, which was only resolved by putting on a night shift to catch-up.



Solution

New and additional packing tables were designed and built in a U-Shape configuration. An air conditioner was installed and the outside of the packing shed painted with an insulating, reflective thermal paint. This meant that the packed fruit did not have to be put back in the coolroom and as fruit packing generally kept up with picking, the coolroom didn't have to run at storage temperature (that is about 10 degrees instead of one degree) thus reducing running costs. Since the first season, we have installed a Greefa grader for the nectarines that has tripled the number of fruit trays packed in a day. Peaches are still graded by hand as they get bruised going over the Greefa. It was the grading of nectarines that use to cause the bottle neck in the packing shed.

Challenge: Marketing

The marketing aspect of this business is contentious. It when we lose control of our product. Price is dictated by market demand and the skills of our agent. We don't know from day to day what the market is doing and are reliant solely upon the openness and transparency of the market agent. Trust is everything. The quandary is this; do you trust the individual sales person or the company? Is it the salesman that sells the fruit or the company? Whilst price is certainly the main contributing factor, having the confidence that the market agent will actually move your product on any given day, on the best day for the best price, is imperative. Additionally, how much and what else is that market agent selling in the same line? Do they have the buyers? The contacts? Is our fruit sitting on the floor next to someone else's who does not apply the same grading standards? How many times is the fruit dragged in and out of the coolroom? Is coolroom storage adequate? Is the

company liquid and do they pay? There is no value in getting a high price per tray and having to wait a month to get paid or not paid at all because the company has gone bankrupt.



Green fruit. Green fruit on the market can destroy it. Last season a buyer bought green fruit in a particular variety of peaches which resulted in that organisation's hierarchy putting a 'no-buy' policy in place for nearly two weeks [on that variety]. Interestingly, market agents tell us that our name is everything. Our name is our reputation that speaks to the quality of our fruit; didn't make any difference on this occasion.

Solution

Since our first season we have had some different experiences with market agents. In order to retain some modicum of control, since the second season we split our fruit deliveries between them. In this way, 'all our eggs' are not 'in one basket' and a clearer picture of what the market is doing can be obtained. The market agents provide sales dockets by email either daily or every second day which we scrutinise against delivery dockets. Any queries can be addressed at the next delivery as we endeavour to 'walk the floor' of the markets on a regular basis. Based on that information we determine who gets the next deliveries. There is little point making a delivery to a market agent who still has pallets of fruit sitting on the floor. We also keep a running analysis on price per size by variety as some market agents do better with some varieties than others.

At the end of each season we do a comparison of sales between agents and taking into consideration the sales return, ease of dealing with the market agent (that is payments & congeniality) we determine who we will supply the following season.

In a nutshell....

From the time we took over the orchard, we have:

- Automated the irrigation system and installed tensiometers.
- Installed a fertigation system.
- Insulated and air-conditioned the packing shed.
- Introduced new equipment (squirrels / Greefa grader / U-shaped packing tables).
- Obtained Freshcare Food Safety Certification.
- Learnt to pick, pack and grade fruit (!!!),
- Experienced and learnt the joys of pruning and thinning fruit.
- Developed a business plan for the future of the orchard and
- Eaten more peaches and nectarines than we'd care to remember...

Improvements and Future

Tree Shape & Spacing

For us, there is little doubt that the economics of growing stonefruit trees in a vase configuration is less viable than other methods. The new orchard blocks have been developed on a two-leader trellis system, (spacing of four metres by one and half metres). This is intended to maximise returns by growing the tree as quickly as possible to commercial production levels and by reducing labour costs associated with picking, pruning and thinning. We are looking to get the trees to the top of the trellis system (approximately 3.6 metres high) within the first twelve months of growth. Fruiting would start at the 18 month old stage.

The trellising system allows for simpler pruning practices as training people to prune vase trees has been complicated. Pruning on a ladder is tiring and coupled with the use of manual secateurs, has proved labour intensive and expensive. The purchase of Squirrels with air compressors gave the opportunity to use pneumatic secateurs. This combination saw a decrease in man-days required to prune the orchard by one third, however it did not assist in the transfer of pruning know-how. From talking with growers in the Perth Hills, we understand pruning trellised trees is a much simpler and faster job. Additionally, we intend using a working platform to increase productivity and reduce fatigue of workers. The same time and economic savings should apply to thinning and picking fruit.



