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Seed Notes

for Western Australia

No. 8 Banksia

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Department of Environment and Conservation

Our environment, our future

Banksia

The genus *Banksia* was named after Joseph Banks, the botanist. It is a member of the Proteaceae family and was first collected at Sydney in 1770 by Joseph Banks and Daniel Solander. By 1788 several species of *Banksia* were kept in England in heated glasshouses due to their cold sensitivity. Today many species of *Banksia* are being cultivated in home gardens in Australia and are good specimen plantings that attract birds and insects.

Description

Banksia species are woody evergreen perennials, sometimes prostrate, sometimes shrub-like and sometimes trees to 15 metres tall. The larger trees are often noted for their thick rough barked trunks and gnarled low branching habit. Prostrate species generally regenerate from underground roots and have their flowering and fruiting bodies emerge from ground level. *Banksia* plants have



Above: *Banksia verticillata*. Photo – Maurice McDonald

dense flower spikes, or candles. The flowers are in spikes or inflorescences and may be spherical or globular to cylindrical. Each spike is made up of tightly packed and spirally arranged flowers, although there are a few exceptions. Flower colours are usually creamy-yellow or yellow, although some species have scarlet (*B. coccinea*), bronze, orange (*B. ashbyi*) or purple flowers. The main flowering of most species is in summer, autumn and winter. The leaves may be small and needle-like or large and leathery, often with serrated or deeply divided margins.



The underside of the mature leaves may be whitish. The leaves are often alternate or crowded in whorls around the branchlets. New growth is often soft, velvety and brightly coloured in rusty-brown tones. The fruit of the *Banksia* is a cone and these strange woody fruits make them very distinctive. In most species, these cones remain firmly closed on the plant for many years until fire causes the cones to open and the seed to release.

Left: *Banksia brownii*.

Photo – Maurice McDonald

Above right: *Banksia coccinea*.

Photo – Sue Patrick

Geographic distribution and habitat

There are over 75 species of *Banksia*, all but one occurring naturally within Australia. The greatest concentration of species is found in Western Australia. Some species are common and widespread and others are restricted to small isolated occurrences. Many species occur on deep sandy soils, although others are found in impoverished lateritic loams with good drainage. Some species occur naturally on coastal cliffs, in forest and into the inland semi-arid areas. Most are found in heathlands.



Approximate distribution of *Banksia* in Australia.



Banksia verticillata. Photo – Maurice McDonald

Reproductive biology

Banksia plants are a food source and host for many species of native fauna. The pollen presenter of the flower is a swelling of the style end that will attract birds, insects and small marsupial pollinators. Flower spikes consist of hundreds or thousands of individual flowers. After pollination the woody follicles develop, although in most instances only a small proportion of flowers are fertilised or produce seed. Almost half of all known *Banksia* species can regenerate from rootstock using a lignotuber, or can resprout from buds located under the bark. The dieback disease,



Above: Underdeveloped *Banksia* flower. Above (centre and right): Prostrate *Banksia* species. Photos – Anne Cochrane

Seed collection

Collection of *Banksia* cones is very easy, requiring only a pair of secateurs to cut the woody fruits from the branches. Cones may consist of only a few follicles (e.g. *B. ilicifolia*) or alternatively may have many dozens of follicles along a cylindrical cone (*B. attenuata*). Follicles may take one or more years to mature and fruits collected for germination must be ripe. Cones are usually dark grey to brown and dry when mature with the old flower parts (perianth and styles) either absent or dry and worn away. Plants of all but the prostrate species hold cones from several years flowering.

The age of some plants can be estimated from the number of branchings up the stem. The more recent and immature fruits will be located towards the outside of the plant. These should not be collected as the seed will not be ripe. Some species release seed in the absence of fire and seed collection must be timed to ensure that seed is not missed. Other species retain their follicles closed until fire or death causes them to open. Before collecting cones check for signs of predation by stem boring insects, although in many cases it is very difficult to determine whether fruits are predated until seed extraction occurs. Parrots cause severe damage to flowers and cones in their search for these insects.



