CROP ROTATION WITH *BRASSICA* REDUCES DISEASE IN POTATO CROPS

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A long-term trial (5 years) was conducted at a commercial property with a history of high incidence and severity of soilborne diseases. Five rotational crops (potato, pasture, *Brassica*, cereal and squash) were tested for their effects on soilborne diseases on potatoes. These crops were grown in plots for about 4 months and then ploughed back into the soil 30 days prior to planting potatoes. Soil applications of metalaxyl fungicide were used as a standard (control) treatment. After four growing seasons there was evidence that rotational treatments, particularly Treatment 2 (cereal + *Brassica* crop), reduced the amount of diseased potatoes, and the proportion of the crop that was diseased compared with the control treatment (potatoes and pasture with or without metalaxyl) ($P=0.046$ and 0.016 respectively). Combining these results with harvest data from previous years, there was no significant difference between the treatments in terms of yield per plant. However, there did appear to be a marginal difference ($P=0.1$) in the proportion of the crop that was diseased, with Treatment 4 (without *Brassica* crop) being higher than other treatments that had *Brassica* crops. In previous work, soil analysis had shown that a rotation with *Brassica* crops reduced the level of *Phytophthora* and other species of soilborne fungi compared with the same rotation without *Brassica* crops.

EFFECT OF HOT WATER DIP TREATMENT ON SEEDBORNE PATHOGENS AND GERMINATION OF CARROT SEEDS

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The effect of hot water treatment of carrot seeds on seedborne pathogens (*Alternaria* and *Fusarium* spp) and seed germination was studied. Carrot seeds (no fungicide) were dipped in water at 50°C or 52°C for 10, 20 or 30 min and plated on potato dextrose agar to assess pathogen growth. Treated seeds were sown in cell trays to assess germination in a glasshouse. The weight of the germinated seedlings was also recorded. All hot water treatments significantly ($P<0.001$) reduced the number of seeds bearing pathogens compared with the control (tap water). Treatment at 50°C for 30 min and 52°C for 10 and 30 min gave almost complete kill of seedborne pathogens. For *Alternaria*, treatment at 52°C gave fewer seeds with pathogens than treatment at 50°C ($P<0.001$), whereas for *Fusarium* 50°C gave fewer seeds with pathogens than 52°C ($P<0.001$). Treatment time did not affect the proportion of seeds bearing *Fusarium*, but longer treatments reduced the numbers with *Alternaria*. Treated seeds were more likely to germinate than control seeds (treated=43-64%; control=23%; $P<0.001$). There were only marginal differences in germination between treatment times: at 50°C , treatment time did not affect germination, whereas at 52°C longer treatment reduced germination. All hot water dip treatments (except 52°C for 30 min) gave increased seedling weights over the control.