

# EXTENSION BRIEFS FOR JUNE/JULY 2011

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

*Citrus Research International*

## INTEGRATED PEST MANAGEMENT

### False codling moth S.D. MOORE

All fruit remaining on orange, mandarin and grapefruit trees (i.e. all FCM susceptible cultivars) after harvest must be removed and destroyed. This is because FCM activity does not cease during winter and any remaining fruit can therefore serve to facilitate this activity. In addition, this winter fruit creates a reservoir of inoculum of FCM for the following spring. Conversely, removal of all fruit after harvest can dramatically reduce FCM levels in the following season. In addition, fruit fly numbers can also build up on unharvested fruit.

would normally be applied in August, September or after petal fall and will be discussed in the next edition of Extension Briefs.

**Ant control T.G. GROUT** Ants are usually indirect pests on citrus and interfere with the behaviour of natural enemies, sometimes protecting and even transporting pest species. The winter months are a good time to control ants before honey-dew-producing pests such as aphids increase on the spring growth flush. If trunk barriers are being used as a control method they should be replaced or rejuvenated at this time and trees should be skirt-pruned to prevent branches from touching the ground later in the season when bearing fruit.

### Red scale T.G. GROUT

Those growers who have experienced red scale problems

during the past season should consider applying narrow distillation range horticultural mineral oils. Although the oil price is higher than it used to be, oil is probably the most IPM-compatible treatment option for red scale. The generally accepted period to apply this treatment is from budswell to budburst (mid-July to mid-August). The concentration to be used is dependent on the grade of the oil to be applied (generally 1.0 – 1.25% medium grade oil). When spraying oil, care must be taken to apply the oil as a full cover, film wet spray. This is because oil suffocates the insect, a job it cannot do if the scale is not covered with oil. Trees to be sprayed must also not be under any stress. Other treatments for red scale

**NA-OES PRAKTYKE P.J.R. CRONJÉ** Vir die voorkoming van na-oes fisiologiese afwykings is die korrekte produksiepraktyke, soos bemesting en besproeiing, asook snoei, uiters belangrik. Daar is egter gedurende die oes en pak-proses kritiese faktore waarop gelet moet word wat die voorkoms van skildefekte, asook algemene vrugkwaliteit kan beïnvloed. Bepaal die optimum plukvenster vir elke kultivar per area deur 1 maand voor die beplande oesdatum met rypheidsindeksing (interne kwaliteit en skilkleur) te begin. Daar moet gepoog word om die temperatuurlading op die vrug te beperk vanaf die plukproses tot in die pakhuis, deur die vrugte se veldhitte so gou as moontlik te verwyder (bv. deur vrugte gouer te “drench”). Die paklyn het 1 invloed op skilkondisie, asook die voorkoms van skildefekte, en dit is belangrik dat detail aandag aan alle bewegende dele, bv. rollers en borsels, asook waks-tipe en aanwending geskenk word.

Ontgroening is 1 belangrike aspek van die sitrus na-oes hantering en moet optimaal bestuur word. Dis belangrik om te besef dat daar 1 interaksie tussen kultivar, vrugrypheid en die effektiwiteit van ontgroening bestaan. As vrugte te vroeg (onvoldoende kleur-ontwikkeling aan boom) in die ontgroeningkamer geplaas word, sal die verlangde kleur nie ontwikkel nie. Gedurende ontgroening is daar egter aspekte wat streng beheer moet word, nl. etileen konsentrasie (1-3 ppm), temperatuur en relatiewe humiditeit (95%+).

