

## **Identifying the plant contribution to efficient nitrogen fixation in chickpea**

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Legumes form a symbiotic interaction with rhizobia that can fix atmospheric nitrogen, allowing them to access fixed nitrogen and reducing their reliance on nitrogenous fertilizers. The interaction plays an important role in sustainable agricultural systems. In the past there has been a lot of research to identify rhizobia that allow efficient nitrogen fixation in crop plants but the contribution of the plant to this process has rarely been a focus. In our research program we aim to identify chickpea genotypes that are efficient at accessing and utilising fixed nitrogen. We are screening a range of genotypes from the ICRISAT core collection, as well as commercially released chickpea varieties. Our initial work is assessing rhizobial strains obtained from the collection of Rosalind Deaker at University of Sydney to identify those that can interact with a wide range of chickpea genotypes. A mixture of these rhizobia, including the current chickpea inoculant CC1192, will be used to screen the 260 chickpea genotypes. We will assess the ability of inoculated plants to generate biomass and compare this to biomass production in plants supplied with nitrogen containing fertilizers. Results will be used in a genome wide association study to identify plant genes that contribute to effective fixation of nitrogen and utilisation of this nitrogen. Genotypes with traits that are superior to current cultivars can be used in prebreeding to transfer the traits into more commercially acceptable germplasm.