TIMELY *hints*

**JANUARY 2018**
STONE FRUIT PRODUCTION

# SOIL

## Plan new orchard establishment

- Start the re-establishment process as soon as the final harvest is off the orchard in order to allow for the maximum time before planting.
- There are three parties to contact as soon as possible:

1. The Nursery should have been contacted and trees should be ordered 24 months before establishment. Visit the Nurseryman from time to time to ensure that the trees are still in a good condition.

2. The Irrigation designer should be contacted to do an orchard and contour survey. This survey will be used by both the designer and the soil scientist.

3. The Soil Scientist should be booked for a soil survey and new orchard design.

## A detailed soil survey entails:

- Dig profile pits on a 50m grid. The pits should be 1.2m deep, or 30cm into the limiting layer albeit clay or fresh rock. These pits are ideally dug using a digger or TLB (Tractor-Loader-Backhoe).

- The soil scientist will classify the soil and note the following:
  - Soil form and family (naming the soil is the primary basis for drawing a soil map)
  - Number of and depth of horizons
  - Limitations present within each horizon. These limitations include:
    - coarse fraction content (stone)
    - percentage, type and structure of clay
    - soil compaction
    - degree of wetness
    - colour
    - sand grade

- These limitations will be visually displayed in the form of a soil map. The farmer can discuss these findings with the irrigation designer, horticulturist and soil scientist around

a table in order to decide on the best irrigation system, soil preparation, rootstock (if not yet ordered), row direction, need for drainage, need for irrigation breaks etc.

# IRRIGATION

Maintain optimal irrigation as long as fruit are still on the tree. Systematically reduce the irrigation post-harvest until only 50-60% of the pre-harvest demand. Do not stop irrigation all together as trees will still grow to end of January and flower bud initiation is occurring at this time.

# NUTRITION

Leaf samples should be taken in week 4. The following procedures can be followed:

1. Samples should be taken for trees that are:
   - The same **cultivar**
   - The same **age**
   - The same **rootstock**
   - Planted on the same **soil type**

   Thus do not mix leaves from trees that differ with respect to the above factors.

2. Select **one or two rows** in the orchard that represent the orchard as a whole. These rows should be marked as the index rows.

3. Sample **1 or 2 leaves from each tree** from the sample site in order to compile a sample of approximately **70 - 80 leaves** in total.

4. Sample on **both sides of the row**. Sample leaves on one year old wood (the current season's growth). Do not sample on water shoots or buds. Sample leaves at **shoulder height**.

5. Leaves should **not be wet or** mechanically, biologically or chemically **damaged** in any way. If the leaves are wet, dry them with a fan or paper towel before placing them in the sample bag. A veggie net bag works best.

6. Label the bag thoroughly. Place the samples inside an **insulated box or bag** in the **cold-room** or the **bottom of the refrigerator**. Do not freeze the samples. Place the samples in a

box for delivery with the sample list on top. 7. Deliver the samples to the laboratory for a standard foliar analysis.

# HARVESTING TIPS

Your exporter will be giving you guidelines as to the maturity standards that they require for export and the Department of Agriculture, Forestry, and Fisheries (DAFF) applies maturity standards for export which are monitored and verified by the Perishable Products Export Control Board (PPECB) who acts as an assignee for DAFF. The following are just some tips when it comes to harvesting:

## Apricots

The most common maturity standard used for Apricots is the so called 'wring test' which involves cutting the apricot in half and wringing the two halves apart. The pit should be loose from the flesh. If it is loose then the apricot is mature enough to harvest. Exporters also have their own firmness guidelines which you must check as well as checking with your exporter as to what flesh firmness they require. Especially for over maturity, firmness is critical. Soft apricots will be rejected.

When harvesting Apricots the following is recommended:

- Give the pickers cotton gloves for picking. This is a good idea as it will reduce the incidents of nail injuries etc. greatly and psychologically also makes pickers realize that it is a very sensitive fruit to handle.
- Injuries such as torn stems or stem causing injuries to the fruit are the biggest problem in apricots.
- Most injuries happen when the apricot is picked as it is lifted against the branch as one picks it. Give apricots a slight twist when harvesting but be careful not to injure the shoulders with this action.
- Once one has determined the colour of the fruit of the maturity that one wants to harvest, one aims to pick to that colour standard. Almost a green, lime, yellow colour, is normally the standard.

## Dessert peaches

Check with the exporter for the maturity standards they require. Peaches are harvested according to flesh firmness and correct firmness will determine the background colour that one needs to harvest at.

