

EXTENSION BRIEFS APRIL & MAY '09

H.F. LE ROUX & J.J. BESTER

Citrus Research International

INTEGRATED PEST MANAGEMENT

T G GROUT

Phytosanitary pests

All the recommendations made in the Extension Briefs for February and March also apply to this period. Monitoring numbers of fruit flies and false codling moth is critical to determine whether control measures taken are adequate. Take note of the lowered threshold of 2 Natal fruit flies per Sensus trap per week when using Capilure. Sanitation of split, stung or infested fruit in the trees, or fallen fruit on the ground, should take place at least once a week.

Blemish factor analysis

The analysis of fruit blemish factors on the tree just prior to harvest or once fruit have been harvested, provides the grower with an evaluation in commercial terms, of all control programmes implemented during the season and also assists with pest management decisions for the season to follow. With the trend towards selective picking and a variable degree of culling

occurring in the orchard, it is more accurate to conduct the final analysis of fruit blemish factors before picking starts. Care must be taken to include fruit from inside the tree and all blemish factors or pest infestations should be recorded, whether they are sufficient to cull the fruit from export quality or not. If fruit blemish is analysed at the packhouse, samples can be taken at a convenient point before the fruit are graded. Samples should be randomly selected and the number of samples should ensure that a true picture is obtained of the situation in a particular orchard. Having taken the sample, it is important to record separately each pest or other blemish factor that is severe enough to downgrade a fruit in its own right. With this procedure a particular fruit in the sample may be shown to have more than one factor that can cause it to be culled from export.

CROP AND FRUIT QUALITY MANAGEMENT

J S VERREYNNE

Maturity indexing

Maturity indexing on early cultivars should commence. Maturity indexing is done to predict the rate of change in fruit maturity in order to harvest fruit at a maturity that would maintain acceptable commercial shelf life. The aim is to define changes or rate of change in acids and sugars and to build up a database over a number of years for comparison. Random sampling of fruit every week from each of ten representative trees should start 4 to 6 weeks before the expected harvest date. Titratable acidity is determined by titration with sodium hydroxide, sugar content (Brix) is determined by a hand-held refractometer, the sugar:acid ratio calculated and fruit colour should be read from a colour chart. All the parameters mentioned above should be plotted on a graph over time. Once plotted, trends will become apparent, harvest dates can be estimated and problem areas in internal and external quality parameters can be identified and manipulated.

Post harvest rind disorders

The publication, "Postharvest Rind Disorders of Citrus Fruit" by Paul J.R. Cronje is available. It is very useful in the correct identification of physiological rind disorders. It is available from CRI. Contact Bella Thulare at 013 759 8000.

Pruning

Pruning of early cultivars (Satsuma, Clementine) should be done during this period as soon as possible after harvest. Prune heavier after a light crop and if a heavy crop is expected and when the orchard has a history of alternate bearing.

Post harvest urea application

A foliar urea application (low biuret urea at 1%) can be applied



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on early cultivars (Satsuma, Clementine) as soon after harvest as possible.

GRONDGEDRAAGDE SIEKTES

M C PRETORIUS

Phytophthora en aalwurmbeheer

Dit is nou 'n goeie tyd van die jaar vir die winterreënvalgebiede soos die Wes-Kaap om *Phytophthora* en aalwurmontledings te doen. Beheerprogramme moet 'n aanvang neem na die eerste goeie winterreëns. Beheermaatreëls moet 'n program van minstens twee maar verkieslik drie toedienings (twee maande uitmekaar) insluit. Let op residu-weerhoudingstydperke van veral aalwurmdoders en lees die ETIKETTE van die verskillende produkte!!!

Phytophthora beheer

Wortel en kraagvrot Wortel en kraagvrot beheerprogram in winterreënvalgebiede kan in die herfs begin. Ridomil wortel-sone behandeling (2 g/m²) en fosfonaat blaarbespuitings kan gebruik word om wortel en kraagvrot effektief te beheer. Drie fosfonaat toedienings twee maande uitmekaar behoort gedoen te word. Slegs 'n ligte dekbespuiting met die fosfonaat produkte sal effektief wees.

