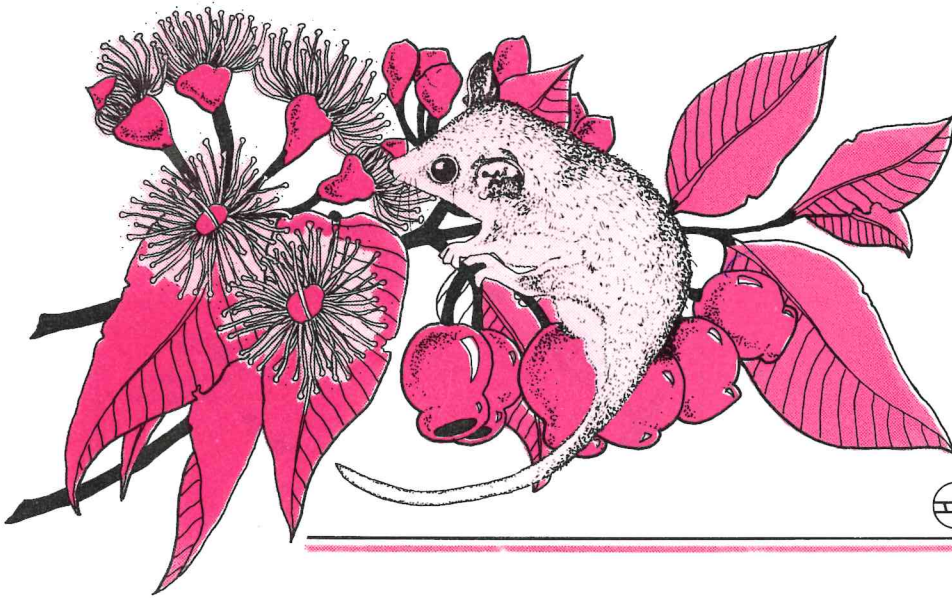


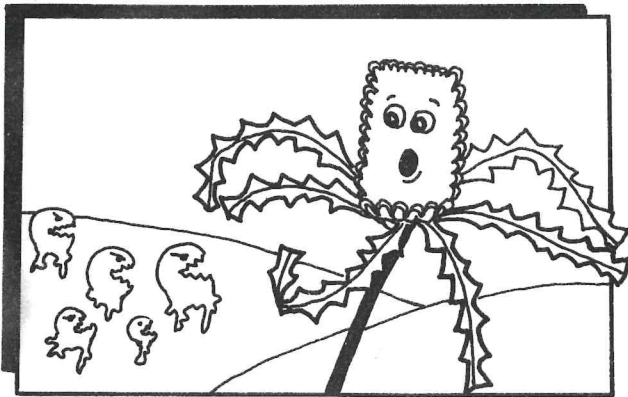
Resource Notes

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 Department of Conservation and Land Management



WHAT IS DIEBACK?



