

Germination of seeds



Seed germination of *Eremophila* is considered to be difficult and unreliable, and cuttings are generally used to propagate plants. Delayed germination is a survival strategy for most *Eremophila* species. The hard woody fruits may contain chemical inhibitors that suppress germination. The hard fruit also resists the penetration of water, gas exchange and root growth until some form of mechanical injury or fire occurs, thereby stimulating germination. If you are not in a hurry, sow fruits on site in the ground and wait for weathering to occur. Or assist the weathering process by burning plant litter on top of pots containing seed.



Eremophila seed germinating—(above) from within partially dissected fruit, (below) seed fully extracted from fruit.
Photos – Anne Cochrane



Right: *Eremophila longifolia*.
Photos – Babs and Bert Wells/DEC

Alternatively, the wetting and drying cycle over the seasons and a certain amount of abrasion from soil movement will eventually break down the hard fruit coat and stimulate germination. This may take several years depending on how old the fruits are. Older fruits collected from beneath adult plants will germinate faster, although check that predation of the fruits has not occurred. To speed up the germination process fruits can be split with a knife or scalpel and seeds exposed undamaged to a growing medium. Care should be taken not to damage the seed, as damaged seeds are unlikely to germinate. Put the extracted seed on a sterile medium (for example agar, vermiculite or filter paper). The addition of Gibberellic Acid (as GA₃ at 25mg L) will help germination. Germination of up to 100 per cent should be achieved for many species under these conditions. It has been suggested that seed viability is reduced over time, but there have been instances where seed has germinated many years after collection. Chances are that in cases of documented poor germination, the fruits are empty or predated and therefore not viable. Fruits containing good seed will maintain their viability for many years if stored dry and under cool conditions.



Recommended reading

Elliot, W. R. and Jones, D. L. 1984. *Encyclopaedia of Australian Plants Suitable for Cultivation*. Volume 2. Lothian Publishers, Melbourne.

Richmond, G. and Osborne, J. 1993. *Eremophila* germination studies. *Australian Plants* 17, 134, 70-75.

Richmond, G. S. and Ghisalberti, E. L. 1994. Seed dormancy and germination mechanisms in *Eremophila* (Myoporaceae) *Australian Journal of Botany* 42, 705-715.

Sharr, F. A. 1978. *Western Australian Plant Names and Their Meanings. A Glossary*. University of Western Australia Press, Perth.

Seed Notes for Western Australia



These **Seed Notes** aim to provide information on seed identification, collection, biology and germination for a wide range of seed types for Western Australian native species.



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Seed Notes

for Western Australia

No. 5 *Eremophila*

IN THIS ISSUE

This issue of **Seed Notes** will cover the genus *Eremophila*.

- Description
- Geographic distribution and habitat
- Reproductive biology
- Seed collection
- Seed quality assessment
- Seed germination
- Recommended reading



Department of Environment and Conservation



Our environment, our future

Eremophila

The name *Eremophila* (family Myoporaceae) originates from the Greek word *Eremophilos* meaning desert loving plant or lover of solitude. These plants are often known as poverty bushes because of their unpalatability to stock and their ability to persist under conditions that other more desirable plants cannot. They have also been known as the emu bush because emus will feed on the fleshy fruits of some species, or fuchsia bush referring to the fuchsia-like flower.

Description

Eremophila are hardy perennial plants that range in habit from prostrate ground covers to small and large shrubs or small trees. They are important understory species in arid and semi-arid regions with low rainfall. They are characterised by viscid or resinous (sticky) vegetative parts, tubular flowers and indehiscent woody fruits. They have an array of spectacularly coloured



Eremophila flower.

Photo – Anne Cochrane



The rare prostrate *Eremophila subteretifolia*.

Photo – Anne Cochrane

flowers and calyces. Many are horticulturally interesting and some are found in cultivation.

Eremophila have played an important role in traditional Aboriginal medicine and culture, and many have the potential for pharmaceutical uses. There are documented cases of species being poisonous to travelling stock, although certain species are valued as fodder. Although native, in some parts of the eastern states of Australia, species of *Eremophila* are considered invasive in pastoral areas.



Eremophila shrub.

