Timely Hints

March 2017

Soil

Soil Conditioning Programme

In the December *Timely Hints* we looked at the procedure for soil sampling for maintenance lime. The analysis results should now be available.

In the Western Cape we are prone to speak of a "Liming Programme" when it comes to rectifying soil chemical conditions in established orchards. As fruit production occurs in many areas where no lime is required, I will refer to this programme as a 'soil conditioning programme' instead.

This programme should incorporate the soil analysis and leaf analysis (Sampled in weeks 3 to 4) and orchard observations. The aim is twofold:

1) Create a uniform orchard by treating zones of variation differently, and
2) Balance the chemistry in the soil to create optimum conditions for crop production.

These optimum conditions are:

- pH (KCl) 5.5 (5 to 6)
- Salinity absent (Resistance greater than 400 to 750 ohm)
- Ca 70-80% of CEC*
- Mg 12-15% of CEC
- Ca:Mg of 4:1
- K 80ppm and/or 4% of CEC
- Na <8% of CEC
- P 30ppm (Bray 2)

* CEC = Cation Exchange Capacity, very simply put, is the soil's capacity to bind positively charged compounds (cations). We thus not only consider the absolute values of elements, but also the portion of the CEC occupied by an element.

For maintenance programmes we will not apply trace elements, these should have been incorporated at planting. If there is a drastic deficiency in the foliar analysis we can consider analyses for trace elements on an ad hoc basis for troubleshooting purposes. Trace element uptake through roots is limited at soil pH greater than 7 and we will not even consider it in these conditions. Amend through foliar application the case of the latter.

The soil conditioning programme will aim to amend the above mentioned parameters through application of:

- Calcitic Lime (Increase pH and Ca)
- Dolomitic Lime (Increase pH, Ca and Mg)
- Gypsum (Increase Ca)
- Magnesium Oxide (Increase Mg)
- Phosphate should be ameliorated if:
  - Soil P (<30ppm) and leaf P (< 0.2-0.25%) OR
  - Soil (<20ppm) OR
  - Leaf (< 0.2-0.25%)
  - P products are expensive and regular analysis and interpretation will allow for effective management.
- Saline soils should be treated on an ad-hoc basis as each scenario is unique. The approach should review drainage, irrigation water, soil chemical and physical status and fertilization.

A soil conditioning programme should be done every 2 to 3 years to address the changing requirements.

Use of precision sampling methods and precision agriculture

There are more and more precision services being offered to farmers every day. These include both wonderful and worthless technologies and strategies.

Precision agriculture is not the use of drones, big tractors and GPS's. Yes, these are tools used in precision agriculture. Precision agriculture is a strategy of farming more accurately by doing the 'right thing' in the 'right place' at the 'right time'.

The GPS technology mentioned above is used to identify the 'right place'. The other two factors ('right thing' and 'right time') can only be determined through thorough inspection and interpretation. There are farmers in the industry that have been doing precision zone management for over 20 years, not with a GPS, but purely by painting trees in areas that require more or less fertilizer than the flat rate dose.

With this in mind I want to give some pointers to consider when using such a service:

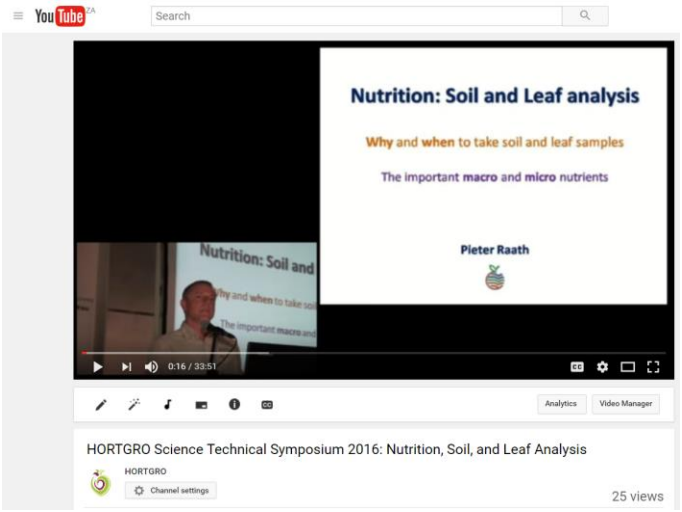
- Taking samples on a grid instead of a composite sample per orchard
  - This will have a great cost implication as we are taking more samples
  - Do not reduce cost of analysis by leaving out critical analysis such as resistance
  - Do you have the means to apply ameliorants (lime etc.) on the scale that you are sampling?
  - Are samples taken from a single point on a grid (core sample) or is it still a composite sample. A core taken in a misrepresented spot will give skewed results
  - Is the variation in your soils such that it justifies the scale of sampling?

