Donald and District Landcare Group Chairman Leo Tellefson pumps saline groundwater from the aquifer east of Lake Buloke. Inset: The seaweed *Gracilaria* may form the basis of a new industry for inland Victoria. Max Berry

Seaweed trial promises inland aquaculture

It is ironic that the north-west Victorian town of Donald – in semi-arid country 250 kilometres from the coast – is investigating the potential of seaweed as the basis for a new industry.

Seaweed is used in many applications, ranging from cosmetics and pharmaceuticals to the gels stabilising ice cream, toothpaste and pet food. Recently, it has been in the news as a resource for diabetes research. Seaweed, or marine algae, is also an important element in other aquaculture, such as prawn and abalone farming.

Much of the seaweed used in Australia is imported, with the main domestic operation based on harvesting drift kelp on King Island. Elsewhere around the coastline, seaweed is mostly protected, preventing the launch of mariculture businesses.

While the contrast between seaweed's marine environment and the drought-ravaged Wimmera region is stark, the two environments have something in common – salinity.

Running north and south of Donald is a 50-metre-thick underground aquifer, estimated to be 50 kilometres long and four to eight kilometres wide. The aquifer's salinity is evident by the sparse vegetation – mainly salt bush – east of Lake Buloke, which has been dry for the past decade. Even without a drought, salinity has ruined the prospects for prosperous farming above the aquifer.

Against this background, hydro-geologist Phil Dyson and marine biologist Rob Cordover approached the Donald and District Landcare Group in 2003 with the radical idea of using the saline groundwater to grow seaweed. They found a receptive audience in the group's chairman, Leo Tellefson, who was keen to turn the saline water to a productive use and revitalise the business of local farmers. Seaweed is one of several potential new industries being investigated by the Buloke Shire.

Phil Dyson has extensive experience in saline groundwater and remains involved in managing the project, overseeing a diverse team including a local chemist, an aquaculture expert and Melbourne University botanists, who are carrying out experimental work.

The Donald seaweed project became a reality in 2004 when the group won a $154 000 grant from the National Landcare Program Innovation Fund, reflecting the project's potential to make salt-affected land productive.

Dyson explains that the project has seen several phases, beginning with drilling into the aquifer on a site north of Donald and testing the water. He says chemical analysis indicated a 'very strong correlation' between the chemistry of the groundwater and seawater.

The project team then tried to grow seaweed in ponds dug at the bore site and lined with plastic. After a 12-month trial, the team conceded that growth was insufficient.

The team abandoned the ponds and set up micro-scale experiments to determine optimal growth conditions, with local pharmacist Bruce Rowe undertaking to grow seaweed in small tubs. Work is continuing and the team is confident of eventual success.

The crucial success factor is the control of water quality, including pH levels, and the presence of parasites and nitrous compounds. Rowe says the species chosen for experimentation, provisionally identified as *Gracilaria chilensis*, 'doesn't like nitrogen in the form of ammonium, but it feeds on nitrate'. He is also looking at a suitable carbon source; so far vinegar seems to be the best growth-promoter.

Phil Dyson believes the best use of the Donald seaweed may be as a basis for integrated aquaculture, such as prawn or abalone production. This has the attraction of minimising waste because effluent is absorbed by the seaweed.

Donald boasts the first Australian trial of inland seaweed aquaculture, but a group from Western Australia is catching up. Researchers at Curtin University of Technology have grown seaweed in saline groundwater under laboratory conditions and are planning a farm-based trial next year.

● **Max Berry**

More information:
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