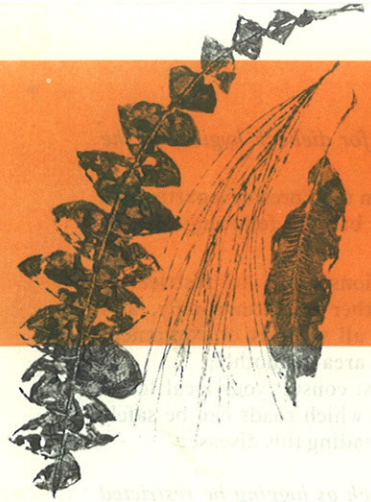

INFORMATION SHEET 39

AUGUST, 1978

SOME QUESTIONS AND ANSWERS ABOUT JARRAH DIEBACK

A great deal has been written about *Jarrah Dieback,* the disease which threatens the destruction of Western Australia's unique jarrah forest. However, the subject of dieback is complex and many people remain confused about the nature of the disease, its method of spread and the steps being taken to contain it.

In this Information Sheet, we will try to answer in the simplest possible terms some of the most important and frequently asked questions on this subject.

For further reading on jarrah dieback see *Forest Focus* No. 14 and Forests Department Information Sheets Nos. 4 and 35.

The Questions and Answers

1. What is jarrah dieback?

Jarrah dieback is a disease which causes the gradual destruction of the roots of many plants and eventually leads to their death.

2. What causes jarrah dieback disease?

The disease is caused by a microscopic fungus in the soil which feeds on and eats away the roots of many trees, plants and shrubs. The fungus is called *Phytophthora cinnamomi,* or "Cinnamon Fungus". (The word "Phytophthora" means "killer of plants".) The fungus is very hard to detect, even with a microscope, so much so that its absence can rarely be guaranteed. The presence of Phytophthora in a forest area can normally only be confirmed through observation of its effects on plant species with very low resistance to infection (for example, banksia). An infected tree or plant normally develops yellow leaves and dies back from the crown as it starves to death. However, there is often a time-lag of eighteen months to two years between infection and first sign of disease symptoms.

3. Where did the dieback fungus come from?

Most people agree that it was accidently introduced to W.A. near the turn of the century, probably on soil attached to fruit trees. The fungus does occur naturally in many parts of the world (where the native vegetation is usually adapted to its presence) but it is highly unlikely that *Phytophthora cinnamomi* could have been native to W.A. where numerous native plants are highly susceptible to attack, and whole plant communities can succumb to the disease.

4. What plants are attacked in W.A.?

The dieback fungus can kill jarrah trees and most of the other tree and shrub species which grow in the jarrah forest.

However, many important tree species appear to be resistant—for example, karri, marri, blackbutt, wandoo and tuart do not succumb to jarrah dieback. The tea-tree and most of the wattle scrub in southern forests are also resistant.

Not all jarrah forests are equally susceptible to infection. The "weakest" (those most likely to be attacked and killed) are found along moist valley bottoms, on poor, infertile soil or on rocky laterite soils. However, jarrah forests on rich, red loamy soils seem to be particularly resistant.

5. How much dieback is there?

The most recent surveys show that almost 10 per cent of all State Forests in W.A. are infected. This amounts to roughly 175000 ha. Dieback infections have been found throughout the South-West, from Esperance to Gingin, but the worst areas are the western section of the Darling Ranges, from Mundaring to Augusta.

6. How is dieback spread?

Firstly, the fungus can move through the soil by itself. Movement *uphill* is very slow, usually less than 30 cm (1 ft.) a year, but movement *downhill* is free and very rapid, as the spores of the fungus are readily carried by water flowing through or over the surface soil.

However, the most important means of spread is through *transport of infected soil on vehicles or machinery.* When a car or bulldozer travels through a dieback area, clods of soil stick to the wheels, tracks or chassis. Later these clods may drop off. If the fungus was present it will commence growing, and a new dieback infection has been started.

