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Different arbuscular mycorrhizae and competition with an exotic grass affect the growth of *Podocarpus cunninghamii* Colenso cuttings

Alwyn Williams · Hayley J. Ridgway · David A. Norton

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Abstract There is growing interest in the use of arbuscular mycorrhizal fungi (AMF) for ecological restoration. Numerous commercial AMF products are now available and are often used in preference to collecting indigenous AMF in treating restoration plants. Commercial AMF products are typically based on AMF strains exotic to the plant species and locations where they are used. We treated rooted cuttings of an endemic New Zealand tree species (*Podocarpus cunninghamii*) and an exotic and invasive grass (*Agrostis capillaris*) with an indigenous, pot-cultured AMF (*Acaulospora laevis*) and an exotic commercial AMF product (*Glomus* spp.). *P. cunninghamii* was grown in monoculture and together with *A. capillaris*, the latter to simulate field competition that often occurs in restoration plantings. In monoculture, the indigenous AMF resulted in significant increases in *P. cunninghamii* growth rates and tissue concentrations of both nitrogen and phosphorus. The commercial AMF had either no effect or a negative effect on *P. cunninghamii* growth and nutrient levels. *A. capillaris* growth and nutrient status were unaffected by the different AMF treatments. Competition eliminated any AMF benefit for *P. cunninghamii*. The results show that, for our chosen indigenous woody plant species, the commercially available AMF did not improve its early growth and nutrient acquisition in monoculture while, over the same period, the indigenous AMF induced positive growth and nutrient responses. These results have potential implications for forest restoration, particularly for nursery production of indigenous woody species.

A. Williams (✉) · D. A. Norton
Rural Ecology Research Group, School of Forestry, University of Canterbury, Private Bag 4800,
Christchurch 8140, New Zealand
e-mail: alwyn_williams@hotmail.co.uk

Present Address:

A. Williams
Centre for Environmental and Climate Research, Lund University, SE 223-62 Lund, Sweden

H. J. Ridgway
Faculty of Agriculture and Life Sciences, Lincoln University, Lincoln 7647, New Zealand