Cutting Edge
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Thrips management affects FCM populations

by
Sean Moore and Tim Grout
Citrus Research International
(Port Elizabeth and Nelspruit)

It has been known for many years that a preblossom spray to control thrips on the spring growth flush will reduce numbers of the next generation of thrips at petal fall and facilitate the control of thrips at that time. This strategy once again proved to be beneficial last year in much of the country where numbers of citrus thrips at petal fall were unusually high. With the high numbers of thrips it was also evident that most plant protection products did not control the pest for as long as expected. With Delegate being the only new thripicide that has become available in the last couple of years it is important for growers to reduce the selection for resistance by applying insecticides from different chemical groups. In addition, any assistance from natural enemies should be maximised. Areas with wet winters, or at least high relative humidity during that time, should have good numbers of predacious mites in the trees in spring (>1 per inside leaf) so a preblossom application of a carbamate like Mesurol plus sugar or Dicarzol plus sugar should not be used at this time as it will have a severe impact on these natural enemies. In the subtropical areas where winters are very dry, numbers of predacious mites are low in spring so the use of carbamates will not have much of a negative impact on natural suppression of thrips populations. Where predacious mites are abundant after petal fall it would also be beneficial to use copper rather than mancozeb as a contact fungicide for citrus black spot in the first spray of the season when the weather is still cool because copper is less detrimental to predacious mites than mancozeb.

The effect of long-residual thripicides (Regent, Hunter and all pyrethroids) on natural enemies of red scale, mealybug and soft scales is well known and for that reason these products should be used close to petal fall when the disruptive effect on the biological control of these pests is minimised. However, the impact of these thripicides on the natural enemies of false codling moth has not previously been recognised. Surveys of FCM egg parasitism by *Trichogrammatoidea cryptophlebiae*, conducted from 1999 to 2002 in the Eastern Cape, revealed extremely high levels of parasitism during the second half of summer. Early in the season parasitism levels were low, but began to pick up from December, peaking at close to 100% egg parasitism later in the season. Consequently, FCM infestation, which was generally at its highest level of the season in December, plummeted towards harvest. A highly significant correlation was established between egg parasitism and fruit infestation in a number of orchards, verifying the substantial effect of *T. cryptophlebiae*. Conversely, in orchards where egg parasitism remained low, FCM levels increased towards harvest. Further evidence of the effectiveness of the egg parasitoid was obtained where higher levels of FCM infestation were recorded on trees sprayed with a pyrethroid than on unsprayed trees in a couple of trials. Similar negative results have been recorded after kaolin sprays – kaolin emulating the negative effect of dust on parasitoids.

In the past few seasons, inspections for FCM egg parasitism in citrus orchards in the Eastern Cape have revealed very low levels of parasitism or a total absence of parasitoids. This coincides with a dramatic change in the spray programme, particularly pertaining to thripicides. Long residual non-IPM compatible thripicides have been used later in the season than was previously the case. Additionally, abamectin has been used by some growers at unregistered rates, sometimes three times higher than the registered rate, despite previous warnings from CRI (see Cutting Edge no. 39, May 2006). Lastly, organophosphates and pyrethroids – specifically targeted at FCM – have been applied during mid- to late summer by some producers. Consequently, the previous trend of increasing egg parasitism and decreasing FCM levels has not been observed in the last couple of years; on the contrary, it has even been reversed (Fig. 1).

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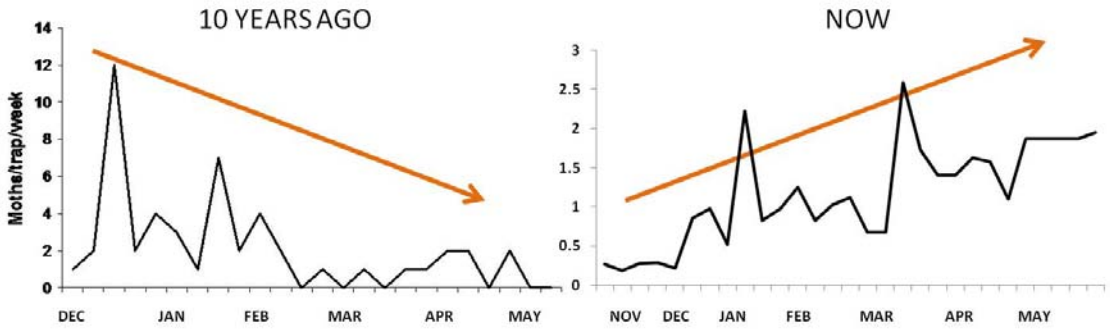

Figure 1. A comparison of FCM trends in a representative navel orange orchard in the Eastern Cape in 2000/01 and in 68 navel orange orchards in the Eastern Cape in 2009/10.

