

Too wet, too acid, too saline?

Using saltbush and other plants on saline soils

John Greig

"Tilga", Ootha 2875

Summary: "Tilga" is a property 30 km east of Condobolin in central NSW. The property has an area of about 20 ha that is severely affected by dryland salinity. Over 100 species of salt tolerant plants have been trialled on this area by the owner since 1969. The aim of these trials is to find a diversity of plants that will help return the bare areas to grazing. This paper looks at establishment methods and plants that have been successful.

Situation and history

"Tilga" is a family property situated at Ootha (70 km west of Parkes and 30 km east of Condobolin) in central NSW. Rainfall is variable with an annual average of 425 mm. The soils are mainly red earth loams with some gravelly soils on the ridges. The Ootha district had its native timber of mainly Bimble Box and Pine rung around the 1880s. Wind and fire prevention breaks of five chains (100 metres) wide were left in a grid pattern, although many of these have been cleared since.

Our farm was cleared for wheat growing in the years between 1905 and 1925. The area now affected by salinity was some of the most productive cropping and grazing ground on the property before it became a bare salt scald in 1956. 1956 was a very wet year, which caused the watertable to rise to the surface, killing all the vegetation. Soil tests taken by the then Soil Conservation Service in the late 1950s showed levels of salt in the soil which were considered too high to allow any plant growth. The area remained totally bare until 1969, when the planting of Old Man Saltbush was recommended by Soil Conservation Service staff in Condobolin. Fencing was carried out to reduce stock pressure and encourage plants to grow. Naturally occurring salt tolerant species growing on the less saline parts then included creeping saltbush, *Atriplex semibaccata*, spinyfruit saltbush, *Atriplex spini-bractea*, sea barley grass and curly rye grass.

Treatment

In 1969 the first of over 1000 saltbushes were hand planted from tubestock. Most of these died, but those that survived grew well. In May 1970 Old Man Saltbush seed was thrown from the back of the combine while sowing puccinellia, strawberry clover, tall wheat grass and Rhodes grass. This resulted in a good germination of saltbush and a few patches of the other species. Most of these saltbushes are

still alive now, and plants of all the others, except strawberry clover, can still be found. Runners of *Paspalum vaginatum* were also planted on wetter parts about this time and these continue to spread in spite of some heavy grazing (by sheep) and the severe droughts of the 1980s.

Further introductions of salt tolerant plants were made over a number of years until 1990 when the Derriwong Ootha Landcare Group was formed. Funds available to the group were used to purchase seed for comparative trials of fodder plants. Additional material was collected by the author and over 100 salt tolerant species have been tried. From these there are now about 25 different saltbush species, 11 bluebushes, 10 grasses and 11 other species that have established. These do not include trees. Most of the species considered in this paper have been growing on the salt area at Tilga for between 7 and 28 years. This means they have had sufficient time to give a fair test of what are valuable saltland plants in a range of conditions.

Recommended species

As a result of personal observation on our salt patch and others, both in the Ootha district and elsewhere, I would recommend sowing a mixture of species in any attempt to reclaim saline land. In our area the best species would be various saltbushes, bluebushes and grasses. Some of these are described in the remainder of this paper.

Old Man saltbush, *Atriplex nummularia*, is one of the best known saltbushes and it is suited for growing on very saline ground, provided it is not waterlogged for long periods. It has established better from seed than it has from tubestock or speedlings at this site. It recovers well from an annual heavy autumn grazing with sheep.

Mealy saltbush, *Atriplex pseudocompanulata*, is an annual saltbush which has spread over most of the saline area. It lives for up to 15 months, is

grazed by stock and will grow and seed in summer in places that are too wet for saltbushes to survive the winter. It provides excellent cover for other perennial saltbushes to germinate in and quickly provides ground cover. It also makes an good companion plant to puccinellia (a widely grown perennial saltgrass) as the saltbush grows and uses soil water during summer when the puccinellia is dormant. Flat Topped saltbush, *Atriplex lindeyi*, performs in a similar manner to Mealy saltbush. Both species grow to a similar size of up to 30 cm high and 40 cm wide and appear to be of equal grazing value.

Bladder saltbush, *Atriplex vesicaria*, the perennial saltbush from the Hay plains grows to about 50cm high and is well suited to our area. It has established from seed, both initially and by regeneration.

River saltbush, *Atriplex amnicola*, is a large, spreading bush, some of which have grown about 6 meters wide and 1.5 meters high. Although it is sometimes hard to establish from seed, and is not as deep rooted as Old Man saltbush, River saltbush is long lived and more tolerant of waterlogging than most other saltbushes.

Ruby saltbush, *Enchylaena tomentosa*, grows here as a low mat up to a metre across. It is a useful plant whose succulent red seeds are spread by ants. It is also readily grazed by stock.

Yanga Bush, *Maireana brevifolia*, and small fissure weed, *Maireana excavata*, are both useful bluebushes and like most bluebushes, grow best in drier areas.

Salt water couch, *Paspalum vaginatum*, is a summer growing couch-like grass. It is the most waterlogging tolerant plant tested. It will grow under water and on any soil type. Best suited for eroded salty or saline seepages that are wet in summer. It can only be grown from runners or rooted pieces. Produces soft green feed which stock will graze to a lawn. (It is used as a lawn grass in some places.)

Samphires are probably the most salt tolerant of all plants that were tried. These plants look a bit like a cacti made of jointed bead-like segments. They are able to survive drought, waterlogging and salt, but do not produce very good feed. Their main value is in being able to grow in conditions which are too severe for anything else to grow in. They can

be grown from seed, but results at Tilga have been variable, with best results occurring from natural spread or spreading parts of plants around. The seed is contained between the segments, and is about the size of a pinhead.

Rhodes grass, phalaris, and strawberry clover often grow well around the edges of saline scalds and are worth sowing. Tall wheat grass and puccinellia are also good, with the puccinellia being the best quality feed of the two and the most salt tolerant.

Establishment method

Growing something on ground which has been bare for forty years because of salt may seem impossible but it can be done!

Fencing and total stock exclusion is the first step, followed by ripping. In most situations, scattering seed over the rough ripped surface in autumn will give a reasonable result. On our property however, there were areas that remained totally bare even after ripping and seeding and 5 years of nil stock. We are now treating these areas by ripping in summer when the risk of bogging is less. Sowing is best done in March or April (dry) by placing a hatful of old straw, uneaten round bale leftovers or sawdust every 4 metres along the rip lines. A teaspoon of various salt tolerant plants is then placed on top the straw (or if sawdust is used it is premixed with the seed). The mulch prevents evaporation of salty water from the watertable and so prevents further salt accumulation at the surface. Rain leaches salts from the soil below the mulch and this enables plants to become established. In our area the best results have been obtained by placing the mulch and seed in the hollow formed by the ripper rather than making a mound as some suggest. It appears that soil salinity levels are more critical here than waterlogging and when the mulch is placed on top of a mound the water tends to run off and not leach the salt down under the mulch. Be prepared to wait; these plants often do not germinate on the first rain and then remain very small and hard to see for several months. Exclude all stock for at least 22 months if sowing saltbushes.

Finally, if what you have tried before did not work, why not try something else? There are so many different plants which can be tried, and even the worst areas can be greatly enhanced, so improving the property's appearance and productivity.