

# Canary Islands bear more fruit

**A**t first glance the connection between the volcanic islands of Macronesia in the Atlantic Ocean and some dryland agricultural regions in Australia may not be clear. But as plant breeder and PhD student Graeme Sandral has discovered there is plenty of common ground.

“Essentially, the common factor is a poor capacity to store soil moisture,” Graeme said. “What’s interesting is there’s not actually a lot of soil – it’s mostly volcanic rock, so plants can’t capture water easily.”

Graeme was collecting annual legumes potentially suitable for Australian grazing systems when he became interested in the perennial legumes of the Canary Islands, off the coast of Morocco.

“If you do a climatic analysis of the Canary Islands, you find up to six different climatic zones,” Graeme said. “On the island of Tenerife, which rises to 2000 metres, there can be snow on the mountains and sunbathing on the beach;

the windward side of the mountain is wet, the leeward side is in a rain-shadow. Some of the other islands don’t have the topography to lift the clouds and form rain, so they are essentially deserts.

“Within this climatic range is one of the highest densities of perennial legumes in the world. It’s also the centre of diversification for tagasaste.”

## Making the connection

Graeme drew connections between the low water availability in the Canary Islands and the situation in Western Australia, where porous and non-wettable sands have poor water-holding ability. He started collecting plants from the genus *Lotus*, a group of sub-shrubs that grow from about 30 millimetres to 80 mm tall. Initial work involved producing the first key for the genus. Work has proceeded to looking at species with fodder potential in dryland systems.

“We sowed a field trial in non-wetting deep sand at the CSIRO research centre at Yalanbee in WA in early spring 2004,” Graeme said. “We sowed it and left it.”

Two species in the trial have survived to date, through one of Western Australia’s worst droughts – *L. campylocladus* and *L. spartioides*.

## Breeding for the best

Despite its promise of producing drought-tolerant species, the *Lotus* genus is not without its problems. For example, *L. australis* (native to Australia) contains cyanide, although individuals within one population have been found to have low or no cyanide present. These plants have been a focus within the *Lotus Breeding Program* based at UWA.

While *Lotus* is not used as fodder in the Canary Islands some species are grazed elsewhere. The most common of these is *L. corniculatus*, however its low drought tolerance is something researchers hope to improve through the breeding project.

“With *L. campylocladus* and *L. spartioides* we will work on cross-breeding the best plants for drought tolerance with those for low cyanide levels,” Graeme said.

“Working with perennials, you need to look at longer time frames than when looking at annuals. There’s still along way to go. But interesting things are discovered on islands.” 🌱

## More information

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## More promise from international collaboration

**I**nternational links are being fostered in a project investigating the potential of varieties of *Bituminaria bituminosa* for use in dryland agricultural forage systems in Australia.

FFI CRC plant breeder, Dr Daniel Real, has developed links with European researchers working on the perennial legume.

The *Bituminaria* work is a cooperative effort between Australia, Spain, Portugal and Italy.

Dr Real became interested in *Bituminaria* when he attended a workshop in Italy during 2000 and made contacts with researchers who had been working on the plant for 10 years. The international partnerships fostered in the research have been important in making rapid progress.

The research collaboration has involved sharing information and expertise. Researchers have spent extended periods working with colleagues in other countries. Professor Segundo Rios from University of Alicante in Spain spent three months working in Perth on seed technology and Mr Enrique Correal from Murcia Institute of Agriculture and Food (IMIDA) in Spain spent two weeks in Perth working on plant breeding. Dr Real has also worked with them in Spain.

Dr Real, originally from Uruguay, said the early days of the partnership were assisted by him speaking Spanish. However in the long term, there needs to be a sound basis to make such partnerships work.

“International collaboration can’t be one side just helping another. Both sides have to win. They are providing us with germplasm and previous breeding and agronomy experience. We are providing plant breeding and rhizobia expertise.”

“Australia has many researchers and expertise we can put into getting things done,” said Dr Real, who taught the European researchers how to cross the sub-species.

“They had never developed rhizobia suitable for the plant – they had only naturally occurring rhizobia. We developed an inoculant which they will now test with their sowings.”

There are plans to extend the research collaboration, with possible funding from the European Union and the likely involvement of Greece, Israel and Chile. 🌱

## More information

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