

PLANT DISEASE

DIEBACK CAUSED BY *PHYTOPHTHORA CINNAMOMI*: what is at risk and what can we save?

Joanna Young

Dieback is arguably the greatest threat to biodiversity across the south-west of Western Australia. Of the 5700 plant species known to occur in the Southwest Botanical Province some 2300 species have been classified as susceptible to *Phytophthora cinnamomi*; the soilborne organism which kills by destroying the root systems of plants.

Phytophthora cinnamomi (Pc) was first identified as the culprit causing dieback in the jarrah forest over 40 years ago. Jarrah trees and susceptible species in the forest understorey such as banksias were dying. What is so sad is that it continues to spread and be spread across the south-west, being transported in soil and water. Its spread has been relentless and unfortunately few people either grasp the magnitude of this biological disaster or appreciate the great range of plant species being lost from woodlands, heaths and forests. Positive isolations of the pathogen have now been made from Eneabba in the Northern Agricultural Region, right through the south west corner of the State to the east of Esperance in Cape Arid National Park. Few people realise how important it is for us to all work to protect areas that remain healthy and free of the disease.

Recognising Dieback caused by *Phytophthora cinnamomi*

Dying banksias are one of the best indicators of the disease but many



Typical dieback site in jarrah forest
Photo: Dieback Working Group

other species of the genera listed in Table 1 are also susceptible. When patches of vegetation made up of a diverse mix of species collapse and die, Pc may well be the cause. Warm, moist conditions are most conducive to the disease, so often plants are seen to collapse and die after summer rain. The disease is often worst in plant communities growing on poor grey sands or poorly drained soil profiles. Even in the jarrah forest disease expression can vary with soil type and profile. Dieback caused by Pc not only kills plants in the bush, it can kill susceptible species in gardens and orchards including avocados and proteas.

Examples of Impact

The disease has ravaged many ecosystems and in some areas where a little of the history is known, the last individuals of some susceptible species, such as the banksias and grass trees, are dying. There are many examples of the chronic situation throughout the south-west:

- The understorey of much of the jarrah forest has lost a significant number of susceptible species over a vast area.

- The Stirling Range National Park has been devastated. Both species and communities are now threatened with extinction.

- The once-common *Banksia attenuata* is now represented by only a smattering of individuals in the Two Peoples Bay Nature Reserve.

- Thickets of *Banksia quercifolia*, once common throughout the south-west and particularly in the woodlands and forest, are now hard to find.

- Most, if not all, natural populations of *Banksia coccinea* are infected. Fine stands of this Albany banksia are very hard to find.

- Cape Le Grande National Park is largely impacted with significant loss of endemic plants including *Lambertia echinata* subsp. *echinata*, as well as its *Banksia speciosa* dominated heaths.

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Table 1: Species in the following genera of plants are commonly killed by *Phytophthora cinnamomi*:

Adenanthos
Andersonia
Astroloma
Banksia
Hypocalymma
Isopogon
Leucopogon
Lysinema
Macrozamia
Persoonia
Petrophile
Pultenaea
Tetralochea
Sphenotoma
Xanthorrhoea

What can you do?

Simple guidelines for land owners wishing to minimise risk of new infections in healthy bushland.

1. Schedule any activities that could involve soil movement to days when the soil is too dry to stick to machines, tyres or footwear.

2. Be wary of bringing in plants or materials from outside the area. Nursery stock can harbour all sorts of pathogens and it is worth going to nurseries that practice rigorous hygiene.

3. Don't bring in gravel or road making materials from sources that have never been checked for "dieback".

4. Check that any contractors you engage have knowledge of dieback. Find out where they have been last working and request they clean down before arrival.

5. Stay on tracks unless you have taken precautions and made sure shoes or vehicles are clean on entry to healthy areas. Do not drive off tracks and through mud and slush.

6. When exploring the bush make sure you don't walk through areas of dead banksias and grass trees before going to well drained

upland areas which are most likely to have remained disease free.

In the SCRIPT NRM Region

The South Coast Regional Initiative Planning (SCRIPT) is addressing the problem in their region by working to put "dieback on the map". The first goal of the SCRIPT dieback project is to produce a strategic broad scale map of where dieback is impacting on vegetation within the Natural Resource Management (NRM) region which runs from Walpole across to Cape Arid east of Esperance. The second goal is to identify areas that are still free of disease, supporting susceptible vegetation in conditions conducive to disease. The third goal is to put dieback management plans in place to protect special areas within the region. Best practise guidelines will also be made more readily available to anyone with a will to be involved in "arresting the threat".

As SCRIPT Dieback Project Manager, I am seeking community involvement in the project in a number of ways.

Please can you help by:

- Thinking "disease free". Discourage or avoid taking soil in any quantity into areas of bushland that look relatively healthy or undisturbed.

- Recognising "disease free". Record or note large areas of healthy banksia woodlands, mallee and heathland communities which may be worthy of more active dieback management to keep them "green".

- Nominating valued areas of disease-free native vegetation for dieback assessment. Field visits and briefings on the disease can be arranged in the SCRIPT region.

Dr Joanna Young is a plant pathologist who has worked on the management of Phytophthora Dieback for many years. She is currently project manager for the SCRIPT Dieback Project and can be contacted by phone 98401068 or email young@denmarkwa.net.au.

For more written information:

SCRIPT has just published a pamphlet about the dieback project and a copy can be requested by emailing the SCRIPT office script@agric.wa.gov.au.

Recently WWF and the Dieback Consultative Council have also published a booklet "Arresting *Phytophthora* dieback, the Biological Bulldozer" which highlights actions needed to protect some of our biodiverse plant communities and ecosystems from dieback caused by *Phytophthora cinnamomi*.

The booklet is online at www.wwf.org.au and information is provided so copies can be ordered.

Web sites with further information:

www.calm.wa.gov.au/projects/dieback

www.cpsm.murdoch.edu.au/ Information on susceptible and resistant Western Australian native plants.

www.deh.gov.au/biodiversity/threatened For the National Dieback Threat Abatement Plan.

www.ngia.com.au/niasa/ Information on best practise gardening.