

INTEGRATED PEST MANAGEMENT

Valskodlingmot

Hendrik Hofmeyr

Met die uitsondering van die granulovirus, Cryptogran, wat deur die bedryf se eie maatskappy River Bioscience geregistreer is, is daar geen nuwe insekdoders vir die bestryding van valskodlingmot op sitrus beskikbaar nie.

Teen die tyd dat dié joernaal gepubliseer word, sal daar waarskynlik slegs tyd wees om 'n enkele bespuiting van Alsystin (10 ml produk per hl water), Nomolt (20 ml produk per hl water), of Cryptogran (10 ml produk plus 250 ml molasse per hl water plus 18 ml Agral 90) toe te dien. Meothrin (30 ml produk per hl water 4 tot 5 weke voor oestyd toegedien) is slegs as 'n enkelbespuiting geregistreer. Produsente word sterk afgeraai om dit meer as een keer per seisoen vir VKM-bestryding te gebruik.

Weerstand teen bogenoemde insekdoders (Cryptogran uitgesluit) word alreeds geruime tyd ondervind. Die onderdrukking wat deur die produkte verskaf word, is egter dikwels nog swakker as gevolg van swak bespuiting. Let daarop dat goeie bespuitings die grondslag vir doeltreffende VKM-bestryding is.

Fruit fly

Tim Grout

Fruit fly monitoring and control is critical during this period. Please consult the previous edition of Extension Briefs or Cutting Edge circulars 26 and 27 for recommendations.

BEMESTING EN BESPROEING

Produsente wat nog nie blaar- en grondmonsters laat ontleed het vir bemestingsaanbevelings nie moet dit nou doen!

GRONDGEDRAAGDE SIEKTES

M.C. Pretorius

Phytophthora en aalwurmbesmer

Dit is nou 'n goeie tyd van die jaar vir 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-weerhoudings-tydperke van veral aalwurmdoders!!!

Phytophthora bruinvrot

Herfsreëns kan lei tot ernstige na-oesbederfverliese wat veroorsaak word 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 somerreënsvalgebiede word bruinvrot op sitrus hoofsaaklik veroorsaak deur die swam *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 winterreënsvalgebiede daarenteen kom *Phytophthora citrophthora* ook voor. Hierdie swam beweeg 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.

Kontakmiddels wat gespuit kan word sluit in mancozeb en koper. Aansienlik beter beheer word egter met fosfonaat swammiddels verkry. Die fosfonate moet egter as 'n blaarbespuiting toegedien word volgens die etiket. Stamaanwendings is nie effektief teen bruinvrotbeheer nie. Verseker dat die bome onder geen vorm van stres is wanneer die middels toegedien word nie.

CROP LOAD AND FRUIT QUALITY ENHANCEMENT

G.H. Barry & J.S. Verreyne

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 data base 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.

Degreening

The publication "Common Defects Associated with Degreening of Citrus" by Andy Krajewski and Tim Pittaway is a must for any grower who degreens fruit. It is available from CRI. It puts degreening in perspective, gives the correct manner of treatment as well as a photographic identification of degreening defects.

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 nitrogen application

Post-harvest (before winter) nitrogen application in the form of

foliar-applied low-biuret urea at 1% can be done on Satsuma. Trees bearing high yields are low in nitrogen reserves after harvest and foliar applied nitrogen is part of a strategy to increase the nitrogen reserves and, therefore, return bloom.

NA-OES PRAKTYKE

P.J.R. Cronjè

Vir die voorkoming van na-oes fisiologiese afwykings is die korrekte produksiepraktyke, soos bemesting en besproeiing, uiters belangrik. Maar tydens die oes en pakproses is daar egter drie kritiese faktore wat die kwaliteit van die vrugte beïnvloed. Eerstens moet die optimum plukvenster vir elke kultivar per area bekend wees (d.w.s. rypheidsindeksing) en gehandhaaf word. Daar moet dus selektief gepluk word om vrugte van dieselfde kleur en volwassenheid saam na die pakhuis te stuur. Snoei, om die lig-huishouding te verbeter, kan die proses vergemaklik. Ontgroening is die volgende faktor; buiten die korrekte konsentrasie van etileen is dit krities dat die regte temperatuur en relatiewe humiditeit (95%+) gehandhaaf word:

Satsuma mandaryne:	18 tot 21°C
Clementine en Nova mandaryne	19 tot 22°C
Nawel lemoene	21 tot 23°C
Ander lemoene	23 tot 24°C
Pomelo's en suurlemoene	24 tot 25°C

Ontgroen altyd vrugte, wat meer gevoelig voorkom, teen die laagste temperatuur. Die etileenbehandeling is ook die effektiëste as vrugte van dieselfde kleur gelyktydig behandel word. Die tydperk van die behandeling moet ook so kort as moontlik wees. Hou die CO₂ vlakke onder 0.3% (3000 dpm) deur die ventilasie sodanig te stel; hoë CO₂ vlakke verlangsamen die ontgroeningsproses deur as kompeterende inhibitor teen etileen op te tree. Stadiger ontgroeningstempo sal 'n langer tyd in die ontgroeningskamer vereis en 'n verkorte rakleefyd tot gevolg hê.