Above: *Banksia grandis*.

Below: *Banksia meisneri* ssp. *ascendens*.

Photos – Anne Cochrane



Seed quality assessment

Extracting seed from the woody *Banksia* cones can sometimes be difficult, and many species require heating or burning before the individual follicles will open. The cones can be passed over a bunsen burner or placed on a barbecue for a short period of time until the follicles crack and open a few millimetres. Cones should then be placed into a bucket of water for a several hours. The cones then need to be dried in a warm oven. Seed should extract reasonably well after this treatment; if not, the wetting and drying cycle can be repeated. Viable seed is white and firm with a dark brown or black seed coat. The seed is flat with a terminal papery wing and sits in a separator or intervening plate in the follicle. This separator holds the seed in place in the follicle. It is important that the separator is not mistaken for the seed. The separator is usually brown in colour, whereas the seed is black. Many species have two seed per follicle. Predation of seed can be a problem, in particular in older cones. Look for signs of frass (the debris or excrement of insects or insect larvae, looks like sawdust) or holes in the seed and discard these.



Banksia meisneri ssp. *ascendens* winged (right) seed and separator (left).

Photo – Anne Cochrane



Banksia grandis. Photo – Andrew Crawford

Germination of seeds

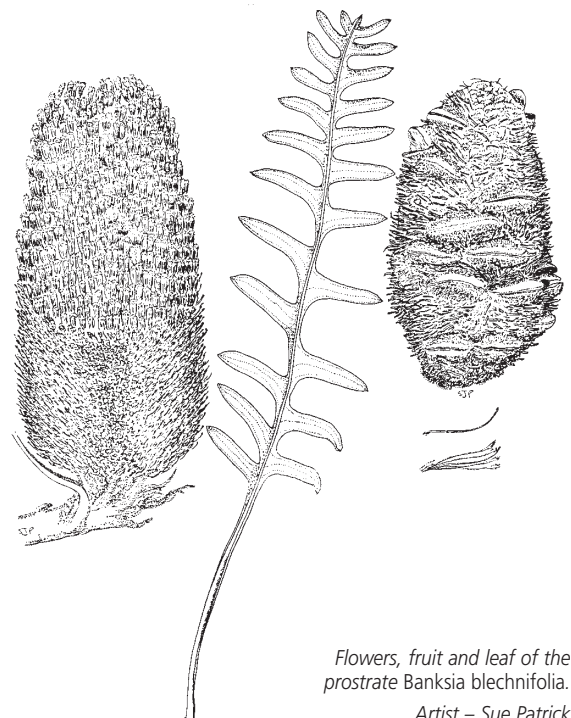
After extraction from the cone, *Banksia* seed is highly germinable without pre-treatment and should germinate in a matter of weeks after sowing. Place the seed directly in the soil, or alternatively germinate the seed in small dishes on filter paper or vermiculite and then pot on. There are a few species from the alpine high country of the eastern states that benefit from cold stratification (placing into a fridge) prior to sowing. This pre-treatment helps the germination as these species naturally experience cold to very cold temperatures over winter (even snow), with spring regeneration. These are not Western Australian species. Seedlings of some species are prone to damping off like many seedlings in the family Proteaceae, so be careful not to over water them.



Above: Seed of *Banksia laevigata*.

Below: Seed of *Banksia epica*.

Photos – Anne Cochrane



Flowers, fruit and leaf of the prostrate *Banksia blechnifolia*.

Artist – Sue Patrick



Seed Notes

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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.

THREATENED FLORA



SEED CENTRE

They have been written and compiled by Anne Cochrane, Manager of DEC's Threatened Flora Seed Centre.

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Top left: *Banksia media*. Top right: *Banksia grandis*, Walpole Nornalup National Park. Above: *Banksia scabrella*.
Photos – Sue Patrick

Recommended reading

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