

EXTENSION BRIEFS FOR AUGUST & SEPTEMBER 2016

**J.J. BESTER &
M.C. PRETORIUS**

Citrus Research International

INTEGRATED PEST MANAGEMENT

CITRUS THRIPS TIM GROUT

Suppressing citrus thrips populations on the spring growth flush will assist in lowering populations experienced at petal fall. On younger trees a methamidophos stem treatment is a useful option for this. An alternative may be an organophosphate that cannot be sprayed after petal fall, but sprays should be completed before flowers open to reduce the potential impact on honey bees. If mealybug requires control, the organophosphate could be sprayed at full cover. These treatments will also reduce developing populations of citrus psylla. Avoid using abamectin at this time, because it will be needed for citrus thrips control in summer and only three applications are permitted per season.

FALSE CODLING MOTH SEAN MOORE

It might be tempting to neglect orchard sanitation in winter, as FCM levels are usually low and Valencias being harvested at this time are generally less susceptible to FCM than some of the earlier cultivars. This would however be a big mistake, as it has been shown that Valencias can fulfil an overbridging role for FCM from one season to another. The most effective way to ensure the lowest FCM inoculum possible at

the start of a season, is to diligently continue orchard sanitation until the previous season is truly over. Growers have to ensure that no fruit, whatsoever, remains on trees or on the orchard floor after harvesting.

BOLLWORM SEAN MOORE

Depending on the region of the country, which influences temperature and blossom phenology, bollworm may begin invading orchards as early as September or even August. Growers should therefore start weekly blossom inspections for bollworm eggs and larvae no later than early September. Particularly if a biological product, such as DiPel, Helicovir or BollDex, is going to be used, sprays should be applied as soon as eggs begin to hatch. This can only be determined by vigilant and regular scouting, but honeybee populations will benefit if sprays need to be applied during bloom, because these products are harmless to bees.

CITRUS FLOWER MOTH SEAN MOORE

Moths of the citrus flower moth (also known as the lemon borer moth), *Prays citri*, are attracted to lemon blossoms. Growers should inspect these blossoms in spring to determine whether they are infested with larvae or pupae. These can be identified by their colouration, which

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is usually greenish and the association of webbing with pupation.

Even if the damage to and loss of blossom is not considered sufficiently severe to justify control measures, the absence of intervention may allow the development of a second generation. It is the moths of this second generation that lay their eggs on the lemon fruitlets. Hatching larvae can potentially cause severe damage. It is therefore more effective to control the first generation. No plant protection products are registered for use against the lemon borer moth. However, there are a number of pesticides which are registered for other pests on citrus that are effective, including Bt (DiPel) and mevinphos.

CROP & FRUIT QUALITY MANAGEMENT

JAKKIE STANDER & PAUL CRONJE

It is important to keep managing and monitoring fruit pickers throughout the harvest season to reduce fruit culls caused by picking injuries. Pruning of early- and mid-season cultivars should commence as quickly as possible after harvest to allow enough time for flower induction.

MATURITY INDEXING

Maturity indexing is done to predict the rate of change in fruit maturity to harvest fruit at a

maturity that would maintain optimal 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 comparisons. Random sampling of fruit every week from each of ten representative trees should start four to six 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 these data should be plotted on a graph to determine the optimal picking window. Growers should adhere to the time and temperature protocols for each citrus type to ensure optimal shelf life of the fruit (Cutting Edge No. 99). It is important to maintain good records of the maturity indicators over a number of years, to identify and possibly manipulate possible problems associated with internal and external quality parameters.

