

# Research for Queensland's 'wet belt'

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The South Johnstone Research Station (SJRS) near Innisfail is one of Australia's few agricultural research centres in a humid, tropical, lowland environment. The station's research is directly applicable to some 800 000 ha of coastal lowlands between Bambaroo and Cape Tribulation (15-19°S). Indirectly, the work is applicable to other warm, humid areas of Queensland, the Northern Territory and tropical countries overseas.

The station services Queensland's 'wet belt', areas with average annual rainfalls from 1500 to 4000 mm, falling mostly between December and May. However, for significant periods between August and January, plants are stressed by too little water and so high-value crops are often irrigated. Temperatures seldom drop to frost level, but cold stress can still sometimes affect sensitive crops and pastures.

South Johnstone's research history goes back to 1917, when it was established for sugar cane experimentation. However, the northern headquarters for such work was moved to Meringa near Cairns in 1934, and over the succeeding decades sugar research at South Johnstone dwindled. No cane has been grown here since the 1950s. Since 1935, firstly as the Bureau of Tropical Agriculture, then the Tropical Agriculture Research Station (1962 to 1969) and now as the SJRS, many plants have been introduced and grown, including fruits, oil, root, medicinal, beverage, grain and fibre crops, as well as thousands of pasture plants.

Headquarters and major facilities for the 17 full-time staff are on a 49 ha site bordering the South Johnstone River, and two there are sub-stations. One of 267 ha is at Utchee Creek where much of the world famous grazing trial work of the past four decades has been conducted. The other is smaller (11 ha), on naturally infertile and poorly drained soil near

Silkwood and used only for small plot work.

Research associated with fattening beef cattle on tropical pastures has been a consistent major activity at South Johnstone for over 50 years. This reflects an appreciation of the potential productivity (recently estimated at up to 400 000 head annual turnoff) of the climatically favoured and strategically situated beef industry of this region. The present research program is giving emphasis to the integration of all available information on climate, soils, plants and animals to develop more profitable and stable farm production systems. Special priority areas include research into more precise fertiliser programs, pasture systems that require lower management requirements and better pasture species for poorly drained land.

Horticultural research has expanded significantly over recent years. This growth is partly due to development of the \$100 m banana industry (1989) and partly in an attempt to provide further diversification options for the periodically embattled sugar cane industry. Work on bananas includes improving production methods, evaluating imported varieties for agronomic suitability and resistance to some serious diseases (e.g. Black Sigatoka, Panama Disease Race 4), screening new fungicides for controlling leafspot, developing integrated pest management programs (e.g. for scab moth, weevil borer and spider mites) and researching maturity bronzing, a fruit disorder.

Exotic tropical fruits are becoming important with increasing numbers of producers in the area, and variety evaluation trials on three of the most promising ones (rambutan, durian and longan) have been established.

Plantation beverage crops are also researched. Tea has been grown on the station since 1936, and recent expansions in the commercial industry (both near the coast and on the nearby Atherton Tableland) have led to renewed interest in clonal selection. Coffee cultivars Arabica and Robusta are being evaluated for suitability for mechanical harvesting.

Soil erosion is a major concern on the sloping cultivation land in this high rainfall area. Research on local cane farms has proven that changing to minimum or zero till farming systems which involve green cane harvesting can dramatically reduce soil erosion. A soil conservation advisory service operates from the station.

Land resource assessment of 600 000 ha of the wet tropical coast is based at SJRS. This assessment involves describing and mapping all the different soil - land form types, using air photographs and field survey information. This phase is being carried out in collaboration with the CSIRO Division of Soils. It also involves determining the suitability classification of each map unit for all appropriate land uses. Some 25 land uses encompassing arable crops, horticultural tree crops and grazing have been classified.

South Johnstone's environment is somewhat unique in Australia. Because of the quality and sometimes pioneering nature of their research, officers based here have often achieved international recognition with agricultural research and teaching institutions. Our specialists are often called upon for consultancy and training at home and abroad — a significant feature of the stations' activity.

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