- Injuries are also a major problem. One must take the same care as one would with apricot harvesting and ensure that one does not injure the fruit - especially the shoulder of the fruit.
- Over mature fruit is a problem, so one needs to harvest dessert peaches at least three and sometimes four to five times.

- It is best to harvest some of the early dessert peaches into trays and always keep the tip of the peach upright.
- Spray ReTain (3-Buteoic Acid Hydrochloride) to delay harvest a little bit and give firmer fruit with less soft tips. This works very well for nectarines but also for some of the peach varieties. Discuss with your exporter and spray representative.

## Nectarines

Nectarines are also picked on flesh firmness; you should check maturity standards with your exporter. Some of the new nectarine varieties that are full red are difficult to harvest as they obtain the full red colour before they mature and one cannot just pick on colour. If there is a bit of background colour, that is useful to pick on but a tip that I have found that worked well over the years is that when the nectarine loses its glossy shine and gets a bit of a dull haze on the epidermis, is normally a sign of correct maturity. Again taking firmness tests and determining which fruit is mature and which fruit is not, can give one an indication of the colour standard one must pick to. Size does play a role in maturity, in that the larger fruit are more mature than the smaller fruit, especially for the first one or two picks.

## Yellow cling peaches

Probably the easiest to pick but that does not mean to say they can be handled roughly. Here it is really only colour that determines maturity and especially if one is picking for canning. The canners will determine maturity by colour, they don't want green fruit. South Africa's reputation as a supplier of top quality canned peaches is partly because of the very good yellow colour. This is why many buyers around the world prefer South African canned peaches - because of their excellent yellow colour standard.

## Plums

Plum maturity is also determined by flesh firmness, as well as % TSS (Total Soluble Solids). Check with your exporter regarding the maturity standards that they require for their markets. Most plum varieties are picked out, using colour as the guide of what to pick and what to leave behind. A good rule of thumb is, the day you think you must start picking the plum variety, wait two days and then pick. Your first pick should be at least 20% of the crop, if you cannot take off 20% with the first pick then you are picking too early. The following guidelines are given:

- Varieties such as Laetitia: The first pick is almost always ¾ red fruit and redder. The next pick half red and redder fruit and the last pick is a strip pick. In other words for the 2$^{nd}$ and 3$^{rd}$ pick one has less red colour in the fruit. This rule of thumb generally works.

- Injuries are also a great problem in plums.

- Rub marks are also a big problem in plums. Some varieties are far more susceptible than others. Either pick plums into plastic bins or use plastic liners. The warmer the fruit, the more likely they are to incur rub marks. Try not to pick in the heat of the day.

- The size, especially with the first pick is an important maturity parameter, normally the larger fruit ripens first.

- For some of the yellow plums such as Songold, one can often get away with a single pick (strip pick). This can only be achieved if one had a very even blossom (Bud break).

- It is best to pick plums into plastic buckets (20 Litre) as the picking bags can cause too many rub marks and then to be transferred gently from the bucket to the picking bin.

- If one is transporting the fruit in bins to the pack shed it is very worthwhile to put a 150mm Polyethylene Sponge Mattress on top of the bin and tie it down tightly. This prevents fruit from moving up and down on the load bed of the lorry and causing rub marks.

A good norm for picking productivity is that a picker in a nine hour picking day should be able to pick 450kgs of plums per day. That is 50kgs per hour. If you are doing a strip pick then the rate should be at least 75kgs per hour.

### General

Visit the SA Orchard Video Training Website to learn more about picking of stone fruit. (See: www.saorchard.co.za)

# WHAT TO PLANT AND HOW TO PLAN

## 1. What to plant?

For stone fruit, this is a very difficult question as there are a number of new varieties being made available almost weekly.

Most of these varieties have not been tested adequately and the producer has very little knowledge and information to go by when deciding if this variety would perform well for her/him. Hopefully the new independent evaluation initiative, namely Provar, will make us much better informed about new cultivars.

- The first decision that one needs to make, is, will it be peaches, nectarines, plums or apricots? Will it be early or late maturing varieties of these four fruit kinds? A very good pointer to help you decide which of these four fruit kinds and early or late is what does well in your district? For example, the late plums do very well in the Warm Bokkeveld. Early Nectarines do very well in the Limpopo District etc. Have a look at what is doing well in your district.