- Sampling to correct soil chemical status
  - Is this done only from a soil perspective or is the leaf analysis taken into consideration?
  - Is the person/software making the recommendation familiar with the crop type, the specific phenology, farm soil distribution or the orchard history?

I would like to close this section with an analogy:

Many farmers will try precision agriculture services out of curiosity, much like that month spent trying the newest diet. They will be left with a disappointed memory of money spent on no results, only to return to the old way of doing things. If the adoption of a 'diet' is to work it has to be paired with a mind-set change, consistent application and no exceptions when feeling lazy.

Ensure your precision approach is based on proven scientific principles, offered by reputable providers, fits your budget and current equipment. The tools (and toys) will come over time.



Watch video: https://youtu.be/W38rLB-wuQY

Irrigation

Continue 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 (February) and flower bud initiation is occurring at this time. Only if trees are growing excessively should water be reduced further.

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:

Harvesting video: https://youtu.be/K9dirGNRA8s

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 2nd and 3rd 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)

Pruning

1. **Autumn pruning**

Pruning videos:

- Peach/nectarine trees: https://youtu.be/CXkqZ03pXZw
- Apricot trees: https://youtu.be/SniQ4e2XloU
- Plum trees: https://youtu.be/Tx4SSAUqTMk

As discussed in previous *Timely Hint* Articles, the most important goal during the post-harvest period is to build up reserves within the trees for the following season. The greater the effective leaf area to photosynthesize and create reserves for next season, the better. One does not want photosynthetic products to go into new shoot growth, but into reserves. So everything you do, should be done so as to ensure that there is no new shoot growth in late summer in stone fruit trees. The question then is; when is the best time to start pruning and which fruit kinds and cultivars should be tackled first?

- Do not start pruning before you are sure that any cuts you make, will not stimulate new shoot growth.
- Start pruning in the most vigorous, shaded orchards, so that if you reduce the size of the "factory" a bit in these vigorous trees it doesn't matter. The most important thing is to increase the light distribution in the tree and make sure that all the leaves intercept enough light to photosynthesize reserves for the adjacent buds for next year.

From approximately April onwards, one can start pruning vigorous peach and nectarine trees. You can do the final prune in April and May. The more one can open up the trees and expose the one-year-old, good quality-bearing wood to the sun, so that the wood ripens and matures properly, the better. So you can start pruning peach and nectarine trees that are over-vigorous and over-shaded as soon as you believes that you will not stimulate new shoot growth.

It is very important when pruning to practice the necessary sanitation and especially on stone fruit, not to prune on wet, rainy days. Especially the early pruning when the sap flow is to the roots, one makes a cut with a disinfected pruning shear or saw. The moisture can distribute the fungus and the bacteria and this makes bacterial and fungal infection a high risk. So always prune on dry, sunny days and disinfect all pruning equipment.

I prefer to prune the following fruit kinds and varieties in-blossom:

- Apricots: As apricots are very susceptible to bacterial disease infection and pruning in blossom means the sap flow is to the shoot tips, the risk of getting bacterial infection into the tree is greatly reduced.
- Vigorous orchards that struggle to set fruit: Pruning in blossom reduces the vigour and the competition of shoot growth with flower set and one tends to get slightly higher fruit set.
- Varieties that we make cutting back cuts into the two year old wood such as certain plum varieties and apricots etc.: Are best pruned in Spring when these heading back cuts do not result in too great a stimulation of vegetative growth.

Important note: it is important to keep the leaves healthy as long as possible, so that they can carry on photosynthesizing for as long as possible and build up reserves. New shoot growth should not be stimulated otherwise all the energy generated by the leaves goes into shoot

growth and one lacks reserves the following summer.

