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FOR PROFITABLE, ADAPTIVE AND SUSTAINABLE PRIMARY INDUSTRIES

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Tree planting for salinity affected areas

Forests NSW Nurseries

When the watertable in an area is less than two metres below the soil surface, capillaries in the soil enable water to be evaporated from the surface. If the water or the soil is naturally saline, salt can become concentrated in the surface layers. Unless corrected, this inevitably leads to land degradation and the loss of productive land.

Planting trees alone is seldom sufficient to overcome salinity problems. Mechanical works to better drain the area, in conjunction with reduced grazing to allow increased grass growth, is critical. Tree planting, however, can be an important part of a comprehensive approach.

Benefits of trees in salt affected areas

With their extensive root systems, trees are capable of using large amounts of water from depth. Trees, along with deep-rooted pastures, help keep watertables lower. Various tree species can grow in areas affected by salt and can play an important role in reducing the effects of salinity.

Planted in large numbers in the recharge areas of catchments (where water enters the local groundwater system) trees can reduce the amount of water entering the system. Over time, this can help lower watertables further down the slope.

Trees established around the edge of waterlogged, salt-affected areas, trees may help lower the water level sufficiently to help prevent the further spread of the problem.

Planting new trees also help to beautify areas of land with minimal productive use, potentially increasing property values and at the same time provide habitat for native wildlife and natural insect predators.

Trees help reduce the wind flow over bare salt areas and their roots help bind the soil, and this may reduce further erosion of the site. Plantings can also provide future stock shelter in marginally waterlogged and/or salt-affected areas that are being reclaimed.

Planting and care to boost growth and survival

Improved drainage

A common factor in salt-affected areas is prolonged periods of saturated soils. It is this double combination of salt and waterlogging that is particularly damaging to plant growth. Plants can withstand a much higher soil salt concentration if the soil around the roots is well drained.

Deep ripping the site greatly improves water infiltration that helps reduce the concentration of salt in surface layers. It may also reduce ponding of surface water.

Ridge mounds provide a well drained area of soil for young seedlings to grow during the critical first year. Tree growth and survival are maximised where the mound is more than half a metre above natural soil level and where double mounds are formed. This enables trees to be planted in a slight depression that catches rainwater but still keeps initial root growth above the saturated soil profile.

Additional deep furrows alongside the mounds will drain the site better and may further boost tree growth. Ridge mounds constructed on a grade can also help to channel water away from the affected areas. Care must be taken, however, to avoid creating additional erosion problems.

Mound ploughs enable the rapid formation of mounds, though several passes of a road grader will do an equivalent, if slower, job.

Reduced evaporation

Mulching around young seedlings reduces surface evaporation and salt concentration. This further boosts tree survival. Various materials can be used including straw, spoilt hay, grass clippings, stable sweepings, old animal manure, tree mulch, woodchips, newspapers, old carpet and rags.

Suitable trees and shrubs for salt affected areas

A number of trials of successful plantings have been undertaken though New South Wales and other states. Although soil types vary, these trials give a reasonable guide to potentially suitable species for salt-affected areas. The selection of trees should be based on their ability to tolerate salt levels, soil drainage, soil types and the exposure of the site.

Severely saline sites (24+ dS/m)

These sites are usually bare and are typically waterlogged during the winter. Virtually no trees will successfully grow under these extremely adverse conditions.

Samphire (*Halosarcia* sp) that grows as a small groundcover on salt lakes in Western Australia, may survive. A few exceptionally tolerant shrub of the *Melaleuca* family have been successfully established in trials.

Highly saline sites (Approx. 16-24 dS/m)

These may have a patchy covering of sea barley grass and other highly salt tolerant ground covers, but still has an obvious salt crust when dry. Several *Melaleuca* species and an acacia can be established at the higher salinity levels within this range, whilst salt bush and a few she-oaks (*Casuarinas*) and eucalypt species can be established on areas at the lower end of the range.

When choosing plants for such sites, the provenance (locality where the seed was collected) is as critical as the species. Various clones specially adapted to high salt levels are also being developed.

Very saline sites (approx. 8-15 dS/m)

Salt tolerant grasses can persist on these sites, including couch. A number of salt tolerant eucalypts can be successfully grown on these areas, as can several hardy shrub species.

Moderately saline sites (approx. 5-10 dS/m)

Rye and couch grass may persist under these conditions, though growth is reduced. A fairly broad range of reasonably salt tolerant trees and shrubs will grow on these sites.

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