EXTENSION BRIEFS FOR DECEMBER 2009 & JANUARY 2010

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INTEGRATED PEST MANAGEMENT
(S.D. MOORE)

Mealybug

Growers should be scouting for mealybug regularly, by inspecting underneath calyxes and thereby determining percentage of fruit infested. The most effective way of doing this is to break the fruit off from the calyx. Both the fruit and the underside of the calyx should then be inspected. Where mealybug is under good biocontrol, infestation should peak during December in the northern production areas and during January in the Cape production areas. If mealybug infestation does not decline during early January and late January to early February, respectively, suppression with a chemical treatment is advisable on early maturing cultivars. Trial results have demonstrated that buprofezin (Applaud) is by far the most effective corrective option for mealybug control and a 45-day withholding period applies for most countries. Where buprofezin is applied correctively it is imperative that application be targeted against the younger stages of mealybug, i.e. eggs, crawlers and second instars. In addition, it is crucial that a full cover film spray be applied.

This is also a good time to determine which species of mealybug are present. This is important, as it appears that the biocontrol complexes of oleander mealybug and longtailed mealybug, in particular, might not be as effective as that of citrus mealybug. Therefore, treatments can be applied more readily when either of these species are identified as the dominant species in a particular orchard. The phytosanitary status of certain species must also be borne in mind.

Lemon borer moth

Moths of the lemon borer moth (or citrus flower moth), *Prays citri*, are attracted to lemon blossoms. These pests often appear in spring (most often in imidacloprid-treated orchards) but tend to reach even higher levels on the mid-summer blossom. Growers should inspect these blossoms to determine whether they are infested with larvae or pupae. These can be identified by their colouration, which 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, no intervention will allow the development of a second generation. It is the moths of this second generation which 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 effective, including Bt (DiPel) and mevinphos.

CROP AND FRUIT QUALITY MANAGEMENT
(J.S. VERREYNNE)

Fruit growth and size

Fruit growth during this time is important to achieve optimum size at harvest. An individual factor or a combination of factors may be responsible for small fruit size. All the factors influencing fruit size should be considered and managed optimally. For a revision of the various citrus fruit size management strategies please refer to Cutting Edge no. 72. Also take note of the Recommended Usage Restrictions pertaining to Corasil E® (Dichlorprop) residue tolerances in markets, as communicated in Cutting Edge 71. Therefore, the choice of fruit size management strategy should be guided by the usage restrictions pertaining to the various target markets, as reflected in the Recommended Usage Restrictions document and its updates.

Fruit size and crop load prediction should commence after the physiological fruit drop period. Please refer to the article "Fruit size and crop load prediction for citrus" in the SAFJ of Oct/Nov 2009 for details on how these predictions can be made.

Regrowth control, especially after heavy pruning earlier in the season, should commence. A lot of regrowth adversely affects fruit size and is antagonistic to fruit colour development, especially for early maturing cultivars.

Creasing: Gibberellic acid (GA) is applied in January to reduce the incidence of creasing. It should be noted that improper timing of GA delays colour development.

Oleo incidence: Late summer vegetative growth of bearing trees should be kept to a minimum as excessive vegetative vigour during this period is associated with high incidence of oleo at harvest.

Rind colour development: Late nitrogen application and the use of heavy summer oil sprays should be avoided as these treatments are antagonistic to rind colour development. In addition, GA treatment to reduce creasing incidence is also antagonistic to colour development.

DISEASE MANAGEMENT

GRONDGEDRAAGDE SIEKTES
(M.C. PRETORIUS)

Phytophthora beheer

Alhoewel redelike goeie reënval gedurende Desember maande voorkom is Januarie en Februarie maande gewoonlik droër en die dagtemperature heelwat hoër. Daarom die waarskuwing dat indien van fosfonate gebruik gemaak gaan word om Phytophthora wortelvrot te beheer, die middels met sorg en volgens gebruiksaanwysings toegedien moet VERVOLG OP BLADSY 55

VERVOLG VAN BLADSY 52 word. Wat van uiterste belang is is dat die middels nie gespuit behoort te word indien dagtemperature hoër as 28°C is nie, of die bome onder enige mate van droogte- of hittestres verkeer nie. Geen bespuitings moet gedoen word indien enige warm bergwinde waai nie. Geen wortelvrot bespuitings behoort in hierdie warm maande op vroeë sagtesitrus kultivars, bv. Satsumas, Clementines, gespuit te word nie.