Die derde faktor waarop gefokus moet word is temperatuur-beheer. Eerstens moet gelet word op die hantering van die vrugte vanaf die boom tot in die pakhuis en spesifiek die verwydering van veldhitte.

Dit is belangrik dat vrugte vanaf die oomblik van oes nie aan hoë temperature blootgestel word nie en indien moontlik afgekoel

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moet word. Die tempo van vogverlies uit die vrug is direk afhanglik van die vrug se temperatuur asook die omgewing waar die vrug verkeer. M.a.w. hoe warmer die vrug is hoe meer vog word verloor. Die vogverlies speel 'n rol in verskeie skildefekte bv. "Zebra skin". 'n Eenvoudige maatreël soos nat komberse oor die vrugtekrat of plukwa sal keer dat die vrugte nie warm gebak word as die krat of wa in die son moet staan nie. Tweedens moet daar gepoog word om vrugte na verpakking so spoedig moontlik in die koueketting te kry.

Al dié fasette het 'n betekenisvolle invloed op vrugrespirasie en vogverlies en indien die korrekte stappe geneem word, kan die respirasietempo en dus veroudering so laag as moontlik gehou word. Dit verseker dat vrugte 'n langer rakleefyd het en dat die ontwikkeling van fisiologiese afwykings verlaag word.

To reduce the incidence of peteca spot it is advisable to delay harvest while oleo conditions are prevalent (cold, misty and high relative humidity). Be sure not to harvest outside the normal picking window as immature fruit are considered to be more prone to peteca. In the packhouse some practices were found to affect the occurrence of peteca. Fruit should be stored for 3-5 days before packing.

Avoid over-brushing and excessively hot drying tunnels. Heavy waxes are known to cause more peteca. Fruit should also be brought under cooling conditions as soon as possible after packing. Peteca is viewed as a post-harvest disorder, but is most probably the result of sub-optimal cultural and environmental factors. It is therefore important to maintain optimum irrigation scheduling during warm dry periods of fruit development. It is also advisable to check the peteca spot sensitivity before harvesting by picking fruit and dipping it in a wax with a high solid constitute. This should be done a week or two before the proposed harvesting date and could give an indication of susceptibility to peteca spot.

POST-HARVEST PATHOLOGY

Waste Control -

Essential points to remember

K.H. Lesar

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 pathogen 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 or chlorine dioxide (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.
- Prompt fungicide treatment after picking.
- Prevent over-maturity.
- Training of Pickers (Picking video).
- Prevent build-up of latent pathogen (Diplodia, Anthracnose) inoculum by pruning of dead wood in trees at end of season.

How safe is your descaler water? A simple method to check whether your descaler 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. Recommend that you push a nail through a cork so that the sharp end of the nail extends 12 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 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.
- Place 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 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 already fungicide treated, 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 production.

One needs to understand how sanitisers complement the use of fungicides and the reality of what sanitisers can and cannot do.

The difference between fungicides and sanitisers
Fungicides are specific and only kill specific fungi. Whereas sanitisers are non-specific and will kill not only fungi but bacteria as well. Fungicides will kill fungi over a prolonged period whereas sanitisers 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, sanitisers are highly reactive and once inactivated will no longer offer any residual protection. Sanitisers 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 sanitiser will lose its activity.

Sanitisers, 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 sanitising the water and preventing



MACFRUT 2006

Cesena Italy • 4/6 may



The 2006 MACFRUT, organised by Cesena Fairs, will take place from Thursday May 4th to Saturday May 6th (Pievesestina pavilion - Hours: 9:00 - 19:00) with about 700 exhibitors on over 30 000 square meters.

In 2006 over 250 bilateral meetings will take place between Italian operators (of exhibiting companies) and accredited foreign representatives, based on each party's needs.

This is part of a project sponsored by the Emilia Romagna Region's Councillor for Productive Assets, ICE, the Forlì-Cesena Chamber of Commerce and Cesena Fairs, which will bring official delegations (operators in the sector and representatives from associations and bodies) from various countries to Macfrut.

Meetings that by now are practically routine include the 17th annual Agro Bio Frut (Exhibition of new technologies and seeds), the 11th annual Exhibition of Mediterranean Organic Production (both dedicated to organic fruits and vegetables) and the 17th annual Trans World Exhibition of Agro-food transport.

Macfrut has long since had the role of tackling controversial topics and issues, and this role will be maintained in 2006 with a specific meeting on the crisis itself, while in another conference operators and buyers from organized distribution will compare notes on the question of certification and phytosanitary residues. This high profile international conference will be attended by the entire European fruit and vegetable supply chain. The goal of this event is to put together a "Manifesto for harmonizing European fruit and vegetable regulations and procedures".

