Tools for saltlands diagnosis formulated

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Australian farmers could soon be provided with new ways of diagnosing the capability of salt-affected land for agriculture.

New research suggests using saltland capability assessment methods such as depth to watertable and subsoil salinity could help farmers determine suitable areas within saltland sites where the growth of perennial halophytes (salt-plants) will provide economic returns.

Researchers from UWA's Centre for Echohydrology tested the growth and survival of five salt-tolerant perennial plants – samphire, river saltbush, small leaf bluebush, saltwater couch and Rhodes grass – using measurements of depth to watertable and subsoil salinity at three separate saltland sites in WA from 2003 to 2006.

The three sites had varying watertable depths, with Meckering being the site with the shallowest waterable while Wubin and Pingaring had deeper watertables.

Lead author and UWA's Edward Barrett-Lennard says salinity has been an enemy of agriculture for 10,000 years and not all salt-affected land is productive.

"Thus, we are trying to provide farmers with robust ways of distinguishing areas of salt-affected land that is suitable for agricultural productivity, from areas that is not," Professor Barrett-Lennard says.

Prof Barrett-Lennard says planting perennial halophytes on saltland is

environmentally beneficial as they can lower the watertables slightly.

"Their ability to lower the watertables even slightly means perennial plants can encourage the growth of less salt tolerant plants underneath and around them—bringing in a change in the local hydrology of the saltland sites."

The measurement of the relationship between the electrical conductivity of the saturated extract (ECe) of the subsoil and plant survival in the study found samphire (27-65 dS/m) to be the most salt tolerant plant and Rhodes grass to be the least salt tolerant.

"Plant survival was related to the subsoil rather than surface soil because salinity in the former is not seasonally variable, making it easier for farmers to diagnose the capability of saltlands any time of the year," Prof Barrett-Lennard says.

While the researchers initially hypothesised that the combined effects of salinity and waterlogging would affect plant growth and survival on saltland, Prof Barrett-Lennard says the findings of the study indicated otherwise.

"The most important principle affecting plant survival in the trials was not waterlogging – the presence of shallow watertables due to the seasonal rainfall in winter – but rather the depth to watertable in summer."

"We found that highly salt-tolerant plants such as samphire needed shallow watertables to survive in summer, while moderately salt-tolerant plants such as small leaf bluebush and river saltbush needed deeper water tables," he says.

The researchers also concluded that sites growing samphire are likely to

be too saline to grow saltland pastures and are not economically profitable.

Provided by University of Western Australia