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Seed Notes for Western Australia

No. 15 Hard seed – *Chorizema*, *Daviesia*, *Gastrolobium* and *Gompholobium*

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Chorizema, Daviesia, Gastrolobium and Gompholobium

In Greek *chorizo* means to divide and *nema* means thread or stamen and together the name *Chorizema* was formed. *Daviesia* was named after Hugh Davies, a Welsh botanist. *Gastrolobium* comes from the Greek *gaster* or *gastros* meaning pauch or belly and *lobos* meaning pod. This name refers to the ovoid pod. The name *Gompholobium* joins the Greek word *gomphos* meaning club with *lobos* (pod), in reference to the club-shaped fruits. Many species in these genera have horticultural value and should be used in landscaping. Unfortunately, few are found in cultivation. The decorative nature of the fruits of *Daviesia* should be sufficient alone for growing these as specimen plants.



Above: *Chorizema dicksonii*. Photo – Andrew Crawford
Below: *Daviesia bursarioides*. Photo – Leonie Monks

Description

These four genera are in the family Fabaceae. They are small prostrate to medium shrubs or climbers (*Chorizema*) generally considered as understorey species. All have pea-type flowers with a standard, keel and wings. *Chorizema*, the flame pea, has bright flowers in reds, oranges and pinks, and sometimes in combinations of these colours. Flowers of *Daviesia* are most commonly yellow and brown, but can be found in shades of red to orange, and pink to purple. *Gastrolobium* flowers are usually yellow or yellow with red markings and *Gompholobium* flowers can be in colours ranging from



cream, yellow, orange to red. Foliage in these genera can range from simple and entire leaves to small bi-pinnate ones, or large flat glaucous ones depending on the species, with the foliage of *Daviesia* having the greatest variability. The genus *Gastrolobium* has a very important function in both conservation and farming history. Plants contain a toxic substance that is poisonous to stock and humans. The toxin, monofluoroacetic acid, is used in the poison 1080 which is effective in the control of introduced rabbits and foxes. Early settlers lost stock to the poison as their sheep and cattle ate the leaves as fodder. Once the poisonous nature of the genus was known, vegetation containing these plants was either fenced or cleared.



Above: *Gompholobium knightianum*.

Photo – Anne Cochrane



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Geographic distribution and habitat

These genera are all endemic to Australia, with the majority of species in each of the four genera restricted to the south-west of Western Australia. Plants are found mainly in coastal heaths, on mountain slopes and in poor soils consisting of sands and gravel. Habitat fragmentation, weed invasion, rising salt levels and waterlogging may threaten many of these species. In addition, the genus *Daviesia* has been found to be susceptible to the dieback disease, *Phytophthora cinnamomi*, in areas that experience high rainfall.



Approximate distribution of *Chorizema*, *Daviesia*, *Gastrolobium* and *Gompholobium* in Australia.

Reproductive biology



Above: *Daviesia rhombifolia*. Photo – Andrew Crawford

Species in these genera are fire responsive and generally germinate in large numbers after disturbance. Plants tend to be insect-pollinated and moths, native bees and butterflies may be implicated in pollen movement. The fruits of *Chorizema*, *Gastrolobium* and *Gompholobium* are swollen pods, but the fruit of the *Daviesia* is distinctively triangular and quite different from that of other pea-flowered plants. One to many seeds may be contained within the fruits.



Seed collection

The timing of seed collection for species in these genera is important, as most species will release their seed when ripe. This usually occurs in the summer months when temperatures are high. Seed of *Daviesia*, in particular, will release explosively when mature. Seeds will be hard and may range from pale brown to black when ripe. It is possible to collect seeds of some species when still slightly immature, as long as the seed has fully grown and there is no requirement to store the seed for any length of time. On the whole, it is better to collect seeds at the point of natural dispersal for better germination and storage. Nylon stockings or muslin bags can be tied over developing fruits until seed shed. Check the bags every few weeks until the seed has dropped. Ants and seed eating insects need to be kept out of the bags or seed will be taken away or damaged. Flowering of most species is in early spring with early summer ripening of fruits. It will generally take between two to three months for fruits to ripen. Some plants flower once a year to produce seed in large numbers (e.g. *Gastrolobium bilobum*) while other species will flower and fruit simultaneously so that several collecting trips are needed to ensure sufficient seed is collected.



