

Agriculture and Food

Agriculture and food industries are Western Australia's second biggest export industry, and the State's proximity to Asian and Middle Eastern markets presents an excellent opportunity to capitalise on the growing demand for safe and high quality food products. The State's agricultural producers and commercial fisheries are highly innovative, especially in dryland farming and sustainable seafood production. These innovations are founded on a history of dedicated research across the sector. Collaboration between Government and universities continue to deliver new knowledge and innovation.

Productive and sustainable industries

The State Government Department of Agriculture and Food (DAFWA), working with local, national and international parties, conducts a diverse range of applied agricultural research. With funding from the State Government's Seizing the Opportunity initiative, DAFWA has boosted effort to address challenges to crop productivity through several programs, including:

- The **Boosting Grains Research and Development Project** will establish a new research and development entity and infrastructure at a Grains Innovation Centre in Northam, with nodes in key regions. New and highly skilled positions will also be created.



Credit: DAFWA

▲ Northam Regional Office of DAFWA.

- The **Water for Food Project** will continue a program of State-wide scientific assessments of new and existing water sources to identify water resource availability for irrigated agriculture. Bringing more water to the sector will expand its productive and export potential.

To support the economic development of livestock industries, DAFWA undertakes a range of research and development through



Credit:

Department of Water

▲ The Mowanjum irrigation trial is a partnership between the State Government and Mowanjum Aboriginal Corporation. Part of the Water for Food program, this trial will serve as a demonstration model for other Aboriginal pastoral stations in the Kimberley.

two other Seizing the Opportunity projects – the **Northern Beef Futures Project** based in Broome; and the Sheep Business Centre in Katanning, as a focus for sheep research, development and extension through the **Sheep Industry Business Innovation Project**.

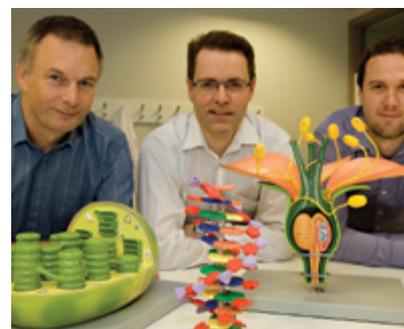
The **Commonwealth Scientific and Industrial Research Organisation's (CSIRO) Agriculture Flagship**, with a node at Floreat, is conducting research to identify and test methods for overcoming soil constraints to crop production, such as subsoil constraints, soil surface water repellency and low soil fertility. Research for soil nutrient testing, crop response to fertiliser and soil biology is also being undertaken.

Two bioinformatics projects with an agricultural focus are being progressed through the **Pawsey Supercomputing Centre's PetaScale Pioneers Program**. A project led by Curtin University aims to modify agricultural practices to significantly reduce losses due to crop disease by developing a model

to investigate how crops are infected by fungal diseases. At The University of Western Australia (UWA), researchers are simulating selective breeding in plants to understand the genetic reasons why hybrid strains have better resilience or yield when compared to their parents.

The **Centre of Excellence in Plant Energy Biology** at UWA is progressing work to understand how agricultural plants can more efficiently use energy for greater yields when grown in infertile soils.

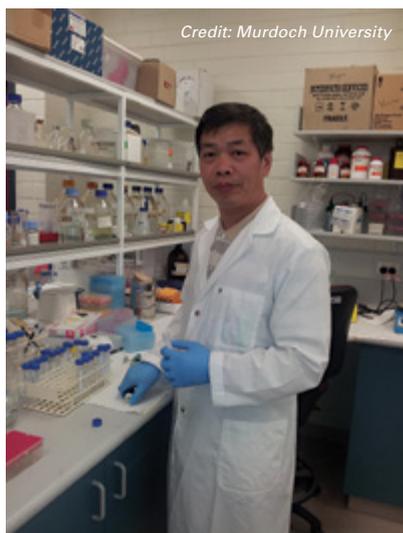
Credit: ARC Centre of Excellence in Plant Energy Biology, The University of Western Australia



▲ Left to right: Professor Ian Small, Professor Harvey Millar (Director) and Professor Ryan Lister from the Centre of Excellence in Plant Energy Biology.