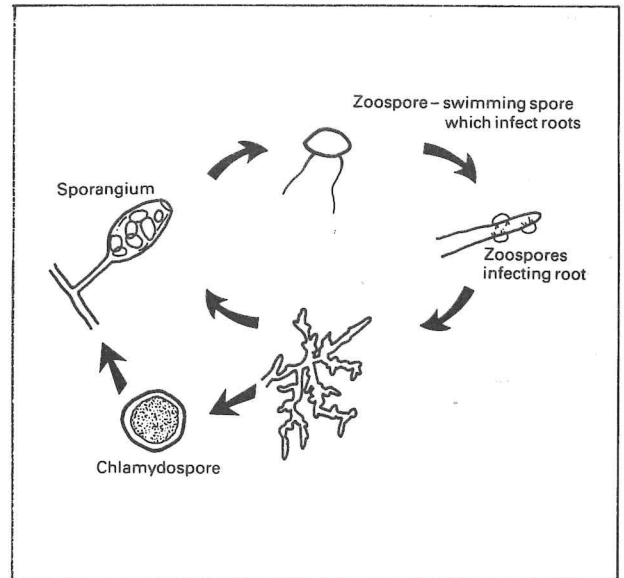
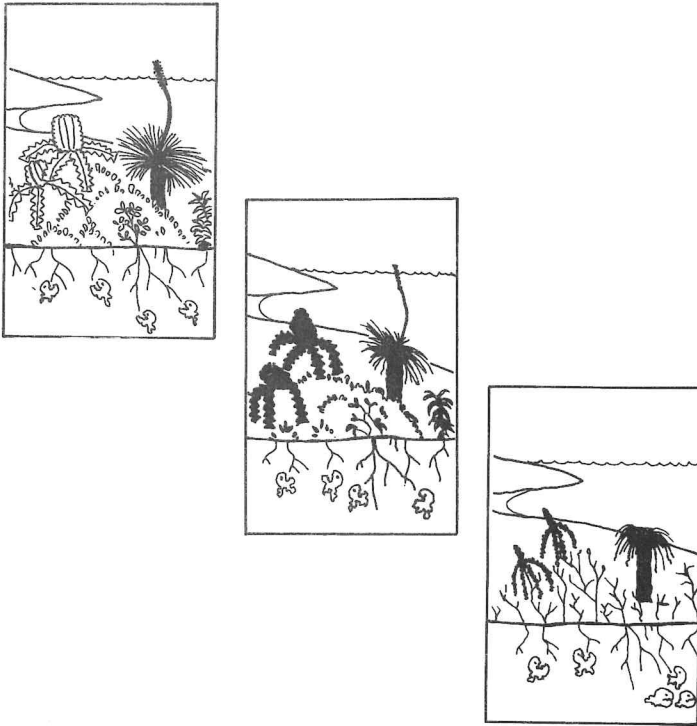
Dieback in W.A. is usually caused by a microscopic fungus which lives in the soil. Although it causes the leaves of plants to die it actually attacks the roots. Plants killed by dieback, because they die from lack of water, look just like those affected by drought. Although it is a tropical fungus, *Phytophthora cinnamomi* 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 fungus is similar to those which grow on bread or on oranges, only it grows in the roots of susceptible plants. The main body of a fungus - the mycelium - is a mass of threads, capable of producing the millions of tiny spores which reproduce the fungus. Similar spore formation can be seen on orange mould: the white mycelium produces powdery

green spores which are so light they can be carried in the air. Fortunately, *Phytophthora cinnamomi* spores cannot be transmitted in the air.

Phytophthora cinnamomi produces two main kinds of spores. One, the zoospore, is small and spread rapidly through water and moist soil. As they move through the soil zoospores 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 *Phytophthora cinnamomi* is called a chlamydospore. These are larger than zoospores, and have a thick wall to protect them from dehydration. Chlamydospores are able to survive for long periods in the soil, provided conditions do not become too dry. They cannot move on their own, but can be transferred in particles of infected soil. When conditions are favourable the fungus again becomes active: the chlamydospores produce mycelium and zoospores.

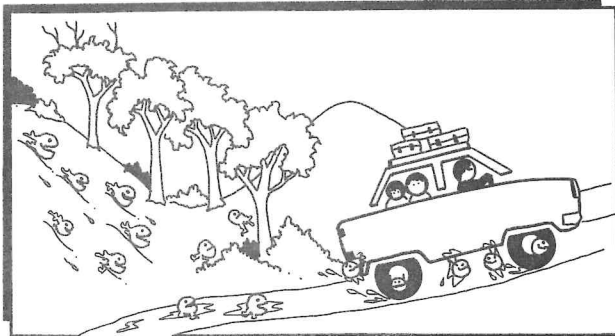
Phytophthora cinnamomi is a tropical fungus, and is most active when conditions are warm and moist - usually in spring and autumn. In



Life cycle of *Phytophthora cinnamomi*.

winter it survives in moist soil, but low temperatures keep it inactive. 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 by the movement of zoospores through soil, or artificially by movement of infected soil. 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 good 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.

Phytophthora cinnamomi has proved to be well suited to W.A., and is now spread widely through the State - 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.