



House of Representatives Standing Committee on Agriculture and Industry

Submission: Inquiry into agricultural innovation - *Committee to examine technological advancement in Agriculture*

SUBMISSION FROM THE TASMANIAN INSTITUTE OF AGRICULTURE

The Tasmanian Institute of Agriculture welcomes the opportunity to respond to the inquiry into agricultural innovation.

ABOUT THE TASMANIAN INSTITUTE OF AGRICULTURE

The [Tasmanian Institute of Agriculture \(TIA\)](#) is Tasmania's joint State Government/University agricultural research agency. This unique partnership has brought together the human and physical resources of the Tasmanian Government with the scientific research and teaching capacity of the University of Tasmania to create a centre of excellence in agricultural research, development, extension, education and training.

Improvements in the efficiency of agricultural practices due to new technology, and the scope for further improvements

There are many advances in technology that are available to support further improvements in agricultural systems. These include, but are not limited to precision agriculture technologies, plant breeding programs, communication, engineering, automation and robotics. There are challenges in supporting the uptake of the relevant technologies within individual businesses and efforts into further research, development and extension will facilitate the uptake the use of these new technologies. There is ongoing scope for further improvements in efficiencies of agricultural practices through the constant improvement of technology.

Tasmanian agricultural systems are currently undergoing transformational change with the expansion of irrigation. Irrigation management and associated technologies are facilitating improved profit and production, however in many situations refinement of irrigation scheduling, application and crop and soil monitoring technologies represent significant opportunity to improve efficient application of inputs and increased yield.

Emerging technology relevant to the agricultural sector, in areas including but not limited to telecommunications, remote monitoring and drones, plant genomics, and agricultural chemicals

Many of the challenges and opportunities relating to improving the efficiency of agricultural production are ongoing. The opportunities in remote monitoring (through drone and even satellite technologies) to facilitate precision agriculture based production systems are extensive. To further the uptake of these technologies there needs to be RD&E effort into the interpretation and calibration of the data that is utilised in these systems.

Challenges exist with the operation of drone technology with respect to licencing and operation within the rules of the Civil Aviation Authority. If satellite technology and data is utilised more widely, there are still large knowledge gaps around the calibration and ground truthing with respect to factors such as crop type, regional characteristics, and interpretation of the data for supporting efficiency gains in agricultural practices.

Close relationships and collaborations are required for the successful deployment to farmers of many of the emerging technologies is required. Many technologies taken to market before robust evaluation and “proof of concept” on-farm fail, leading to an extended time period between development and wide industry adoption. Therefore deployment of new or improved technology to assist farm decision making and management must be market ready at the deployment phase.

Genomics based breeding supporting marker assisted selection is becoming more common in mainstream crops, however further opportunities exist in lesser crops. In the lesser crops insertion of traits to overcome agronomic barriers to adoption on farm could be targeted to create opportunities for rotations with mainstream crops to increase profit, production and sustainability.

Internet download speeds are in many instances limiting the uptake of new information to producers and private sector advisers. Real time decisions are based on the availability and processing of data of many decision support tools.

Sensory technology to measure in-crop conditions are emerging, and while many are currently costly, improvements in calibrations, manufacturing and supporting controlling software leads to cost effective availability. Sensors monitoring crops for disease prediction, nutrition status and harvest scheduling are emerging, but require research for calibration and subsequent application. Currently monitoring technology is being developed for the use in pasture systems to facilitate real time in-situ application of appropriate fertiliser. Savings in fertiliser cost up to 30% of are being realised.

Barriers to adoption of emerging technologies

There are many potential barriers to adoption of emerging technologies. These include cost and opportunity cost, usefulness, integration into existing systems, and training gaps. Currently there are many technologies that farming businesses have access to, but little adoption has occurred in many instances.

One of the limitations to integration of these systems on farm is also the lack of interoperability of the various systems. This leads to potential confusion around which systems are useful at individual business level. For example, variable rate irrigation is an obvious improvement for the application of irrigation water, however the full economic benefit will not be realised until cost effective, real time, reliable soil moisture monitoring technology is available, and linked with the variable rate irrigation technology.

Capability to develop and deploy many technologies is often insufficient. Underpinning research and development to refine new technologies with a target to adoption is required. New technologies are often successfully deployed through supporting robust research to underpin cost effective operability in farming systems.