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 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 AND FRUIT SET

Pruning of early and late cultivars should be done as soon as possible after harvest. All of the following should be removed during pruning: old, broken and dead shoots/twigs; weak and entangled shoots crossing each other; and rootstock regrowth (water shoots). Removal of all dead wood is important to reduce fruit blemishes and reduce the inoculum of latent pathogens which cause postharvest decay. Light levels of at least 30% of full sunlight are necessary for optimal photosynthesis, and sufficient light levels also improve fruit colour development. In dense and old trees, light levels inside the tree canopy can drop to below 30% and adversely affect fruit set and size. At least one “window” cut should be made to allow for

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adequate light distribution to improve bearing wood within the tree canopy. An increase in photosynthesis and light distribution will lead to increased fruit size and internal fruit quality, better fruit colour, increased rind condition and less variation in fruit quality within the canopy. Pruning should be used as a thinning technique by pruning more heavily after a light crop (if a heavy crop is expected in the subsequent season) and when the orchard has a history of alternate bearing. A follow-up of regrowth management in the summer is critically important to maintain light management throughout the season.

Proper pruning also improves spray penetration and effective control of pests and diseases, and is especially important for the effective control of phytosanitary pests and diseases. Pruning tools should always be sanitised on a regular basis with 10% Jik to prevent spreading of viral diseases, and should be done at least after each row, and when moving from one orchard to another.

One or two **pre-bloom foliar** urea applications (low biuret urea at 1%) should be applied for uniform flowering and fruit set, especially when

leaf nitrogen (N) levels are low and a light blossom is expected. If leaf N levels are sufficient, consider replacing the foliar urea application with a 1.5% KNO₃ application, only if leaf potassium (K) levels are below optimum.

Fruit set treatments according to cultivar requirements need to be applied. A general guideline cannot be given as fruit set treatments differ by cultivar and, in many cases, by orchards depending on the previous crop load. Specific treatments include the application of gibberellic acid (GA₃) and trunk or branch girdling, especially for weakly parthenocarpic cultivars that have a poor set. Girdling during full bloom improves set, as the removal of bark temporarily restricts carbohydrate allocation to roots and allow for utilization by flowers.

Be careful not to girdle too deep into the trunk, or to remove a strip of bark. Moisture stress should be avoided at all costs during full bloom, fruit set and early fruit growth, as these periods are characterized by the cell division stage of fruit development, during which water supply is of critical importance.

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GRONDGEDRAAGDE SIEKTES

M.C. PRETORIUS & JAN VAN NIEKERK

AALWURMS EN PHYTOPHTHORA

Grond- en wortelmonsters kan in die lente getrek word en na die Diagnostiese Sentrum in Nelspruit gestuur word vir ontleding sodat die aalwurmpopulasie in die wortels bepaal kan word. Die resultaat sal dien as 'n bestuurshulpmiddel om 'n koste doeltreffende aalwurm-beheerstrategie daar te stel.

Die gebruik van chemiese aalwurmdoders vir die beheer van die sitrusaalwurm word nie aan-beveel alvorens ten minste 30 mm reën geval het nie. Elke aalwurmdodertoediening behoort met 'n behoorlike besproeiing opgevolg te word, om te verseker dat die middels deeglik deur die grondprofiel gewas word.

Toedienings moet slegs volgens etiketaanbevelings toegedien te word. Afwykings van die geregistreerde dosisse, om kostes te bespaar, lei tot oneffektiwiteit. Dit is belangrik om 'n program te volg, een aalwurmdodertoediening per seisoen is 'n mors van geld!

Die gebruik van fosfonaatprodukte is 'n uiters effektiewe en bekostigbare beheermaatreël vir *phytophthora* wortelvrot. Bestudeer die etiket en waarskuwings deeglik voor produk gebruik om effektiwiteit te verseker en fitotoksisiteit te voorkom.

Indien kraagvrotletsels voorkom, kan 'n stamverf of blaarbespuiting aangewend word, drie aanwendings per seisoen met agt weke intervalle. Vir wortelvrotbeheer word drie blaarbespuitings, met agt weke intervalle aanbeveel. Dit word sterk aanbeveel om nuwe aanplantings en nie-draende bome op 'n fosfonaat-program van drie aanwendings per jaar, twee maande uitmekaar, te hou om gesonde wortel-ontwikkeling te verseker. Producente word gemaan om seker te maak dat bome nie oorbesproei word nie.