Early season levels of FCM are lower than were recorded as recently as 7 years ago, due to the widespread and effective usage of virus sprays and mating disruption. However, thereafter, in the absence of meaningful levels of egg parasitism, FCM levels often increase towards harvest. This is an untenable situation for a pest with the phytosanitary status of FCM and must be corrected with haste.

Growers are advised to plan their thrips spray programme judiciously. Obviously, programmes will differ depending on cultivar susceptibility to thrips and historical thrips pressure. Where thrips pressure is lower, growers may still be able to escape with a soft thrips programme. However, **where thrips pressure is traditionally high, growers are advised to start their programme with a pre-blossom thripicide**. This should preferably be an organophosphate, such as a Citrimet stem treatment or sprays of Methidathion, Profenofos or Prothiofos, as these will not only control thrips but will simultaneously provide suppression of mealybug. Methidathion will have the least effect on predacious mites. This pre-blossom spray must be applied on the spring flush, as the first thrips infestation of the season (if thrips is present this early) will be well synchronised with this flush. Good control of thrips on this flush ought therefore to have a substantial effect in reducing thrips pressure post-blossom.

This can be followed up with a pyrethroid or Hunter bait application. **Long residual thripicides should be applied no later than three weeks after petal fall** and Dicarzol or Hunter baits no later than 4 weeks after petal fall (preferably as close to petal drop as possible). **All follow-up treatments for thrips thereafter should be with products which are regarded as softer or more IPM-compatible**, such as Delegate or abamectin. Where predacious mites are not an important component of the biocontrol complex later in the season, a Mesurol bait can also be considered. Essential to the successful use of these "softer" or shorter-residual products is good scouting. Calendar sprays for blackspot (applied 2 to 6 times per season) often include a thripicide. This practice has caused many growers to neglect the role of scouting in determining when and what to spray for thrips. This can result in the application of the thripicide once thrips levels are too high, once damage has already occurred or even before reapplication is necessary.

It is important to realise that the use of any "harsh" or disruptive products after petal fall can have a devastating impact on the FCM egg parasitoids, leading to elevated levels of FCM infestation in fruit. It is also important to note that the pyrethroids, Cypermethrin and Meothrin, are registered to be used no earlier than 5 weeks before harvest, if being applied for FCM control. Any spray earlier than this could result in doing more harm than good for FCM control. If a late season chemical spray for FCM is warranted, Delegate would be a preferable option to the pyrethroids, with regard to non-target effects.
If a pyrethroid was used earlier in the season for thrips control, growers should refrain from applying a second pyrethroid later in the season (for FCM). Such a practice will only serve to hasten resistance of both thrips and FCM to pyrethroids.

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Blaaspootjie-bestuur beïnvloed VKM-populasies

deur
Sean Moore en Tim Grout
Citrus Research International
(Port Elizabeth en Nelspruit)

Dit is al vir jare bekend dat 'n voorblom bespuiting om blaaspootjie op die lente blaargroei te beheer, blaaspootjie getalle van die volgende generasie tydens blomblaarval sal verminder en dus beheer van blaaspootjie op daardie stadium sal ondersteun. Hierdie strategie is verlede jaar weereens oor groot dele van die land voordelig bewys, waar blaaspootjie druk teen blomblaarval besonders hoog was. Met hierdie hoë blaaspootjie druk was dit ook ooglopend dat meeste plantbeskermingsprodukte korter beheer van die plaag gegee het as wat verwag is. Delegate is die enigste nuwe blaaspootjiedoder in die laaste paar jaar. Daarom is dit dus belangrik dat produsente die druk vir weerstandbiedendheid verminder deur insekdoders van verskillende chemiese groepe te gebruik. Tesame hiermee moet enige hulp van natuurlike vyande ten volle gebruik word. Streke met nat winters of minstens hoë relatiewe humiditeit gedurende díe tydperk, behoort goeie getalle roofmyte in bome in die winter te hê (>1 per binneblaar). 'n Voorblom toediening van 'n karbamaat soos Mesurol en suiker of Dicarzol en suiker behoort nie op hierdie stadium gebruik te word nie, omdat dit 'n groot nadelige impak op hierdie natuurlike vyande sal hê. In die subtropiese streke waar winters droog is, is roofmyt vlakke in die lente laag. Dus sal die gebruik van karbamate nie veel van 'n negatiewe impak op die natuurlike onderdrukking van blaaspootjie bevolkings hê nie. Waar roofmyte na blombaarval volop is, sal dit ook meer voordelig wees om in die eerste sitrusswartvlek bespuiting van die seisoen koper eerder as mankozeb as 'n kontakswamdoder te gebruik. Op hierdie stadium is die weer nog koel en koper is minder nadelig vir roofmyte as mankozeb.

