

Orange Agricultural Research and Veterinary Centre

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The Agricultural Research and Veterinary Centre is located at Orange on the Central Tablelands of New South Wales (latitude 35°19'S, longitude 149°06'E, altitude 900 m). Temperatures in mid-summer (January) range from 12°C to 29°C and in mid-winter (July) from -1°C to 11°C with frosts occurring from April to October. Rainfall averages 880 mm per annum with the lowest chance of effective rainfall in summer.

The Centre is the research headquarters for the Department's Central West, South-East and Illawarra Region. Animal health and regulatory services are provided from the Centre as well as veterinary diagnostic services to the Central and Far Western areas of NSW.

Laboratories have facilities for chemical analysis, entomology, plant pathology and plant physiology research, veterinary pathology, biochemistry, microbiology, serology, parasitology research and diagnosis. There is a weed herbarium located at the Centre which is also headquarters for the regional library and regional computer network.

Research is directed at improving the productivity, profitability and sustainability of the State's agricultural industries, in particular the grazing and horticultural industries of the Central Tablelands and Slopes, ensuring the high quality of its agricultural produce

and at the same time protecting and maintaining its agricultural resources and the environment generally.

Plant Production

Weeds. Orange is a major centre for weed research with programs concentrating on taxonomy, ecology and the development of cost-effective and sustainable control methods. The Research Centre is an international centre of excellence for research into the biological control of weeds.

Weed control research for cropping and pasture systems is targeting the development of mycoherbicides from indigenous fungal pathogens to kill adult plants or to reduce soil weed seed populations.

Pastures. Research into the establishment of pastures using aerial techniques aims at replacing weeds, increasing pasture productivity and reducing land degradation.

Research is developing pasture management technology to maintain and restore the desirable components of native and sown pastures and increase the reliability of the pasture feed supply. New legumes, particularly those from the National White Clover and National Subterranean Clover Improvement Programs, are evaluated for their potential to tolerate temperature and moisture stress and to improve feed quality and quantity on the Central Tablelands and Slopes.

Horticulture. 13 hectares of experimental orchards at the Centre are used primarily for research on pome fruits with a minor input into cherries and nuts.

The main area of research is on orchard management with particular emphasis on planting methods and technology for hail protection and increased harvesting efficiency. Research is also undertaken on

Plant Protection

Entomology. Research is developing technology for more rational use of pesticides in horticultural crops to delay the on-set of resistance to those pesticides and to reduce the chance of chemical residues in fruit. Studies involve investigation of chemical resistance in European red mites, codling moth and woolly aphids. Control methods under development include integrated insect control strategies where predatory mites are used in combination with pest mite monitoring to ensure that sprays are only used when pest populations exceed a danger threshold.

Plant pathology. In horticultural crops, emphasis is given to diseases of deciduous fruit such as apple scab and the control of post-harvest rots. Research includes studies on the effect of latent viruses on growth, yield and fruit quality of stonefruits; evaluation of disease incidence under hail protection canopies; orchard management to minimise pesticide use. With field crops, research is conducted into indigenous pathogens that may be used to control weeds of wheat and rice, and the effect of control treatments and herbicides on diseases in crop legumes.

Weed demonstration unit. The Weed Research and Demonstration Unit provides a specialist advisory service to district agronomists and farmers on weed control in the southern half of N.S.W. On-farm trials are conducted to assess the effectiveness of herbicides for control of weeds in crops and pastures.

tional and reproductive) of genetic differences in wool production in Merino sheep.

Vertebrate pests. Current research has been redirected from feral pigs and dogs to problems caused by house mice in agricultural crops. Techniques for the prediction, prevention and control of mouse 'plagues' are being investigated.

Biometrics

The biometrics group contributes statistical expertise to the design analysis and reporting of all types of experiments conducted in the Region. Research is aimed at determining the efficiency of experimental designs and reviewing established methods of analysis.

Economics

Research economists based at Orange are involved in developing a reliable national lamb market forecasting mechanism; evaluating the economic impact of out of season and accelerated lamb production systems; studying the relationships between consumer preference for lean lamb and the cost penalties/price advantage associated with its production and sale; and assessing the benefits to the Australian economy and to primary producers of R & D investment into the production and processing of agricultural commodities.

Animal Production

The Research Centre's **Sheep Genetics Group** comprising geneticists, livestock research officers, biometricians and advisory officers has the overall objective of genetic improvement to Australia's sheep flocks and development of more efficient sheep. The group is contributing to the development of national performance recording schemes to improve wool production and quality (WOOLPLAN) and to improve sheep meat production and quality (LAMBPLAN).

Meatsheep genetics research. Research is aimed at increasing the rate of genetic improvement in the prime lamb industry. In particular, the genetic contribution to variation in ewe reproduction, lamb growth and carcass composition are being investigated.

Merino genetics research. Research is aimed at increasing the rate of genetic improvement in Merino sheep. Studies on the genetic contribution to variation in wool production, wool quality, body weight and reproduction are undertaken to develop more accurate selection criteria and breeding strategies for use in Merino breeding flocks.

Wool biology and nutrition. Investigations are aimed at determining the biological basis (eg. nutri-

Veterinary Research

Investigations into neurological diseases of sheep associated with grazing *Phalaris* or *Tribulus* aim to define the specific causes and provide recommendations to minimise disease effects. Improved laboratory tests for diagnosis of Johne's disease in cattle and brucellosis in rams are being developed.

Veterinary Diagnostic Services

The Regional Veterinary Laboratory provides a diagnostic service to the Central West and Far Western areas of N.S.W. Laboratory testing can involve necropsy, bacteriology cultures, histopathology, parasitology, serology, biochemistry, haematology and toxicology. The main objective of the diagnostic service is the early detection and control of diseases likely to prejudice the quality, safety, market acceptability or efficiency of production of livestock or their products. The service is also responsible for the diagnosis of animal diseases affecting human health, disease monitoring, market certification, and support for department advisory, research and regulatory programs.

Veterinary Regulatory Services

Veterinary service provided to livestock owners and Rural Lands Protection Boards is co-ordinated from the centre. Activities include investigation of disease outbreaks, pesticide tracebacks, advice on dis-

ease prevention and regulatory matters under the Stock Disease Act.

The oversight of the Tuberculosis and Brucellosis national eradication campaigns and the provision of training for veterinary and para-veterinary staff in the Region is undertaken from the centre.
