PRIMARY INDUSTRIES AND RESOURCES SA

FACT SHEET

FS

Potential of Inland Saline Aquaculture

Aquaculture SA

Introduction

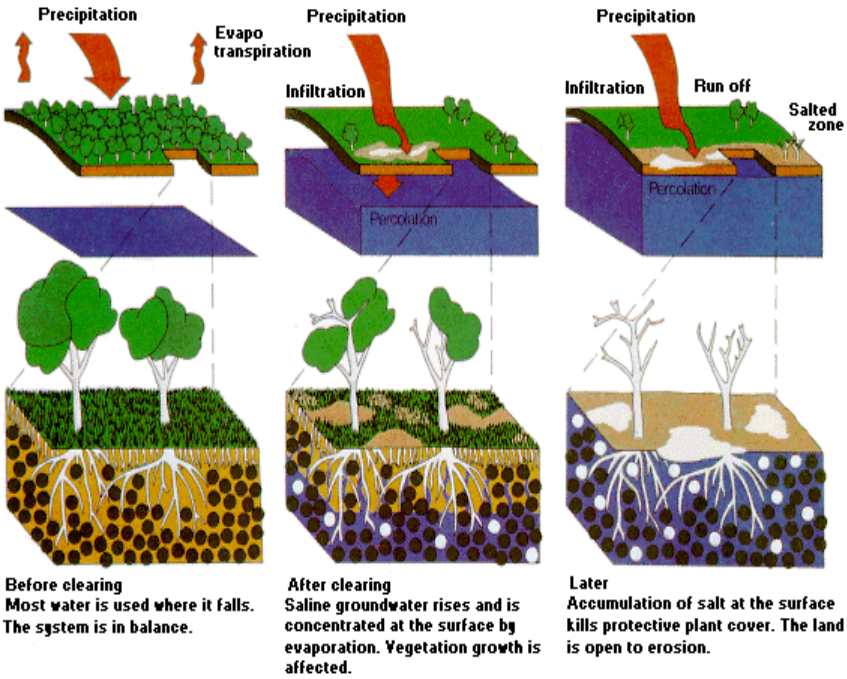
The use of inland saline water to culture marine species has been practiced widely in other countries. The potential for inland production of marine fish is now becoming recognised in Australia including South Australia.

Causes of Saline Groundwater

Rising saline groundwater is becoming a major agricultural problem in many parts of South Australia. It occurs when vegetation is cleared from the surrounding land causing groundwater to rise and increase in salinity (Fig 1).

This is mainly due to shallow-rooted crops using less rainfall than deep-rooted native vegetation therefore causing less rainfall becoming used in that area by the plants. Water not taken up by plants will seep into the watertable thus causing it to rise. The water will then become saline by salts leeching in from the surrounding sediments and rock strata.

Fig 1: From PIRSA Fact Sheet: "Causes of dryland salinity"



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www.pir.sa.gov.au

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Use of Inland Saline Water for Farming Marine Fish

Saline water tables can be lowered by pumping directly from a bore water however a suitable, environmental method is required for the disposal of the saline water.

In most situations this water can be intercepted and pumped through a series of tanks or ponds in which marine finfish can be cultured.

Before saline groundwater can be utilised for marine finfish culture it must be tested for chemicals, pesticides and dissolved ions as high concentrations can be unsuitable for aquaculture or even lethal.

Pilot Projects

There are a number of people in South Australia who are trialing this form of aquaculture and initial results have shown to be promising.

The "Bedford Groundwater Interception Project" managed by the Coorong District Council in Tailem Bend, South Australia is one such venture and is located in Cooke Plains, approximately 100km south-east of Adelaide. This project, initially funded by the Rural Industries Research and Development Corporation (RIRDC), is investigating the use of saline groundwater for the culture of various species of marine finfish. So far they have successfully cultured Tommy ruffs, snapper and brine shrimp, and will be looking at the potential of species such as flounder, King George whiting, Yellowtail kingfish and black bream.

The fish were grown in two 10,000 litre tanks which are located within a poly tunnel to stabilise climatic conditions. Saline groundwater is initially pumped through a filtration system to remove the high concentrations of iron that is present. Water is then pumped into the tanks and reused using a recirculation system.

Besides growing fish, the project has also assessed the use of saline groundwater for betacarotene production, salt production and the production of brine. Since the project's commencement in 1997 the saline watertable level within the local vicinity has dropped around half a metre.

Culture Techniques

The techniques for culturing finfish using saline groundwater range from using ponds to recirculating aquaculture systems. This will depend on the individual site specifications and the value of capital money that can be injected into the operations. There are fact sheets available on both pond construction/design and recirculating aquaculture systems.

Species

There are presently a number of species that have been cultured in saline groundwater, some successful, some not so successful and others needing further research and development.

Species that have been trialed using saline groundwater include; barramundi, trout, black bream, mulloway and brine shrimp. There is also interest in Yellowtail kingfish, Atlantic salmon and King George whiting. As the success of farming these species has been mixed, it is highly recommended that anybody wishing to farm species using inland saline water commercially should join the Inland Aquaculture Association of South Australia to network with growers undertaking similar activities.

Future Directions

The use of inland saline groundwater for the aquaculture of marine finfish shows great potential. Not only does it provide a method for lowering saline water tables which can harm surrounding native vegetation and crops, its use will also produce an alternative crop.

However further research is required to investigate best practice and management techniques and to aid in identifying future potential species suitable for this form of aquaculture.

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Further Information

A report entitled “Inland Production of Marine Finfish” composed by Stewart Fielder and Geoff Allan from NSW Fisheries is also available on the website. This report discusses various aspects concerning the production of marine finfish using inland saline groundwater.

This report as been extracted from the following publication produced by RIRDC;

“The New Rural Industries – A Handbook for Farmers and Investors” (Hyde,K. editor)

The handbook provides plenty of information on alternative crops including aquaculture, crops and animals. Individual chapters can be downloaded from the following website;

www.rirdc.gov.au/pub/handbook/contents.html

Alternatively a 570 page full colour book is available from the RIRDC for around $40 plus postage by telephoning (02) 6272 4819.

Further information is also available from;

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