Aalwurmbeheer

Reën asook besproeiingswater is nodig om die aalwurmdoders effektief deur die grondprofiel te was. Dien aalwurmdoders toe op nat gronde direk nadat goeie reën voorgekom het. Volg die toediening op met ten minste 35 mm besproeiing.

Wenk vir effektiewe bestuur van wortelgesondheid

Onthou die neem van grond en wortelmonsters as 'n bestuurshulpmiddel, om die aalwurm en *Phytophthora* status in die grond en wortels van sitrusboorde te bepaal, moet ten minste elke drie jaar gedoen word. Dit is uiters noodsaaklik om 'n monster te neem voordat 'n boord vir herplant doeleindes verwyder word om die aalwurm en *Phytophthora* status te bepaal vir toekomstige onderstamkeuses.

FRUIT AND FOLIAR DISEASES
(G.C. SCHUTTE)

Growers are reminded that mancozeb may not be sprayed later than December on fruit destined for the Canadian market and not later than the end of January for Japan. Carbendazim and any other breakdown products of the benzimidazole fungicide group that result in carbendazim residue (Benlate, Spotless, Bavistin, Bendazid, Knowin) may again be sprayed on fruit intended for the EU and countries that abide by the CODEX MRL system (refer to Recommended Usage restrictions document). Copper fungicides or strobilurins in tank mixtures with copper or mancozeb are also options for January. If a spray mixture containing copper will be used, then a copper spray less than 60 days prior to this is not permitted as it will cause stippling. Remember that the addition of mancozeb or copper fungicides is essential and has been proven to be necessary for effective control of CBS in independent studies. Never allow gaps to occur in and during the susceptible period from October to January, especially where contact fungicides are chosen for control. Problem periods are usually over Christmas and New Year. Follow-up treatments are necessary where rainfall occurred within 6 hours after applications. Sporekill (100 ml) is registered for the control of CBS in tank mixtures of reduced rates of mancozeb or copper at 100 g/100 L water in both cases.

Unusual abundance of beetle mites (Oribatida) on citrus in KwaZulu-Natal

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During Autumn 2009, high numbers of the mycophagous or saprophagous beetle mite *Siculobata sicula* were found on citrus trees on several farms in southern KwaZulu-Natal. This mite has only twice been officially recorded from citrus in South Africa before; from orange trees near Letsitele in 1965 and from Clementine mandarins near Paarl in 1998. Arboreal beetle mites are normally associated with honeydew or sooty mould on fruit but in these cases there was no obvious reason for their abundance. Although this mite is found in various parts of the world and is not considered a pest, bioassays were conducted with various plant protection products to determine what products would be effective in reducing their numbers. A slide-dip bioassay technique was used with adult mites being attached to double-sided tape on microscope slides that were dipped in water mixtures of plant protection products for 15 seconds. Approximately 60 mites were used per treatment and mortality was determined after 1 hour and after 18 hours by checking for leg movement. Mortalities were corrected for control mortality in water alone by using Abbott's formula. The mites were very tolerant to organophosphates, and only slightly affected by several other plant protection products (Table). Treatments causing the most mortality were chlorfenapyr, fenproprathrin, abamectin plus oil and mineral oil alone at 1%.

Figure. A photograph through a microscope of the beetle mite Siculobata sicula.

Table *Results of slide-dip bioassays with* Siculobata sicula *corrected for natural mortality.*

Treatments with dosages / 100 L water	Mortality after 1 h (%)	Mortality after 18 h (%)
Abamectin (EC 18 g/L) 40 ml plus Horticultural mineral oil (C23) 500 ml*	46.6	87.7
Bromopropylate (EC 500 g/L) 75 ml	14.3	52.1
Chlorfenapyr (SC 360 g/L) 30 ml	23.3	98.0
Chlorpyrifos (WG 64 g/L) 64 g	0.2	13.9
Cypermethrin (EC 200 g/L) 20 ml	5.2	26.7
Fenbutatin-oxide (SC 550 g/L) 55 ml	0.0	23.0
Fenpropathrin (EC 200 g/L) 60 ml	16.1	84.7
Horticultural mineral oil (C23) 1 Litre	24.1	67.0
Methomyl (SP 900 g/kg) 100 g	15.2	38.2
Mevinphos (SL 500 g/L) 30 ml	0.0	6.5
Spirodiclofen (SC 240 g/L) 15 ml	4.5	38.8

*This combination of dosages is not registered on citrus in South Africa