



## Common diseases of native plants in home gardens

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Various diseases can damage native plants in home gardens at all stages of growth. A description of some of the more important diseases is given here, together with general methods for control. When using chemical control agents, always follow the label instructions.

There are occasions when a home gardener may notice a new disease which is different to the diseases they have seen in the past. Exotic diseases are a concern for the farming community, as they could threaten the agricultural and horticultural industries and increase the price of production, and cost to the consumer. Please report anything unfamiliar to the Pest and Disease Information Service (see last page).



*Botrytis and Alternaria-infected Geraldton wax (Chamelaucium uncinatum) bush, showing leaf drop and lack of inflorescence on left-hand stems, compared to healthy stems on the right.*

### Botrytis (grey mould)

Grey mould (*Botrytis cinerea*) may occur on the foliage of many native plants in still, humid or drizzly conditions. In Western Australia it is commonly observed on native plants of arid regions in the cooler months of autumn, winter and spring. Solanums, *Ptilotus*, Sturt peas and boab trees may be affected as they are dormant in the cooler months. Attacks are worse on species with dense foliage or those with soft hairy leaves. Most grey mould infestations cause little damage unless there are long periods of suitable weather. Infection of developing flowers can also occur, which results in flower abortion. If plants are grown in well ventilated, sunny positions, both leaf and flower infection is usually not as severe as on plants in crowded, shady conditions. Grey mould can also be very damaging to seedlings and cuttings in glasshouses. Iprodione is registered for chemical control of botrytis and other fungal diseases on ornamentals in home gardens.



*Flower buds of Geraldton wax affected by Botrytis, showing damage on young buds.*

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## Galls

Galls are growth malformations caused by the stimulus of an insect, small animal, fungal or bacterial attack. Insect feeding, insect egg deposits or fungal/bacterial infections may result in an increased level of hormones flowing to the site of irritation. This promotes abnormal growth around that point which leads to formation of galls. Galls vary widely in size and shape, and the shape of a gall may be specific to its causal agent.

Galls should be removed manually and destroyed when first noticed, in case they are caused by insects. This will curtail a build-up of the insect pest. Chemical control with systemic insecticides is usually ineffective. Good general health and vigour of the trees is the best prevention of gall damage. Keep up water and nutrient supplies to the plant.



Galls on Acacia caused by *Uromycladium* sp., a fungus disease.

## Inkspot (ink disease)

Ink disease is an attack by a fungus called *Alternaria alternata* which affects Kangaroo paws. Ink spot shows up as blackening of the leaves and flower stems. The disease usually starts at the leaf tips, then spreads down the leaves into the rhizomes. If uncontrolled, ink spot may kill weak plants of certain Kangaroo paw species (*Anigozanthos manglesii*, *A. viridis*). More vigorous species, such as *A. flavidus*, are resistant to infection.

A range of cultural control measures can be tried. Manipulating the microclimate, as well as nutrient modifications can be of benefit. The best way to control fungal diseases is to keep the plants vigorous and healthy. The addition of essential trace elements, especially potassium and calcium, may improve the vigour of the plants and reduce the plants' susceptibility to ink spot. If the plants are situated in a shady, cool, moist environment, it may be of benefit to increase ventilation and sunlight by thinning neighbouring and overhanging plants.



Inkspot on Kangaroo paw

## Phytophthora

*Phytophthora cinnamomi* is commonly known as Jarrah dieback or cinnamon fungus. The disease is caused by a fungus which attacks the root system of various plants.

Jarrah dieback is common in Western Australian home gardens, parks and nurseries. The fungus is readily transported in infected soil which may stick on shoes or vehicle tyres.

Once plant roots are infected, the fungus produces mobile zoospores at an optimum temperature of around 15°C. These swim in water to the root tips of other plants which they may infect. If the conditions are right (warm, wet conditions such as heavy rainfalls in summer) the fungus can complete its life cycle within 24 hours. Little infection takes place below 15°C.

*Phytophthora cinnamomi* causes a variety of symptoms in various plants, depending on the species attacked and the soil conditions where it grows. Plants infected with the disease may suddenly collapse and die within a few days after having been apparently healthy. This type of collapse is common in susceptible dry climate plants such as many *Banksia* spp., *Dryandra* spp., *Adenanthos* spp., *Isopogon* spp., *Hakea* spp., *Grevillea* spp. and *Eucalyptus* spp.