Baie belangrik: LEES DIE ETIKETTE VAN DIE VERSKILLENDE PRODUKTE DEEGLIK VERAL DIE WAARSKUWINGS! Vermoë die gebruik van die fosfonate indien toestand mag voorkom wat bome onder enige vorm van stres mag plaas. Produsente het oor die algemeen 'n probleem om te weet wanneer hulle boorde onder vogstremming is en wanneer nie. Bo en behalwe droogte en hitte kan bergwindtoestande ook bome onder tydelike verwelkte toestande plaas wat 'n gevaar inhou vir blaarbespuitings. Bome moet dus nie tydens of kort na sulke toestande gespuit word nie. Laastens beïnvloed drag ook 'n boom se gevoeligheid vir droogtespanning. Hoe hoër die drag, hoe gevoeliger is die boom vir uitdroging en hoe groter is die risiko vir fitotoksiteit. Bly dus weg van die gebruik van fosfonate op Satsumas en/of enige ander sagtesitruskultivars.

Bruinvrot Herfsreëns kan lei tot ernstige na-oesbederfverliese deur *Phytophthora* bruinvrot, soos wat verlede jaar ondervind is deur sekere produsente. 'n Enkele vrug besmet met bruinvrot kan tydens verskeping die res van die vrugte in 'n uitvoerkarton laat bederf teen die tyd wat die vrugte hul bestemming bereik.

In die somerreënvalgebiede word bruinvrot op sitrus hoofsaaklik veroorsaak deur die patogeen *Phytophthora nicotianae* var. *parasitica* en affekteer dit meestal die vrugte op die onderste 1.5 m van die boom naaste aan die grondoppervlak. **Dit behoort dus redelik veilig te wees om slegs hierdie onderste band vrugte te spuit.** In die winterreënvalgebiede kom *Phytophthora citrophthora* hoofsaaklik voor. Hierdie patogeen versprei hoër op in die boom en kan vrugte tot bo in 'n sitrusboom besmet. Daar word dus aanbeveel dat die bome in hierdie streke volledig bespuit sal word. Bruinvrot ontwikkel slegs wanneer die klimaatstoestand gunstig is vir die patogeen (*Phytophthora*) om te infekteer en te ontwikkel. **Indien dit dus 'n droë najaar is en geen of slegs ligte reënbuie voorkom, is voorkomende bespuitings nie nodig nie.** Indien dit egter 'n nat winter of na-

jaar is, moet bome gespuit word. Koper (200 g/100 l) of mancozeb (200 g/100 l; let op marktoeganklikheid tov residu) kan gespuit word om bruinvrot te beheer. Hierdie produkte is slegs kontakmiddels en die moontlikheid dat dit afgewas kan word deur reën en besproeiing is wel moontlik. Fosfonaat swammiddels is uiters effektief maar is tans nie geregistreer vir die gebruik teen bruinvrot nie. Hierdie middels sal wel effektief wees selfs indien dit in 'n wortelvrot program gebruik word. Fosfonaat stamaanwendings is nie effektief teen bruinvrot nie. **WAARSKUWING – PHYTOPHTHORA BRUINVROT**

Aliette is glad nie geregistreer vir die beheer van *Phytophthora* bruinvrot nie, slegs vir wortelvrot. Aliette mag volgens die etiket **nie na April maand toegedien word nie!!** Bly dus weg van die gebruik van fosfonate op Satsumas en/of enige ander sagtesitruskultivars. Sien waarskuwings soos genoem by wortel- kraagvrot beheer. Lees etiket tov waarskuwings vir die gebruik van die fosfonate.

GEÏNTEGREERDE BEMESTING

J G K COETZEE

Die stikstofstatus van sitrus gedurende die herfs en vroeë winter

Die voorsiening van stikstof aan die bome moet bestuur word sodat dit gedurende die laat winter en lente (Julie tot Oktober) hoog is en dan geleidelik daal om in die laat somer, herfs en vroeë winter (Februarie tot Junie) 'n laagtepunt te bereik. By vroeë kultivars soos Satsumas moet die lae stikstofvlak selfs vroeër bereik word. Om die hoë en lae stikstofvlakke te bereik, moet voorsiening deur bemesting beheer word. Dit sal nie van self gebeur nie en moet bestuur word.