7. What is the most potent means of spreading dieback?

Any operations which results in the transfer of infected soil from a dieback area to "clean" healthy forest will spread the disease. Operations which must be most carefully controlled are therefore such things as road constructions and maintenance, logging, mining and powerline or pipeline construction through the forest.

8. How quickly will a new infection show up?

There can be a time lag of up to three years between a new infection and the first sign of symptoms in the forest. This means that many areas of forest which *appear* healthy today may, in fact, be infected.

9. Can dieback be controlled?

It does not seem to be practically possible to eradicate the fungus from infected forest. Research is active at the moment to find ways of reducing its level of activity. The most important thing is to stop the artificial spread of the disease. We must stop the spread of infected soil to healthy areas if we are to save the jarrah forest.

10. How can artificial spread be minimised?

The first thing is to make absolutely certain that all vehicles and machines are thoroughly cleaned down before they move from known or suspect dieback areas to healthy forest. This is known as *hygiene.*

The second is to find out exactly where the disease is. To be able to do this accurately and with confidence that symptoms of all infections are visible it is necessary to *quarantine* the forest. This is done by preventing all access to the forest (as far as possible) for about a three-year period. After this period of quarantine, all infections are visible and can be carefully mapped from aerial photographs. Proper hygiene forest operations can then be planned around accurate dieback maps.

11. What does forest "quarantine" really mean?

Large areas (approximately 720000 ha) of State Forest in Western Australia have been "quarantined". The term quarantine is used to describe a *Disease Risk Area* —an area of forest where the Forests Department can legally prevent entry by all vehicles. There are two reasons for this restriction. The first is to prevent further spread of the disease; the second is to buy time in which existing infections can show themselves.

12. How is an area quarantined?

The area selected for quarantine is marked on a map. This proposal must be submitted to Parliament for approval. If approved, the area is declared a Disease Risk Area. All roads are then physically closed, forest operations shifted from the area, and entry (except for certain emergencies) is prohibited. Within a quarantine area, unrestricted access is only permitted along main public highways or for entry to private property. Very restricted access for certain essential services is available under permit and along specified routes, but a very good case is necessary to obtain such a permit.

There are no restrictions to entry to quarantine areas on foot.

13. What are the basic rules for dieback hygiene in the forest?

Detailed rules are spelt out in the Forests Department's *Dieback Hygiene Handbook,* but the following are the most basic:

(i) For "off-road" operations: plan to restrict all operations to dry weather conditions only, and even then, clean down all vehicles or equipment before moving from one area to another.

(ii) For "on-road" activities: consult your local forest officer who will tell you which roads can be safely used without risk of spreading this disease.

14. How can an operation such as logging be restricted to dry weather only?

Logs are hauled in the summer only and accumulated in a stockpile in a safe area from which they can be drawn all through the winter months. Summer stockpiling is common in timber industries throughout the world.

15. Will bauxite mining spread dieback?

Any activity in the forest that requires movement of soil will increase the risk of spread of dieback, and the risk is more or less in direct proportion to the amount of soil movement. The projected production of 9·5 million tonnes of alumina (from 40 million tonnes of ore) is by far the greatest source of disease spread in the forest estate.

16. Does prescribed burning spread dieback?

There is no evidence to suggest that controlled burning of jarrah forests will spread dieback. However, there is a relationship between some fire regimes and the nature of the forest ecosystem which favours development of the disease. These are matters for continuing research.

17. What would be the consequence if nothing was done?

The amount of dieback in the forest would inevitably increase. The bulk of the jarrah forest could be threatened with extinction. This could result in salty water from the forested catchments and loss of a productive forest with all its many protective, social and economic values.

18. Who is responsible for preventing the spread of jarrah dieback?

Every single person who works in or visits the forest has a responsibility to prevent further spread of this devastating disease. If you love and value the forest, ask yourself this question every time you enter it: "Will I spread dieback today?" If the answer could be yes, then replan your operation or seek advice from a trained forester. The application of some simple hygiene precaution could save many hectares of forest from destruction.