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E-mail: info@macfrut.com ¥ www.macfrut.com

spores washing onto clean fruit or into wounds on clean fruit.

Effective use of any sanitiser requires a reliable, approved test kit (no dipsticks) to be able to read and monitor the sanitiser concentration in a washing system, and maintain the sanitiser 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 sanitiser and the less effective the sanitiser 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.

BELANGRIKE KENNISGEWING

Benlate mag nie meer in die voorontgroening storting of "Drench" gebruik word nie. TBZ, was en is nog steeds die standaard aanbeveling en moet weer gebruik word teen 'n konsentrasie van:

1 l/1000 l (500 dpm) Winter re nvalgebiede; en

2 l/1000 l (1000 dpm) Somer re nvalgebiede

Daar is nou drie nuwe geregistreerde formulasies van TBZ, bo en behalwe die Tecto 500, vir gebruik vanaf die begin van die 2006 sitrus seisoen:

ICA Thiabendazole 500 SC, van ICA International, Universal Thiabendazole 500 SC, van Universal Crop Protection en Thiazole 500 SC, van Villa Crop Protection.

Die konsentrasies van hierdie drie sal dieselfde wees as vir Tecto 500 SC.

Die prys van TBZ behoort nou goedkoper te wees, in vergelyking met wat dit was.

4TH CITRUS RESEARCH SYMPOSIUM

This is the first announcement of the 4th Citrus Research Symposium to be held at Boardwalk Casino, Port Elizabeth, from 20-23 August 2006.

Contact person for registration and accommodation is Jean De Gasperi, Tel: 013-759 8000, Fax: 013-744 0578, or email: jeandeg@cri.co.za.

For the best accommodation register now!

It has been announced in previous communication that accommodation at the Beach Hotel in PE for the 4th Citrus Research Symposium be made with Nadine at the Marine Hotel. *This has now changed.*

From immediate effect please make reservations at the Beach Hotel with Carmen Rossouw

Tel: 041-5832161; Fax: 041-5836220;

or email: reservations@pehotels.co.za Thank you.

4de SITRUSNAVORSINGSIMPOSIUM

Hierdie is die eerste aankondiging van die 4de Sitrusnavorsingsimposium wat gehou sal word by Boardwalk Casino, Port Elizabeth 20-23 Augustus 2006.

Die kontakpersoon vir registrasies en akkommodasie is Jean De Gasperi, Tel: 013-759 8000, Faks: 013-744 0578 of epos: jeandeg@cri.co.za.

Vir die beste akkommodasie bespreek nou!

Daar is voorheen aangekondig dat akkommodasie by die Beach Hotel in PE vir die 4de Sitrus Navorsingsimposium by Nadine gemaak word. *Hierdie reeling het nou verander.*

Sal u asb van nou af u besprekings by die Beach Hotel by Carmen Rossouw maak

Tel: 041-5832161; Faks: 041-5836220;

of epos: reservations@pehotels.co.za). Baie dankie.

4th CITRUS RESEARCH SYMPOSIUM

The 4th Citrus Research Symposium will be held in Port Elizabeth from Sunday, 20 August 2006 at 17:00, to Wednesday, 23 August 2006 at ± 17:00. The Citrus Research Symposia are held on a bi-annual basis and have previously been held in the following areas: Mpumalanga (2000), the Western Cape (2002) and the Limpopo Province (2004). During the 2006 symposium citrus growers from the Kat River Valley, the Sundays River Valley, the Gamtoos River Valley and Knysna will have the opportunity to attend the Symposium as it will be within easy reach.

The symposium will give feedback on citrus research conducted for the southern African citrus industry during the previous two years. This research has been conducted by researchers from CRI, several universities and researchers from the private sector contracted by CRI to do research. The symposium will be attended by citrus growers, citrus exporters, SASSCON members, SACNA members, the chemical industry and delegates from other related industries.

This symposium will be the first Citrus Research Symposium where guest speakers from abroad will be invited as keynote speakers.

SCIENTIFIC PROGRAMME The programme will consist of plenary sessions. Each paper will be allocated 15 minutes plus 5 minutes for discussion. A keynote speaker will introduce each session daily. A workshop will be held on the Monday afternoon after tea. Breakaway groups will be accommodated on the Monday afternoon in smaller rooms adjacent to the Tsitsikama room. Four rooms are available for groups to meet, such as SASSCON, SACNA and the CRI Board of Directors.

COSTS Registration:	R700-00	Pensioners/ Students/ Citrus BEE growers:	R300-00
Late registration (after 01/07/2006):	R800-00	Day visitors:	R300-00

FOR MORE DETAILS & REGISTRATION FORM CONTACT JEAN DE GASPERI 013 759 8000