The **Australia-China Centre for Wheat Improvement**, based at Murdoch University, is conducting research into grain proteins, the key determinants of grain quality, utilising new genomic and proteomic technologies. This includes genome sequence research as part of the International Wheat Genome Sequencing Consortium.

Edith Cowan University's **e-Agriculture Research Group** is contributing to research into the sustainability and productivity of agriculture industries by utilising leading edge information and communication technologies.



Credit: Murdoch University

▲ Professor Wujun Ma, Co-director of the Australia-China Centre for Wheat Improvement.

The State Government **Department of Fisheries** continues to pursue activities to ensure the sustainable management of the State's wild fish stocks and their associated commercial and recreational fisheries, including completing the annual series of risk assessments to individual fishery resources and the cumulative risks to regional level aquatic resource assets. This logic is also being applied to the development of two aquaculture development zones in the Kimberley and off the Mid-West coast to promote the sustainable growth of that industry.



Credit: Department of Fisheries

▲ Western Australia's commercial fishing industry produces high-value products in a sustainable manner.

The **Centre for Fish and Fisheries Research** at Murdoch University conducts a wide range of research to enhance knowledge of fundamental biological processes in fishes and marine wildlife, and of aquatic ecosystem function in general.

Preserving our reputation for clean, sustainable and quality products

Through the **Biosecurity Research and Development Fund**, part of the Seizing the Opportunity initiative, DAFWA is leading the development of innovative solutions to better manage agricultural biosecurity risks. Priorities include prevention and early detection of pests and diseases that have the capacity to adversely impact on agriculture, increasing our ability to respond to and recover from significant pest and disease incursions and enhancing our ability to manage established pests and diseases at the local or State level.



Credit: DAFWA

▲ Examination of spot-type net blotch. This stubble-borne fungal foliar disease is found in parts of Western Australia's Wheatbelt region.

The establishment of the \$100 million **Centre for Crop and Disease Management** at Curtin University, jointly with the Grains Research and Development Corporation, is an important step in research and development activities to sustainably reduce the impact of significant grain disease (such as tan spot). The Centre will ultimately provide solutions to critical factors impacting farm business, including drought.

Credit: Centre for Crop and Disease Management, Curtin University



▲ The Centre for Crop and Disease Management's Dr Fran Lopez-Ruis and research assistant Wesley Mair test for fungicide resistance.

The **Plant Production Systems Program** of UWA's Institute of Agriculture is progressing several projects to combat the impact of disease on crops, including developing cereal varieties with resistance to rot, and improving heat and drought tolerance to canola.

The **Australian Herbicide Resistance Initiative** at UWA is undertaking fundamental research on biochemical and molecular resistance mechanisms responsible for endowing herbicide resistance.

The Western Australian **State Agricultural Biotechnology Centre** at Murdoch University has a research focus on molecular activities that involve or promote primary production of commercial livestock, crop plants or microbes, or their subsequent processing for added value. The Centre also supports research in biosecurity, biomedical sciences and environmental biotechnology.

The **International Institute of Agri-Food Security**, based at Curtin University, is building new linkages in quality food for health, agriculture, aquaculture, climate change, agri-business, value chains, and lifestyle choices to address the growing concerns for food security and food policies.

Managing the impacts of a changing climate

The **Department of Fisheries** is conducting research into the management implications of climate change effects on fisheries in Western Australia.

Climate related activities through the **Boosting Grains Research and Development Project**, include:

- frost-proofing farm businesses through new technologies and skills;
- linking growers to better agronomy and new varieties to ensure productivity gains continue during dry seasons;
- development of new crop management packages that will provide new opportunities for growers to take advantage of high rainfall seasons; and
- development of industry collaborations to support agri-businesses to adapt to changing climatic conditions and environmental conditions.