Die effek van lang nawerkende blaaspootjiedoders (Regent, Hunter en alle piretroides) op natuurlike vyande van rooidopluis, witluis en sagtedopluise is bekend. Daarom moet hierdie produkte uitsluitlik na-aan blomblaarval gebruik word wanneer die versteurende effek op die biologiese beheer van diéíe plae minder sal wees. Die impak van hierdie blaaspootjiedoders op die natuurlike vyande van valskodlingmot is egter nie voorheen besef nie. Opnames van VKM eierparasitisme deur *Trichogrammatoidea cryptophlebiae*, wat van 1999 tot 2002 in die Oos-Kaap uitgevoer is, het besonderse hoë vlakke van parasitisme gedurende die tweede helfde van die somer getoon. Vroeg in die seisoen is parasitisme-vlakke laag, maar het van Desember begin optel en laat in die seisoen 'n piek van bykans 100% eierparasitisme bereik. Gevolglik het VKM-besmetting, wat gewoonlik op sy hoogste was in Desember, na oestyd se kant toe dramaties gedaal. 'n Hoogs betekenisvolle korrelasie is tussen eier parasitisme en vrugbesmetting in verskeie boorde gevind, wat die beduidende effek van *T. cryptophlebiae* bevestig het. In teenstelling hiermee het VKM-vlakke na oestyd se kant toe gestyg in boorde waar eierparasitisme laag gebly het.. Verdere bywyse van die doeltreffendheid van die eierparasiet is in 'n paar proewe waargeneem waar hoër vlakke van VKM-besmetting gevind is in piretroid-bespuite bome as in ongespuite bome. Soortgelyke negatiewe resultate is na kaolin-bespuitings waargeneem – kaolin boots die negatiewe effek van stof op parasiete na.

In die laaste paar seisoene het ondersoeke vir VKM-eierparasitisme in sitrusboorde in die Oos-Kaap baie lae vlakke, of 'n totale afwesigheid, van parasiete getoon. Hierdie val saam met 'n dramatiese verandering in die spuitprogram, veral wat blaaspootjiedoders betref. Lang nawerkende blaaspootjiedoders, wat nie met GPB ("IPM") verenigbaar is nie, is later in die seisoen gebruik as wat voorheen die geval was. Daarmee saam is abamektien deur sekere produsente teen ongregistreerde dosisse gebruik – soms tot drie maal hoër as die geregistreerde dosis, ondanks vorige waarskuwings van CRI (sien Snykant nr. 39, Mei 2006). Laastens is organofosfate en piretroides, wat spesifiek teen VKM gemik is, gedurende middel- tot laat somer deur seker produsente gebruik. Gevolglik is die vorige tendens van toenemende parasitisme en afnemende VKM-vlakke in die laaste paar jaar nie waargeneem nie. Die teenoorgestelde tendens is eerderwaargeneem (Fig. 1).

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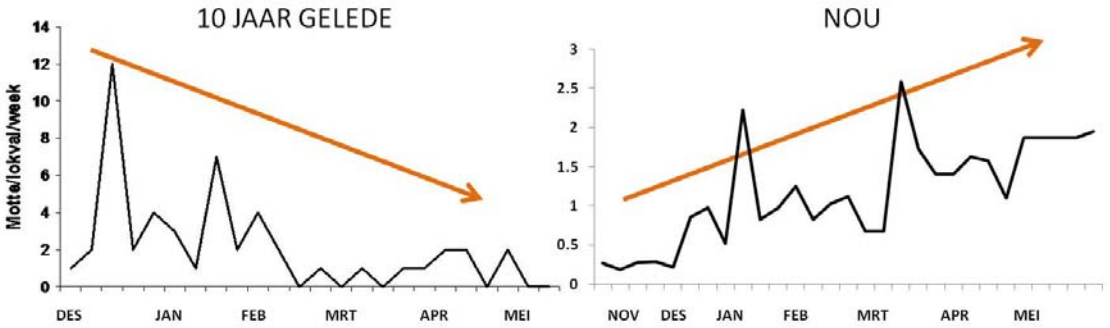

Figuur 1. 'n Vergelyking van VKM tendense in 'n verteenwoordigende nawelboord in die Oos-Kaap in 2000/1 en in 68 nawelboorde in die Oos-Kaap in 2009/10.

