Survey of emerging pulse root diseases in South Australia

Tara Garrard[1]
Kelly Hill[1], Laura Davies[1], Blake Gontar[1], Katherine Linsell[1], Daniele Giblot-Ducray[1] and Alan McKay[1]

[1] SARDI

In South Australia the occurrence of pulse root diseases has been increasing with the intensification of pulses in cropping rotations. During the 2018 growing season, SARDI have initiated a pulse root survey to assess the prevalence and distribution of known soil-borne pulse root pathogens and to detect the occurrences of new pathogens. The survey will continue throughout the 2019 and 2020 growing seasons.

Pulse root samples were sent to SARDI by growers and agronomists predominantly from the South East region of SA. Excess soil was washed from the roots and any plant material above the basal stem was removed. Pulse root DNA was extracted from the dry samples and analysed using a test panel of 22 quantitative real time PCR tests. The tests have been developed by SARDI's Molecular Diagnostic Centre for the detection of known pulse pathogens. In addition Next Generation Sequencing was used to identify potential new pathogens.

The survey has so far collected almost 100 samples of pulse roots from crops, most of which were showing signs of poor performance. The crops included chickpea, lentil, faba bean, field pea, lupin, vetch, clover and Lucerne. Canola was also included in the survey.

From the pathogens currently assessed by the pulse test panel, *Pratylenchus neglectus*, *Pythium* clade F and *Didymella pinodes/Phoma pinodella* were the most prevalent in the samples analysed. *Rhizoctonia solani* AG8 and 2.1, *Pythium* clade I and *Macrophomina phaseolina* were also present at significant levels. *Aphanomyces euteiches* was found in 18% of samples, all from faba bean crops experiencing moderate to severe root rot symptoms. There were no detections of *Phytophthora medicaginis*, a known cause of root rot in chickpea, in the samples received despite some samples showing symptoms consistent with the disease.

The Next Generation Sequencing have detected multiple species of *Phytophthora* and *Fusarium*, which could be potential pathogens on pulse crops. This data provides valuable insight into which pathogens are emerging in South Australia and should be further investigated in host range, pathogenicity and disease management work in the future.