Managing the nitrogen supply

High N-status Control is obtained by starting with the first nitrogen application in July (Northern areas) or August (Western Cape and Vaalharts). Depending on the clay content of the soil and the type of irrigation used, one, two or more applications are required to maintain the high from July/August until October and to facilitate the steady decrease reaching a low in February to June. The aim is to increase the nitrogen content of the trees rapidly, keep it at a high for 3 to 4 months and then let it decrease gradually. The high concentration of nitrogen in the trees is required for cell division, cell growth and fruit set.

Lae N-status Gedurende November moet die stikstofstatus van die bome begin daal om die minimum gedurende Februarie tot Junie te bereik. Die lae stikstofvlak gedurende Februarie tot Junie, is noodsaaklik vir die produksie van kwaliteit vrugte en die akkumulering van reserwes vir die komende bot, blom, seldeling en vrugset periodes. Daar is net een manier waarop bepaal kan word of die stikstofstatus van die bome reg bestuur word, en dit is om 'n vaste program te volg en dit met blaarontoedienings gedurende Februarie tot Junie te kontroleer.

Blaar- en grondontledings

By sitrus word blaar- en grondmonsters gedurende Februarie tot Mei geneem maar die periode kan tot Julie verleng word. Die enigste probleem met monsters wat in Julie geneem word, is die beperkte tyd om die resultate betyds te verskaf sodat met

bemesting in Julie/ Augustus begin kan word.

Ensure that the correct leaf is picked from the trees in the index rows or block. Collect 50 to 100 leaves per sample. Take the soil sample at the same index trees. Collect 15 to 20 sub-samples, mix and submit 500 g of the composite samples for analyses.

How much nitrogen to apply?

The following process can be followed;

- Calculate the removal of nitrogen by the crop by applying the figures below.
- Ensure that the application of nitrogen will promote the mentioned high and low status.
- Take leaf samples and adjust the rate and application times if the leaf level is beyond the optimum.

Die volgende verwyderings-syfers kan gebruik word. Alles word in gram N per ton vars vrugte aangegee en kompenseer reeds vir 80% doeltreffendheid.

2750-3000 vir suurlemoene

2000-2500 vir satumas

2000-2500 vir pomelos

2500-2750 vir nawels

2250 tot 2500 vir alle ander

Deficiencies

Any nutrient deficiency will reduce the potential of the trees. It is therefore important to avoid going into this high activity period of flowering and fruit set with any deficiency. Foliar sprays can be used to correct deficiencies or at least reduce their impact, even during autumn and winter.

Maak seker dat die regte dosis gespuit word en dat toestande so gunstig moontlik vir opname deur die blare is. Die aanvaarbare dosis is 100 mg Zn, 300 mg B, 50 mg Cu en 450 mg Mn per liter wat gespuit word. Pluk die blaarmonster voordat u 'n herfs of winterbespuiting doen.

POST HARVEST PATHOLOGY – WASTE PREVENTION CHECKLIST K H LESAR

Waste Control – Essential points to remember

High humidity, rainfall and temperatures create an environment that is suitable for waste development. However, the mere occurrence of the above does not necessarily mean that there will be higher waste. Other factors or conditions are necessary. These include injuries (mechanical, stings, etc.) as well as the presence of decay-causing organisms (pathogens) in the orchard, packhouse and picking bins.

The disease triangle

Since the pathogen, the host (fruit) and the environment are invariably related, they can be grouped into three basic components which are illustrated in the form of a 'disease triangle'. The elimination of one or more of the components of the disease triangle results in a situation where waste cannot develop.

Although we have no control over the environmental factors, we definitely have control over the presence of the patho-

gen and the susceptibility of the fruit to waste. Below are some points to take heed of:

Pathogen: Keep inoculum to an absolute minimum.