Vroeë-seisoen vlakke van VKM is laer as wat so onlangs as 7 jare gelede aangeteken is, as gevolg van die wydverspreide en doeltreffende gebruik van virus bespuitings en paringsontwrigting. Daarna egter, in die afwesigheid van beduidende vlakke van eierparasitisme, het VKM-vlakke gereeld na oestyd se kant toe vermeerder. Hierdie is 'n ondraaglike situasie, vir 'n plaag met die fitosanitêre status van VKM, wat dringend reggestel moet word.

Produsente word aangeraai om hul blaaspootjie spuitprogram oordeelkundig te beplan. Vanselfsprekend sal programme verskil afhangend van kultivar vatbaarheid vir blaaspootjie en geskiedkundige blaaspootjie druk. Waar blaaspootjiedruk laer is, behoort produsente nog steeds met 'n sagter blaaspootjie-program te kan wegkom. **Waar blaaspootjiedruk egter tradisioneel hoog is, word produsente aangeraai om hulle programme met 'n voorblom blaaspootjiedoder te begin,** verkieslik met 'n organofosfaat soos 'n Citrimet stambehandeling of 'n Methidathion, Profenofos of Prothiofos bespuiting. Hierdie sal nie net blaaspootjie beheer nie, maar terselfdertyd ook witluis onderdruk. Methidathion sal die minste effek op roofmyte hê. Hierdie voorblom bespuiting moet op die lente groeistuwing toegedien word, omdat die eerste blaaspootjie-besmetting van die seisoen (as blaaspootjie so vroeg teenwoordig is) goed gesinkroniseerd met dié groeistuwing is. Goeie beheer van blaaspootjie op hierdie groeistuwing behoort daarom 'n beduidende effek in die vermindering van nablom blaaspootjie-druk te hê.

Hierdie kan met 'n piretroid of 'n Hunter lokaas-toediening opgevolg word. **Lang nawerkende blaaspootjiedoders moet geensins later as drie weke na blomblaarval toegedien word nie** en Dicarzol of Hunter lokase nie later as 4 weke na blomblaarval nie (maar verkieslik so naby aan blomblaarval as moontlik). **Alle opvolg behandelings vir blaaspootjie daarna moet met produkte wees wat as sagter of meer GPB-veringbaar beskou word**, soos Delegate of abamektien. Waar roofmyte nie 'n belangrike komponent van die biologiesebeheer kompleks later in die seisoen is nie, kan die gebruik van 'n Mesurol lokaas oorweeg word. Goeie verkenning is noodsaaklik vir die suksesvolle gebruik van hierdie "sagter" of korter nawerkende produkte.. Kalenderbespuitings vir swarvlek (2 tot 6 maal per seisoen toegedien) sluit gewoonlik 'n blaaspootjiedoder in. Hierdie praktyk het veroorsaak dat baie produsente die rol van verkenning in die besluitneming oor wanneer en wat om vir blaapootjie te spuit, nagelaat het. Hierdie kan lei tot toediening van die blaaspootjiedoder wanneer blaaspootjie vlakke te hoog is, wanneer skade alreeds gebeur het of selfs voor hertoediening nodig is.

Dit is belangrik om te beself dat die gebruik van enige "harde" of versteurende produkte na blomblaarval 'n vernietigende impak op die VKM-parasiete kan uitoefen, wat na verhoogde vlakke van VKM-besmetting in vrugte kan lei. Dit is ook belangrik om kennis te neem dat die peritroides, Cypermethrin en Meothrin, geregisteer is om nie vroeër as 5 weke voor oes vir VKM gebruik te word nie. Enige bespuiting vroeër as dit kan meer skade as goed vir VKM-bestryding doen. As 'n laatseisoen chemiese bespuiting vir VKM regverdig word, sal Delegate 'n beter opsie as die piretroides wees as gevolg van die nie-teiken effekte.

As 'n piretroied vroeër in die seisoen vir blaaspootjie-bestryding gebruik was, moet 'n tweede piretroied nie later in die seisoen (vir VKM) gebruik word nie. So 'n praktyk sal net weerstandbiedendheid van beide blaaspootjie en VKM teen piretroiedes versnel.