- When deciding early or late and which of the four fruit kinds one should plant, discuss it with your Marketer. You need to plant a fruit kind that has good market prospects and here your exporter will help you greatly.
- Planting the wrong fruit kind and cultivar can be very costly. If you have to graft it over in four years' time or grub it because it is not working, this can be exceptionally costly. Being the front runner in planting new cultivars is very high risk. It often pays to be second or third and not the first to commercially trial a new cultivar.
- Especially for plums, local (South African bred) is often the safest and the best choice. Too many of the imported plum cultivars either have a high chilling requirement or are very susceptible to *Xanthomonas*. You must know the variety's chilling requirements and disease susceptibility before one decides to plant it. Consulting your neighbours, and technical experts as to what does well for them and what produces high tonnages of good quality, well sized fruit, and is very important.
- They say any new cultivar should fulfil the three "P's" namely: Production, Pack out and Price. It should have high yield, high pack out and high price. Price of course is a function of fruit size as well.
- One is often limited as to which sites one can plant new orchards on and the terroir of the site is critically important when it comes to fruit kind and cultivar selection. Planting a high chill, very prone to sunburn plum variety on a North facing slope, baking in the setting Western sun is not a good selection as you will surely have delayed foliation and lots of sunburn. As they say, chose the right horse for the right course. Chose the right fruit kind and variety for the right site.

## 2. Rootstocks

It is probably one of the most difficult decisions to know which rootstock to use for which fruit kind and which cultivar. Fortunately because of the work that Dr Piet Stassen has done, we have a lot more information about the various stone fruit rootstocks and on which soils they do well. We also know more about nematode resistance, susceptibility to wet feet and chilling requirements. Choosing the right rootstock is critical. Planting a rootstock that has a high chilling requirement and is very susceptible to ring nematodes in the Berg River Area, where we don't have enough chilling and we have lots of ring nematode issues, would not be a wise decision. It would be very wise to consult widely as to which would be the best rootstock for the site that you have chosen to plant, for the cultivar and fruit kind that you have chosen.

The biggest problem that we have is that there is a huge shortage of stone fruit rootstocks at present and if you wanted to plant the fruit kind and cultivar of your choice and the right rootstock for the site, you would not likely get that right for the 2017 planting and at best for the 2018 planting but most likely only by 2019. So it shows that

one must plan one's new orchard development at least three years in advance. One should secure the rootstock at least three years in advance and one can decide which scion variety to use a year before planting.

The biggest mistake that we can make is when we cannot get the rootstock of our choice and also cannot get the second best rootstock, we then plant on a rootstock that is really not suited for the site or cultivar. Again a very costly mistake considering that you are going to have to live with that orchard for at least 20 years, so you have to put up with 3rd, 4th or 5th best compromise for 20 years, not worth it.

## 3. Training Systems

Once one has decided what fruit kind and what cultivar, one needs to also decide what planting density to plant at and what training system one is going to use. This decision will have an impact on your rootstock selection as well. The more dwarfing the rootstock, the closer one needs to plant in the row and between rows, i.e., a higher density. Is one going to be planting a 3-dimensional tree or just a fruiting wall, so called 2D training system? The cultivar and rootstock chosen will influence this decision greatly. Certain varieties like to be trained horizontal, some need to be trained in a 45° angle, some need to be vertical. The training system chosen must take into account which system the tree is likely to be happy with.

## 4. Irrigation

Irrigation will not really influence what fruit kind and cultivar one is going to plant but the availability of water may make you decide to plant early maturing varieties that will require less water because the crop is harvested earlier. However, the quality of the water will influence which rootstocks one is likely to choose as some rootstocks are more "brak" tolerant than others. With stone fruit, drip irrigation is a good system and one does use less water, even if one goes for a double line drip system (which is preferred by the author).

## 5. Soil Preparation

The soil preparation probably has very little to do with fruit kind, cultivar and rootstock selection but it is important with soil preparation that one works hard at illuminating all the limiting factors such as poor drainage, chemical rectification, soil depth etc.

## 6. Conclusion

As once can see, choosing the right cultivar and fruit kind for the right site and the right rootstock is not that easy a decision and one that needs a great deal of consideration and planning. Successful farms have a 5-10 year planting programme drawn up well in advance. This programme is not cast in concrete but it does help one make sure that when one does come to planting, one plants the right cultivar, of the right fruit kind, on the right rootstock, on the right site. Then one can fulfil all three "P's" namely: Production, Pack out and Price. Now is the time to start with detailed planning for the at least the next 5 years.

