NSW DEPARTMENT OF
PRIMARY INDUSTRIES

PRIMARY INDUSTRIES SCIENCE AND RESEARCH

Health Sciences, Strategic Alliances & Evaluation

The Health Sciences branch undertakes research on plant and animal health, food science, weeds, vertebrate pest management and economic evaluation to improve biosecurity and underpin profitable and sustainable primary industries.

This Branch is responsible for five major program areas as well as creating and oversighting alliances with universities, CSIRO and Cooperative Research Centres.

Plant Health Sciences

The Plant Health Sciences Unit helps to reduce the effects of insect pests and diseases on the yield, quality and marketability of grain and horticultural crops using effective and environmentally sustainable practices. Major crops targeted include wheat, rice, chickpeas, faba beans, canola and sesame seed, as well as citrus, bananas, deciduous fruits, nuts, berries and vegetables, plus pastures, cotton and ornamentals.

New diagnostic tests are developed to underpin surveillance, prevention, control or eradication strategies for significant agricultural and horticultural plant diseases and pests, both endemic and exotic. Research seeks to reduce pesticide use and environmental impact and improve market access in fruit, vegetable and field crop production. Strategies to delay and manage the impact of insecticide resistance by a range of insect and mite pests are also developed.

Research information from the unit provides a sound science basis for policy decisions by the NSW, Commonwealth and other state governments in plant health science, quarantine and biosecurity areas.

Key research collaborations

Research funders: Grains R&D Corporation, Horticulture Australia Limited, Rural Industries R&D Corporation, Cotton R&D Corporation, Australian Centre for International Agricultural Research (ACIAR), Plant Health Australia, Australian Quarantine and Information Service, AusAID, Biosecurity Australia, Cooperative Research Centre for Naational Plant Biosecurity.

Research providers: Queensland Department of Primary Industries and other state departments of agriculture or primary industry, the Universities of Sydney, Western Sydney, Newcastle, Charles Sturt, New England and Southern Cross and CSIRO Entomology.

International: Consultative Group on International Agricultural Research, ACIAR in Vietnam & Cambodia, and various cooperators in Europe, NZ and USA.

Animal Health and Food Sciences

The Animal Health and Food Sciences Unit undertakes research and diagnostic testing on endemic, exotic and emerging diseases of livestock to minimise the impacts of pests and diseases. Research is undertaken in veterinary virology, microbiology, molecular biology, parasitology, pathology, and epidemiology for beef and dairy cattle, sheep, pig, poultry, honey bee, aquaculture and other animal industries. The research provides the science to develop new recommendations to improve livestock production, enhance welfare and maintain market access for the state's animal products.

Food science in the areas of food safety microbiology, epidemiology and risk analysis, as well as molecular biology and immunology, is carried out for both animal and plant foods. This underpins NSW's and Australia's position as a major source of high quality food products on the world market.

NSW DPI scientists also develop new diagnostic tests and vaccines and the innovative science needed to underpin surveillance, prevention, control or eradication strategies for significant terrestrial and aquatic animal diseases and pests, both exotic and endemic. They are involved in control programs for sheep footrot, internal and external parasites and other endemic diseases. They also provide significant animal health inputs to the Pork Industry CRC.

Sound science is used to develop management strategies to reduce the risks of human foodborne pathogens and chemical contaminants entering the food processing chain on the farm. Research involves epidemiological surveys of antibiotic resistance and investigates the spread of antibiotic resistance between animal and human bacteria. Tests are developed to identify, validate and reliably detect probiotic bacteria (which help protect against gastro-intestinal illnesses), as well as health-promoting factors and other quality traits in foods.

Key research collaborations

The Animal Health and Food Sciences Unit collaborates extensively with industry, through funding bodies co-investing in projects, and cooperatively with other research organisations on specific projects.

Research funders: Rural Industries R&D Corporation, Meat and Livestock Australia, Australian Wool Innovation, Australian Pork Ltd, Dairy Australia, Pork CRC, Value Added Wheat CRC, Australian Research Council, McGarvie Smith Institute, Commonwealth Dept of Agriculture, Forestry and Fisheries, Biosecurity Australia, National Health and Medical Research Council.

