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“Modelling the risk of Sclerotinia stem rot of canola in the Western Cape of South Africa for improved chemical control”

After my undergraduate studies (BSc Molecular Biology and Biotechnology), I completed my honours in Plant Pathology in 2022, working on Fusarium wilt of banana. In 2023, I continued with an MSc in the same field, but on another yellow crop: canola. Having grown up on a grain farm in the Western Cape, I was excited to contribute to the local canola industry and producers. At the beginning of this year, my MSc was upgraded to a PhD study, building on data collected from 2023.



Research aim & objectives

Aim: To develop a disease risk prediction model for canola stem rot in South Africa and optimise fungicide deposition for improved chemical control

Completed:

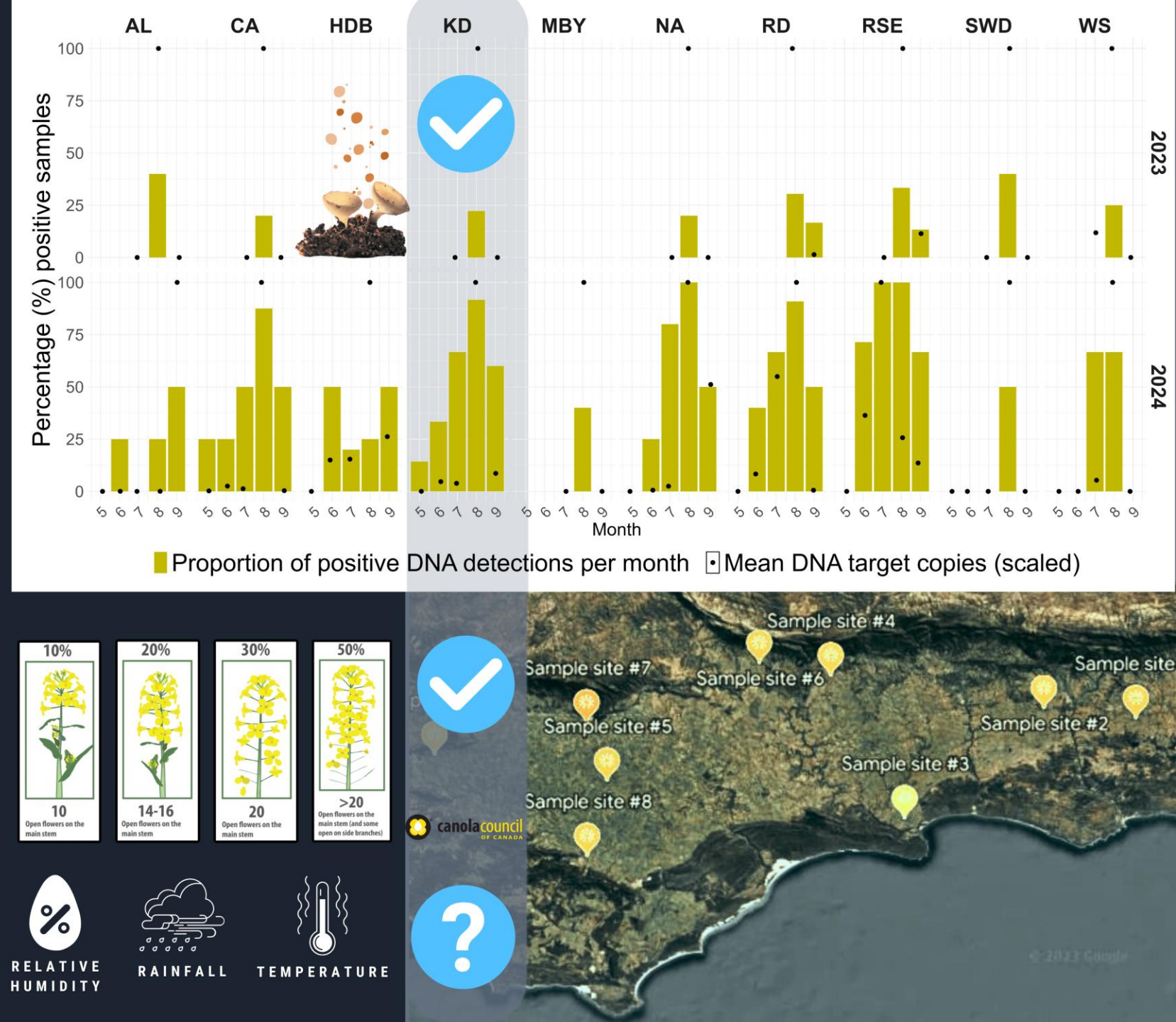
1. Determining the epidemiology of *Sclerotinia sclerotiorum* in South African canola production systems
2. Optimising fungicide deposition in the canola canopy using different application techniques

In progress:

3. Optimising a remote wireless data transfer protocol on an advanced spore sampling system for improved data collection in the field
4. Developing a disease risk prediction tool for SSR of canola in South Africa using recent and historical datasets
5. Investigating fungicide efficacy using optimised inoculation techniques

Key findings

- Highest *Sclerotinia sclerotiorum* DNA abundance in the air mostly observed in August, aligning with peak flowering at field locations
- The complex host-environment-pathogen interactions were highlighted when comparing rainfall, relative humidity and temperature data to pathogen DNA detected in the air
 - Further analysis will be conducted using different statistical modelling approaches
- Fungicide deposition in the canola canopy is affected by spray volume, speed and aerial vs ground-based sprayers



Importance of this study

- Sclerotinia stem rot management is challenging due to complex environment-pathogen-host interactions
- Proper fungicide application timing during canola flowering is crucial for effective control
- Understanding the disease cycle & monitoring airborne inoculum = preventative intervention
- Disease risk forecasting = improved fungicide timing, sustainable and economic use of chemistry
- Effective fungicide deposition on the crop target is directly linked to disease control
- Deposition needs to be optimised by evaluating different spray volumes, speed and crop sprayers in complex crop canopies like canola

Tracking the invisible suspect:

Airborne ascospore detection and monitoring
of *Sclerotinia* stem rot of canola

By Mariana van Deventer, Lisa Rothmann, Lizette Nowers, André van der Merwe, and Diane Mostert



Read more about our research on
Sclerotinia stem rot