The collapse is thought to be the result of the breakdown of the plant's root system. Plants may have survived for a long time as the remaining functional root system supplied sufficient nutrients and water under mild conditions. However, in period of high evaporative demand, the damaged roots supply insufficient water to maintain effective transpiration and cooling.

*Phytophthora cinnamomi* becomes more of a problem in waterlogged soil, and only resistant plants survive. A list of species believed to be resistant is given in Jones and Elliott (1986), see last page.



*Phytophthora cinnamomi* on *Banksia speciosa*

In the well drained soils of most Perth metropolitan gardens, *Phytophthora cinnamomi* may not kill the plants but may cause stunting, slow growth and affect the growing tips. The small feeder roots are attacked and the leaves are often yellow with brown margins and apices. After warm, wet periods of 24 hours or longer, the fungus may cause sufficient damage to the roots of the plants to kill them.

Cultural control can be achieved by improving the soil drainage through installation of underground drains, raised beds and sunken garden paths. In areas of known infection, only tolerant species should be grown. Sowing infected areas to grass for at least three years should reduce the chance of fungal re-infection.

The home gardener can achieve chemical control with phosphorous acid which can be sprayed onto the foliage of plants.

### **Pythium, Fusarium and Rhizoctonia (damping off disease)**

These are diseases which affect seedlings all year round, but mainly in wet conditions. Seedlings die before they emerge or after emergence. In the latter case, rot develops on the stems and constricts water and nutrient movement near the soil surface. The stems are physically weakened and the plants collapse.

To avoid damping off disease, do not over-water. Sow seeds into sterilised soil thinly, to avoid crowding of the seedlings. Pythium may attack plants which have soft tissue due to an over-use of nitrogenous fertiliser. For chemical control, use soil drenches of furalaxyl (Pythium), propamocarb as HCl (Pythium), sulphur + mancozeb (general damping off).



*Damping off disease: Rhizoctonia on seedlings*

### **Powdery mildew**

Powdery mildew is caused by a group of related fungi. These are usually host-specific. Amongst Western Australian native plants, *Verticordia* spp. and *Chamelaucium* spp. frequently become infected in autumn and winter. Initially, faint white spots on the leaves indicate a powdery mildew infection. These spots gradually increase in size, until the whole leaf surface is covered in white powdery growth. When young leaves are attacked, they may become distorted and/or fold up. Powdery mildew spores require high humidity to germinate. However, once established, the fungus will continue to grow, even in dry conditions.

For cultural control of powdery mildew, improve ventilation by reducing plant density.

Powdery mildew can be controlled with wettable sulphur and triforine.



*Powdery mildew on Eucalyptus*

## Rusts

The disease which is commonly named as rust, can be caused by many different fungal groups. Generally, the symptoms consist of the appearance of small yellow patches or spots on the upper leaf surface. Powdery pustules form when the fungus within the leaf spots produces spores which burst through the epidermis of the leaf. Most rust pathogens have a limited host range, so infestation from one plant species to the next is unlikely.

Amongst native plants in Western Australian home gardens, rust may affect kangaroo paws and boronias.

Rust disease of Kangaroo Paws is evident as small (approx. 2 mm diameter) reddish brown pustules on the leaves, gradually becoming more dense until the plant is killed. Rust can be a serious disease of cultivated kangaroo paws, but it is rare in wild populations.

In Boronias, rust (*Puccinia boroniae*) causes brown pustular growths on leaves and stems which may result in defoliation.

For natural control, try to select rust-resistant varieties. For chemical control, use mancozeb or sulphur.



*Rust on Callistemon citrinus (Photo by University of Florida)*

## Acknowledgement:

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## Further reading:

Jones, D.L. and Elliot, W. R. *Pests, Diseases and Ailments of Australian Plants*. Lothian, Melbourne, 1986

McMaugh, J. *What Garden Pest or Disease is That? Organic and Chemical Solutions for Every Garden Problem*. Landsdowne, Sydney, 1994.

## Specimen identification requirements

When sending or delivering samples, the following information is required:

- Collector's name, location (where the specimen was found), full address, telephone number and e-mail address, description of the damage and date collected.

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