



Department of
Primary Industries and
Regional Development

Digital Library

Natural resources factsheets


Natural resources

17-5-2021

Samphires (*Tecticornia* species) for dryland salinity management in Western Australia

Department of Primary Industries and Regional Development, Western Australia

Follow this and additional works at: https://library.dpird.wa.gov.au/nrm_factsheets

 Part of the [Agricultural Education Commons](#), [Natural Resources Management and Policy Commons](#), [Other Plant Sciences Commons](#), and the [Soil Science Commons](#)

This factsheet is brought to you for free and open access by the Natural resources at Digital Library. It has been accepted for inclusion in Natural resources factsheets by an authorized administrator of Digital Library. For more information, please contact library@dpird.wa.gov.au.

Last updated:
17 May 2021

DPIRD-6

Samphires (*Tecticornia* species) for dryland salinity management in Western Australia

Samphire is the common name for native plants from the genus *Tecticornia* (synonym *Halosarcia*). Although slower growing than saltbush and bluebush species, samphires have higher tolerance to saline conditions and waterlogging, and are common in waterlogged saline areas of south-west Western Australia.

Samphire is not a desirable grazing species.



Image 1: Sheep grazing in a samphire area.



Image 2: Samphire plant on a saline site.

Family: Chenopodiaceae

There are 65 *Tecticornia* taxa, all native to Australia (see [FloraBase](#)). Note that samphire was previously genus *Halosarcia*: some of the linked pages and information still refer to *Halosarcia*.

Description

Samphires are perennial shrubs, with either a spreading or a more erect habit, up to 1 metre high. Branches comprise succulent, hairless stem segments (Image 3), varying in colour from green to red-purple. Flowering is mostly in summer to autumn, depending on the site latitude.

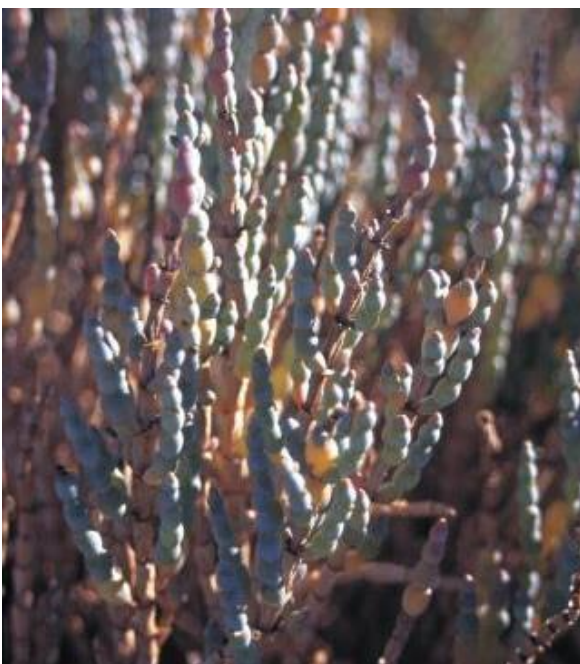


Image 3: Close-up of samphire branch and stem sections.

Flowers and seeds are minute and hidden between the fleshy segments (Figure 1). The seed is small (less than one millimetre in diameter) and may be brown or black, depending on the species. Locate seeds by splitting or rubbing the ripe segment. Seeds mature in late summer but the fleshy seed heads may not dry off until autumn.

