Fully-funded MSc position 2027 – 2028

Comparative genomic and transcriptomic characterisation of *MAPK* defence genes in avocado rootstocks

Phytophthora root rot, caused by *Phytophthora cinnamomi*, is a major constraint to avocado production. Avocado rootstocks differ in their disease responses, but the signalling mechanisms underlying these differences remain poorly understood. Mitogen-activated protein kinase (MAPK) cascades are central regulators of plant immune signalling and are known targets of *Phytophthora* effectors. This project will investigate *MAPK* gene variation and expression in avocado rootstocks with contrasting responses to *P. cinnamomi*.

Research activities:

- Identify, annotate and characterise sequence and gene-structure variation in *MAPK*, *MAPKK* and *MAPKKK* genes across the West Indian avocado reference genome, Dusa®, Leola™ and R0.12.
- Assess the structural effects of selected coding variants using protein-structure prediction.
- Conduct a *P. cinnamomi* infection trial using resistant (Dusa®, Leola™) and susceptible (R0.12, R0.38) rootstocks.
- Analyse root RNA-seq data to compare MAPK pathway expression across rootstocks and infection timepoints.

Requirements:

- BSc Hons in Genetics/Microbiology/Biotechnology/Bioinformatics or a closely related discipline, achieved with an above-average grade.
- Students must register for full-time study at the University of Pretoria in 2027 and will be based full-time at the Hatfield campus.

Bursary:
Competitive MSc bursary funded by the Hans Merensky Legacy Foundation.

HOW TO APPLY:
Applications can be sent to Prof. Noëlani van den Berg (noelani.vandenberg@up.ac.za) and must include:

1. A comprehensive curriculum vitae;
2. Certified copies of qualifications and academic records;
3. A cover letter providing reasons for your interest in the project;
4. The names and contact details of two academic referees.

CLOSING DATE: 31 OCTOBER 2026