



Management of *Elsinoë fawcettii*, causal organism of citrus scab

Jan van Niekerk, Providence Moyo, Elma Carstens and MC Pretorius
Citrus Research International (CRI)

In Cutting Edge 270 of May 2019, growers were alerted to the fact that *Elsinoë fawcettii*, causal organism of citrus scab, was recently listed as a regulated pest by the European Union (EU). As mentioned in Cutting Edge 270, no phytosanitary measures were specified but interceptions in the EU could lead to specific control measures for scab being stipulated. Growers were therefore urged to be on the lookout for fruit symptoms of scab in their orchards. It was also stated that **it is of the utmost importance that no fruit with scab symptoms be packed for export to the EU.**

This Cutting Edge is aimed at outlining the disease cycle of the pathogen, cultural management practices that can be followed as well as chemical control strategies.

Disease cycle

Spores of the pathogen are produced on the surface of scab lesions on young fruit and leaves throughout the year. The optimum temperatures for spore production, germination and infection are between 24 – 28°C. However, infection is still possible at temperatures below 24°C if wet conditions persist for long enough. The spores are spread in the orchard by rain or even overhead irrigation. Infection of susceptible leaf and fruit tissue occurs when wetness duration is 3 – 4 hours.

Young leaf flush is especially susceptible to infection but becomes resistant when the flush hardens off. Young fruit remain susceptible up to 12 weeks after fruit set. In the orchard, the pathogen survives on infected or symptomatic leaves, twigs, and fruit within the tree canopy.

Cultural management

Based on the disease cycle it is clear that **prolonged periods of wetness in the tree canopy promote the development of scab.**

Regular pruning of trees is therefore important as this improves airflow in the canopy, which ultimately reduces the duration of wetness. Spray penetration is also improved leading to better chemical control. Pruning and removal of dead wood and leaves from the tree canopy furthermore

reduces the inoculum available in the orchard for future infections.

Chemical control

In areas where the disease occurs annually, a preventive approach should be adopted. Treatments should commence as soon as the first spring flush emerges and continue up to 12 weeks after fruit set. In areas where the disease occurs infrequently, or has not yet occurred, young vegetative flush and fruit should be inspected after rainy periods for the presence of scab lesions.

Currently in South Africa, only copper oxychloride (200 g/100 L water) and cuprous oxide (90 g/100 L water) are registered for the control of citrus scab. Both active ingredients are recommended to be applied at between 75% and 100% petal fall. This application will protect the young leaf flush and small fruitlets. Further protection of fruit can be achieved with additional applications of the copper actives mentioned above, 5 weeks after the first application. For protection of fruit, the applications need to be repeated until fruit are 12 weeks old. All sprays must be applied at medium cover spray intensity, ensuring that all fruit surfaces and leaves are thoroughly wetted.

In South Africa, the chemical management of Citrus Blackspot (CBS) is based on the application of a contact fungicide (copper or mancozeb), done at 80% petal fall, followed by two applications of a strobilurin fungicide (in a tank mixture with copper or mancozeb and mineral oil). The programme is usually ended with a contact fungicide (copper or mancozeb) application. The chemical control programme of Alternaria Brown Spot (ABS) is similar, but with the application of an additional contact fungicide (copper or mancozeb) 4 – 5 weeks prior to the first contact fungicide application for CBS control. **Therefore, a standard CBS or ABS chemical control programme, with copper oxychloride or cuprous oxide as the contact fungicide, should provide sufficient control of citrus scab.**

Care should be taken with copper applications on sensitive varieties where stippling can occur if more than 3 copper applications are done per season. On such varieties, using copper fungicides in the first 3 applications of the ABS and CBS control programmes should also provide scab control as it would protect fruit for the whole period of susceptibility.

Azoxystrobin and pyraclostrobin are registered in the USA and are effective against scab control.



However, at this stage these actives are not registered in South Africa for scab control.

For any further queries contact Jan van Niekerk (021 808 3721) or MC Pretorius (013 759 8032).



Bestuur van *Elsinoë fawcettii* wat sitruskurf veroorsaak

Jan van Niekerk, Providence Moyo, Elma Carstens en MC Pretorius
Citrus Research International (CRI)

In Snykant 270 van Mei 2019, is produsente in kennis gestel dat *Elsinoë fawcettii*, die organisme wat sitruskurf veroorsaak, onlangs as 'n geregleerde (kwarantyn) pes in die Europese Unie (EU) gelys is. Soos in Snykant 270 genoem, is daar geen fitosanitêre maatreëls aangedui nie, maar onderskeppings in die EU kan tot die instelling van spesifieke beheermaatreëls vir sitruskurf lei.

