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Current Nursery Practice With Regard to Mycorrhizas and the Propagation of New Zealand's Native Plants©

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Mycorrhizal fungi have great potential for use within plant nurseries as they can increase plant growth by increasing plant uptake of soil nutrients. This paper reports the findings of a survey of New Zealand native nurseries to determine whether nurserymen consider mycorrhizal fungi to be important for plant growth and whether they actively incorporate them into their propagation setups. It also explores in more detail the current means by which nurseries inoculate plants with mycorrhizal fungi. The majority of nurseries do consider mycorrhizal fungi to be important for plant growth and expend time and resources on their collection and use (82%). However, the methods currently employed by nurserymen lack efficiency and do not maximise the potential benefits of utilising mycorrhizal fungi. This can be addressed with a better understanding of the basic biology of the different types of fungi and how they interact with their plant hosts.

INTRODUCTION

The vast majority of New Zealand's indigenous flora is mycorrhizal, meaning most species form symbiotic associations with mycorrhizal fungi. The type of mycorrhizal association is dependent on the plant species in question. The great bulk of species form associations with the arbuscular mycorrhizal fungi (AMF), including the iconic podocarps, the myriad species of *Coprosma*, as well as the tussock grasses and ferns (Baylis et al., 1963; Baylis, 1967; Crush, 1973; Cooper, 1976; Johnson, 1977). *Nothofagus* form purely ectomycorrhizal (EMF) associations while *Kunzea ericoides* and *Leptospermum scoparium* are unusual amongst the flora by forming associations with both the AMF and EMF (Orlovich and Cairney, 2004). The biology of the different types of mycorrhizal fungi are very different; for example the AMF sporulate within the soil or even within plant roots while the EMF typically produce wind-dispersed spores from distinctive above-ground fruiting bodies (Smith and Read, 1997).

It is well established that plants inoculated with mycorrhizal fungi can enjoy improved growth rates compared with non-mycorrhizal equivalents, due mostly to increased uptake of soil phosphorous (Baylis, 1959; Gerdemann, 1964; Daft and Nicholson, 1966; Baylis, 1967). However, while early research focussed simply on presence versus absence of mycorrhiza, with presence almost invariably resulting in enhanced plant growth, more recent studies have revealed that the association is not always a mutualism; the association is found to lie on a mutualism-parasitism continuum depending on the specific plant-fungus combination (Johnson et al., 1997; Klironomos, 2003).

As a consequence of the enhanced growth rates possible, interest in the use of mycorrhizal fungi for industrial plant propagation is increasing and numerous my-