Capability Statement – TIA Extensive Agriculture Centre

The Extensive Agriculture Centre (EAC) is one of five sector-based research, development and extension (RD&E) centres within the Tasmanian Institute of Agriculture (TIA).

**TIA**

TIA is a joint venture between the University of Tasmania and the Tasmanian Government. TIA has approximately 150 staff and 100 higher degree research students. TIA’s headquarters are based in Hobart, with offices, laboratories and research farms located around Tasmania.

**Extensive Agriculture – what we do**

The EAC conducts RD&E across a range of industry sectors including red meat, wool, grains, seed and herbage plant development in the context of sustainable production across a range of production systems. The EAC’s outputs align with the TIA strategic plan, with emphasis on understanding the impact of practices and developing knowledge for conducting agriculture in challenging landscapes. The centre recognises that much of the RD&E it undertakes has significant farming systems impacts at both the on-farm and wider agricultural production system level.

Key activity areas for RD&E delivered from the centre include: Herbage Development, Grazing and Cropping Systems, and Plant physiology and Stress tolerance. Increasingly our work is extending into irrigated farming systems from the traditional dry-land agriculture associated with Tasmania’s extensive agriculture farming systems.

Much of our RD&E is conducted within the context of the National RD&E Framework, and associated National RD&E Plans for particularly the Sheep, Wool, Grains and Beef national strategies.

Further, we are guided by our industry partners and stakeholders, particularly the UTAS Open for Talent Strategic Plan, the State Government Development Plan, industry stakeholder and reference groups, and our own developing EAC Advisory Group.

Centre Staff contribute significantly to the teaching of the agricultural science at the University of Tasmania, with staff supervising a large number of Research Higher Degree (mostly PhD) candidates.

The EAC maintains high levels of consultation and collaboration with industry, scientific and government partners and industry stakeholders.

**Industry development and extension**

Centre staff are responsible for the delivery of industry development and extension across Tasmania, within industry sectors that contribute over 30% of the gross value of Tasmania’s agricultural output.

While it is a required function that our research activity includes extension components, most of our extension is delivered in partnership with our industry stakeholders. Key extension programs we deliver include:

- **More Beef from Pastures** (MBfP) supported by Meat and Livestock Australia (MLA)
- **Sheep Connect** (SC) supported by Australian Wool Innovation (AWI)
- **Making More from Sheep** (MMfS) supported by both MLA and AWI.

While the focus of delivery from these programs is agreed with industry, either through levy funded objectives determined by the funding partner or a state based reference group, delivery can be tailored to address specific local issues. Currently the MBfP program is working in partnership with the State Government to deliver targeted messages to producers affected by the closure of the King Island Abattoir. The SC program is delivering specific information and providing support to producers impacted by recent bushfires in Southern Tasmania.

Extension of our R&D is also delivered with our industry partners, such as Southern Farming Systems, Grasslands Society of Tasmania, local farmer groups, and agribusiness.

**Research and scientific contribution**

EAC staff will be playing a key role in convening the Australian Agronomy Society Agronomy Conference in 2014 to be held in Hobart. A number of staff attended conferences as keynote presenters reflecting the value and esteem of their research in the scientific community.
Staff from the centre conduct and publish high impact research as evidenced by the Excellence for Research in Australia (ERA) rankings for 2012. Scores of 3/5 for Crop and Pasture Production, and 5/5 for Agriculture, Land and Farm Management illustrate our research is performed at a world standard to outstanding level.

Flagship activities

Herbage Development Program
The Herbage Development Program in TIA is supported by the State Government and has been conducted for over 20 years. The purpose has primarily been to develop pasture plants adapted to the medium and low rainfall regions of Tasmania, from which over 10 long-lived perennial grass and legume pasture cultivars have been developed.

Grazing and cropping systems
This is a diverse land use and management based activity area with work ranging from studying the impact of continual cropping on soil health, to factors affecting crop Water Use Efficiency. Staff are also researching improved management strategies for dual-purpose cereal cropping systems through to management of rangeland pastures to maximise the sustainability of those systems while considering future impacts of climate change.

