

## Abstract

# Variations in macadamia varietal susceptibility to *Phytophthora multivora* and *P. cinnamomi*

Olumide Jeff-Ego <sup>1,\*</sup>, Juliane Henderson <sup>2</sup>, Bruce Topp <sup>1</sup>, Andre Drenth <sup>1</sup> and Olufemi Akinsanmi <sup>1</sup>

<sup>1</sup> Centre for Horticultural Science, Queensland Alliance for Agriculture & Food Innovation, Queensland Alliance for Agriculture & Food Innovation, The University of Queensland, Dutton Park, QLD 4072, Australia; b.topp@uq.edu.au (B.T.); a.drenth@uq.edu.au (A.D.); o.akersanmi@uq.edu.au (O.A.)

<sup>2</sup> Department of Agriculture and Fisheries, Dutton Park, QLD 4072, Australia; Juliane.Henderson@daf.qld.gov.au

\* Correspondence: o.jeffego@uq.net.au

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**Abstract:** Incidence of diseases caused by various *Phytophthora* spp. in macadamia is increasing worldwide, often resulting in severe yield loss and death of both juvenile and old macadamia trees. In Australia, *P. cinnamomi* and *P. multivora* has been identified to cause severe stem canker in macadamia orchards. Currently, various varietal improvement research programs on macadamia are underway, not only to obtain high-yielding and precocious macadamia germplasm but to develop macadamia genotypes with acceptable levels of tolerance/resistance to pests and diseases. In this study, we selected macadamia genotypes for their acceptable levels of tolerance/resistance to *Phytophthora* infection, after screening about 360 macadamia genotypes against to *P. cinnamomi* and *P. multivora*, using a rapid detached leaf and plant inoculation assays. These macadamia plant materials were collected from a major macadamia arboretum in Queensland. Our results revealed segregation of macadamia genotypes into two spectrum of susceptible and tolerant macadamia genotypes. Hence, strong representatives within the tolerant and susceptible spectrum were further investigated in order to understand if the basis of the differential response is driven by a variation in structural, physiological or genetic markers, following a challenge with *Phytophthora* spp. Our result revealed a marked variation in structural response during the infection process, between the selected susceptible, ‘HAES816’ and tolerant germplasm and ‘HAES344’. This information will provide evidence to support potential preferential selection of tolerant macadamia genotypes potentially useful for breeding against *Phytophthora* diseases. Further studies will characterize tolerant macadamia progenies to develop marker-assisted selection protocols for resistance, and explore defense mechanisms response.

**Keywords:** proteacea; pathogen; tree nuts

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