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Seed Notes for Western Australia

No. 9 Acacia

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

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Acacia

The name *Acacia* comes from the Greek *acacia*, *ace* or *acis* meaning a point or thorn, or from *acazo*, to sharpen, although this name applies more to African than Australian species (Australian *Acacia* have no thorns or larger prickles, unlike those that are native to Africa). Many species of *Acacia*, or wattles as they are commonly called in Australia, are valuable for a range of uses, in particular as garden plants. They are also used for amenity plantings, windbreaks, shade trees, groundcovers, erosion and salinity control. The timber of some *Acacia* is very hard and is ideal for fence posts (e.g. *A. saligna* or jam). Other *Acacia* species are used to make furniture and ornaments. The seed of some wattles is a good food source for birds, other animals and humans as 'bush tucker'. *Acacia* are generally fast growing, but many are short-lived.



Phyllodes and flowers of Acacia aprica.

Photo – Andrew Crawford

Description

In Australia, *Acacia* (family Mimosaceae) are woody plants that range from prostrate under-shrubs to tall trees. *Acacia* flowers are small, regular and usually bisexual. They occur in spikes or in globular heads and range in colour from cream to intense yellow. The leaves of *Acacia* may be bipinnate (the primary leaflets being again divided into secondary leaflets) or entirely absent at maturity and the petiole

is modified to form a leaf-like structure or phyllode. These phyllodes may be flat or terete. Some species do not have phyllodes and the flattened stems or cladodes act as leaves. Foliage can vary from blueish to dark green to silvery grey. Most species of *Acacia* have glands on the axis of the phyllodes, although in Australian species these appear to have no function, but aid in the identification of the species.



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Top: *Acacia trulliformis*. Above: *Acacia alata* var. *platyptera*. Above right: *Acacia insolita* ssp. *recurva*. Photos – Anne Cochrane

Geographic distribution and habitat

Acacia is the largest genus of higher plants in Australia with more than 1200 species worldwide and more than 900 of these occur in Australia over a wide range of habitats. *Acacia* occur in a range of climatic and soil conditions, from coastal situations to mountain tops, from tropical to arid inland areas. They grow in a range of soil types from limestone to laterite, from granite to deep sands. They are generally drought hardy. The genus is not thought to be susceptible to the dieback disease, *Phytophthora cinnamomi*, although many species are threatened by rising salt levels and waterlogging. The centre of diversity for *Acacia* in Western Australia is in the heavily cleared agricultural wheatbelt, where in addition to salinisation, small population size and weed invasion further threaten the survival of these species.



Approximate distribution of *Acacia* in Australia.



Acacia nervosa.

Photo – Andrew Crawford

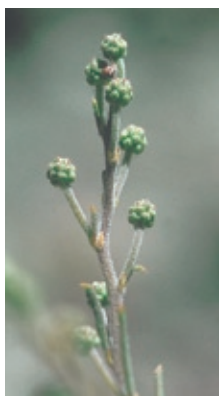
Reproductive biology

Many species of *Acacia* flower at an early age, and are insect pollinated, although wind may have a lesser role to play in reproduction. Birds may also play a part in pollination, attracted to the flowers by the insects and by extra-floral nectaries on the phyllodes. There may be some pollinator specificity. Although there are usually large numbers of flowers per inflorescence, few pods are formed. The fruit is a legume that may be straight, curved or coiled. Multiple seeds are contained within the fruits. These seeds contain a protein-rich appendage, or aril, on the outside of the

seed which may be large or small and can range in colour from greenish to white to yellow and to red. The arils attract birds and ants, and are known to disperse the seed of many species. This myrmecochory, or ant distribution of seed, is well established in Australia and for some species, burial of seed

beneath the soil surface prevents destruction of seed during wildfires. Seedlings can often be seen germinating from old ants' nests after fire. Birds are also known to disperse seed. Natural hybridisation between species occurs to some extent, but is not widespread like in the eucalypts. Seed of the genus are

known to have a long storage life and some species are reported to still be viable after 50 or more years when stored under ambient temperatures. Drying and freezing of seed will further improve this longevity.



Clockwise from far left: Buds of *Acacia*; multiple seedlings of *Acacia* emerging after fire; *Acacia microneura* flowers; and *Acacia insolita* ssp. *recurva* inflorescence.