A key part of our work includes parameterisation and use of system analysis tools or modelling, and development of decision support tools. Decision support tools developed by centre staff include FlyBoss and LiceBoss, and models such as APSIM and GrassGro are widely used.

Centre staff also lead an Australian Centre for International Agricultural Research (ACIAR) project in Vietnam: “Overcoming technical and market constraints to the emergence of profitable beef enterprises in the north-west highlands of Vietnam”.

Plant physiology and stress tolerance
These two closely related research areas combined provide a pathway to developing an understanding the mechanisms of stress tolerance, and quantifying the degree of the tolerance and mapping the genes responsible. The mechanisms are studied in the laboratory using the MIFE system, while grow-outs are conducted in saline, waterlogged or acid soil controlled conditions to provide a rapid screening of pre-breeding material. The main plants being studied are cereal grains.

Extension
As described earlier, extension is an essential output for the Centre. Not only is delivery to address specific industry knowledge needs but also as a conduit for our own research to reach local and regional stakeholders and producers.

National and international collaborations
The centre conducts a range of collaborative activities with collaborators such as:
- Department of Agriculture and Food Western Australia
- South Australian Research and Development Institute
- Department of Primary Industries Victoria
- Tasmanian State Government
- CSIRO
- Wageningen University (Netherlands)
- Sheep Co-operative Research Centre.

External funding
A range of partners (both public and private) provide direct or indirect funding assistance for a large proportion of our activities. These include:
- Meat and Livestock Australia
- Grains Research and Development Corporation
- Australian Wool Innovation
- Department of Agriculture Fisheries and Forestry and Fisheries
- Rural Industries Research and Development Corporation
- Australian Centre for International Agricultural Research
- Australian Research Council

Staff
A full centre staff list is available on the TIA website, including credentials and research interests.

Current projects
www.tia.tas.edu.au/foodsafety/projects

Facilities
The EAC utilises a range of facilities across laboratories and field sites. Key facilities include:
- Sandy Bay (Hobart) – glasshouses, agronomy laboratory, and plant stress physiology laboratory.
- Mt Pleasant Laboratories (Launceston) – glasshouses, stress tolerance screening facility including salinity, acid
soil and water-logging tanks, agronomy laboratory, plant introductions nursery.

University Farm (Cambridge) – field trials with or without irrigation.

Cressy Research Farm (Cressy) – field trials, dedicated grazing evaluation facility, variable rate lateral move irrigator.

The Centre also has access to the laboratories run by the University’s Central Science Laboratory.

**Publications**


Parsons, D and McRoberts, KC* and Cherney, JH* and Cherney, DJR* and Bosworth, SC* and Jimenez-Serrano, FR*, ‘Preharvest Neutral Detergent Fiber Concentration of Temperate Perennial Grasses as Influenced by Stubble Height’, *Crop Science*, **52** pp. 923-931. ISSN 0011-183X (2012) [Refereed Article] [Full Text]

Zhou, M and Johnson, PG and Zhou, G and Li, C* and Lance, R*, ‘Quantitative Trait Loci for Waterlogging Tolerance in a Barley Cross of Franklin x YuYaoXiangTian Erleng and the Relationship Between Waterlogging and Salinity Tolerance’, *Crop Science: A Journal Serving The International Community of Crop Scientists*, **52** pp. 2082-2088. ISSN 0011-183X (2012) [Refereed Article] [Full Text]

Bose, J and Xie, Y* and Shen, W* and Shabala, SN, ‘Haem oxygenase modifies salinity tolerance in Arabidopsis by controlling K+ retention via regulation of the plasma membrane H+-ATPase and by altering SOS1 transcript levels in roots’, *Journal of Experimental Botany*, **64** (2) pp. 471-481. ISSN 0022-0957 (2013) [Refereed Article] [Full Text]

Horton, BJ, ‘Models for estimation of hourly soil temperature at 5 cm depth and for degree-day accumulation from minimum and maximum soil temperature’, *Soil Research*, **50** (6) pp. 447-454. ISSN 1838-675X (2012) [Refereed Article] [Full Text]


* Not a member of this University.