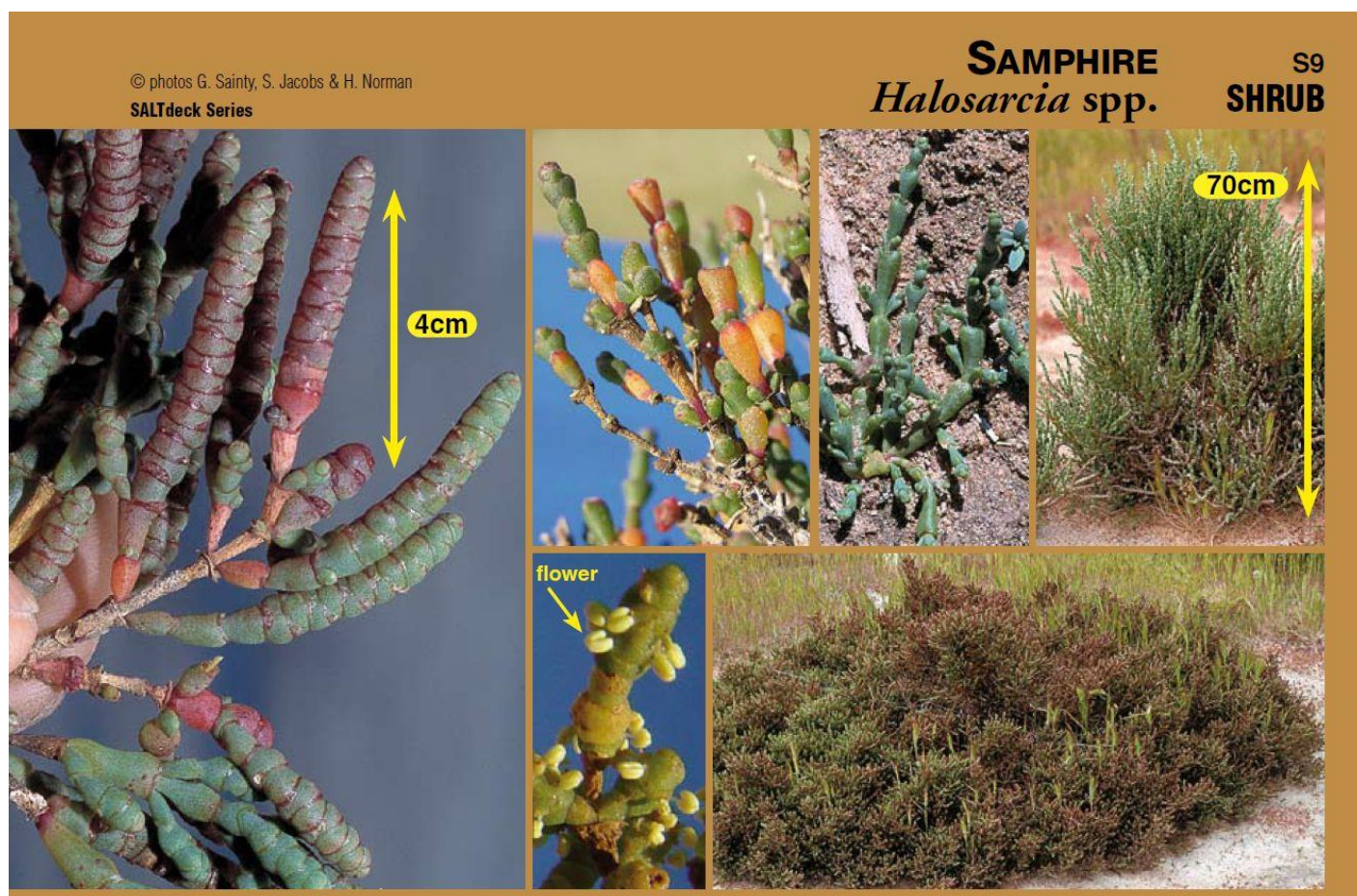


Figure 1: Samphire (*Tecticornia* species) photographs from SALTdeck.

Occurrence

Samphires grow in intermittently flooded, saline land. They are widespread inland, and along coasts, estuaries and the margins of salt lakes. They generally form the first fringing community adjacent to the bare margins of salt lakes, and are found in many drainages in Australia's pastoral and agricultural areas.

Suitable sites for samphire

Matching plants to a saline site

Tecticornia species differ in their salinity and waterlogging tolerance (Figure 2). The species commonly found on salt flats in WA (*Tecticornia pergranulata pergranulata*) will withstand months of waterlogging and weeks of inundation and total submergence. However, there are samphire species that grow on well-drained banks around saltland (e.g. *T. indica*), and these plants are likely to be more sensitive to inundation.

