

Nutrient-enriched desalinated water more feasible for agriculture

January 12 2015, by Hamish Hastie



The study found desalinated water was particularly feasible when growing high-value greenhouse crops. Credit: Sundrop Farms

CSIRO scientists say adding nutrients to desalinated water could make the water more financially attractive to farmers.

A recent study—funded by the National Centre for Excellency in Desalinisation—assessed whether groundwater desalination technologies could cost-effectively supply water at agricultural sites across Australia.

Researchers found cost to be the main constraint limiting desalination

for agriculture, with fewer than 10 per cent of possible sites likely to be supplied with [desalinated water](#) for less than \$1 per kilolitre.

In determining probable costs, researchers included the distance from agricultural land and towns, the number of bores required at groundwater sites, bore installation and maintenance costs, and the cost of disposing of the by-product brine.

CSIRO Land and Water principal research scientist Dr Olga Barron says many farmers currently pay just 20 cents per kilolitre for water, and are unlikely to pay more than \$1.20 per kilolitre.

"Desalinisation technology is considered to be an expensive option," she says.

"Desalination is a technology-intensive enterprise, and the idea that a farmer will invest millions of dollars in a [desalination](#) program probably is unlikely."

She says any desalinated water needs to improve farming efficiencies, or come with something extra to make it more cost-effective, like adding feedwater and nutrients to improve crop production.

"[Groundwater companies] need to shift the focus from desalinated water for agriculture to integrated water-and-food production," she says.

Dr Barron says desalinated water could be conditioned with minerals and nutrients at the same time it is treated.

"For every crop you might have specific needs for certain minerals and certain fertilisers, so you can introduce [these], and when you use [nutrient-added] water, you actually use less to improve the quality and productivity of agriculture," she says.

"[If] you use less water and produce much higher quality agricultural product, it's actually offsetting the cost of desalinisation."

Dr Barron says the research highlights an opportunity for someone in the agricultural industry to develop infrastructure to support the sale of nutrient-added agricultural water.

The study identified groundwater as the most likely feedwater source for cost-effective desalinisation, with the possibility of increasing water production by up to five times if feedwater salinity is only slightly higher than the salinity required for crop use.

The most cost-effective results were found in greenhouse agriculture, where high-value crops are intensively grown.

More information: Olga Barron, Riasat Ali, Geoff Hodgson, David Smith, Ejaz Qureshi, Don McFarlane, Elena Campos, Domingo Zarzo, "Feasibility assessment of desalination application in Australian traditional agriculture," *Desalination*, Available online 22 October 2014, ISSN 0011-9164, [dx.doi.org/10.1016/j.desal.2014.07.024](https://doi.org/10.1016/j.desal.2014.07.024).

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