



**JOURNAL**  
**RESOURCE NOTES**

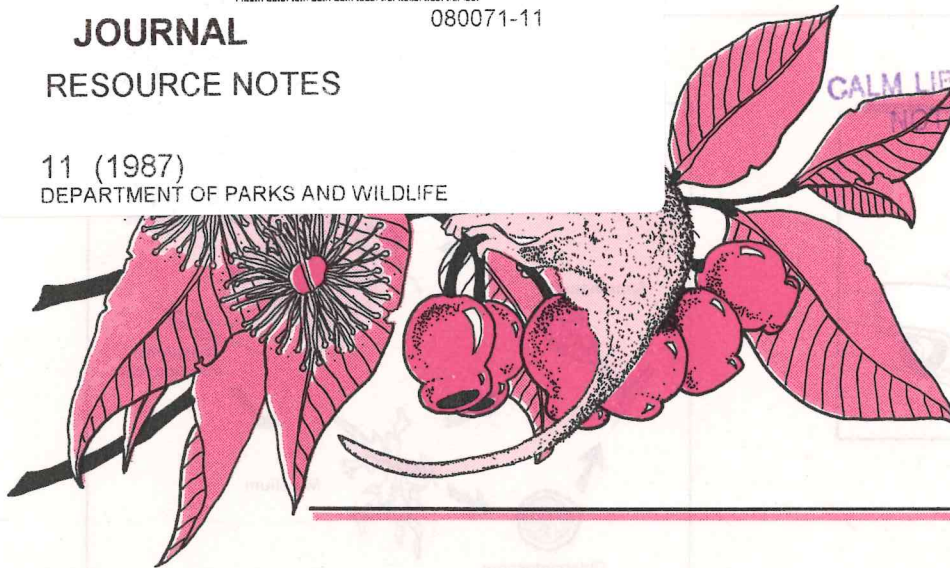
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DEPARTMENT OF PARKS AND WILDLIFE

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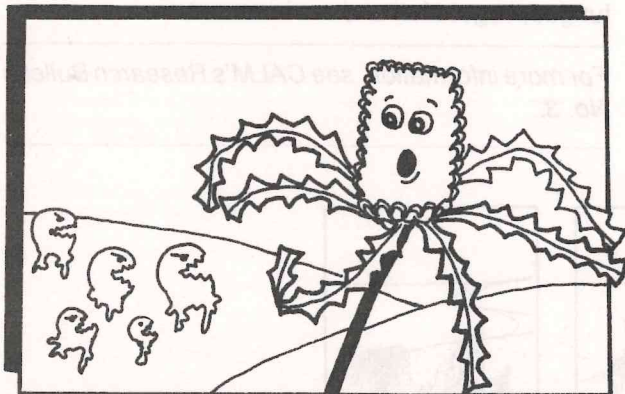
# Resource Notes

Number 11 January 1990

Department of Conservation  
and Land Management, W.A.



## WHAT IS DIEBACK?



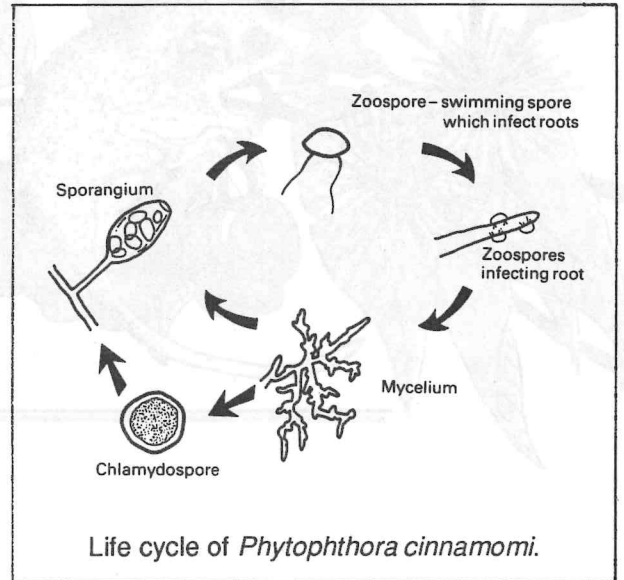
Dieback in W.A. is usually caused by microscopic fungi called *Phytophthora* which live in the soil. Although infection by *Phytophthora* causes the leaves of plants to die, the fungi actually attack the roots. Plants killed by dieback die from lack of water, and look like those affected by drought. Of the *Phytophthora* species attacking native flora in the south-west, *P. cinnamomi* is the most widespread and destructive. It thrives in our environment and threatens our unique vegetation.

*Phytophthora cinnamomi* is a parasitic fungus; it requires a living host on which to feed. The main body of fungus - the mycelium - is a mass of threads, capable of producing the millions of tiny spores which reproduce the fungus. *Phytophthora cinnamomi* produces two main kinds of spores. One, the zoospore, is small and spreads rapidly in water and

moist soil. As zoospores move through the soil they come into contact with plant roots. They lodge on roots, infect them, and, in susceptible plants, produce mycelium. The infected plant acts as a host for the fungus; the mycelium grows, feeding on the host, rotting the roots and cutting off the plant's water supply. The other type of spore produced by the fungus is called a chlamyospore. This is larger than the zoospore, and can survive for long periods in the soil, provided conditions do not become too dry. Chlamyospores cannot move on their own, but can be transferred in infected roots and particles of infected soil. When conditions are favourable the fungus again becomes active: the chlamyospores produce mycelium and zoospores.

*Phytophthora cinnamomi* is a sub-tropical fungus, and is most active when conditions are warm and moist - usually in spring and autumn. In winter it survives in moist soil, but is not favoured by low temperatures. When the soil dries out in summer the fungus usually dies, but it does have ways to survive. It can endure in infected roots or in soil which retains some moisture all year - gullies, swamps, and poorly drained upland areas.

The fungus spreads naturally and by the movement of zoospores through soil and in water, or artificially by movement of infected soil and roots. Any activity which disturbs the soil or alters the drainage pattern will encourage the spread of dieback. To protect our unique vegetation from further destruction, such activities must be restricted.



Plants vary in their ability to resist the disease. Those which provide a food base for the fungus are most vulnerable. Many species, e.g. banksias, have no resistance and die quickly once infected. Blackboys, zamias and many plants of the coastal heath are susceptible. Dieback was originally associated with jarrah; however, jarrah is more resistant than many species. Jarrah is able to fight small infections by producing new tissues around the invading fungus, but repeated infections cause the gradual decline which gave rise to the term 'dieback'. The fungus has little or no effect on marri, wandoo and wattle trees. It is not only native plants which are affected by *Phytophthora cinnamomi*; many plants in domestic parks and gardens die if infected soil is introduced. These include azaleas, avocados and pineapples. The fungus is known to attack at least 1 000 plant species. A large number of these are rare, and exist

only in parts of the south-west of W.A. These are threatened with extinction if the disease is not controlled.

The environment of southern Western Australia has proven to be well suited to *Phytophthora cinnamomi*, which is now wide spread - though not all areas are affected in the same way. Its impact in any area is determined by the complex interaction between fungus, vegetation and environment.

For more information, see CALM's Research Bulletin No. 3.