# PEST AND DISEASE CONTROL

The December Timely Hints giving the red spider and post-harvest leaf pathogen control strategies may need more implementation in the mid-summer, after the crop has been harvested. In addition to this, the mid to later season cultivars will need very effective programmes for the control of the following pests and pathogens:

- **False Codling Moth (FCM) – All Stone Fruit.** FCM is mainly a problem of stone fruit cultivars that mature after mid-December. Mating Disruption is a most efficient control measure for FCM. With the new legislation on EU market access, cultivars from high pressure areas being harvested from late January onwards, should preferably be covered with a MD product. Isomate FCM @ 600 Disruptors/Ha, giving 5-6 months of pheromone disruption, should be hung from early - mid October to give the required cover on the later cultivars. Alternatively, Checkmate FCM-F, needs to be applied 21-28 daily (based on heat), using 110ml/Ha applied as a bait application into the tops of the trees, in 50 L water/Ha.

- Where MD is applied, it is important to monitor for FCM activity both outside the orchard and above the dispenser height in the orchard. The trap needs to be fixed to a wire attachment on a reed and positioned high up in the tree, pushing it above the pheromone dispensing height, but allowing it to be readily accessed for monitoring purposes.

- The FCM Virus Cryptex is registered on all stone fruit. This should be applied 10-14 days after a peak moth catch in the traps, at a rate of 60ml/Ha and be repeated 14 daily thereafter at 35ml/Ha, until the moth infestation is under control. These virus applications should be applied in the later afternoon or evening (owing to their UV sensitivity), to assist in the viral load to suppress the FCM activity. All the FCM remedies,

including the virus, are very Ph sensitive, and need to be maintained in the 5-8 range, for optimum efficacy.

- In addition to the sprays listed in the table, there are a range of pyrethroids registered for FCM control on stone fruit. One must however, be cautious of using too many pyrethroids, as they have a very detrimental effect on predators, which can result in problems controlling red spider. Pyrethroid use is not considered good IPM strategy.

| Product | Safety (Days) | Number of Sprays | Peaches | Nectarines | Plums | Apricots |
|---|---|---|---|---|---|---|
| Altacor 10g | 14 | 2 | √ | √ | √ | |
| Ampligo 350ml/Ha | 28 | 3 | √ | √ | √ (14) | √ |
| Calypso 15ml | 60 | 3 | √ | √ | | |
| Delegate 20g | 7 | 4 Including Tracer | √ | √ | √ | √ |
| Steward 20g | 28 | 2 | √ | √ | √ | |
| Warlock 80ml | 21 | 4 | √ | √ | √ | √ |

- **Fruit Fly – All Stone Fruit.** Monthly baiting should be done throughout the winter (May until August inclusive), irrespective of trap catches. In September and October, fortnightly baiting should be undertaken. For the period, November till end April, weekly baiting needs to be complied with, early in the morning. "Hotspots" on the farms (home gardens), should have the intensity of baiting doubled – 2 weekly in the winter and weekly in the spring. When baiting, it is critical to apply 1L/Ha of attractant per bait application. Hymelure OR Loklure at a 2L/hl solution rate, mixed with 175ml/hl Mercaptothion, applied at 50L/Ha of solution, applies the 1L/Ha. The ph of the water solution should be buffered to 4.5 – 5.5 for optimum efficacy of Mercaptothion. When one applies GF120 closer to harvest, again the rate is 1L/Ha of GF120 in 10 to 20L of spray solution/Ha. The lower the volume of water, the better it works. Alternate rows need to be sprayed, effectively wetting 1 side of every tree when baiting. The bait solution needs to be aimed into the top third of the trees, wetting the underside of the leaves.

- **Post-harvest decay – All Stone Fruit.** Apply 80ml/hl Indar, 21 days before expected harvest to cover for Monilinia (Brown rot). Indar has a 5 day export safety window and 1 day local.

  Apply 2L/Ha Protector, 3 days before harvest, covering for Botrytis and Monilinia. A 3 day safety window applies to both export and local. In the event of the weather being conducive to decay, one could consider rather applying 2L/Ha Tutor, 3 days before

harvest, covering for Botrytis, Monilinia and suppression of Rhizopus. Tutor also has a 3 day safety window for both the export and local markets.

**Thrips – Nectarines and Plums.** As fruit **approaches maturity**, thrips damage may cause "silvering" on the fruit. If required, apply 15ml/hl Tracer @ first sign of thrip activity. No more than 4 sprays may be applied per season in any one block. Safety window = 7 days on nectarines, 21 days on plums.

## TIMELY HINTS CONTRIBUTORS


| Soil, Irrigation, and Nutrition | Thinning and Newly planted trees | Pest and Disease control |
|---|---|---|
| Mico Stander<br>Soil scientist<br>Agrimotion<br>021 851 1051 | Peter Dall<br>Technical consultant<br>Peter Dall Consultancy<br>028 272 9671 | Andrew Hacking<br>Technical consultant<br>Ad Lucem Agricultural Services<br>021 880 1905 |