

Postdoctoral Research Fellowship, Department of Plant Pathology, University of Stellenbosch

Project Title: Development of a risk-based system for management of Citrus Black Spot

Scope of Research

Citrus black spot, caused by *Phyllosticta citricarpa*, has a negative impact on the South African and Brazilian citrus industries. The disease causes superficial and cosmetic lesions on mature citrus fruit but leaf lesions seldom occur. Fruit lesions reduce the visual quality of fruit produced for fresh fruit markets.

Infection of tissues depends on availability of inoculum and climatic conditions during the fruit susceptibility period as well as the age of the fruit at the time of infection. Fruit are susceptible to infection from fruit set and remain susceptible for 4 to 5 months after fruit set. Following infection, the pathogen remains in a quiescent state and most often becomes visible after fruit colour break. Leaves are susceptible to infection for up to 10 months.

P. citricarpa inoculum in orchards builds up over time, and the CBS epidemic is described as polyetic. Disease pressure in younger orchards is generally very low, with CBS symptoms on fruit becoming more evident in older orchards. The condition of the orchard or trees is also important, as symptoms are more prominent on older trees than on young trees and symptom development in mature fruits is accelerated by stress factors, such as drought and low tree vigour.

Control of CBS in South Africa and Brazil is largely based on fungicide protection during the fruit susceptibility period. Citrus fruit was shown to develop ontogenic resistance to *P. citricarpa*. In South Africa and Australia, fruit protection is required only for the 4- to 5-month period after petal fall. In Sao Paulo, a longer protection period was required given the high inoculum pressure and disease conducive conditions.

Effective CBS control will undoubtedly be compromised by the imminent loss of chemical control actives. Generally regarded as safe (GRAS) chemicals, lower-risk chemicals and biological control options were evaluated in South Africa and Brazil, and found to be significantly less effective than the fungicide standards, and is unlikely to provide CBS control at the zero tolerance level required for fresh fruit exports.

Accordingly, the objective of this research project is to develop a risk-based and integrated system for CBS management, which includes the following components: (1) development of tools to measure inoculum potential in orchards, (2) management practices to limit inoculum build-up, (3) development of a risk matrix for assessing the CBS-risk in orchards, and (4) development and evaluation of orchard-specific chemical control programmes based on CBS risk (i.e. softer programme for low-risk orchards and harsher programmes for high-risk orchards).

Objectives

1. Development of tools to measure CBS inoculum potential in orchards
2. Management practices to limit CBS inoculum build-up in orchards
3. Development of a risk matrix for assessing the CBS-risk in orchards
4. Development and evaluation of orchard-specific chemical control programmes based on CBS risk

Host: The research will be done within the Citrus Research program under the leadership of Prof. Paul Fourie within the Department of Plant Pathology, University of Stellenbosch, South Africa. The project will be part of an existing contractual agreement between Citrus Research International and the University of Stellenbosch. Funding is provided by the citrus industry through Citrus Research International and also carries a full grant-holder bursary for the successful applicant.

Requirement: PhD (obtained in the last 5 years)

- Advanced knowledge of the *Phyllosticta citricarpa* and citrus pathosystem.
- Advanced molecular skills relating to conventional and quantitative PCR
- Extensive experience in classical plant pathology research techniques and methodology.
- Computing literacy, with emphasis on Microsoft Office suite.

Please note that postdoctoral fellows are not appointed as employees and their fellowships are awarded tax free. They are therefore not eligible for employee benefits.

Commencement of duties: 1 April 2022

Closing date: 21 February 2022

Enquiries: Send a letter of application, accompanied by a comprehensive curriculum vitae, including list of publications and the names and contact details of at least two referees, to Prof Paul Fourie at E-mail: phfourie@cri.co.za