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# Seed Notes for Western Australia

No. 11 Grevillea

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## Grevillea

The genus *Grevillea* (family Proteaceae) was named after Charles Greville, Vice President of the Royal Horticultural Society in England in the early 19th century. It is the third largest genus in the Australian flora and is perhaps the most popular horticulturally.



The spider-like flower of *Grevillea bipinnatifida*.

Photo – Andrew Crawford



Recently dehiscent fruits of a *Grevillea*.

Photo – Kate Brown

## Description

*Grevillea* are noted for their considerable leaf variation, with leaf shapes ranging from simple and entire to very deeply toothed. Flowers are rarely solitary and the inflorescence is usually loose and terminal. Species range in size and habit, from prostrate mat-like sub-shrubs which support ground moving pollinators, to stoutly-trunked bushes up to six metres tall and to the large tree, *G. robusta*. Many species are worthy of cultivation and are grown either for their attractive gold to pink to red flowers, their interesting foliage or as dense mat groundcovers. Plants for the nursery industry are traditionally propagated from cuttings, often because of the paucity of seed and/or the difficulty in germinating that seed.



The red spider flower of the rare *Grevillea humifusa*.

Photo – Kate Brown



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## Geographic distribution and habitat

The genus *Grevillea* occurs principally within Australia, with the greatest diversity and frequency of species occurring in south-western Australia. Of the 350 species in the genus, 150 are concentrated in the sandplains of the kwongan in lateritic soils and around granite outcrops in Western Australia. They tend to like dry well-drained sites, and are adapted to soils deficient in nutrients such as nitrogen and phosphorous. Grevilleas are generally considered susceptible to the dieback disease, *Phytophthora cinnamomi*, although individual species response may be variable.



Approximate distribution of *Grevillea* in Australia.



The rare *Grevillea brachystylis* ssp. *australis* from the Scott River National Park, WA.  
Photo – Anne Cochrane

## Reproductive biology

Many species flower intermittently throughout the year, with peak flowering during spring. A large number of *Grevillea* species are insect pollinated, with beetles, flies and possibly bees implicated as pollinators. The flowers of most species are well adapted for bird pollination with honeyeaters and bees feeding on nectar. Mammal pollination and nectar feeding on flowers has also been reported. Flowers may take many months to form fruits and spring flowering plants would have ripe fruit for collecting by summer.

Many *Grevillea* are obligate seeders, being killed by fire and relying on soil-stored seed to regenerate, although some species are root suckering and can survive fire and regenerate from lignotubers or epicormic buds. Large quantities of seed may be produced by individual plants, although seed set is low relative to the numbers of flowers produced. Plants often begin to flower after two or three years growth.

## Seed collection

The fruit of the *Grevillea* is generally a dry, dehiscent follicle. It is often very distinctive and may be smooth, ribbed, hairy, glabrous and/or sticky. There are two types of fruits: thin walled non-woody follicles with a persistent style and two narrow oval seeds, or woody follicles with a deciduous style with two winged seeds. The latter type is found exclusively in the tropics. Most species generally flower for long periods and fruit ripens differentially. Most seeds fall soon after dehiscence.



Above and below: Nylon stockings are useful to collect seed. Immature follicles are bagged to ensure that seed is not missed. Unfortunately seed predators easily find this meal, so check bags frequently.

Photos – Anne Cochrane



The endosperm of the seed is white, moist and firm, and many species from south-western Australia have seed that contains a membranous outgrowth or elaiosome which is ant attracting. Ant dispersal of the seed to nests protects the seed from predation until soil disturbance results in mass regeneration of obligate seeding species. The seed is highly nutritious and is predated by birds, rodents and insects such as grasshoppers. Plants that flower and fruit for long periods make cost-effective and efficient seed collection difficult. *Grevillea* seed is often difficult to collect because seed ripens and disperses quickly.

Being at the right place at the right time is often not possible and bagging developing follicles with stockings or light muslin bags is an effective means of collecting seed. Care must be taken not to bag the fruits too early or development of fruits may be impaired.



Above: Collecting seed by hand from the rare *Grevillea calliantha*.  
Photo – Anne Cochrane



Above: Unripe fruit, still green and several weeks from ripeness.

Below: Locust damage on *Grevillea* fruits.  
Photos – Anne Cochrane



*Grevillea bipinnatifida* with green fruit on the right and a ripe fruit in the centre of the photo.  
Photo – Anne Cochrane

## Seed quality assessment

To be of good quality and therefore germinable, seed needs to be full and plump. This is easy to determine by observation alone. Some species will produce only one good seed per follicle whereas others will produce two. The second 'seed' may be papery thin and aborted and should be discarded.



*Grevillea* seeds (clockwise from above left): *Grevillea maxwellii*, *Grevillea brachystylis* ssp. *australis*, *Grevillea curviloba* ssp. *curviloba*, *Grevillea brachystylis* ssp. *australis*.

Photo – Anne Cochrane

## Seed germination

Delayed germination is a survival strategy for most *Grevillea* species. The hard seed coat resists the penetration of water until some form of mechanical injury or fire occurs, thereby stimulating germination. If you don't mind waiting a long time, *Grevillea* seed will germinate without any pretreatment. Seed can be placed in soil and left for one or two years before it will germinate. The wetting and drying cycle over the seasons will crack the seed coat and stimulate germination. To speed up the process it is necessary to nick or remove the seed coat from the seed before putting it in a sterile medium (agar, vermiculite, filter paper). The addition of gibberellic acid and even smoked water solution will help germination. Percentage germination up to 100 per cent should be achieved for many species under these conditions.



Germinating *Grevillea* seed. The radicle, or root, elongates and breaks out of the seed coat.

Photo – Anne Cochrane



Above left: *Grevillea petrophiloides*.  
 Top: *Grevillea dielsiana*.  
 Photos – Babs and Bert Wells/DEC  
 Above: *Grevillea prostrata*.  
 Left: The prostrate and rare *Grevillea dryandroides*.  
 Photos – Anne Cochrane

## 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.



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

Concept by Grazyna Paczkowska.

Designed by DEC's Graphic Design Section.

The **Seed Notes** are available from [www.naturebase.net](http://www.naturebase.net)

## Recommended reading

- Elliot, W. R. and Jones, D. L. 1984. *Encyclopaedia of Australian Plants Suitable for Cultivation. Volume 5*. Lothian Publishing, Melbourne.
- George, A. S. 1984. *An Introduction to the Proteaceae of Western Australia*. Kangaroo Press, Sydney.
- Langkamp, P. 1987. *Germination of Australian Native Plant Seed*. Inkata Press, Melbourne.

- Makinson, R. O. 2000. *Grevillea. Flora of Australia* 17A, 1-460. ABR/CSIRO, Melbourne.
- Olde, P. and Marriott, N. 1994. *The Grevillea Book. Volume 1*. Kangaroo Press, Sydney.
- Sharr, F. A. 1978. *Western Australian Plant Names and their Meanings. A Glossary*. University of Western Australia Press, Perth.