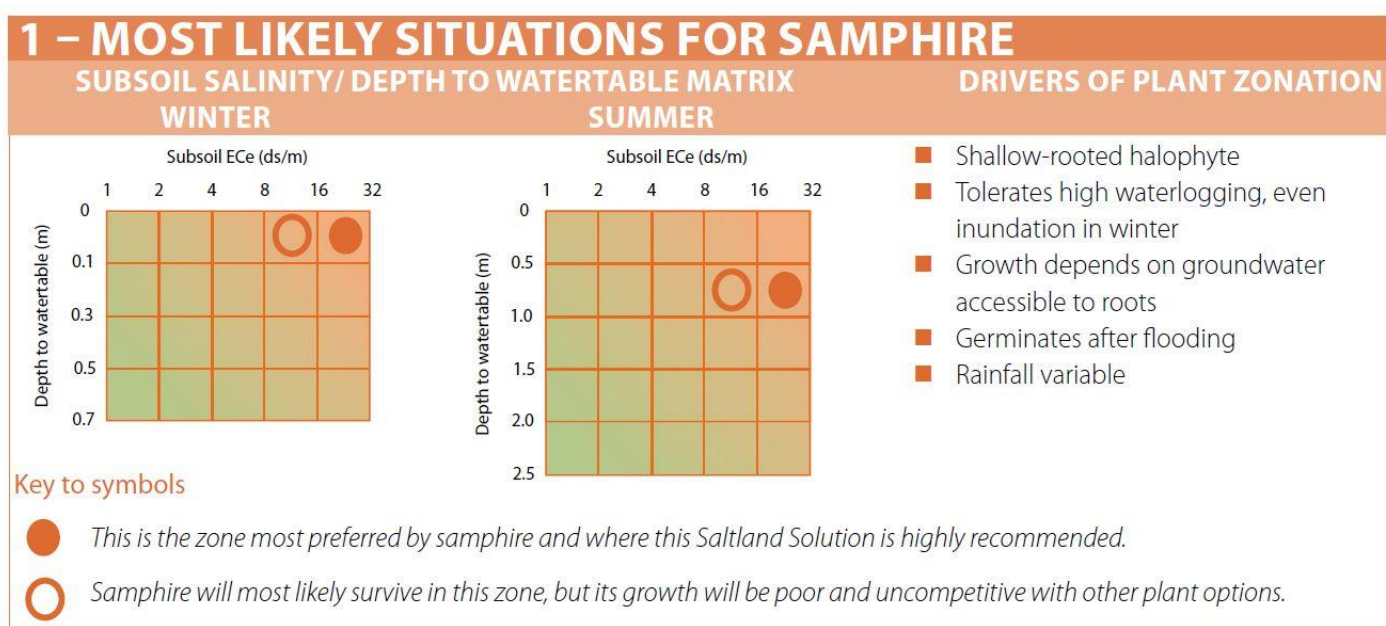


Figure 2: Site conditions that most suit samphire.

A study of samphire zonation in WA found that different species selected positions in the landscape primarily in response to soil moisture and salt load. Soil pH played a small role.

The presence of samphire on a site is a good indicator that the area is too waterlogged or salty for economically viable planting of more productive species (Figure 3).

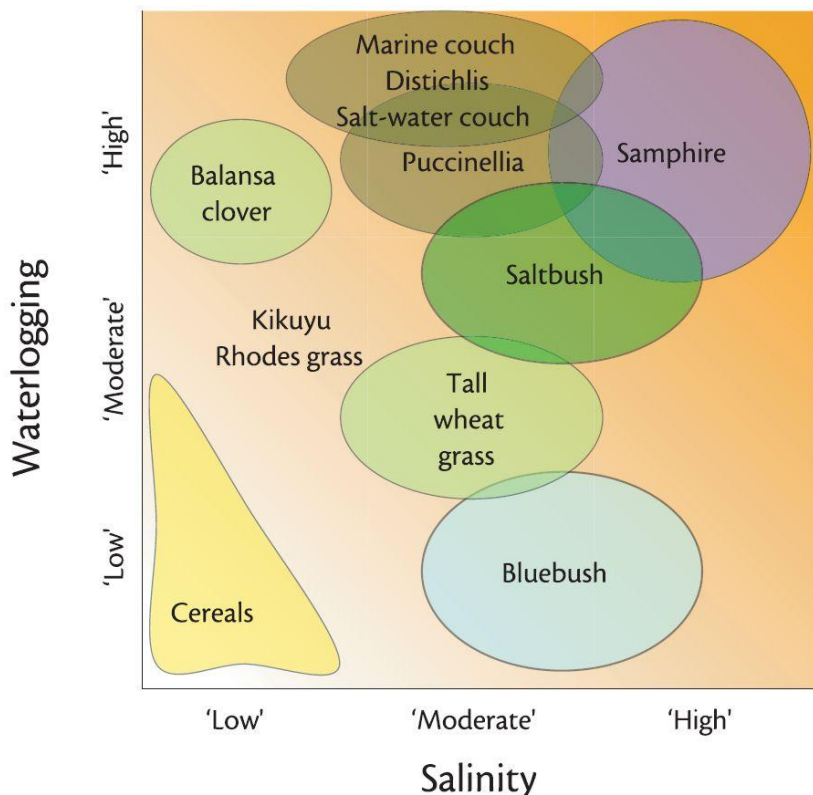


Figure 3: Relative rankings of different saltland pasture species in the salinity-waterlogging matrix.

Most samphires are able to tolerate hypersaline, alkaline and waterlogged soils. They are good pioneer plants for severely saline land reclamation.

Waterlogging/inundation

Samphires can grow in soils that are more or less permanently waterlogged, and some species can withstand up to six months' partial inundation.

Salinity

Samphires are highly salt-tolerant once established. Specimens growing on salt flats near Kalgoorlie in Western Australia (WA) have been able to withstand extreme salinity, with measured soil ECe values of 7000 to 10 000 mS/m at depths of 10–20 cm over summer. At Wubin in WA, samphire growing in the Sustainable Grazing on Saline Land experiments had ECe values of ~4000 mS/m at 0–25 cm depth in spring. Seawater is typically about 5500 mS/m.