Pruning the existing orchard for better economic returns over the next few harvests is critical. To address this issue, we implemented a yield tracking procedure during the 2005 harvest, for each block by variety. The intent was to ascertain the labour costs versus tray pack out (return) per orchard block and variety. Labour is currently thirty percent of orchard turnover and we needed to determine the viability of picking some of the trees due to their height.



The historical management of some trees has, for instance, allowed the trees in Block 2 of the orchard, to reach a height of four and half metres. Even when the limbs are fully laden with fruit, fruit has been missed or deliberately left on the trees in previous harvests due to the height. In light of the data collected some trees will be pruned radically this year. The drop in fruit bearing for the 2006 harvest will be outweighed in the longer term by reduced picking costs.

Nutrient Management

Nutrient management is another high priority area. The sandy ground creates issues for growing in terms of water and moisture management, leaching of nutrients and tree vigour. A comparison of fruit tray sizes between the 2003 and 2004 harvests revealed that the fruit in the 2004 harvest was much smaller. Whilst some of this may be attributed to climatic characteristics (2004 was cooler than 2003), pruning and thinning practices, the fertiliser program was also limited. The 2004 harvest saw a band application of mineral fertiliser

applied in the summer with foliar sprays of calcium and potassium throughout the spring. A full nutrient programme was developed and implemented for the 2005 harvest via fertigation and foliar spraying commencing post-harvest. The results in size were outstanding.

The following table demonstrates clearly the value of the nutrient programme:



The installation of soil tensiometers are helping to gain a clearer picture of watering requirements. Soil moisture monitoring will improve the quality of the fruit crop, and reduce watering costs and fertiliser leaching. Additionally inter-row cover crops are being sown in order to add nutrients to the soil act as mulch between rows to improve soil organic matter, decrease soil temperatures during the hot summers and provide mulch for the trees.

Varieties

The trials of new varieties of apricots, peaches and nectarines were planted in winter 2005 are growing well. Growing our own rootstock from sprouted seed to replace existing public varieties is a massive cost saving and enables the funds saved to be directed towards purchasing PBR varieties.

To date we have chosen not to plant varieties that require a licensing arrangement as the royalties associated with sales of first class produce from these trees are high. The combination of the royalty, market agent, levy and supermarket fee percentages can total twenty per cent would have a detrimental impact on our bottom line. As an example, for every one hundred dollars of sales, twenty dollars is deducted before any growing costs. There is no guarantee that these varieties will bring in a consistent high price per tray.



At this stage, we believe we can maintain a satisfactory business without the need to go down the licensing path however we will retain open minds about it. We do understand that a lot of money is spent by breeders to create viable and productive varieties and that they are entitled to a return on their work. We would prefer that this cost is recovered by adding an extra amount to the individual tree purchase. In this way, whilst the initial capital outlay may be higher the grower gets the reward from the production. After all plant breeders do not guarantee performance or production rates of the variety, it is the management of the tree by the grower that ‘bears the fruit’.

Challenges for the Future

Expansion, marketing and competition are the challenges for the future.

The new block development basically doubles the size of the existing orchard area to 10 acres. As the return from the older vase trees diminishes, they will be replaced with the new trellising system. We are looking for a nectarine to fill the timing of the Early Grand peach crop, as Early Grand’s remain a fairly unpopular variety. Nectarines are easier to handle and bring a better price per tray.



The biggest issue in the short term for the marketing of our fruit is the packing into black boxes. The height of the boxes we have been shown by our market agents are insufficient for the Florida Star peaches size 23 fruit plus, and Early Grand peaches size 25 plus. Current packing tables are designed to cater for the existing trays which are shorter and narrower. We continued using these trays last season (2005) and as we understand it, none of the low-chill stonefruit growers in Western Australia used black boxes. The requirement to use black boxes has implications in terms of:

- If machine erected boxes only available, costs of transport & capacity to store.
- Cost of new packing tables.
- If the major supermarket chains do not purchase the produce, will it be treated as poor quality by premium / other grocers?
- Do current trays continue to be used?

Sales of stonefruit are slower when the weather is cooler, as we experienced in 2005. We think it noteworthy that whilst levies are paid on fruit sales, we have yet to see any advertising campaigns in Perth promoting the consumption of stonefruit since starting in this industry.

Finally.....

The large scale planting of new varieties of low-chill stonefruit trees by of bigger growers and grower groups needs to be considered. We are looking to create a business that has an effective economy of scale given our available land area and market. The impact of these larger plantings requires assessment and integration into our business plan.

Happy growing.

