



Grains Research & Development Corporation

GRDC Media Release – 14.9.05

BREEDING WITH COUSINS

Australia's chickpea growers could enjoy higher yields from a new phytophthora root rot resistant variety developed by crossing chickpea with a wild cousin and this is just one possible way wild relatives can improve crops.

Although chickpea can bring \$A450 per tonne in WA, it is often ravaged by disease.

One such disease is phytophthora root rot, which, according to Ted Knights, chickpea breeder at Tamworth Agriculture Institute, seriously threatens Australia's chickpea industry, with an estimated 100,000 hectares at risk this year.

“Affected areas could suffer yield losses greater than 20 per cent at the regional level in any one year and above 50 per cent at the grower level,” Mr Knights said.

Working through the Centre for Legumes in Mediterranean Agriculture (CLIMA) at the University of WA, Fucheng Shan and colleagues have studied all known annual wild relatives of cultivated chickpea from the world's gene banks to transfer a more diverse genetic heritage into commercial crops.

Supported by the Grains Research and Development Corporation, CLIMA has characterised the international family of about 200 annual wild *Cicer* accessions using DNA markers.

“Knowledge of where these wild species grow and their diversity has, effectively, mapped global ‘hot spots’, making further collection and future research easier,” Dr Shan said.

Dr Shan noted that the low genetic variation of chickpea, which is the unique cultivated *Cicer* species, is one reason why global chickpea yield improvement has been slower than in cereals.

“This reinforces the necessity to introduce valuable genes from its wild relatives.

“Successful crop improvement depends on genetic diversity of germplasm.

“Characterising the world's wild *Cicer* collections, using DNA markers, showed they have much wider genetic variation and are potential gene donors to help chickpea win its battle against pests, diseases and other constraints,” Dr Shan said.

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CAPTION: Dr Fucheng Shan at the CLIMA glasshouse in UWA noted that the low genetic variation of chickpea, which is the unique cultivated Cicer species, is one reason why global chickpea yield improvement has been slower than in cereals.