Faculty of Science and Engineering

2021 Australian Government Research Training Program Scholarships

Strategic Project Profile

PROJECT TITLE: Tree to landscape: eDNA and GIS as tools to understand spatial influences on pollinator assemblages associated with Hass avocado production in south-west Western Australia

FIELD OF RESEARCH CODE: 0502

PROJECT SYNOPSIS:

Food production industries across the globe are experiencing a decline in pollination services resulting in reduced yields. The avocado industry in south-west Western Australia (SWWA) occupies over 2000 ha and produces 22,000 tonnes of avocado fruit worth ca. $80 million per annum. Avocado trees in SWWA typically produce large numbers of flowers; however, they consistently yield low crops. Sub-optimal pollination has been identified as one of the main contributors to this low realised fruit production, likely as a consequence of insufficient pollinator services. Without knowledge of the spatial influences on pollinators of avocado trees

in SWWA, pollinator limitation will continue to limit the industry with an estimated productivity loss of 15% or more.

Pollinator assemblages change from local to landscape scale; this can influence crop yield in ways that are not fully understood. The aim of this project is to use eDNA monitoring tools through to landscape scale spatial analysis to explore this question from the level of the flower to the landscape.

Pollen eDNA metabarcoding is a novel approach to studying plant-pollinator relationships. Spatial analyses such as GIS are established techniques for exploring landscape scale variation in vegetation cover. Integration of these two approaches will yield powerful insights into the role native vegetation plays in the provision of pollinator services.

You would be joining a group of researchers with extensive experience in both eDNA and spatial ecology. You will also have the support of a cohesive peer group of students in the Ecology discipline of MLS.

FEASIBILITY AND RESOURCING – DESCRIPTION OF THE SUPPORT THIS PROJECT WILL RECEIVE:

We have acquired 210,000 AUD in industry funding for operating costs from the Smart Farms Initiative through collaboration with the South West Catchment Council (SWCC), Federal Government, and Department of Primary Industries and Regional development (DPIRD). In-kind support will come from entomological skills through DPIRD collaborators and access to sites through the SWCC industry connections.

THE SIGNIFICANCE OF THE PROJECT/ PROGRAM FOR THE ENROLLING SCHOOL OR INSTITUTION:

The Faculty has identified several areas of emerging research strength, including Ecological Agriculture – the proposed project falls squarely within the remit of this. Furthermore, the research techniques that we will be using have wide application in other areas of emerging research strength that the team is involved in: Biomonitoring, Bioremediation and Ecological Restoration.

Students must express interest in this scholarship opportunity by emailing the Project Lead listed below. Please provide a copy of your current curriculum vitae and detail your suitability to be involved in this strategic project.

PROJECT LEAD CONTACT:

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