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Abstract

Air Temperature an Influential Climatic Factor for Growth and Reproduction of Dry Flower Pathogens of Macadamia †

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Abstract: In order to assess the influence of climatic factors on abundance of conidia of dry flower pathogens, *Pestalotiopsis macadamiae* and *Neopestalotiopsis macadamiae*, a Burkard spore trap was used to determine daily aerial conidia concentration at Alstonville (28.852° S, 153.456° E), New South Wales, Australia. Weather data including minimum and maximum air temperatures, rainfall, wind speed and relative humidity were obtained from an automated weather station at the same location. The effect of each, and the combined climatic parameters on conidia abundance was analysed using the GLM procedure for the all-subset regression link functions. A model containing weekly maximum temperature and weekly rainfall produced the best significant effect on conidia abundance (R^2 = 72.7%, P = 0.003) compared with the model containing daily data of both climatic parameters (R^2 = 35.4%, P = 0.000). *In vitro* assays were established to examine the effect of different temperatures (12, 19, 22, 25, 29, 33, 37 and 41 °C) on growth and reproduction of the pathogens. The results showed that maximal mycelial growth, conidia production and germination occurred at 25 °C and declined significantly ($P < 0.05$) at cooler and warmer temperatures. Temperatures above 40 °C were lethal for growth and functioning of the pathogens. The results confirmed that air temperature significantly influenced growth and reproduction of both dry flower pathogens. These findings will underpin development of a disease prediction model for dry flower in macadamia.

Keywords: airborne inoculum; dry mould; flower disease; Pestalotiopsis blight; Proteaceae; tree nut

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