Modelling fungal spore dispersal using *Neonectria ditissima*

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Neonectria ditissima is the causal organism of European canker in apple. Conidia are formed in sporodochia in canker lesions and released during rain. The splash pattern of conidia was monitored in four directions from a central inoculum source held at approximately 1.7 m height, using vertical and horizontal rain traps, trap plants and petroleum-jelly-coated glass slides during simulated rain events. Non-linear models were fitted to the conidia count data to estimate the proportion of inoculum exceeding any distance from the inoculum source. When fitted to horizontal rain trap data, the model suggested that half of all spores splashed beyond 0.42 m from the inoculum source and 4% travelled over 2 m. Conidia were observed at a greater distance from the inoculum source using rain traps than glass slides. In a separate set of experiments, water was dropped in single droplets from various heights onto either a sealed surface or bare soil, and water-sensitive paper was used to estimate droplet sizes and dispersal (height and distance). Water droplets were found to splash up to 120 cm outwards and 60 cm upwards. Smaller droplets travelled further than larger droplets.

The role of woolly apple aphids (*Eriosoma lanigerum*) at vectoring *Neonectria ditissima* conidia

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Colonies of woolly apple aphids (*Eriosoma lanigerum*) were sampled from canker lesions from apple orchards in Motueka, New Zealand, between February and April 2015 to determine their ability to vector the fungus *Neonectria ditissima*, the causal organism of European canker. Five percent of collected aphids carried *N. ditissima* conidia. Galls formed on young shoots by the feeding behaviour of these aphids also harboured symptomless infections of *N. ditissima* (18.0%) when such galls were incubated on apple sap amended water agar (ASAWA). Exposing some woolly apple aphids to *N. ditissima* conidia-contaminated glass slides for <2 min showed that 55% of the aphids were able to carry an average of 46.3 and up 184 conidia. Approximately 12.5% of aphids were still found to carry viable conidia 10 days post contamination. Woolly apple aphids might play a role in the epidemiology of *N. ditissima*, but their relative importance still needs investigation.