Above from top: Immature fruit of *Daviesia chapmanii*; *Gompholobium* sp. Dehiscent fruit of *Daviesia elongata*.

Photos – Anne Cochrane

Below: *Daviesia rhombifolia*. Below centre: Immature *Daviesia* pods.

Photos – Andrew Crawford

Below right: *Daviesia obovata*. Photo – Anne Cochrane



Seed quality assessment

The seeds of these four genera can come in all shapes, sizes and colours. Some will be black, some brown and others mottled in colour. The seed could be very small or in the case of some of the *Daviesia* species could be quite large and round. Hard-seeded species tend to have a portion of seed that is predated. These seed will have telltale holes in them. Some seed may also be shrivelled and not full. These should be discarded. Some species will have naturally shrivelled seeds. The best method to determine good quality from bad quality seed is to use a flotation test. Place the seed into a beaker of water with a little detergent and agitate slightly. Good seeds should sink as they are heavier, and the bad seed will generally float. Check this by cutting a representative portion of both the sinkers and the floaters to verify your results. A quick look under the microscope should be sufficient.



Above: *Daviesia cunderdin*.

Below: *Daviesia obovata*.

Photos – Anne Cochrane



Top: Counting flower buds of *Chorizema humile*.

Above: Bagged *Daviesia pseudaphylla*.

Below right: *Daviesia obovata* fruit and calyces.

Below: Immature fruit of *Daviesia dielsii*.

Photos – Anne Cochrane



Seed germination

Species in these four genera all have hard seed coats and require pre-treatment to break dormancy before germination. The hard seed coat prevents the uptake of water and oxygen and can even prevent root development. There are a number of methods to break this physical dormancy. These include soaking the seed for up to 24 hours in warm to hot water, filing or scarification of the seed coat, chipping away a small part of the seed coat, or dry heat shock (put the seed in an 80°C to 120°C oven for between 10 minutes and one hour).

Immersing the seed in concentrated sulphuric acid can also rupture the seed coat but care must be taken as the acid is corrosive and can not only damage the seed if immersion time is too long, but can also be dangerous to people. After acid treatment, the seed should be well rinsed before sowing. Seed that has been pre-treated in any of the above ways should give good germination. The easiest method, although not always the most effective in terms of germination success, is to pour near boiling water over the seeds and allow them to cool in the water before sowing. Some species will have seed coats that are less hard than others and may even germinate without treatment. If seeds have been collected slightly immature there should be no need to pre-treat seed to stimulate germination.



Above: *Daviesia microcarpa*, Norseman.

Below: *Chorizema humile*.

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.

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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Seed Notes

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Top left: *Gompholobium* species. Top right: *Chorizema varium*. Above: *Chorizema humile*.
Photos – Anne Cochrane

Recommended reading

Cavanagh, H. T. 1987. Germination of hard-seeded species (Order Fabales). In *Germination of Australian Native Plant Seed*. P. J. Langkamp (ed) Pp. 58–70. Inkata Press, Melbourne.

Cochrane, A., Kelly, A., Brown, K. and Cunneen, S. 2002. Germination characteristics of rare and threatened flora from the south west of Western Australia: an important prerequisite of the recovery process. *Ecological*

Management and Restoration. 3, 1, 45–58.

Elliot, W. R. and Jones, D. L. 1984 *Encyclopaedia of Australian Plants Suitable for Cultivation*. Volume 3, 4 and 5. Lothian Publishing, Melbourne.

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

