

<p>INTEGRATED DISEASE MANAGEMENT TOOLS TO MANAGE SUMMER CROP DISEASES IN THE NORTHERN REGION</p>	<p>Leader: Dante Adorada, Research Fellow (Summer Crop Pathology)</p> <p>Team: Kirsty Owen, Research Fellow (Nematology) Encarnacion Adorada, Research Officer (Summer Crop Pathology) Yuriy Tsupko, Research Officer (Summer Crop Pathology) Martin Fiske, Research Officer (Nematology) Murray Sharman, Senior Plant Pathologist/Virologist (QDAF) Lisa Kelly, Plant Pathologist (QDAF) Peter Vukovic, Molecular Biologist (QDAF)</p>	<p>The project is progressing well and meeting milestone schedule.</p> <p>An Annual Operating Plan (AOP) was submitted to and accepted by GRDC for the project to commence on 1 July 2019.</p> <p>Research</p> <p>The Fusarium wilt host range glasshouse experiment has been established in August, that looks into the range of hosts, i.e., mungbean, sorghum, chickpea, barley, etc., being affected by the two Fusarium wilt pathogen of mungbean, <i>Fusarium oxysporum</i> and <i>Fusarium solani</i>. Also in August was the establishment of a glasshouse experiment investigating the interaction between the two Fusarium wilt pathogens and root lesion nematode, <i>Pratylenchus thornei</i>, on severity of Fusarium wilt in mungbeans and black gram.</p> <p>The glasshouse experiment that investigates the potential of six Trichoderma-based products in managing sorghum charcoal rot disease, caused by <i>Macrophomina phaseolina</i>, was established in September. Different rates of the different products were evaluated for their efficacy as biological control of the disease when applied as seed treatment. In a related study, a total of 26 isolates of indigenous <i>Trichoderma</i> spp. were isolated from sorghum paddocks' soil collected from Central Queensland (CQ), Southern Queensland (CQ) and Northern New South Wales (NNSW). The different Trichoderma isolates are currently being evaluated <i>in vitro</i> via dual culture test against three different isolates (one each from CQ, SQ and NNSW) of <i>M. phaseolina</i>. Simultaneously, these <i>Trichoderma</i> spp. are being identified using molecular techniques. PCR amplification and DNA sequencing using markers (ITS, EF1, Calmodulin, etc.,) used to identify <i>Trichoderma</i> spp. have been used and the purified DNA has been submitted to Macrogen for sequencing. Isolates that show potential in inhibiting growth of <i>M. phaseolina</i> in <i>in vitro</i> test will be further tested as seed treatment in an <i>in vivo</i> replicated glasshouse experiment. Those that were not found to be antagonists will still be tested in <i>in vitro</i> glasshouse experiments for their potential as plant resistance inducers (PRIs) to reduce infection by sorghum plant against <i>M. phaseolina</i>, when applied as seed treatment.</p> <p>A total of 13 systemic fungicides provided by three agrochemical company research collaborators are</p>
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		<p>currently being evaluated <i>in vitro</i> for their ability to inhibit mycelial growth of three isolates of <i>M. phaseolina</i> (one each from CQ, SQ and NNSW). The tests used the “poison food technique” where the growth medium, potato dextrose agar (PDA), of <i>M. phaseolina</i> was amended with varying concentrations of the different fungicides and mycelia growth and growth inhibition was observed weekly up until six weeks to determine as well the fungicide efficacy longevity. Potentially efficacious fungicide will be selected and tested as seed treatment in a replicated glasshouse experiment using a sorghum cultivar. This is to be set up this coming November.</p> <p>For the Peanut Kernel Shivel (PKS) disease in peanuts, the association of PKS and phytoplasma is currently being investigated, The method of peanut plant grafting with phytoplasma is the method being employed. Phytoplasma infected peanut plants is being scouted at the moment for use in this experiment. The vector species detection and identification for phytoplasma is also a currently on-going investigation. Barcoding for ID-ing vector species has been adopted in this phytoplasma investigation.</p> <p>Extension, Communication and Training</p> <p>The milestone report for developing an extension, communication and training plan was submitted to GRDC on 30 September 2019 and is now under review.</p> <p><u>Related activities are:</u></p> <p>A Northern Pathology review Panel meeting was organised and scheduled for 6 November 2019 at USQ Toowoomba. The meeting aims to 1) Identify research gaps/research priorities for the northern grains region, and 2) identify pathology capacity in the northern region. The meeting will be attended by representatives from GRDC, university researchers, government researchers, agrochemical companies, agronomist and grower groups. At the end of the meeting, the northern pathology research direction will be identified.</p> <p>Pre-season sorghum disease management presentation at the Central Downs Grower Group meeting at Bongeemba Qld, 11 Sept 2019</p> <p>Pre-season sorghum disease management presentation at the Clifton-Allora TopCrop Growers meeting in Allora on 10 Sept 2019</p>
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