

# GRDC investment in R, D & E to address important issues identified by the Southern Regional Cropping Solutions Network



## CROP PROTECTION - DISEASES

- Australian Cereal Rust Control Program
  - » CIMMYT delivery of resistance germplasm and surveillance for resistance in Australian cultivars
  - » Triple Rust Resistance
  - » Molecular Marker Program
  - » Development of genetic tools for Australian barley crops against leaf rust
  - » National Breeding Support
  - » Durable Genes
  - » Advancement of new genes for stem leaf rust resistance from uncultivated relatives of wheat
  - » Development of genetic tools for Australian barley crops against leaf rust
  - » Accelerating the utilisation and deployment of durable adult plant resistance to leaf rust in barley
  - » Hyperparasites for the control of cereal rusts in Australia
- Australian Cereal Rust Control Program - Towards 2019 and a century of monitoring cereal rust pathogens in Australia
- Benchmarking resistance and managing Septoria Tritici Blotch and Leaf Rust
- Blackleg NVT ratings
- Centre for Crop Disease Management
  - » Early detection and management strategies for fungal diseases
  - » Best management practices for fungal disease control
  - » Economics of disease management and capacity development
  - » Extension and engagement
  - » Septoria nodorum blotch biology
  - » Tan (Yellow) Spot
  - » Net form of Net Blotch Functional Genomics
  - » Sclerotinia Stem Rot of canola and lupins
  - » Ascochyta blight of pulses
  - » Durable resistance to Powdery Mildew
  - » Fungicide resistance
- Continuation of fungicide control of rhizoctonia
- Crown Rot Resistance
  - » Genetic solution to Crown Rot in Barley
  - » Identification and utilisation of novel sources of resistance to Crown Rot and Root Lesion nematodes in adapted Spring and Durum Wheat
  - » Integrated genetic solutions to Crown Rot in Wheat
  - » Managing crop diseases - Improving Crown Rot resistance in Durum
- Effective genetic control of Septoria Tritici Blotch
- Effective genetic control of Stagonospora Nodorum Blotch
- Emerging Foliar Diseases in Canola
- Focused improvement of Durum wheat germplasm from CIMMYT for yield potential, drought and biotic constraints
- Fungicide control of rhizoctonia
- Germplasm enhancement for Yellow Leaf Spot resistance in wheat
- Improved fungicide use for cereal rusts in Australia
- Improved resistance to oat pathogens and abiotic priority traits
- Improving grower surveillance management, epidemiology knowledge and tools to manage crop disease in NSW
- Improving grower surveillance, management, epidemiology knowledge and tools to manage crop diseases in SA

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List of investments was current at 31 May 2019



## CROP PROTECTION - DISEASES (continued)

- Disease epidemiology and management tools for Australian grain growers
- Enabling Analytics For Grain Crop Monitoring Applications - Early detection and mapping of ascochyta blight in pulse crops, sclerotinia and blackleg in canola, and yellow spot in wheat
- Improving grower surveillance, management, epidemiology knowledge and tools to manage crop disease in Victoria
- Management of sclerotinia in farming systems
- Managing Crop Disease - Improving chickpea pathogen resistance
- Managing eyespot in intensive cereal, stubble retention farming systems in South Australia
- Managing on-farm biosecurity risk in wheat through pre-emptive breeding
- Managing on-farm biosecurity risk through pre-emptive breeding - rust in field peas and lentils
- Mining the ICARDA germplasm collection for biotic and abiotic priority traits
- National Barley Foliar Pathogen Variety Improvement Program
- National Canola Pathology Program
  - » Epidemiology
  - » Sclerotinia
  - » Surveillance & Management Strategies
  - » Other Diseases
  - » Blackleg
- National improved molecular diagnostics for disease management
- National pathogen management modelling and delivery of decision-support
- Nematode Resistance
  - » Genetic control of nematode species affecting major crops - Germplasm enhancement for nematode control in cereals and pulses
  - » Assessing collections of wild chickpea for resistance to root-lesion nematodes
  - » Collection, phenotyping and exploration of Wild Cicer genetic resources for chickpea improvement
  - » Genetics of wild germplasm, gene-pool expansion and integrated ASSD approach to enhance adaptive potential in chickpea
- Pre-emptive chickpea pre-breeding for biotic stresses and germplasm enhancement for abiotic stresses
- Regional Agronomy SA - Improving disease management through improved agronomic practices
- Regional communication and extension for growers and advisors to understand the status, risks and management of fungicide resistance in the Southern Region
- Reverse genetics for the development of wheat cultivars with improved resistance to necrotrophic pathogens
- Strategies to provide resistance to the economically important fungal pathogen *Rhizoctonia solani*
- Towards effective control of Blackleg pathogen of canola
- Upper Canopy Blackleg Infection
- Virus Resistance
  - » Effective control Barley Yellow Dwarf virus in wheat
  - » New tools and germplasm for Australian pulse and oilseed breeding programs to respond to changing virus threats
- Yield loss response curves for host resistance to leaf, crown and root diseases in wheat and barley