Ontgroen altyd meer sensitiewe vrugte teen die laagste temperatuur. Die etileenbehandeling is die effektiwiefste as vrugte van dieselfde kleur gelykertyd behandel word. Die tydperk van die behandeling moet ook so kort as moontlik wees. Hou die CO<sub>2</sub> vlakke onder 0.3% (3000 dpm) deur die ventilasie sodanig te stel; hoë CO<sub>2</sub> vlakke verlangsamen die ontgroeningsproses deur as kompeterende inhibeerder teen etileen op te tree. 1 Stadiger ontgroeningstempo sal 1 verlenging van die tyd in die ontgroeningkamer vereis en 1 verkorte rakleef tyd tot gevolg hê. Vir meer informasie raadpleeg die “Common defects associated with degreening of citrus” deur Krajewski en Pittaway, wat bestel kan



CONTINUED FROM PAGE 55

ducing the finest olive oils. Each year, once the harvest is completed, the team under the leadership of Prof. Fontanazza and Gerrie Duvenage make up the best possible blend from the individually stored oils. This is then blended and marketed in the now well recognised and distinct Morgenster embossed bottle.

Packaging is critical, not only in terms of recognition of the product, but also for protection of the oil itself. The Morgenster bottle, imported from Italy, is dark and made from a special UV reflective glass to protect the oil from the elements of light and heat, ensuring the oil reaches the customer in perfect condition. Added to this, the Morgenster bottle features a tamper proof seal which prevents the bottle from being refilled. It is the guarantee that what is in the bottle is exactly what was carefully poured into it in their factory. Other key elements of the packaging are the oil resistant labels, certification by SAOlive and the “Best before” date.

#### Optimum ontgroenings temperatuur

|                              |             |
|------------------------------|-------------|
| 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 |
| Pomelos en suurlemoene       | 24 tot 25°C |

word van CRI in Nelspruit (kontak Bella 013-759 8000).

Die koueketting se invloed op die vrugkwaliteit is van kardinale belang en sal nie net die voorkoms van skildefekte beïnvloed nie, maar ook algemene kwaliteitsaspekte soos vrugfermheid en rakleefyd. Die belangrikste faset van die koueketting is dat dit nie onderbreek mag word nie, m.a.w. as vrugte tot op die verlangde temperatuur verkoel is, mag die tempertuur nie weer styg nie.

## CROP AND FRUIT QUALITY MANAGEMENT

J.S. VERREYNNE

**Maturity indexing** Maturity indexing on mid-season to late 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 using a 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 and postharvest rind disorders** The two publications "Common Defects Associated with Degreening of Citrus" by Andy Krajewski and Tim Pittaway and "Postharvest Rind Disorders of Citrus Fruit" by Paul J.R. Cronje are a must for any grower. Both are available from CRI. Contact Bella Thulare at 013 759 8000 or bella@cri.co.za.

**Pruning** Pruning for the earlier and mid-season cultivars should be done during this period as soon as possible after harvest. Prune heavier after a light crop if a heavy crop is expected and when the orchard has a history of alternate bearing. Pruning in the winter and not later than September improves the light distribution inside the tree and improves the quality of the bearing wood inside the tree. Pruning can also be used as a thinning technique. Light levels above 30% of full sunlight are necessary for optimal photosynthesis and light also improves colour development. In very dense trees and especially older trees, light levels can drop below this threshold level in the inside of the tree and adversely affect fruit size.

**Flower induction:** Citrus trees require a rest period of about 6 weeks to ensure that adequate flower induction takes place. The

two mechanisms involved in floral induction in citrus involve (i) low temperature, or (ii) controlled-drought stress, both to ensure no root activity. In the absence of low-temperature rest, citrus trees should be exposed to controlled-drought stress for a 4 to 6 week period during June and July if possible.

## GEÏNTEGREERDE BEMESTING J.G.K. COETZEE

### Blaarontleding / Leaf analysis

The very last opportunity to get leaf analyses done is in June and July. Leaf analysis is still the best diagnostic method to measure the nutritional status of the trees. Although all the production factors are important for optimal production, the single most important one is still irrigation.

Blaarontleding is egter nie 'n towerstaf nie. Dit is 'n betroubare manier om die voedingstatus te bepaal en help om die regte bemestingsprogram te formuleer. Blaarontleding vorm 'n integrale deel van die totale proses van sitrusproduksie.