Photos – Anne Cochrane

Seed collection

Collection of *Acacia* seed is very easy and seed is generally readily available. The seed is ripe when the pod dries out, changes colour and becomes brittle and splits. Seed of the majority of *Acacia* species in Western Australia ripen in late spring to early summer after mid year flowering, but ripening will occur quicker in more northern hotter climates (e.g. north of Perth) compared to those species from the southern part of the State (e.g. Albany). The pods can split quite quickly so collection needs to be well timed to coincide with the shedding. Time from bud formation to fruit ripening is often a year, with plants displaying small buds at the same time as seed shed. On maturity, the seed is hard and ranges from light brown to glossy black depending on the species. It is possible to collect seed of some species of *Acacia* when fully formed but still green for immature sowing. However, for longevity of seed it is preferable to collect only mature seed.



Top: *Acacia dorsenna*.

Photo – Anne Cochrane

Above: Collecting an *Acacia* from Dandaragan.

Photo – Tony Friend

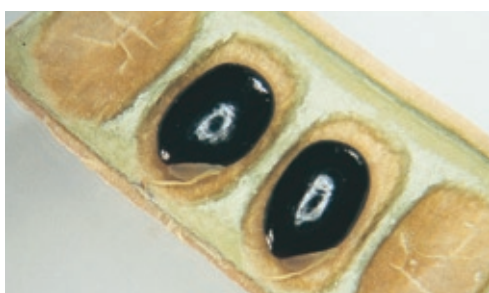
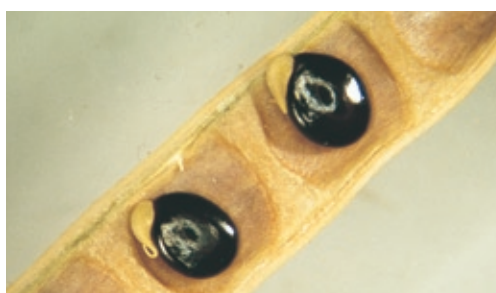


Clockwise from top left: Open pod of *Acacia* species; furry pods of *Acacia alata* var. *platyptera*; *Acacia insolita* ssp. *efoliolata*; *Acacia alata* var. *platyptera* fruits opening to release seed; *Acacia cyclops* with red arils; immature fruits of *Acacia congesta* ssp. *wonganensis*.

Photos – Anne Cochrane

Germination of seeds

Most species are hard-seeded and require pre-treatment to the seed coat before germination will occur. Heat shock (wet or dry) or manual scarification of the seed coat (chipping of a portion of the hard coat to reveal the endosperm, abrading with an emery board or file, or placing the seed in a paint or jewellery tumbler with small stones or sand) are all methods used to artificially reduce the hardness of seeds. Chipping the seed coat is the most successful method, but time consuming, and the use of a microscope may



Seed quality assessment

Acacia seeds are often predated by insects. These insects lay their eggs in the developing fruit. The larvae grow as the fruit develops and the seeds are damaged. Birds are also found to attack the fruits, and grasshoppers, in particular locusts, will damage young green fruits. Any damaged seed should be removed and a simple float test can be conducted to distinguish good from bad seed. The damaged or light seed will float and the whole seed will sink. After placing it in water make sure that you dry the seed off very well before it is stored.



Both insect damaged and undamaged seed of *Acacia pharangites*.



Acacia aprica seed.



Acacia clydonophora seed.



Acacia ataxiphylla ssp. *magna* seed.



Left: *Acacia leptalea* seed and pod.

Below: Insect damage on *Acacia insolita* ssp. *efoliolata* pods.

Photos – Anne Cochrane



be required if the seed is small. The immersion of seed in hot to boiling water reduces the hardness of seeds in many species, although there are some species that have softer seed coats and very hot water can kill these seeds. These latter species will generally germinate without treatment. Be aware that there is a wide variation in the heating requirement for different species. There are many similarities between treatment of *Acacia* seeds and those of other hard-seeded species such as *Daviesia*, *Gastrolobium*, *Gompholobium* and *Chorizema*.



Above: Germinating seed of *Acacia*.

Above left: Seed of *Acacia drummondii* ssp. *elegans*.

Far left: *Acacia drummondii* ssp. *elegans* seed in the fruit.

Left: *Acacia insolita* seed in the fruit.

Photos – Anne Cochrane



The rare *Acacia aprica*. Photo – Sally Madden



Acacia glaucoptera fruit. Photo – Anne Cochrane



Acacia teretifolia. Photo – Andrew Crawford

Recommended reading

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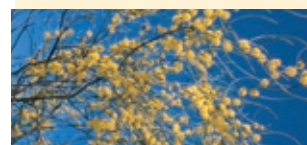
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Seed Notes for Western Australia



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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The **Seed Notes** are available from www.naturebase.net

Seed Notes

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