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New collaborative, international research project to improve crop yields

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An international research project to improve crop yields is leading a significant increase in yields for growers of chickpeas, lentils, and faba beans across Australia within the next decade.

The $11.02 million multi-partner investment includes $6.1m from GRDC for theÂ*Achieving improved genetic gain for yield in chickpea, faba bean and lentil using genetic diversity*Â project, led by Murdoch University.

This will see Australian pulse breeders gain access to advanced knowledge, tools and technologies, and novel sources of germplasm to broaden genetic diversity in pulse cultivars and ultimately drive yield gain.

Project leader Professor Rajeev Varshney FRS, director of the Centre for Crop and Food Innovation at Murdoch University, says chickpea, lentil and faba bean production is currently hamstrung due to limited genetic diversity, resulting in meagre yield improvement of less than 0.5 per cent each year.

Professor Varshney says researchers will use genomic prediction, artificial intelligence and speed breeding to identify and stack novel and superior DNA variants for yield and yield-related traits.

â??By incorporating genetic diversity from other landraces and employing the aforementioned advanced breeding techniques and AI, we believe we can achieve a 1.5 per cent increase in genetic gain, which would be unprecedented,â? Professor Varshney says.

â??As part of the research, we will be collaborating with national pulse breeding programs, including Chickpea Breeding Australia, the National Lentil Breeding Program based in Victoria and the University of Adelaide-led National Faba Bean Breeding Program.

â??Through this investment we will develop â??PulseBaseâ??, a platform for hosting datasets generated through this project alongside other relevant existing datasets accessible for various pre-breeding and breeding programs.â?

Professor Varshney added that the key trait researchers will be targeting from international germplasm is yield as well as improved disease resistance.

Project partners include the Queensland Alliance for Agriculture and Food Innovation (University of Queensland), Agriculture Victoria Research, University of Adelaide, University of Sydney, NSW Department of Primary Industries, and Analytics for the Australian Grains Industry (Curtin University) and ICARDA.