

Extension briefs for December 2019 and January 2020

INTEGRATED PEST MANAGEMENT FALSE CODLING MOTH

S.D. MOORE

It is imperative that the false codling moth (FCM) Management System (FMS) for citrus, including the FCM Systems Approach, be implemented as diligently and thoroughly as possible. There's no room for a lapse in the implementation of comprehensive and effective management practices by growers or by the industry as a whole. The details of all of these practices are described in the FMS, with reference to CRI's IPM Guidelines for FCM Management (available on the CRI website). These Good Agricultural Practices (GAPs) must be followed as described.

One of the most important practices is orchard sanitation, which **MUST** be conducted at least weekly in all orchards, including lemons. This involves not only collecting and destroying fallen fruit, but also removing all hanging fruit that appear damaged or infested in any way. It has been shown that such practice can effectively remove an average of up to 75% of FCM larvae from an orchard. In the hotter months of summer, orchard sanitation should be increased to twice per week in order to have the same effect. Fruit must **NOT** be mulched inside the orchard.

The use of an area-wide control technique, such as the sterile insect technique (SIT) or mating disruption, from early in the season, will also provide effective suppression of the FCM population while it is still low. Only initiating control measures a few weeks or months before harvest is unlikely to be sufficiently effective.

MEALYBUG S.D. MOORE

Apart from the obvious pest status of mealybug, it is also important to control the pest as it can attract carob moth and increase its infestation as

a secondary pest. Growers should be scouting for mealybug regularly by inspecting underneath calyxes and thereby determining the percentage of fruit infested. For best results, 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 to early February, respectively, suppression with a chemical treatment is advisable on early maturing cultivars. Unfortunately, buprofezin can no longer be used at this stage due to residue restrictions. However, there are a couple of relatively new options that can now also be used correctively for mealybug, i.e. sulfoxaflor, fenpyroximate and spirotetramat (as registered). In addition, it is crucial that a full cover film spray is applied.

If it is necessary to spray for thrips during December or January, it is extremely important that only IPM compatible thripicides is used. Any harsh thripicides at this stage will result in mealybug repercussions.

Augmentative releases of parasitoids *Coccidoxenoides perminutus* (which is only effective against citrus mealybug) and *Anagyrus sp. nr. pseudococci* (which also attacks at least oleander mealybug, in addition to citrus mealybug) should be initiated as early in the season as possible for optimal efficacy. The phytosanitary status of certain species must also be borne in mind.

CITRUS THRIPS M. GILBERT

Thrips can still cause damage in December on citrus fruit, particularly in hotter production areas such as the Lowveld and on later-flowering cultivars such as Valencias whose fruit are



J.J. BESTER



M.C. PRETORIUS



W. MOMMSEN





still relatively small at this time of year. Scouting should therefore continue to be carried out at least twice a week, in order to prevent a build-up of numbers, and avoid possible late damage known as "scribbling" or "browning" on the sides of the fruit. Thrips control materials applied at this time of year should preferably not have a long residue, so that the activity of mealybug and scale parasitoids is not significantly disturbed. From January, the chance of thrips damage declines with increasing fruit size, but one should still be vigilant.

CITRICULTURE

P.J.R. CRONJE

Fruit growth and size Citrus fruit development is divided into three distinctive development phases and fruit growth follows a sigmoidal curve.

Phase I of fruit development (end of October - December) spans from full bloom until the end of December, and is characterised by cell division and the formation of the majority of the total cellular structures of the fruit. During this period, the majority of the fruit diameter comprises the rind. In phase II (January - March), the different sections of the fruit pulp volume increase substantially and make up most of the fruit diameter until harvest. The biggest increase in fruit diameter occurs in summer, and very little to no increase in phase III, as temperatures decrease from autumn until fruit harvest (April - August), in phase III. Fruit growth during this period of fruit

development is important to achieve optimal size at harvest and an individual factor or a combination of factors that are sub-optimal, e.g. irrigation or ambient temperature, may be responsible for small fruit size. All the factors influencing fruit size should be considered and managed optimally and it is recommended that Cutting Edge no. 103 or Chapter 5 - 8 in the CRI Production guidelines (Vol. II, www.citrusres.com/category/chapter-5-crop-manipulation) should be used for a revision of the various lemon fruit size management strategies.

Fruit size and crop load prediction should commence after the physiological fruit drop period. Fruit size is inversely related to flower number and eventual fruit load. In contrast to fruit set treatments such as girdling and foliar sprays of GA3, producers can make use of various thinning practices to control flower intensity and eventual crop load. Except for hand thinning, foliar applications of synthetic auxins are particularly successful in this regard and are used to reduce fruit load in an "on-year", and increase final fruit size. A reduction in the number of flowers will reduce the eventual percentage fruit set and the inter-fruit competition, but will increase fruit size. Fruit from trees bearing small yields experience increased growth rate. In contrast, a high fruit load increases the inter-fruit competition for nutrients and water, especially during the early stages of fruit development. This, in turn, decreases the potential fruit size.

Please refer to Chapter 5 - 7 in the CRI Production guidelines (Vol. II, www.citrusres.com/category/chapter-5-crop-manipulation) "Fruit size and crop load prediction for citrus" or in the *SA Fruit Journal* 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 as 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, however it should be noted that improper timing of GA delays colour development. When applying GA ensure that the side of the fruit facing inwards is also covered by the GA, as this part of the fruit is more prone to creasing. The incidence of creasing could

also be promoted by a heavy fruit set.

Oleocellosis 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 oleocellosis at harvest.

Rind colour development: Late nitrogen application and the use of high concentration, heavy summer oil sprays after December 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 and could reduce it, if the treatment is applied later than middle January.

DISEASE MANAGEMENT

GRONDGEDRAAGDE SIEKTES

J. VAN NIEKERK en M.C. PRETORIUS

Phytophthora-beheer

Alhoewel redelike goeie reënval gedurende Desembermaande voorkom, is Januarie- en Februarie-maande gewoonlik droër en die dagtemperatuur 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 word. Wat van uiterste belang is, is dat die middels nie gespuit behoort te word nie indien dagtemperatuur hoër is as 28°C, of die bome onder enige mate van droogte- of hittestres verkeer nie. Geen bespuitings moet gedoen word indien enige warm bergwinde waai nie. Geen wortelvrotbespuitings behoort in hierdie warm maande op vroeë sagte-sitruskultivars bv. Satsumas en 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 grond direk na 'n goeie reën. 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 om die aalwurm- en *Phytophthora*-status te bepaal vir toekomstige verwysings voordat 'n boord vir herplantdoeleindes verwyder word. Inligting aangaande die metode van monstername kan verkry word van die Diagnostiese Sentrum in Nelspruit. Monsters kan ook na die Diagnostiese Sentrum gestuur word vir ontleding.

FRUIT AND FOLIAR DISEASES

P. MOYO

Growers are reminded that mancozeb may not be sprayed later than December on fruit destined for the Canadian market, and no later than the end of January for Japan. There are also severe restrictions for citrus other than soft citrus going to the USA. Mancozeb has a 25-day protection period when applied on its own, but when sprayed in conjunction with a strobilurin spray programme, the first tank mixture application thereafter should be within 21 - 24 days, depending on the strobilurin product used. 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). However, it remains the growers' responsibility to determine the benzimidazole resistance status of their orchards before applying these products. 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 recommended, as it will cause stippling. However, it is important to mention that copper is the only residue permitted when lemon fruit is processed to produce citrus rind oil, while copper and strobilurin sprays are permitted when used for juice processing. 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 six hours after applications.