The plants adapt to salinity by storing salt in the vacuoles of their fleshy stem segments, and can have salt concentrations of 30–45%.

Samphire is a typical halophyte. In solution cultures, its pattern of growth is lower when salinity is low, increasing to an optimum with an EC in the solution of ~2000 mS/m. Growth then gradually declines as concentrations reach 8000 mS/m.

Climate

Samphires are endemic across southern Australia and therefore are well adapted to the temperature and rainfall conditions in almost all areas where dryland salinity occurs in the southern states. Germination appears to be temperature responsive: of a range of temperatures tested, optimal germination occurred with a day/night regime of 5–35°C.

Grazing value of samphire

We recommend that you do not graze samphire dominant areas.

Reasons for not grazing samphire:

Salt concentrations in the forage can reach 40%, and this will limit all feed intake.

If grazed, it must be in conjunction with other feed (stubble or dry annual pastures) to dilute salt intake and provide adequate energy.

There are likely to be other, anti-nutritional factors.

Samphire is susceptible to trampling by stock, and

There is an increased livestock requirement for fresh water.

It is relatively safe to graze samphires as a minor component in mixed-species saltland pastures. Samphire shrubs survive moderate grazing, and young plants appear to be palatable.

Interesting content of samphires

Samphires have high concentrations of glycine betaine, used in salinity regulation. Betaine is sold through many market segments: pharmaceuticals, cosmetics, health foods, and plant sprays to increase drought tolerance. However, there are other, more commercial sources of betaine.

Other potential uses of samphire

Have you tried samphire in salads, or pickled samphire? These are not common uses, but here is something for you to try:

From 'The cook and the chef' on ABC TV in August 2006:

"Samphire is a native succulent. Woody at the base and with many branches, it grows freely on many of southern Australia's salty flats. Samphire is considered best for use in summer when the fleshy leaves are bright green and aromatic. In winter, the leaves turn a reddish/ pink but, as Simon discovered, there is still some green to be found at the base of the plants. Simon also finds that blanching winter samphire before cooking gives him the lovely, salty taste of the sea that he's after for his dishes."

Pickled samphire: Samphire, salt, vinegar

Gather the young and green samphire at the beginning of summer, before it flowers and sets seed. Break into 5 cm lengths, lay on a dish and sprinkle with dry salt. Leave for 24 hours. Drain, then cook gently – in enough vinegar to just cover it – until tender, but do not allow it to get soft. Plain vinegar is best for this, as the samphire has its own spicy flavour. Seal securely in hot jars.

Managing samphire

Establishing by natural spread

We recommend establishing samphire on suitable saline land by fencing the area and letting nature take its course.

For the most salt tolerant samphire species, germination can occur at salinities up to ~4000 mS/m.

Samphire rapidly spreads when protected from grazing. It may occupy sites capable of growing more useful saltland pasture species. Tickling the soil surface with a scarifier can also help create seed niches.

Establishing by spreading collected seed

Identify local sites with similar levels of waterlogging and salinity from which to collect seed. The best time to collect and spread the appropriate samphire species across a site is in autumn after flowering and seed set.

The two options are:

Harvest the shoots or whole plants by hand or with a forage harvester, and spread the harvested material on new site, and

Harvest green mature seed heads in late summer, dry the seed heads, then broadcast the dried material onto scarified soil before the first autumn rains.

As different species can tolerate different conditions, seed should be sourced from local sites with similar salinity/waterlogging profiles for best results.

Under controlled conditions, seed germination is affected by soil salinity, temperature and seed scarification. In practical terms, samphires will germinate in spring after soils have been leached by rainfall and/or floodwaters.

Natural thickening of samphire stands

Once some samphire has been established on a site, the stands may be thickened by cultivating bare areas to encourage soil leaching and create niches in which seeds can lodge.

There is no need to worry about weed control on sites suited to this saltland solution. With the levels of salinity and waterlogging present, weeds have little chance of establishing and, if they do, that is good in the short term.

Resources

Bhuiyan Mohammad SI, Maynard, G, Raman, A, Hodgkins, D, Mitchell, D & Nicol, H, 2016, 'Salt effects on proline and glycine betaine levels and photosynthetic performance in *Melilotus siculus*, *Tecticornia pergranulata* and *Thinopyrum ponticum* measured in simulated saline conditions', *Functional Plant Biology*, vol. 43, pp. 254–265.

Contact information

Ed Barrett-Lennard

P: +61 (0)8 9368 3798

E: ed.barrett-lennard@agric.wa.gov.au

Important Disclaimer

The Chief Executive Officer of the Department of Primary Industries and Regional Development and the State of Western Australia accept no liability whatsoever by reason of negligence or otherwise arising from the use or release of this information or any part of it.

Copyright © State of Western Australia (Department of Primary Industries and Regional Development) 2024.

dpird.wa.gov.au