## Bemesting/Fertilisation

The fertilisation programme for the 2011 crop starts in July or August 2010 and is usually completed by November (where micro-jets are used) or January (where drippers are used). Due to the properties of the specific chemical ion, the properties of the

soil and the physiological requirements of the trees, certain basic rules should be adhered to when applying fertilisers to citrus.

Die hele bemestingsprogram moet by die bome en boord se behoeftes aanpas en nie andersom nie. Die volgende is basiese vereistes vir die bemesting van sitrus.

| Element                    | Mikrosuipte/Micro-jets                                                                                                                                                                                                                                                                        | Druppers/Drippers                                                                                                                                                                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>N</b>                   | Dien die meeste N gedurende Julie tot September toe. Die aantal toedienings word bepaal deur die totale massa en die klei-inhoud van die grond. Die beginsel vir sproeibemesting en uitstrooi met die hand of meganies, bly dieselfde.                                                        | Die beginsel is soos die vir mikrosuipte maar die massa word verdeel in 'n groot aantal toedienings wat tot Desember strek. Die meeste N moet egter nog steeds in Julie tot September toegedien word, en die toedienings moet nie veel langer as Januarie aanhou nie. |
| <b>Organiese materiaal</b> | Dien al die organiese materiaal soos kompos, kraal- of hoendermis gedurende Julie tot Augustus toe. Genoeg tyd moet gelaat word sodat 70% van die stikstof teen Oktober vrygestel is.                                                                                                         | Die huidige metode is om die totale massa organiese materiaal te verdeel en gelyke massas bo-op elke druppers geplaas word. Dit moet ook gedurende Julie/Augustus gedoen word.                                                                                        |
| <b>P</b>                   | Use only single or double supers and apply it in a narrow strip of about 5 cm wide, below the drip line of the trees                                                                                                                                                                          | Use a water soluble source like mono ammonium phosphate (MAP) or phosphoric acid and apply it over an extended period (4 to 5 months) at lowish concentrations.                                                                                                       |
| <b>K</b>                   | Wanneer sproeibemesting gebruik word, kan dit teen 100 g K per boom per keer oor die hele lengte van die siklus toegedien word. Wanneer meganies of met die hand uitgestrooi word, word een (leem- tot klei-gronde) tot drie (sand-gronde) toedienings gedurende die lente/vroeë somer gemaak | Dien die aanbevole massa kaliumnitraat, -sulfaat of -chloried oor 'n periode van 3 tot 6 maande gedurende Julie tot Desember toe.                                                                                                                                     |
| <b>Ca</b>                  | The most critical time for a deficiency would be August to October. Therefore when gypsum is required, apply it during August or September                                                                                                                                                    | Calcium nitrate is the only suitable source and must be applied during August or even July to September/October. The application can however be extended to December.                                                                                                 |
| <b>Magnesium</b>           | Dolomitiese kalk, magnesiumhidroksied of -oksied kan in die lente, vroeë somer of herfs toegedien word.                                                                                                                                                                                       | Magnesiumnitraat of -sulfaat word ook oor 'n periode van 3 tot 6 maande toegedien. Die nitraat gewoonlik vroeg en die sulfaat na Oktober.                                                                                                                             |
| <b>Sulphur</b>             | Sulphur deficiency has the most devastating effect on fruit set. Where a deficiency is present, apply the sulphate during July to August. Maintenance applications are done during spring or early summer.                                                                                    | Magnesium-, potassium or ammonium sulphate are the sources and the application is timed to fit the requirement of these four elements.                                                                                                                                |

Blaarbespuitings word gebruik om tekorte reg te stel of om die bome se fisiologie te manipuleer. Vir manipulasie is dit hoofsaaklik lae biuret ureum of kaliumnitraat wat gebruik word.

