

## **2013 VICE-CHANCELLOR'S AWARDS FOR EXCELLENCE IN RESEARCH**

Professor Brian Cullis and his research partner Grains Research Development Corporation have shared the Vice Chancellor's Award for Outstanding Achievement in Research Partnership.

The Grains Research Development Corporation (GRDC) is a statutory corporation, founded in 1990 under the Primary Industries and Energy Research and Development Act 1989 and operates as a research investment body in partnership with Australian grain growers and the Australian Government.

The GRDC invests approximately \$160 million per annum in research and development to benefit to its stakeholders – Australian graingrowers and Government. The Corporation links innovative research with industry needs to deliver improvements in production, sustainability and profitability. GRDC funding is provided through a levy on graingrowers and matched by the Australian Government up to an agreed ceiling. The GRDC research portfolio covers 25 leviable crops spanning temperate and tropical cereals, oilseeds and pulses, worth over \$7 billion a year in farm production.

The GRDC has had a research partnership with Professor Brian Cullis since it was founded. This partnership has encompassed 19 research projects, training awards and postgraduate scholarships with a combined value in excess of \$12 million. The most recent project, Statistics for the Australian Grains Industry-2 (SAGI-2) program is the largest and seeks to nationally coordinate statistical research and training support for all segments of the Australian grains industry.

The longevity of the relationship and quantum of investment committed by GRDC highlights the importance that GRDC places on Biometrics and the confidence that GRDC places in Professor Cullis to assist GRDC realise its objective of delivering value to Australian grain growers. In a global context, GRDCs annual research investment represents approximately 2% of the \$8 billion annual worldwide investment in the grains segment of agricultural research and development (R&D). In order for Australian grain producers to remain internationally competitive in a global environment of such R&D investment disparity, the quality of Australian R&D programs and the relative success rate of R&D projects are paramount. The SAGI-2 program is a pivotal mechanism by which GRDC ensures that grains R&D quality and success rate are maximised.

The R&D undertaken by Professor Cullis and his team is essential for the delivery of a number of flagship GRDC investments including:

1. The National Variety Trials (NVT) Program. The NVT program was established in 2005 and is a national program of comparative crop variety testing with standardised trial management, data generation, collection and dissemination. This \$5 million per annum program is the largest independent varietal evaluation program in the world and the primary source of variety performance information of eleven winter crop species for Australian farmers and their advisors. The SAGI-2 program is responsible for the analysis of all data collected within the NVT program and the continued improvement of NVT Multi-Environment-Trial (MET) analysis methodologies. In this latter capacity, the SAGI-2 program (Dr Alison Smith and Professor Brian Cullis in particular) has developed a world-leading factor analytic approach for analysing NVT data. This method represents a paradigm shift for estimating genotype by trial effects for the NVT Program and has been so successful it is being adopted by many of the largest private wheat, barley, canola and sorghum breeding companies in Australia for analysis of their own breeding program data.
2. Public Plant Breeding Programs. The GRDC is a co-investor in 10 public plant breeding programs including pulses, winter cereals, summer cereals and oilseeds with a combined GRDC contribution of almost \$9 million per annum. The SAGI-2 program is responsible for providing statistical services to these program including trial design, data analysis and training to assist these programs to realise minimum annual yield potential increases of 2%, 2% and 1% for pulses, oilseeds and cereals, respectively.
3. Wheat Classification. Australia's \$5 billion wheat export industry has an international reputation for delivering high quality wheat with reliable processing quality attributes. This reputation is underpinned by a series of Australian wheat classes which describe the specific end product quality (such as dough strength, baking performance and extensibility) of wheat varieties within the class. New wheat varieties released by Australian wheat breeding programs are measured against a series of technical specifications to determine which wheat class they will be assigned to. Given that considerable premiums are paid for higher quality grades, the impact of Classification decisions on breeders and growers can be considerable. Over the past 5 years, Professor Cullis has been instrumental in assisting industry to improve the statistical rigor of the quality tests applied to wheat and upon which Classification decisions are taken. This activity is ongoing and is critical for the ongoing maintenance of Australia's wheat quality reputation.

In his capacity as leader of the SAGI program, GRDC has also tasked Professor Cullis with the responsibility of strengthening biometrics training within Australian higher education institutions. To this end, Professor Cullis has succeeded in embedding SAGI-2 biometricians within Universities across Australia, has developed a series of statistical teaching modules that will be delivered across Australia and has leveraged additional University investment in Biometric appointments.

Diverse and geographically-dispersed, Australia's grains industry has been historically well served by a consortium of mainly public sector R&D providers (state agencies, universities, CSIRO) strategically co-investing with the GRDC in national and regional programs. Successful as this has been, industry has sought to improve R&D delivery through greater national collaboration in planning and delivery. To facilitate this, the Primary Industries Standing Committee (PISC) R&D sub-committee has established a National Grains RD&E Strategy. National Research Programs form the core of the Strategy and formalise and extend existing national research efforts. The SAGI-2 program represents one of the most successful examples of a National Research Program and one that GRDC uses as a model for development of other National Research Programs with its research partners.