University and other R&D providers: Universities of Sydney, Wollongong, Macquarie, UTS, NSW, New England, Queensland, ANU, Murdoch, Monash, Melbourne, James Cook & Tasmania, CSIRO, other state, territory and Commonwealth departments of primary industries and the Australian Wildlife Health Network.

International: Universities of Guelph (Canada), Berne (Switzerland), Louisiana, Iowa, Connecticut and Washington and US Department of Agriculture, Ministry of Agriculture and Forestry (NZ) and ACIAR (Thailand & Indonesia).

Vertebrate Pest Research

The Vertebrate Pest Research Unit, located at NSW DPI's Orange Agricultural Institute, undertakes research which addresses industry priorities in relation to vertebrate pest management and, increasingly, the management of environmental pests. The aim is to improve agricultural production and enhance conservation values through the reduced impact of vertebrate pests.

The unit's applied research services the needs of all land managers, be they graziers, farmers, foresters, national parks rangers or personnel of other agencies such as Rural Lands Protection Boards.

Key research collaborations

R&D funders and providers: Bureau of Rural Sciences, Department of Environment and Heritage, Natural Heritage Trust, Murray–Darling Basin Commission, Rural Lands Protection Boards, NSW Department of Environment and Conservation, Invasive Animals CRC and CSIRO.

Universities: Canberra, Queensland, Southern Cross, Wollongong, Western Sydney, and Sydney.

International: University of York, UK Department of Environment, Food and Rural Affairs and Landcare Research NZ

Weeds Research

The Weeds Research Unit carries out world class research in the areas of weed science, crop, pasture and environmental weed ecology and integrated weed management by cultural, chemical, mechanical and biological control means. It develops tools and methods to effectively and efficiently reduce the economic and environmental impacts that weeds have on the farms, primary industries and ecosystems of NSW and Australia.

Key research collaborations

Research funders: CRC for Australian Weed Management, Grains R&D Corporation, Cotton R&D Corporation, Catchment Management Authorities, Australian Greenhouse Office, ACIAR, National Heritage Fund, Sydney Water Corporation, McGarvie Smith Foundation.

Research providers: CSIRO (several divisions), other State and Territory Deptartment's of Primary Industry or Agriculture, Universities of Sydney, New England, Charles Sturt, Queensland, Adelaide, Wollongong and Western Sydney.

International: Gansu Agricultural University (China), World Bank projects in China, scientific institutes in Italy and France.

Economics Research

The Economics Research Unit leads and coordinates the research economists in the different Science and Research branches who carry out world class research in the areas of impact evaluation, econometric modelling and cost-benefit analysis.

They also:

- conduct performance benchmarking of projects, programs, enterprises, industries and farming and eco-systems, at international, national, state, catchment, resource and farm levels, providing economic information relevant to decision-making;
- analyse the economic, environmental and social impacts of alternative technologies and resource management strategies for major production systems in the agricultural, fisheries and forestry industries of NSW;
- inform decision making about the Department's and primary industries' R&D strategic direction and appropriate resource allocation, assisting in identifying priorities for research and extension resources; and
- play a major role in assessing the returns to research and development at the state, national and international level.

Key research collaborations

NSW DPI's economics research has been supported by all the major R&D Corporations, the Australian Research Council, various Cooperative Research Centres and ACIAR. Several economists have adjunct appointments at the level of full or associate professor with the University of New England, University of Sydney and Charles Sturt University. NSW DPI economists also supervise graduate students at Monash University, University of Melbourne and University of Queensland.

Strategic Alliances

The Branch Director develops and fosters strategic alliances between NSW DPI and universities, CSIRO and Cooperative Research Centres, to bring a greater critical mass of scientists together to address key regional or industry issues, and to better use specialised infrastructure.

Key contact

Director Health Sciences, Strategic Alliances and Evaluation: Helen Scott-Orr
phone: 02 6391 3320
email helen.scott-orr@dpi.nsw.gov.au

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