Produsente word aangemoedig om op die uitkyk vir vrugsimptome van skurf in hul boorde te wees. Dit is ook aangedui dat **dit uiters belangrik is dat geen vrugte met skurfsimptome vir uitvoer na die EU gepak moet word nie.**

Die doel van hierdie Snykant is om die siektesiklus van die patogeen te verduidelik asook kulturele bestuurspraktyke en chemiese beheerstrategieë wat toegepas kan word.

Siektesiklus

Spore van die patogeen word deur die jaar op die oppervlak van skurfletsels op jong vrugte en blare gevorm. Die optimale temperatuur vir spoorproduksie is tussen 24-28°C. Infeksie is egter steeds by temperature laer as 24°C moontlik as nat toestande lank genoeg voortduur.

In die boord word die spore deur reën of selfs oorhoofse besproeiing versprei. Infeksie van vatbare blaar-en vrugweefsel vind plaas as die natheidsperiode 3-4 ure is.

Jong blare is veral vatbaar, maar word weerstandbiedend sodra hulle afgehard is. Vruggies bly vatbaar tot 12 weke na vrugset. In die boord oorleef die patogeen op geïnfecteerde of blare met simptome, takkies en vrugte binne die boom.

Kulturele bestuur

Op grond van die siektesiklus is dit duidelik dat **langdurige periodes van natheid in die boom die ontwikkeling van skurf bevoordeel.**

Gereelde snoei van bome is belangrik omdat dit lugvloei in die bome verbeter en die

natheidsperiode verkort. Spuitpenetrasie word ook verbeter wat aanleiding gee tot beter chemiese beheer. Snoei en die verwydering van dooie hout en blare uit die bome verminder die inokulum wat in die boord vir verdere infeksies beskikbaar is.

Chemiese beheer

In areas waar die siekte jaarliks voorkom, moet 'n voorkomende benadering gevolg word. Behandelings moet met die eerste lente groei (spring flush) begin en voortgesit word tot 12 weke na vrugset.

In areas waar die siekte sporadies voorkom, of nie voorkom nie, moet jong vegetatiewe groei en vrugte na periodes van reënval vir die teenwoordigheid van skurfletsels ondersoek word.

Alle blaarbespuitings moet as 'n medium dek bespuiting gedoen word. Daar moet verseker word dat alle blaar- en vrugoppervlakke deeglik benat word.

Slegs koperoksiechloried (200 g/100 L water) en koperoksied (90 g/100 L water) is tans in Suid-Afrika vir die beheer van sitruskurf geregistreer. Vir beide aktiewes word dit aanbeveel dat dit tussen 75% en 100% blomblaarval toegedien moet word.

Hierdie bespuiting sal jong blare en vrugte beskerm. Verdere beskerming kan met verdere bespuitings van die koperaktiewes wat genoem is, verkry word, 5 weke na die eerste bespuiting. Vir die beskerming van vrugte moet bespuitings herhaal word totdat die vrugte 12 weke oud is.

In Suid-Afrika berus die chemiese bestuur van Sitrus Swartvlek (SSV) op die toediening van 'n kontakswamdoder (koper of mankoseb) tydens 80% blomblaarval. Dit word deur twee strobilurien (in 'n tenkmengsel met koper of mankoseb en olie) bespuitings opgevolg. Die program word normaalweg deur 'n bespuiting met 'n kontakswamdoder (koper of mankoseb) afgesluit.

Die chemiese beheerprogram van Alternaria Bruinvlek (ABV) is soortgelyk, maar met 'n addisionele kontakswamdoder (koper of mankoseb) bespuiting, 4-5 weke voor die eerste kontakswamdoder bespuiting vir SSV beheer.

'n Standaard SSV of ABV chemiese beheerprogram, met koperoksiechloried of koperoksied, as die kontakswamdoder, behoort voldoende beheer van sitruskurf te verskaf.



Sorg moet egter geneem word met koperbespuitings op sensitiewe variëteite waar brand (stippling) kan voorkom indien meer as 3 koperbespuitings per seisoen toegedien word. Op hierdie variëteite behoort die gebruik van koperswamdoders in die eerste 3 bespuitings van die seisoen voldoende beheer vir skurf te verskaf, omrede dit die vrugte vir die hele periode van vatbaarheid sal beskerm.

In die VSA is asoksiestrobien en piraklostrobien vir skurfbeheer geregistreer. Hierdie aktiewes is egter nog nie in Suid-Afrika vir skurfbeheer nie geregistreer.

Vir enige verdere navrae kontak vir Jan van Niekerk (021 808 3721) of MC Pretorius (013 759 8032).