Myth busting — critical for smart investment

FFI CRC Research Director Dr Mike Ewing (pictured right) has called for researchers to either uphold or 'bust' current salinity management myths by focusing on where the greatest economic benefits can be made.

By Jill Griffiths
Kondinin Group

Speaking at the 2nd International Salinity Forum, Dr Ewing said that when focusing attention in the landscape it was important not to tackle the worst areas first; economic benefits were generally best maximised by intervening on less salinity-impacted areas.

"We should not confuse economic and aesthetic benefits," Dr Ewing said.

Dr Ewing said it was a myth to think plants on saline land always had low inherent productivity and that scarce resources should be directed towards improving productivity and income on non-saline land. Rather, some saline land justified investment in production and research.

Looking beyond halophytes

Another perpetuated myth is that saline agriculture depends entirely on the discovery of new halophytes (extremely salt-tolerant species). Although new salt-tolerant plants are needed, selection and development of some existing crop species for improved salinity tolerance presents a clear alternative to domestication of halophytes.

There is also a need to look beyond salt-tolerant shrubs, as they did not necessarily offer the best prospects for forage innovation and livestock production.

"Legumes represent a priority opportunity for saline pasture innovation based on their high grazing value for livestock, enhancement of companion species, cost savings in fertiliser nitrogen, and under-exploited genetic variation," Dr Ewing said.

Molecular technologies take time

Researchers and farmers alike have high expectations around the ability of molecular technologies in delivering us quick and easy solutions needed for change. The difficulties involved in using molecular technologies to produce plants with useful field salt tolerance restricts their potential to become short- and medium-term solution providers.

"While substantial resources are currently being directed towards understanding salt tolerance at gene level, with some success, it is not a given that associated genetic engineering will lead to substantial or rapid improvements in performance of major field crops when grown in saline environments," Dr Ewing said.

"Research has shown tolerance to salinity is physiologically and genetically complex, so comprehensive tolerance is unlikely to be delivered by a single gene. In this setting, genetic engineering is challenging.

"The observed complexity of salinity tolerance reduces the likelihood that this knowledge will rapidly translate into useful transgenic cultivars."

More information

FFI CRC Research Director, Dr Mike Ewing
T: (08) 6488 1876
M: 0409 116 750
E: mike.ewing@futurefarmcrc.com.au

Do trees really work to tackle salinity?

Planting trees on cleared agricultural land to lower water tables and reduce salinity has been promoted since the mid-1980s.

However, research by hydrologists from the Department of Agriculture and Food, Western Australia (DAFWA) shows that in some systems this may not hold true.

Research published by DAFWA hydrologists during 1999 concluded that trees were best planted in recharge areas, as discharge plantings rarely reclaimed saline areas and water table responses were generally confined to beneath the tree plantings. Extensive planting (up to 80 per cent of the landscape) was needed to significantly reduce the area of salinity.

Recent work supports this earlier research, such as the recent study presented at the 2nd International Salinity Forum by DAFWA hydrologists Don Bennett and Dr Richard George. For the study, trials were established on 15 farms in south-western Australia between 1990 and 1996. The trials featured a variety of tree-planting configurations, mostly within upland catchments with the planted areas covering over 98% to less than 5% of the landscape.

The effect of the vegetation on the water table was calculated from regular measurements made from 226 piezometers and observation bore holes.

Research results concluded that the proportion of vegetation was the most significant factor influencing the water table — the larger the area planted, regardless of configuration, the greater the reduction in water table.

Areas of less than 50% of plantings were unlikely to measurably reduce salinity at the farm scale. Some catchment-scale salinity benefits may occur when moderate revegetation is undertaken, but these benefits may be countered by reduced freshwater run-off.

The research also found that the level of revegetation required to provide significant salinity benefits at a farm-scale was unlikely to be attractive to 'mainstream farmers', unless there was income derived from the revegetation.

Even so, Dr George said it was still important to plant trees.

"There is still a valid set of reasons to plant trees, but the original goals of salinity management have not been realised. Our expectations in that regard were probably too high."

More information

Don Bennett, DAFWA
T: (08) 9780 6298
E: dbennett@agric.wa.gov.au