Where did salinity go?

Salinity is a significant land management problem in Western Australia but not in Queensland. In 2000 the extent of dryland salinity in Queensland was reported to be 48,000 hectares and rapidly increasing to a level where 3 million hectares were likely to be affected by 2050. It was widely believed that tree clearing had to be halted to stop the onslaught of salinity.

Since then it has been confirmed that salinity is not such a big problem in Queensland and the secret that tree clearing is not responsible for salinity has been let out of the bag.

A more detailed review of the extent of dryland salinity in the Murray-Darling Basin of southern Queensland now indicates there is a total of 9428 ha of salt affected land. This was reported in 2003 to be a 400% increase on a previous study in 1991, supporting the concept of a rapidly increasing problem.

However, in the fine print of this report we find that the bulk of this salt affected land, almost 7000 hectares, was contained in two areas where natural salinity has been observed since mankind first explored Queensland.

The biggest of these is referred to as the Yelarbon desert, where hard setting saline soils have been degraded by grazing. It is certainly not a pretty area, but has always been salty and the report admits it is 'primary' salinity rather than 'secondary' salinity, which is induced by farming.

This official estimate now indicates that salinity 'development' in the Queensland part of the Murray Darling Basin is confined to 2459 hectares, somewhat less than the prediction that it was likely to affect 628,000 hectares of land in this area. It currently comprises 192 salt expressions, with an average size of 13 hectares, affecting one hectare in 10,000.

Now, I am the first person to admit that salinity deserves attention, but the point I am making here is that the salinity problem in Queensland is not large and it is not escalating.

In fact there has been some good results with salinity control and the area affected has declined in recent years. An example of this is on one of the largest outbreaks to the north of Oakey. The ground water at this site is not too salty to use on pastures, and pumping for irrigation has lowered the water table and produced a good profit at the same time. As the water table has dropped, salt levels in the soil have retreated and gradually the productivity of the salt affected land is being regained.

A lot of emphasis was put on the need to halt tree clearing in Queensland to prevent the development of salinity. Not only has the salinity problem been exaggerated, the commonly accepted theory that salinity is caused by tree clearing, has been scrutinized and found wanting.

One of the most intensely researched areas of salinity is in the Liverpool Plains region of NSW. Careful monitoring, backed up by computer modeling has found the clearing of vegetation on the upper slopes to be a relatively minor contributor to ground water and the salinity problem. Small amounts of drainage over large areas of cultivation and runoff pooling on the valley floor have been found to be the important contributors to salinity.

Tree clearing on the hills of the Darling Downs, has been blamed for salinity. But the soils on these hills are shallow and do not hold a lot of moisture. If there is significant rainfall, it does not make any difference whether the vegetation is trees or grass, the soil cannot hold much water and some escapes to drainage.

Drainage which could cause rising water tables is very limited on clay soils as we go westwards. Research and modeling by rangeland ecologists suggest tree clearing has almost no impact on deep soil drainage on clay soils where the rainfall is less than 500 mm.

This means that in the western areas where most of the tree clearing was being conducted in Queensland, there is almost no impact of tree clearing on salinity.

Salinity hazard maps drawn up for Queensland were a big furphy. Large areas of Queensland were coloured in red, indicating a high salinity hazard. However, the reason for this classification in many areas, was that the soil contained a significant amount of salt in the subsoil. The 'Catch 22' here is that the salt has built up at depth in these soils over thousands of years, because they have very little drainage. If there is very little drainage, there is very little risk of salinity.

Where there is a problem, salinity deserves attention. Like many of our land degradation issues there are
ways to change farming practices which not only reduce the problem, but which can increase farm profit at the same time.

However some of the answers to salinity, such as agroforestry, salt tolerant pastures and more productive farming systems are having impacts in other ways. Forests planted in parts of Western Australia have reduced runoff into urban water storages. Last time I was out in the Western Australian wheat belt looking at salinity, the comment was made that if effective strategies for salinity control were widely implemented in the catchment to the west of Perth, it would stop the water flow in the Swan River.

The irony of salinity is that it is a problem caused by an excess of water in a dry country. Attention is now switching from salinity being a major curse, to how we can make use of the surplus water, even if it is salty. In Southern states, salt tolerant grass species are being used to utilize more of the water and restart production on saline areas.

One of the most productive ways to use salty water in the future will be to grow algae in ponds and harvest it for conversion to biodiesel. Algae is the most productive plant we can use to convert sunlight into energy and these plants can tolerate salt in a watery environment.