

The Australian Grains Genebank - what is involved in managing the germplasm collection that underpins the development of new, more resilient pulse varieties for Australia.

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The Australian Grains Genebank (AGG) is the national genebank for grain crops for Australia that provides a wide diversity of crop species, their progenitors and wild relatives to the Australian plant research and breeding communities. The AGG is a partnership between Agriculture Victoria and the Grains Research and Development Corporation, with a mandate for the acquisition, conservation and distribution of grain crop genetic resources for all of Australia's agroecological growing environments. Sounds straight forward and simple, but what is really involved? Firstly, the AGG imports new germplasm from all around the world on behalf of Australian research and breeding programs for priority traits/crop species. The AGG processes this material through Post Entry Quarantine, a process that can take 12-18 months before daughter seed is released to the genebank. AGG then curate's data/information about each line in the database and conserves the seed for the long-term in -20°C freezer vaults. Even under long term storage conditions, seed will still lose its ability to grow, so the AGG routinely monitors seed viability and quantity in storage for each line. Seed regeneration and characterisation of prioritised lines is undertaken each year to produce pure seed of each line to add back into storage. The AGG applies high-throughput phenotyping technology using sensors and camera for evaluating germplasm for useful agronomic traits during the seed regeneration trials. Along with the basic passport data, these phenotypic data can be of primarily invaluable information for further research. This process ensures that seed for priority germplasm and its comprehensive data are available for Australian research and breeding programs to evaluate and develop into the new pulse varieties needed to meet the changing conditions expected into the future.