FRUIT AND FOLIAR DISEASES

TIAN SCHUTTE

ALTERNARIA AND BOTRYTIS

Alternaria core rot, also known as navel-end rot and black rot, occurs in all areas of southern Africa. The disease is most prevalent on cultivars

such as navels and Clementines characterised by the presence of a secondary fruit called the fruit-navel, which varies in size and develops at the styler end of the primary or main fruit. These fruitlets are extremely sensitive to environmental stress during early stages of development and are therefore also prone to diseases such as navel-end rot and physiological disorders.

Alternaria core rot is linked to large fruit-navels or to the abnormal growth of the secondary fruit into primary-fruit locules, which lead to the formation of points of entry through which fungi can penetrate to form infections that remain quiescent until favourable conditions stimulate further fungal growth.

The style and stigma of navel blossoms are milky white at first and then turn light brown in colour and abscise cleanly. This happens one week after petals have dropped and young fruit are about 8 mm in size. The two sets of styler tissue present in the primary and secondary fruit locules can be injured during the blossom period if harsh weather conditions prevail for one or more days (hot days >25°C), and low relative humidity (<20%) followed by heavy dew during the evenings.

This causes the outer or primary style to turn brown and dry out, while the inner or secondary style remains unaffected inside the outer style and continues to develop and swell in size to result in longitudinal cracks in the outer tissue. The longitudinal cracks enlarge as the orange increases in size. The inner ovary projects even more as the orange approaches maturity resulting in a large, irregular-shaped navel-end, creating an ideal site for *Alternaria* infections.

Score (50 ml/100 L water) and Folicur (80 ml/100 L water) are registered for control of the disease.

The role played by *Botrytis* and the damage that it can do to lemon fruit drop and the formation of ridging of the rind is still not clear. Damage can be caused during blossom on lemon petals when prolonged wetting and cool weather occur simultaneously. Producers in the Eastern Cape enlisted on the Adcon system can make use of their early warning forecasts for Botrytis. Benomyl is the most effective fungicide to control this fungus and should be sprayed at the balloon stage during blossom, which can also form part of the black spot control programme.



GEINTEGREERDE BEMESTING

TEUNIS VAHRMEIJER

Aan die einde van die groei-seisoen:

1. Blaar en grondmonsters moes aan die einde van die groei-seisoen geneem gewees het (Februarie tot Mei).
2. Resultate van die blaar- en grondontledings tesame met boordinligting (ouderdom van bome, onderstam, kultivar, verwagte opbrengs, ens.) word gebruik vir bemestingsaanbevelings.

Waar mikro-spuite of enige ander stelsel behalwe druppers gebruik word:

1. Begin met stikstoftoedienings in Julie met die uitsondering van die Wes-Kaap en Hartswater wat in Augustus begin.
2. Afhangende van die klei-inhoud van die grond word die stikstof tussen een en vier toedienings verdeel.

Waar druppers gebruik word:

1. Begin met die stikstoftoedienings in Julie met die uitsondering vandie Wes-Kaap en Hartswater wat in Augustus begin.
2. Verdeel die volumes wat per maand aanbeveel is in ten minste weeklikse toedienings.
3. Stikstoftoediening geskied volgens die phenologiese stadium van die boord. Maak seker dat die water nie dieper as die boonste wortels afsak nie (30 tot 40 cm). As breë riglyn kan die volgende gebruik word:

Periode	Phenologie	N (% van totale toediening)
Julie	Seldifferensiasie en seldeling	25
Augustus	Knopbreek, blom en vrugset	25
September	Vrugset en selgroei	25
Oktober	Vrug-groei	15
November/Desember	Vrug-groei	10

BLAARBESPUITINGS:

1. Dien ureum toe as h blaarbespuiting in Julie om vrugset te bevorder of na Oktober vir stikstof-aanvulling.
2. Die kritiese vereistes vir suksesvolle blaarvoeding is die kontaktyd wat die blare nat bly, druppelgrootte en die konsentrasie van die voedingselement in die spuit-oplossing.

