

THE DEVELOPMENT OF *CONIOTHYRIUM MINITANS* AS A BIOCONTROL AGENT

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Sclerotinia minor is a serious pathogen of field grown lettuce causing lettuce drop disease. The plant pathology group at Lincoln University have identified the sclerotial mycoparasite *Coniothyrium minitans* as an effective biocontrol agent. Four years of field trials have shown *C. minitans* can provide effective and consistent control of the disease when applied to the transplant potting mix or as a soil amendment at planting. Currently research is focused on gaining a greater understanding of the ecology of *C. minitans* to allow optimisation of the biocontrol system. Genetic markers for *C. minitans* have been developed allowing detection of the biocontrol strain in the field and visualisation of the host-pathogen interaction. We are currently using this technology to examine the ability of *C. minitans* to survive and spread in the field, rhizosphere competency and the mechanism of action of this biocontrol agent. Commercial development of *C. minitans* is being conducted jointly with Agrimm Technologies Ltd., Christchurch.

BACILLUS AND PAENIBACILLUS AS BIOLOGICAL CONTROL AGENTS OF *APHANOMYCES EUTEICHES*

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Aphanomyces euteiches, a soil-borne oomycete fungus, causes a severe root-rot disease of pea. Currently, there are no effective control options for the disease and farmers must avoid planting peas on heavily infested sites. This may lead to reduced soil fertility and reduced profitability where an alternative crop must be grown. Biological control of the disease using spore-forming bacteria from the genus *Bacillus* and *Paenibacillus* was investigated. After *in vitro* and glasshouse screening, two bacteria, *Bacillus cereus* MW 27 and *Paenibacillus polymyxa* 18-25, were selected for further development. In a series of field trials on a naturally-infested soil, *P. polymyxa* 18-25 was shown to significantly increase the yield and stand of pea plants. This bacterium produced hydrolytic enzymes which were able to degrade both cellulose and chitin. This may account for some of its biological control activity.