- Regular sanitation (this is not only important to keep the spore load down, but is also necessary for reducing fruit fly and FCM levels).
- Disinfection of dumptanks with chlorine, chlorine dioxide or quaternary ammonium compounds. (check regularly and keep records of concentrations).
- Post-harvest fungicides (regular checks/records).
- Disinfection of packhouses, trailers, picking bins, etc. (Sterimist, formalin, etc.).

The fruit: Our most important rots develop from injuries.

- Minimise picking injuries (Indigo carmine test).
- Spray for Phytophthora brown rot.
- Control fruit fly and FCM. The main type of decay found in cartons is green mould and sour rot. This type of waste is mainly caused by injuries made by fruit fly and FCM.
- Minimise any delay between picking and treatments in the packhouse.
- Prevent over-maturity.
- Train contract pickers to handle fruit correctly. Indications are that the substantial waste over the last number of seasons (2004-2008) was due to high numbers of injuries. NB!!!
- Prevent build-up of latent pathogen (Diplodia, Anthracnose) inoculum by removing dead wood in trees at the end of each season.

How safe is your descaler and dumptank water? A simple method to check whether your descaler and/or dumptank water is a source of fungal contamination

- Place 30 uninjured fruit from a picking trailer into a large bucket containing a 1% Jik solution.
- After washing the fruit place the fruit carefully into a clean citrus carton to dry (away from any place where surface contamination of fruit with spores can take place).
- Make an instrument to injure the fruit. It is recommended that you push a nail through a cork so that the sharp end of the nail extends 2 mm from the end of the cork. Sterilise this instrument in Jik.
- Injure all 30 fruit by scraping the instrument across the fruit (2-3 mm long) and penetrating the rind.
- Randomly select 15 of the injured fruit and place them into a paper bag for your control treatment.
- Measure the concentration of your sanitising agent (chlorine, Harvest Wash, etc.) in the descaler water prior to putting the injured fruit through the system.
- Treat the remaining 15 fruit (one at a time) by holding each fruit for 3 seconds under the high pressure spray of the descaler. Allow this fruit to dry in a clean carton and place into a paper bag.
- Make sure that both paper bags are tightly sealed so that no vinegar flies can contaminate the injuries.

Place the two bags in a room with no air-conditioning, and check on the situation 5-7 days later. If the control has no waste



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LAVENDER SWEET LAVENDER

I have to confess that I am very fortunate – I work with herbs on a daily basis and I always enjoy the challenges of the different aspects of this complex entity. I have an absolute soft spot for our indigenous herbs and volatile oils and I promote and market the uses and advantages continuously. However, I have a passion for lavender that transcends common sense – I adore lavender and now I am not talking about the successful commercial cultivation of lavender, but the pure joy of it. We have recently completed a small range of our own lavender-blend products and I am very excited about them.

Let us not get bogged down in the intricacies of lavender taxonomy, suffice to say that the lavenders I refer to are *Lavandula angustifolia* and *Lavandin*. If your lavender flower more than once a year and have more than a whiff of camphor – chances are, they are not the lavender I refer to.

I share some of my thoughts with you.

The beauty of lavender

We have just completed our annual lavender harvest and the fields are grey-green clumps. After the initial visual shock of seeing a field of sculptured cut plant-residue instead of the vibrant purple fields of last month, the stark beauty and rhyme of the plantation gathers appeal.

The lavender field is an ever-changing picture as the life cycle of the plants progress but the purple flowering period that last only 3 – 4 months in full-summer make the most impact.

In winter the plants go into a serious resting period and the few remaining leaves are nearly grey. When the soil temperature has risen enough, almost over night in early summer, the new leaves that have been forming in a cluster will be joined by many stems and flower heads that fan out from the centre. Very soon the stems will grow, the flowers will mature and it will be harvesting time again.

One can incorporate this beauty of change also into your garden landscaping as we are doing around a circular fountain on our werf-area.