OM DIE LOGING VAN STIKSTOF TE BEPERK:

1. Dien stikstof in die middel van of aan die einde van die besproeiingsiklus toe.
2. Voorkom h oormaat van stikstof in die grondoplossing. Stikstofkonsentrasies wat hoër is as 150-200 mg/L het geen addisionele voordeel nie. Oormaat stikstof lei tot moontlike logging van die stikstof en moontlike probleme met vrugkwaliteit.
3. Stikstoftoediening moet verkieslik aan die einde van die groeiseisoen gestaak word sodat die stikstofinhoud in die grond gedurende die wintermaande kan afneem.
4. Die regte hoeveelheid water moet toegedien word tydens besproeiing. Dit is onvermydelik dat h sekere hoeveelheid stikstof geloog word tydens besproeiing, maar oorbesproeiings versnel die proses en h groot hoeveelheid stikstof kan verby die wortelsone geloog word. Reënval moet ook in ag geneem word tydens besproeiingskedulering.

Notice of ANNUAL GENERAL MEETING

31st AUGUST 2016

Intercontinental Hotel, ORT, Johannesburg @ 16h00



PREVENT POST-HARVEST WASTE

KEITH LESAR & PAUL FOURIE

By this time of the citrus season all processes are in full motion. The strain of the season may be taking its toll on management and this may lead to poor management of critical control points. Below are a few suggested critical control points that should be well managed.

Critical control points for improved postharvest disease management

- Monitor the incidence of insect activity in the orchards and institute appropriate measures to reduce their populations, especially fruit fly and FCM moth numbers that could increase with hotter weather.
- Monitor orchard sanitation. Advise the orchard managers and producers if sanitation is being improperly managed or neglected, as this can also fulfil an overbridging role for FCM from one season to the next.
- Monitor injuries to fruit during picking, handling and transport to the packhouse. Advise orchard managers and producers accordingly. Keep the time from harvest to the first fungicide treatment to a minimum, it is strongly recommended to treat at least within 24 hours after picking.
- Ensure that all fungicide applications are replaced frequently as per protocol and kept clean.
- Keep the fruit dumping site where fruit will enter the packhouse as clean as possible.
- Ensure proper removal of any rotten fruit before sanitising and treatment of the fruit.
- Have a sanitation action (total loss chlorine spray) between fruit sorting and the first fungicide application.
- Manage the concentration of imazalil in the fungicide dip tank by doing regular titrations
- Do not wax wet fruit – this could result in a severe risk to fruit quality.
- Apply the correct amount of wax onto the fruit (i.e. 1.0 – 1.5ℓ per ton of fruit) and ensure even spread of the wax over the whole fruit.

- Reduce the time from harvest to cold chain storage
- Packhouse sanitation should be a continuous process and not just a once a day or week activity
- Store fruit destined for the juicing factory as far away from the packhouse as possible and have them removed as soon as possible

CHECKLIST FOR CHEMICAL APPLICATIONS

• Chlorine application

- Solution pH: 6 - 7
- Chlorine concentration: 75 – 100 ppm (free active chlorine)
- ORP: 800 mV

• Fungicide dip tank

- Imazalil concentration: 500 ppm
- Solution pH: not higher than 6
- Exposure time: 1 – 3 minutes in a solution at pH3 or not longer than 45 seconds in a solution at pH6
- Maintain the concentration by following the advised imazalil top-up protocol

• Wax application

- Fruit should be dry when they reach the wax applicator
- Wax load should be between 1.0 and 1.5 litres per ton fruit depending on manufacturers' recommendations
 - Over application can lead to MRL exceedance
 - Under application will lead to poor fruit quality and poor disease control
- The wax solution should be agitated continuously (24 hours a day, 7 days a week)
 - Thiabendazole tends to precipitate to the bottom of the wax drum and cannot be fully re-suspended
- Drying tunnels after the wax applicator should not be overheated
 - Obtain the optimal temperature for the specific wax from the wax manufacturer
 - The correct drying of the wax is crucial to ensure the desired effect.