

News

GRDC Honours Scholarship Successes

26 FEBRUARY | 2015

Grains Research & Development Corporation (GRDC) offers Grains Industry Undergraduate Honours Scholarships to academically strong students who will be undertaking honours for research projects that contribute to the Australian grains industry.

Nicole Cocks and Lauren Borg received GRDC Honours Scholarships for 2015 and will be working on key projects with contribution to the Australian wheat industry. They will be jointly supervised by Prof. Brian Cullis (Director, CBB) and Emi Tanaka (Research Fellow, CBB).

Nicole's Project

Late maturity alpha-amylase (LMA) is a grain defect trait that is routinely assessed in all wheat breeding programs in Australia.

Phenotyping for LMA involves a complex multi-phase experiment with multiple sources of non-genetic variation arising from the glasshouse and the laboratory phases. The current classification protocol makes use of an approximate asymptotic Normal distribution for the posterior distribution of the genetic effects given the part of the data with zero expectation.

Furthermore, the False Discovery Rate approach used in the protocol ignores the dependence between tests (being contrasts to a common positive control). Nicole will be improving this protocol by examining the utility of Monte Carlo based posterior distribution for the genetic effects and alternative methods that account for correlation between tests.

Lauren's Project

Traditional plant breeding approaches have been largely based on the well established theory associated with quantitative genetics. These approaches produce predictions of additive genetic value of an individual based on ancestral information. The rapid advancement of molecular technology offered a range of opportunities to use high density molecular marker data for plant breeding purposes. Linear mixed models can incorporate these genetic and ancestral information as well as non-genetic sources of variation and so is widely adopted for the analysis of phenotypic data-sets in plant breeding programmes. Model selection is a key issue in both the analysis of field trials, using for example, spatial methods, and there is also much interest in model selection for genomic selection (GS).

Lauren will be investigating the performance of a new model selection approach which is an extension of cross validation. This approach may be used in any modelling which involves the use of a linear mixed model.



Nicole Cocks



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Last reviewed: 26 February, 2015

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