Beide bespuitings moet 6 tot 8 weke voor die 50% blom-stadium toegedien word. Dit is meestal Julie of vroeë Augustus.

| Element                    | Timing                                                                                                                                                         |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>N</b>                   | Low biuret urea to improve the quality of the blossom.<br>Low biuret urea to supplement the nitrogen supply                                                    |
| <b>P</b>                   | Om die suur-inhoud van die vrugte te verminder.<br>Om die TOV van die vrugte te verhoog.                                                                       |
| <b>K</b>                   | Potassium nitrate to improve the quality of the blossom.<br>Potassium sulphate to supplement the K supply<br><br>Potassium sulphate to supplement the K supply |
| <b>Mg, Zn, Mn, B en Mo</b> | Waar 'n tekort ondervind word.<br>Instandhouding                                                                                                               |
| <b>Cu</b>                  | Usually only recommended to correct a deficiency                                                                                                               |



## POST HARVEST PATHOLOGY WASTE PREVENTION CHECKLIST

K.H. LESAR

Intermittent rainfall already being experienced in the summer rainfall production areas and possible heavy rain in the winter rainfall production areas during the 2011 packing season could lead to the following problems:

- high pathogen inoculum levels in orchards on all surfaces resulting in
- infections by latent pathogens – Anthracnose, Diplodia and Phomopsis stem-end rot
- infections by wound pathogens – green and blue mould and sour rot
- infections by soil pathogens – Phytophthora brown rot

### Precautions and Recommendations

- Minimise injuries to fruit during picking, handling and transport to packhouse
- Handle the fruit as a perishable product, because it is a perishable product
- Ongoing removal of dead wood from trees
- Ongoing orchard sanitation is a non negotiable requirement
- Minimise the delay between picking and treatment. The longer the delay the higher the risk for high decay
- Packed fruit must be cooled down as soon as possible

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### Phytophthora brown rot

Adequately skirt trees to minimise the risk of *Phytophthora* brown rot infection after rainfall.

Do not pick skirt (low hanging) fruit for packing. Remove this fruit before harvesting and discard or sell on the local market.

Spray contact fungicides only (copper at 200 g/100 l or Dithane at 200 g/100 l) as a preventive measure against *Phytophthora* brown rot after rainfall. Contact fungicides must be resprayed after any follow-up rainfall.

Some phosphonate registrations for the control of brown rot were withdrawn because of isolated instances of phytotoxic damage on fruit and after claims were brought against the suppliers. However, Brilliant is registered.

The registered foliar applications of phosphonates for the control of Root and Collar rot will also be effective against brown rot but producers use the phosphonates at their own risk.

*Do not waste time and money spraying any other compounds for brown rot. Any other products, other than the recommended products have no effect against brown rot, and are not registered.*

### Ethephon (Ethrel) application on export fruit in the packhouse

NB!! The citrus Ethephon (Ethrel) EU MRL remains 0.05 mg/kg and the revised Ethephon residue testing methodology is in use. The recommended restrictions that apply are as follows:

NOT PERMITTED: EU, USA and other markets, except where other restrictions apply.

PERMITTED: Canada, Japan, Middle East and Indonesia

REFER: Cutting Edge/Snykant 84 and "Recommended Usage Restrictions" February 2011.

In the markets where Ethephon is permitted, those packhouses that don't have access to ethylene gas degreening can easily, cheaply and effectively apply ethrel in the packhouse. One major drawback with this application is that relatively green fruit cannot be easily graded out for blemishes.

The colour should shift by 1 or 2 colour plates after treatment and packing if the fruit stands within the confines of the packhouse at a temperature range of 18-25°C or higher for a day or two prior to going into cold storage. Colour development will continue slowly after cold storage.

The application is applied on the packhouse line before waxing

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as a total loss spray over a set of brushes. Ensure that the brushes are adequately wet to ensure good coverage of the fruit.

The ethrel is applied as follows:

156 ml ethrel / 25 L water for lemons grapefruit and Clementines (3000 ppm).  
210 ml ethrel / 25 L water for oranges (4000 ppm).  
plus 2.5 ml Agral 90.

