



**Australia-China Centre for Abiotic and Biotic Stress  
Management in Agriculture, Horticulture and Forestry  
(CABSM)**



## Background

The Australia-China Centre for Abiotic and Biotic Stress Management in Agriculture, Horticulture and Forestry is an initiative of Murdoch University and the Northwest A & F University (NWAUFU), Yangling, China. Murdoch University and NWAUFU are strategic partners in establishing this joint research centre.

NWAUFU is a comprehensive university with well-developed programs in agriculture, forestry and water resources. The university is strong in disciplines of dryland agriculture, soil science, crop genetics and breeding, animal genetics and breeding, agricultural economics and management, agricultural entomology and integrated pest management, agricultural water and soil engineering and plant pathology. NWAUFU holds exclusive state-wide authority for programs in animal and plant breeding, plant protection, agricultural biotechnologies, dry land farming, water saving irrigation, and soil and water conservation on the Loess Plateau in China.

Murdoch University is a research-led university with a reputation for world class research in select areas of knowledge that include environmental sciences, genetics, microbiology, plant biology, zoology, crop and pasture Production, agricultural biotechnology, grain quality, biosecurity, climate change and food security. A recent Australian Government audit of research excellence found that Murdoch University is performing at or above world class standard in over 85% of assessed areas. Research on abiotic and biotic stress management is an important part of biosecurity and primary food and fibre production programs.



## Rationale

Abiotic stress factors (such as heat, cold, drought, salinity, and nutrient stress) have a huge impact on world agriculture and forests. In addition, biotic stress factors (such as fungi, bacteria, viruses, nematodes, and insects) cause widespread crop and forest production losses in different parts of the world. Some reports indicate biotic and abiotic stressors reduce average yields by >50% for major crop plants in different regions of the world. Crop plants often respond differently to a combination of stresses than to individual stress factors. Various analyses suggest that both abiotic and biotic stresses will increase with climate change and this will be translated into lower yields and crop failure. New approaches and systems are needed to manage these challenges.

The joint Australia-China research centre (CABSM) provides a platform that brings together experts in several disciplines and enables the sharing and dissemination of knowledge, information, and expertise between disciplines and across research themes. CABSM enables and facilitates preparation of joint projects, encourages exchange of personnel, including senior researchers, post-doctoral fellows and PhD students, joint supervision of students, joint bidding for national and international projects, and other activities such as the establishment of joint laboratories.

## Opportunity

CABSM provides excellent opportunities to undertake multi-disciplinary research on biotic and abiotic stress factors and their multiple interactions that severely affect annual and perennial plant-based agro-ecological systems. The research outcomes have relevance and strategic importance to achieving sustainable and durable yields of staple crops of food security significance. The Centre aims to produce research outcomes that contribute to developing multiple stress-tolerant crops and production systems. Reducing crop susceptibility to drought and pests and increasing productivity are important research goals.

## Mission

The Centre delivers world-class, innovative and cross-disciplinary research, education and training outcomes for the management of abiotic and biotic constraints to crop and forest production.

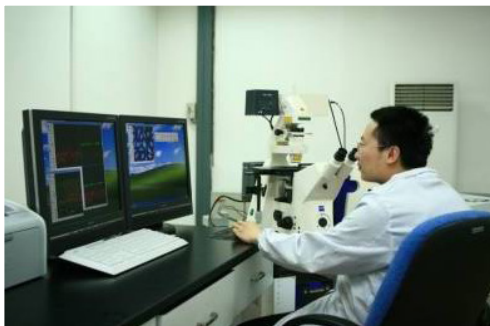
The main focus of the Centre is on alleviation of constraints to producing food and fibre sustainably.

## Core research themes


1. Biotic Stress Management
2. Abiotic Stress Management

## Key research programs


- Soil and crop nutrition
- Water stress management
- Impacts and adaptation to climate change
- Soil health
- Pest and disease management




# Research teams




**Professor Shashi Sharma**  
Biosecurity and food security




**Professor Zhensheng Kang**  
Plant pathology




**Professor Rudi Appels**  
Gene discovery and genetic modification




**Professor Jinrong Xu**  
Functional genomics of plant pathogenic fungi




**Professor Yingang Hu**  
Wheat for drought resistance and yield potential




**Professor Richard Bell**  
Soil fertility and land management




**Professor Tongxian Liu**  
Applied entomology and insect pest management




**Professor Huixian Zhao**  
Molecular bases of crop genetic improvement




**Professor Bernie Dell**  
Agriculture and forestry with a focus on sustainable food and fibre production




**Professor Fengwang Ma**  
Stress biology for fruit trees




**Professor Jun Guo**  
Functional genomics of rust fungi; Molecular mechanism of wheat-rust fungi interactions.



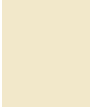
**Professor Giles Hardy**  
Forest pathology, ecosystem function and health




**Professor Song Weining**  
Plant genomics




**Professor Junxiang Wu**  
Agricutral insect and pest control




**Dr William Dunstan**  
Plant pathology




**Professor Lili Huang**  
Pathogen biology and control on apple diseases




**Professor Xiaojie Wang**  
Molecular plant pathology and plant-microbe interactions



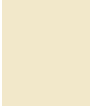
**Dr David Henry**  
Identifying and quantifying deep soil carbon




**Professor Wangquan Ji**  
Wheat breeding and genetic modification




**Dr Hong Zhang**  
Wheat genetic improvement




**Dr Anna Hopkins**  
Description




**Professor Shuoxin Zhang**  
Forest ecology and plant ecophysiology




**Dr Shengbao Xu**  
Wheat heat tolerance mechanism




**Dr Katinka Ruthrof**  
Ecological restoration, mine-site revegetation and management of woodlands




**Professor Zhimin Cao**  
Forest pathology and mycology



**Dr Xiaojun Nie**  
Plant genomics




**Professor Richard Harper**  
Land and water management and carbon mitigation reforestation



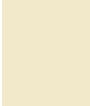
**Professor Yunfeng Wu**  
Plant virology and biocontrol




**Dr Chaoyang Zhang**  
Scientific research administrative management



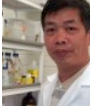
**Professor Mike Jones**  
Plant biotechnology and genetic manipulation




**Dr Stephen Milroy**  
Potato pests



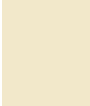
**Dr Steve Wylie**  
Plant virology




**Professor Wujun Ma**  
Grain protein chemistry



**Dr Kirsty Bayliss**  
Plant biosecurity and crop disease



**Dr Gerrard Eddy Jai Poinern**  
Nanobionics



**Dr Ralf Cord-Ruwisch**  
Wastewater and solid waste processing

## For further information contact

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