Photo – Anne Cochrane



Geographic distribution and habitat

The genus *Eremophila* is endemic to mainland Australia, with the greatest diversity and frequency of species occurring in Western Australia. Of the 200 plus species in the genus, some 173 are located in arid regions. More than 80 per cent of these species are endemic to Western Australia. *Eremophilas* occur in a broad range of habitats where the rainfall is low. Plants are generally tolerant to drought, fire, frost, salinity and grazing and are sought after for rangeland revegetation, minesite rehabilitation and for horticulture.



Approximate distribution of *Eremophila* in Australia.

Reproductive biology



Eremophila sp.

Photo – Babs and Bert Wells/DEC

Many species flower on and off throughout the year, with peak flowering during spring. A large number of *Eremophila* species are insect pollinated, with beetles, flies and possibly bees implicated as pollinators. The flowers of most species are also well adapted for bird pollination with honeyeaters and bees feeding on nectar. Mammal pollination and nectar feeding on flowers has also been reported. *Eremophila* are disturbance opportunists and after fire or road maintenance activities can be seen regenerating in the hundreds. Lack of appropriate disturbance may render them temporarily extinct in the standing vegetation until some form of disturbance causes regeneration from the soil seed reserve. A balance between too much and too little disturbance is required for the ongoing survival of many of the threatened species.



Eremophila maculata. Photo – Babs and Bert Wells/DEC

Seed collection

The fruit of the *Eremophila* is generally hard, dry and indehiscent (do not split open to release seed), sometimes fleshy. Fruits turn brown when ripe. Many species have a papery skin around the fruits that will rub off in the fingers. Seed collection of *Eremophila* is relatively easy. Fruits can be collected from the plant when ripe or from the ground below the plant after fruit has fallen. Many *Eremophila* species flower in spring to summer. Fruit develops over a few months and generally is ripe by late summer or early autumn. Unless you particularly require fresh seed, collecting can occur at most times of the year.



Collecting seed of *Eremophila lactea* north of Esperance, Western Australia.

Photo – Anne Cochrane



Collecting seed from the rare prostrate *Eremophila subteretifolia*.

Photo – Anne Cochrane



Eremophila veneta fruit.



Eremophila resinosa fruit.

Photos – Anne Cochrane

Seed quality assessment

The fruits of the *Eremophila* have between one and 10 or more compartments (or locules), each with the possibility of containing one seed. Seed set is often quite low, which means it is rare for all locules to contain seed. A sample of all fruits collected should be dissected to determine whether seed is present. To be of good quality and therefore germinable, seeds need to be full and plump. Other than through X-ray analysis, the only way to determine the presence or absence of seed within the *Eremophila* fruit, or the number of seeds within a fruit, is to dissect the fruit to expose the locules. This needs to be done with a knife or scalpel and preferably under a dissecting microscope as the seed is small, measuring less than five millimetres in length.



From top: The attractive and colourful flowers of the genus *Eremophila*.
Photos – Babs and Bert Wells/DEC



This bobtail lizard stands guard over the rare *Eremophila caerulea* ssp. *merrallii*.
Photo – Anne Cochrane



The three loculed fruits of *Eremophila caerulea*.



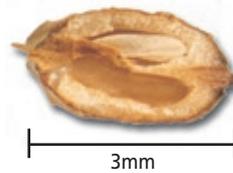
Aborted seed in fruit of *Eremophila resinosa*.



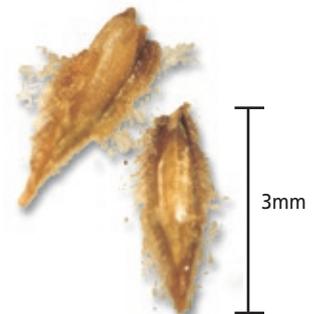
All four of *Eremophila resinosa* locules filled.



Location and size of seed of *Eremophila veneta* within the fruit.



Bisected fruit of *Eremophila nivea* showing aborted seed and empty locule.



Eremophila lactea have relatively soft fruits easily split open to reveal seed.



Eremophila sargentii fruits.



Eremophila microtheca fruits.

Seed photos – Anne Cochrane