

## Molecular detection of *Helicobasidium purpureum* on carrots

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*Helicobasidium purpureum* (anamorph *Rhizoctonia crocorum*) is the causal organism of the carrot disease violet root rot, common in the Ohakune region of New Zealand. *Helicobasidium purpureum* has proven a difficult organism to isolate and grow in culture, confounding diagnosis of early infections. To enable early diagnosis of the disease, a conventional PCR assay was developed with the primer sequences (HelicoPurp1 and HelicoPurp2, 101bp amplicon) targeting part of the internal transcribed spacer (ITS) region of the organism. The assay detected all 15 *H. purpureum* isolates collected and maintained by our laboratory in pure culture. The assay was also robust enough to detect the fungi's full range of inoculum types from the field (sclerotia, hyphae, mycelial mats and 'black sheaths'), and was also able to detect the fungus when it was in association with plant tissues. Samples required washing, as soil inhibited this assay.

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## Determination of potential alternate hosts for violet root rot in Ohakune carrot fields

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Violet root rot (VRR), caused by the fungus *Helicobasidium purpureum* (anamorph *Rhizoctonia crocorum*), is a common problem for carrot growers in the Ohakune region of New Zealand. VRR can still be problematic even after many years of fallow, suggesting that alternative hosts may be maintaining and harbouring the disease. Seeds from a selection of common weed and pasture (ryegrass, clover and plantain) species sourced from the Ohakune area were planted into pots of steam-sterilised Ohakune soil and grown in the glasshouse. Following seedling establishment, pots were inoculated with *H. purpureum*.

Four and a half months post inoculation, all plants were assessed visually, and then well-rinsed root samples were taken for DNA extraction and PCR testing. Of the nine weed species assessed, all tested positive for *H. purpureum* by PCR, and seven had visual symptoms on plants. For the twelve pasture species assessed, ten tested positive for *H. purpureum* by PCR, while eight had visual symptoms on plants. Some plants, in particular various clovers, plantain and dock, had numerous sclerotia on the outside of roots. These results indicate that alternate hosts in pasture or fallowed fields are capable of harbouring *H. purpureum*.