

# Aiming to lead the world in agricultural modelling

**C**SIRO, Queensland Primary Industries and Fisheries (QPIF) and The University of Queensland have joined forces to develop world-leading agriculture modelling technologies to help farmers improve crop risk management and profitability.

The joint venture has been formed to further develop the Agricultural Production Systems Simulator (APSIM) – a computer simulation model which takes into account many of the factors affecting a farm's success, including different plant, soil and management approaches, to inform on-farm management decisions.

APSIM has a broad range of applications including:

- Farming systems design;
- Assessment of seasonal climate forecasting;
- Supply chain planning;
- Development of waste management guidelines;
- Risk assessment for government policy making; as well as,

- Guiding research and educational activities.

The APSIM Unincorporated Joint Venture (APSIM UJV) Steering Committee Chair, University of Queensland Professor Kaye Basford, said the recent signing of a new APSIM agreement builds on over 20 years of research and places the joint venture at the forefront of world agricultural modelling research.

Director of CSIRO's Sustainable Agriculture Flagship, Dr Brian Keating, said the initiative will help Australian agriculture respond to the critical challenges of increasing productivity while reducing its environmental footprint.

"The APSIM research team is well placed to build on its past achievements and achieve new innovations in knowledge-based systems to support the productivity gains and enhanced management practices needed for the future prosperity of Australian agriculture," Brian said.

QPIF APSIM UJV Leader Dr Daniel Rodriguez said in this time of global change

there is an urgent need to help farmers capitalise on opportunities.

"Recent advances in our APSFarm tool, for example, which provides virtual farm modelling, are helping farmers and researchers design more profitable and resilient crops, practices and farm businesses," Daniel said.

"Farmers have to contend with reductions in the allocation of water for irrigation and changes in prices and that is where our work can help farmers adapt."

He said dryland farmers can also benefit from the support available through APSIM and APSFarm to help identify more profitable allocations of their production resources between cropping and livestock enterprises.

"The APSIM and APSFarm models are also helping researchers and farmers identify optimum adaptation pathways in the face of increasing climate variability and climate change," Daniel said.

According to project scientist, University of Queensland Professor Graeme Hammer, advances in areas such as virtual crop modelling are essential to meet the growing demand for grain for feedlots or ethanol production.

"To mitigate the impact of climate change and diminishing water supplies and meet the demand for grain, scientists need to find high-performing varieties that best suit environmental conditions and market requirements – and we are doing this through APSIM," Graeme said.

"Major breakthroughs in molecular technology mean scientists can now engineer genes for water-use efficiency and ideal root-system architecture. Virtual plant technology could provide the answers for new-age crop improvement."

Initially the new APSIM UJV Initiative will consist of CSIRO, the Queensland Dept of Primary Industries and Fisheries and The University of Queensland, but other groups are being encouraged to participate.

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**APSIM and APSFarm models are helping identify the best adaptation pathways under climate variability.**