

EXTENSION BRIEFS JUNE & JULY 2009

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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.

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. The next best IPM-compatible treatment option would be a soil treatment with imidacloprid which can be applied a little later until white-bud stage (August – September).

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.

NA-OES PRAKTYKE (P.J.R. CRONJÉ)

Vir die voorkoming van na-oes fisiologiese afwykings is die korrekte produksiepraktyke, soos bemesting en besproeiing, 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 'n maand voor die beplande oesdatum met rypheidindeksering (interne kwaliteit en skilkleur) te begin. Daar moet gepoog word om die temperatuurlading op die vrug te beperk vanaf die plukproses tot in pakhuis deur die vrugte se veldhitte so gou as moontlik te verwyder (bv. deur vrugte vroeër te "drench"). Die paklyn het 'n 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 'n belangrike aspek van die sitrus na-oes hantering en moet optimaal bestuur word. Dis nodig om te besef dat daar 'n interaksie is tussen kultivar, vrugrypheid en die effektiwiteit van ontgroening bestaan. As vrugte te vroeg (onvoldoende kleur ontwikkeling aan boom) in die ontgroeningkamer geplaas

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, sal die verlange 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 effektiëste as vrugte van dieselfde kleur gelykertyd 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. 'n Stadiger ontgroeningstempo sal 'n verlenging van die tyd in die ontgroeningsskamer vereis en 'n 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 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 kwaliteits aspekte soos vrugfermheid en rakleef tyd. 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 temperatuur 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 post harvest 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.

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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 of 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 drop to below 30% 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 program for the 2009 crop starts in July or August 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 executing the fertilisation program on 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	Mikrospruite/Micro-jets	Druppers/Drippers
N	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 mikrospruite 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.
Organiese materiaal	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 te plaas. Dit moet ook gedurende Julie/Augustus gedoen word.
P	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) and apply it over an extended period (4 to 5 months) at lowish concentrations.
K	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.
Ca	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.
Magnesium	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.
Sulphur	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 die 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 vroeg Augustus.

Element		Timing
N	Low biuret urea to improve the quality of the blossom. Low biuret urea to supplement the nitrogen supply.	July or early August October to February
P	Om die suur-inhoud van die vrugte te verminder. Om die TOV van die vrugte te verhoog.	6 weke na blom-blaar-val. 6, 4 en 2 weke voor oes.
K	Potassium nitrate to improve the quality of the blossom. Potassium sulphate to supplement the K supply Potassium nitrate to supplement the K supply	July or early August August/September for the best results and up to Feb for maintenance. After fruit drop to December
Mg, Zn, Mn, B en Mo	Waar 'n tekort ondervind word. Instandhouding	Julie en weer in Oktober. Oktober tot Desember
Cu	Usually only recommended to correct a deficiency	May to July, before flowering.

POST HARVEST PATHOLOGY WASTE PREVENTION CHECKLIST (K.H. LESAR)

Intermittent rainfall in the summer rainfall production areas and heavy rain in the winter rainfall production areas during the 2009 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 Stem end rot 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

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.

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.

The Phosphonate registration for the control of brown rot has been withdrawn because of isolated instances of phyto damage on fruit and after claims were brought against the suppliers.

The registered foliar applications of Phosphonates for the

control of Root and Collar rot will also be effective against brown rot. However, producers use the Phosphonates at their own risk.

Do not waste time and money spraying sporekill alone for brown rot. Sporekill alone has no effect against brown rot, and is not registered.

Packhouse Sanitation

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

Change dirty systems on a regular basis with clean water and full strength chemicals.

These compounds do not work in dirty systems with high 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 within the packhouse and coldrooms, degreening rooms etc. within the vicinity of the packhouse with a suitable sanitizer on a regular (daily) basis.

Likewise spray out trailers and bins 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 about 2 weeks and check regularly for waste and any other developing factors.