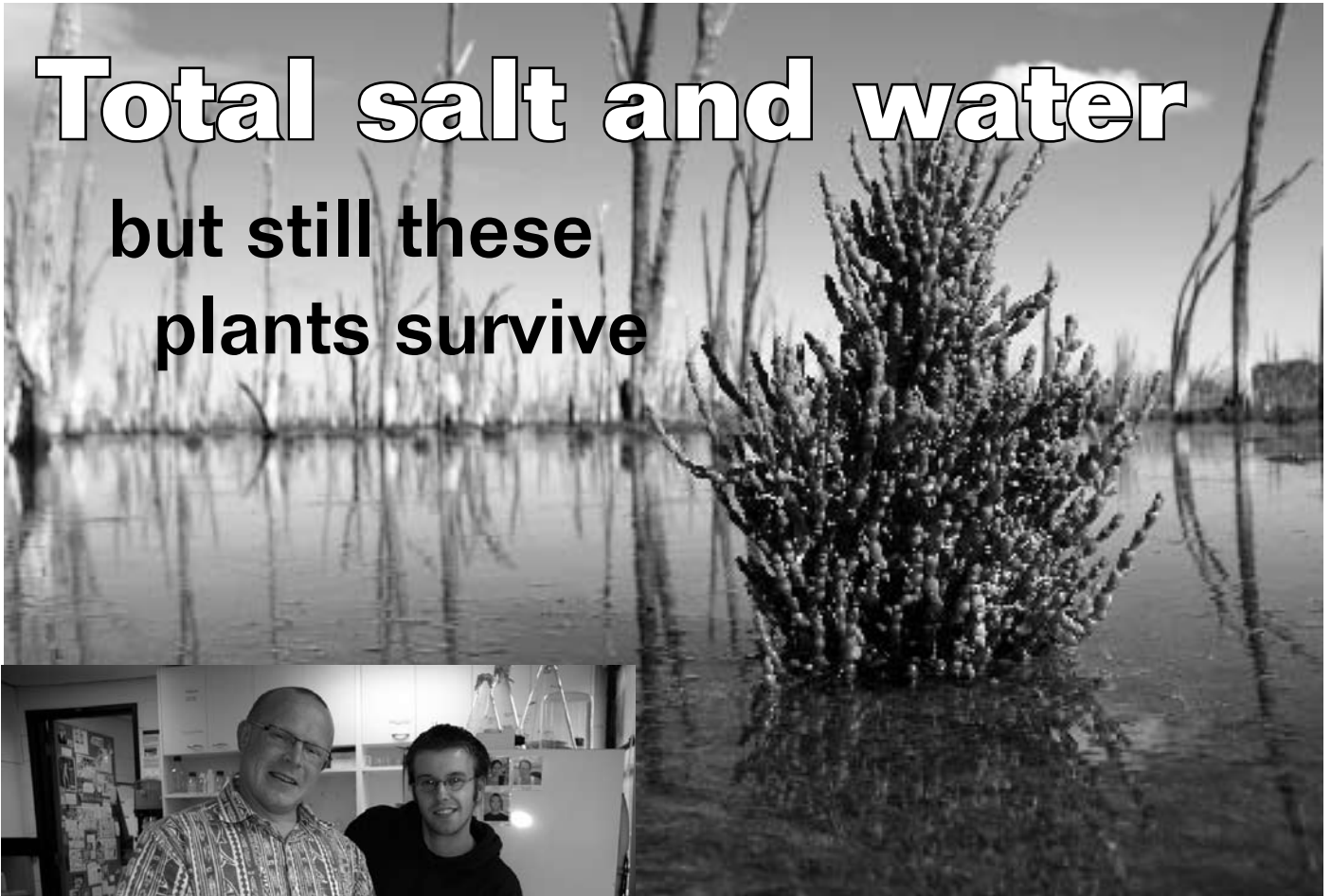


# Total salt and water but still these plants survive



ABOVE: *The halophyte samphire (Halosarcia pergranulata) submerged in salt water in Yenyening Lakes*

LEFT: *Associate Professor Ole Pederson and Harrie Vos take great care with the oxygen micro-electrode, part of a system worth \$60,000*

The salt-affected waterlogged soils that cover nearly 20 million hectares of Australia need plants with specific properties to help them recover.

There could be no plant more attuned to excess salt and water than one which thrives underwater in a salt lake.

Scientists in the School of Plant Biology, and their collaborators are studying plants in this category to understand how they overcome oxygen deficiency associated with submergence. Plant cells require oxygen for respiration, but when flooded this cuts the contact with air, so the plants need to rely on oxygen they produce during underwater photosynthesis or oxygen they can scavenge from the water column.

Dr Tim Colmer and his colleagues, Associate Professor Ole Pedersen, from the University of Copenhagen in Denmark, and a Masters student, Harrie Vos, from Utrecht University in the Netherlands, are sharing their knowledge of how plants cope with complete submergence. The work is the first to examine submergence tolerance in vascular halophytes (plants that grow in highly saline environments).

These plants grow in salt marshes in Europe where they stabilise the environment, help to prevent erosion and provide habitats for birds.

Dr Colmer said the CRC Salinity was interested in the plants, but not for economic use. "We are currently interested in their ecology and physiology," he said. Understanding the ecology and functioning of these plants will aid attempts to revegetate highly saline lands.

But mining companies have already registered their interest in halophytes for use in revegetation to stabilise surface soils and help prevent erosion and dust storms from saline tailings dams and other salt-affected areas.

Professor Pedersen brought with him his own invention (in collaboration with colleagues in Europe), an oxygen micro-electrode, which is used to measure concentrations of oxygen within plant tissues.

The team has been using it to measure oxygen dynamics within samphires (an Australian halophyte species) which are growing underwater in Yenyening Lakes near Brookton.

"It's very challenging to take these measurements in the field, with the delicate glass instrument," Dr Colmer said. "In the long term, we hope to be able to transfer the technology here. We can do these measurements in the lab, but you need Ole's specialised equipment to do it in the field."

Dr Colmer, Professor Pederson and Mr Vos have been writing a joint paper on the ecophysiology of oxygen transport in the succulent halophytes. "There is very little known about it and we have lots of new results from our work at Yenyening Lakes," Dr Colmer said.