**N.B. 2,4-D Deccomone (250 ml/25 L water) must be used when applying ethrel.**

**Fruit must be dry before waxing.**

### Packhouse Sanitation

Constantly monitor sanitiser concentrations in dump tanks and "descaler" water washing systems and fungicide concentrations in the hot water fungicide bath.

Change dirty systems on a daily basis with clean water and full strength chemicals. These compounds do not work in dirty systems with high bacterial and fungal spore load and organic material.

Top up these systems correctly and if not sure revert to CRI for proper procedures.

Spray all packline belts, brushes, conveyors and all surfaces including coldrooms, degreening rooms etc. within the confines of the packhouse and also outside the packhouse with a suitable sanitiser, on a daily basis.

Likewise spray out trailers and bins with a suitable sanitiser before leaving for the orchard.

Remove all decay-rejected fruit from the packhouse.

Remove all infected fruit from grading belts before contaminating brushes and baths.

Sanitise grading belts regularly after removing infected fruit.

*Store all culled fungicide-treated fruit out of the packhouse.*

*Never allow this fruit to stand in a crate and rot in the packhouse. This allows for the selection of fungicide resistant spores and these spores could be carried back into the packline.*

Store all fungicide-treated local market fruit away from the packhouse.

**Retention Samples** Hold back samples of each consignment of packed fruit for a period of at least 2 weeks and check regularly for waste and any other developing factors.

## STANDARD CHARTERED'S PRIVATE EQUITY TEAM INVESTS US\$20 MILLION IN SOUTH AFRICA'S AGRICULTURAL SECTOR

**M**arch 2011, Johannesburg: Standard Chartered Bank's Private Equity division announced it has taken a 30% equity stake in the Afrifresh Group, one of South Africa's top 5 producers and exporters of citrus fruit and table grapes.

Johan van Schalkwyk, Director in the Africa team of Standard Chartered Private Equity commented, "Given our strong presence across Africa, supporting the growth and development of Africa's agricultural sector is a key objective for the Bank across all divisions. This investment is Private Equity's first into the African agricultural sector and we expect to make further sound investments in this segment going forward. The capital will support Afrifresh's continued expansion in line with the Group's ambition to become a world class African producer and exporter of citrus and table grapes. In addition to supporting Afrifresh's growth, the investment allows us to contribute to the growth of South Africa's agricultural sector overall."

Afrifresh was founded in 1992 as an agency business, but since 2007, has actively expanded into production through farm acquisitions, creating a more integrated, profitable and sustainable business. The Afrifresh Group now manages 14 farming units across South Africa (over 3 000 hectares under irrigation), in addition to the Group's export agency business. Afrifresh's major export markets include the European Union, United King-

dom, Russia as well as the Far and Middle East.

"Standard Chartered's capital enables us to fund our expansion plans, increasing our local productivity and export potential, as well as benefiting the economy through additional employment and increased trade flows with key international markets, Asia in particular. The Private Equity team brings valuable financial and commercial expertise that will support our growth aspirations, along with connectivity into Asia and the rest of Africa," commented Chris Conradie, Chief Executive Officer, Afrifresh Group.

With reference to the partnership created with Standard Chartered Bank, Roy Fine, New Business Development Director, reiterated that the Afrifresh Group is continuously looking for similar strategic opportunities in pursuit of growth, and invites interested parties including funds, growers and other exporters to contact him in this regard.

Standard Chartered's Africa Private Equity team has offices in Johannesburg and Lagos, and is responsible for originating equity and mezzanine debt investments, contributing to broader economic development across the continent. The Bank's Africa Private Equity Team has invested over USD150 million in the continent during the last 2 years, with key investments in Nigeria and South Africa.

**For further information contact Roy Fine at [rfine@afrifresh.co.za](mailto:rfine@afrifresh.co.za)**