2. **Post-harvest and autumn chores**
   A number of production inputs need to be attended to in the post-harvest/Autumn period. It is good to go through the check list to make sure that they are all actioned:
   - Drainage: Make sure all drains are open, unblocked and ready for the winter rains
   - Support Trellis: Repair and wires tightened etc.
   - Weed Control: Attended to, especially perennial weeds; perennial grasses such as Kikuyu, Fynkweek etc., these are easy to control in Autumn with a good systemic herbicide when the sap flows to the roots.
   - Study Cull Analysis Results to determine what the pest and disease problems were in the previous season and start defining a strategy for the coming season. Many pest and diseases are controllable in Autumn or Winter.
   - Make sure that all trees are tied firmly to the support trellis, you do not want trees rocking in the ground.
   - Tie leaders firmly to support trellis.
   - Analyse yields of the previous season and determine which factors contributed to lower than expected yields and how many of those factors can be addressed, and attended to, during the coming Autumn, Winter and Spring.
     - For example; cross pollination: Was there adequate cross pollination and did you have the right pollinizers? For plums this is critical. As discussed previously, two pollinizers are better than one. You can determine whether it is necessary to graft in additional cross pollinators in July/August and start making plans to action.
   - Nematode Samples: Take Nematode samples and submit for analysis, to determine if this is one of the limiting factors in the orchards.
   - Obtain a post-harvest fertilizer and foliar nutritional spray programme from your plant nutrition consultant

3. **Conclusion**
   In conclusion, post-harvest/autumn is the time that one starts planning for the new season and try to rectify the short comings of this past season. A well planned strategy for this coming season is invaluable and this should be undertaken in the post-harvest/Autumn period.

Pest and disease control

The January *Timely Hints* giving the false codling moth, fruit fly and post-harvest decay control strategies need to be very thoroughly implemented for the late stage of the season. The fly and moth pressure, **on especially late dark coloured plums**, is going to be very severe this season, given the mild winter, dry conditions and veld fires, destroying the natural habitat of the pests. In addition to this, the all-year round fruiting window being achieved through the combined farming of stone fruit, citrus and vines on the same farm, is creating an ideal haven for pests to flourish and complete their life cycles in different fruit types and times of the year, achieving a year-round build-up of insect pressure. In addition to this, the earlier maturing cultivars may need additional help in preventing red spider and post-harvest leaf pathogen infestations, as follows:

- **Red Spider Mite – Apricots.** Agrimec Gold @ 225ml/Ha (130–320 ml/Ha) + 250ml/hl Eos oil can be applied with an associated 21 day safety window. A maximum of 2 sprays may be applied per season, applying no closer than 21 days apart.

- **Red Spider Mite - Peaches and Nectarines.** Agrimec Gold @ 225ml/Ha (130-320ml/Ha) + 250ml/hl Eos oil can be applied with an associated 21 day safety window for both export and local. A maximum of 2 sprays may be applied per season, applying no closer than 21 days apart.

Alternatively, Epicure @ 100ml/hl may be applied, also with a 21 day export safety window, but a 5 day local market safety window. Here too, a maximum of 2 sprays may be applied per season.

- **Red Spider Mite – Plums.** Agrimec Gold @ 190ml/Ha (130-320ml/Ha) + 250ml/hl Eos oil can be applied with an associated 21 day safety window for both export and local. A maximum of 2 sprays may be applied per season, applying no closer than 21 days apart. Alternatively, Sanamectin @ 35ml/hl + 150ml/hl Light Mineral Oil, **OR** Zoro @ 17,5ml/hl + 150ml/hl Light Mineral Oil may be applied once only, with a 14 day export and 7 day local market safety window being applicable.
- **Post-Harvest Red Spider Mite – All Stone Fruit.** If needed, based on monitoring which confirms the lack of predator activity, a clean-up spray may be needed. Try and use a different chemical group to that which may have been used before harvest, to retard resistance, as residues on the fruit are no longer a problem. Acarstin Flo @ 50ml/hl is registered on peaches, nectarines and plums (not to be applied onto fruit destined for export.) Remember, trees under moisture stress are far more prone to spider mite activity than trees that are not stressed for water.
- **Post-Harvest Fungal Infections – All Stone Fruit.** If orchards have a history of being prone to gum spot, brown rust or powdery mildew, preventative sprays should be applied to ensure the leaf quality and efficacy is not negatively impacted in the post-harvest period when reserve assimilation is so important. Generally speaking, the imported cultivars seem far more susceptible to brown rust, than the locally bred cultivars. Either Mancozeb @ 150g/hl or Wettable Sulphur @ 300g/hl could be applied. The wettable sulphur, will control both powdery mildew and brown rust as opposed to Mancozeb, controlling brown rust and gum spot.

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