Even though the obvious beauty of lavender is in mass-appeal, a single perfect flower can be inspiring – I must admit, one always tends to gather more and more stems and not leave it at one.

The goodness of lavender

To me the best property of lavender is the relaxing property: Lavender will calm and sooth when you are feeling hot and bothered – whether you are walking in a lavender patch or smelling the oil.

Lavender oils have a certain profile where the constituents adhere to ISO standards – this is the oil worth buying and using. This is also the quality of oil that should be used in products.

Some of Lavender essential oil properties are: analgesic, anti-inflammatory, anti-microbial, anti-septic, anti-rheumatic, a cell regenerator and a disinfectant. Put into everyday-use:

- put a few drops into your bath water

EXTENSION BRIEFS

CONTINUED FROM PAGE 61 and the treated fruit has lots of waste then you need to carefully check on your descaler sanitation process.

Citrus Packhouse Sanitation

NB: Important to remember for packhouse sanitation and fungicide resistance

- Do not allow partly decomposed fruit or decomposed fruit with visible spores into the packhouse.
- If decomposed fruit is found in the packing bins or on grading tables the whole line must be disinfected.
- Culled fruit, especially fungicide-treated fruit, must not be left in or near the packhouse.

- Fungicide-treated local market fruit must not be stored in or around the packhouse and allowed to decay and develop spores.

- Spores on fungicide-treated fruit are highly likely to contain a large proportion of spores resistant to that fungicide. If these resistant spores are allowed to spread back into the packhouse, this situation could be conducive to the development of full-scale resistance to a fungicide.

- The packhouse and packline must be cleaned and disinfected every day, after packing.

It is important to understand how sanitizers complement the use of fungicides and the reality of what sanitizers can and cannot do.



- massage a drop onto your temple
- put a drop on your pillow
- use for minor cuts and skin ailments
- use as a natural deodorant

The fragrance of lavender

I am often amazed how few people know the true fragrance of lavender. Most gardeners have been brain-washed with the camphor smell of garden varieties being sold as *angustifolia* or *lavandin*. Lavender should smell sweet and round – immediately relaxing.

The fragrance of the lavender is due to the unique combination of constituents in the oil glands and can be regarded as a

footprint of taxonomy. With distillation of the cut flowers, the oil is extracted and cleaned to be used in the flavour and fragrance industries.

The flavour of lavender

Taste is more than 70% smell . . . so be guided by the same rules as fragrance when choosing lavender for flavour.

Most recipes developed for lavender, use the properties of sweet lavender – do not substitute willynilly for camphor lavender. Try mixing 3 teaspoons of sweet lavender flowers into 500 g of brown sugar and allow to mature for at least a month. Use sparingly in coffee, tea . . . and recipes.

The difference between fungicides and sanitizers

Fungicides only kill specific fungi. Whereas sanitizers are non-specific and will kill not only fungi but bacteria as well. Fungicides will kill fungi over a prolonged period whereas sanitizers will only kill fungi or bacteria on contact. Fungicides bind to fruit surfaces and give some residual protection to the fruit preventing latent infections and infection of wounds after treatment. Unlike fungicides, sanitizers are highly reactive and once inactivated will no longer offer any residual protection. Sanitizers react not only with fungi and bacteria but also with dirt, leaves, twigs and even with fruit surfaces, so the greater the amount of organic matter the quicker the sanitizer will lose its activity.

Sanitizers, thus, cannot prevent mould from developing on infected fruit, but can effectively limit the build-up of fungal

and bacterial spores in dump tanks and high-pressure spray fruit washing systems. This is done by sanitizing the water and preventing spores washing onto clean fruit or into wounds on clean fruit.

Effective use of any sanitizer requires a reliable, approved test kit (no dipsticks) to be able to read and monitor the sanitizer concentration in a washing system, and maintain the sanitizer concentration at the correct recommended concentration, as the washing system becomes dirtier. As stated above, the more the build up of organic material and spores, the greater the demand on the sanitizer and the less effective the sanitizer will be. Therefore it is necessary to maintain a fairly clean washing system and monitor the product concentration for the washing system to be effective.