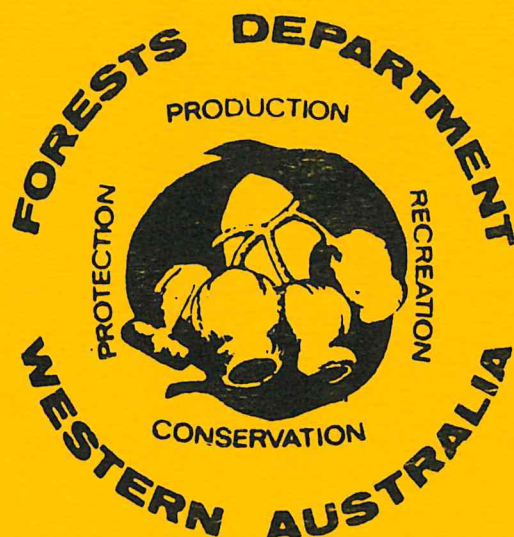




DIEBACK

HYGIENE

MANUAL

DIEBACK HYGIENE MANUAL

Jarrah dieback is a disease which destroys much of the flora in the jarrah forests of W.A. It is caused by a microscopic fungus which lives in the soil. In most cases it is spread by man transporting soil particles containing the fungus from infected to healthy forest or from spores of the fungus carried in groundwater.

This booklet contains the rules which must be followed to minimize the spread of dieback in the forest.

You can help to prevent the spread of dieback disease by following these hygiene rules whenever you enter or work in the jarrah forest.

For further explanation of the disease and the effects, refer to the publications listed in this manual.

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SUBJECT

1. Recognition of jarrah dieback
2. Pegging dieback
3. Washing down
4. Road selection
5. Road construction
6. Road grading
7. Gravelling
8. Prescribed burning
9. Fire suppression

SECTION 1

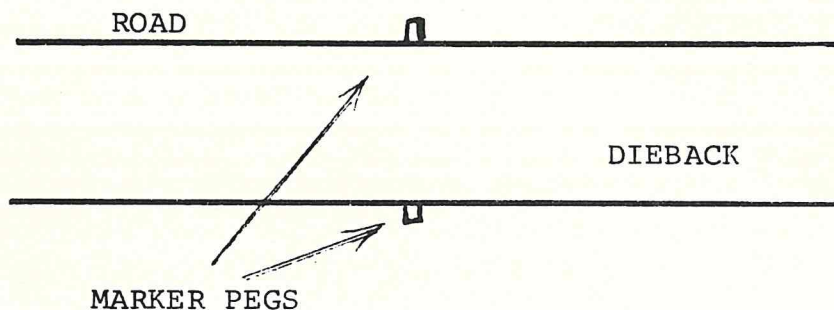
RECOGNITION OF JARRAH DIEBACK

1. The fungus lives in the soil and some plant roots. It cannot be seen with the naked eye.
2. The presence of dieback can be detected from the death of patches of susceptible species of native vegetation.
3. Better known susceptible species (plants usually killed by dieback) include: Banksias, Blackboys, Zamia Palms, Snoddygobble, Emubush, Sheoak and Jarrah. Note it can take up to three years after infection for visible symptoms of death from dieback to show up in vegetation.
4. Deaths of the following plants are NOT due to dieback : Marri, Karri, Blackbutt, Wandoo, Peppermint, Ti-Tree.
5. A single dead susceptible plant (e.g. A dead Banksia) could be dieback, and it is best to assume it is dieback especially if two or more dead plants are seen or dead plants of two different species are present, or there is evidence of recent soil disturbance nearby from a vehicle which could have produced an infection.
6. Presence of dieback can sometimes be determined by sampling the soil and laboratory testing. Refer to Forests Department.
7. Dieback is difficult to detect in areas which have been recently burnt due to dead foliage being consumed by the fire which destroys visible symptoms of the disease.
8. Autumn is the best time to map dieback as plants die after summer drought stress and dead foliage can be photographed from aircraft.
9. If dieback is evident in a watercourse then it must be assumed the water course IS infected and dieback WILL be present downstream from the infection. Therefore it is important to identify the furthest upstream infection in the water course.
10. If dieback occurs on a ridge or upper slope, then areas downhill will be infected in time.

SECTION 2

GROUND DEMARCATION OF DIEBACK AREAS

1. Boundaries between dieback and healthy forest will be marked on the ground (pegs, survey tape, paint etc) before any forest operation involving use of machinery. Where earthmoving operations are involved boundaries will be pegged.
2. Pegs will indicate to machine operators where dieback patches start and finish.



3. Pegs will be 1 m in length (0.7 m above ground), 75 mm in width.
Side visible when entering dieback painted yellow.
Side visible when leaving dieback painted green.
4. Pegs to be located 5 to 20 m uphill from visible symptoms.
5. Where there are no evident symptoms, creeks or shallow flats are to be pegged if dieback occurs upstream from the crossing. Pegs to be located 5 to 20 m each side of watercourse, or edge of flat.

SECTION 3

WASHING DOWN

AT HEADQUARTERS

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|----|--|------|---|
| DO | use designated ramps or pads to washdown vehicles. | DONT | forget to remove mud and soil from cleats and underside of protection plates on tracked vehicles. |
| DO | ensure run-off flows into a sump where it can be treated with fungicide. | DONT | drive vehicle through washdown effluent. |
| DO | use high pressure spray to remove caked-on mud and soil. Use spade or bar to assist removal. | | |

NOTE: Use brush or compressed air rather than washing, if soil is dry and can be removed by this method.

IN THE FIELD

- | | | | |
|----|---|------|---|
| DO | washdown at designated washdown point or on bridges, rocky crossings or hard well drained surfaces, within dieback areas. | DONT | washdown in clean (healthy) forest. |
| | | DONT | fail to clean any machine capable of carrying infection from infected to healthy forest. |
| DO | treat washing down water in tankers with fungicide (1 Tablespoon of copper sulphate per tanker of 3000 l). | DONT | drive vehicles through washdown effluent. |
| DO | use a brush, bar or spade to remove compacted soil where necessary. | DONT | use excessive quantities of copper sulphate as it is corrosive and DONT use treated water for drinking. |

SECTION 4

ROAD SELECTION

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| DO | determine known and suspect dieback along the intended route, using dieback plans, air photos and field check on foot. | DONT | duplicate existing access. |
| | | DONT | use vehicles, bulldozers, tractors in initial selection of roads. |
| DO | avoid crossing from dieback to non-dieback boundaries. | | |
| DO | demarcate by pegging dieback/non-dieback boundaries. | | |
| DO | select roads low in the landscape. | | |

NO MACHINE OR TRACTOR MOVEMENT ON ALIGNMENT ALLOWED
TO THIS STAGE.

SECTION 5

ROAD CONSTRUCTION

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| DO programme earthmoving work for December to March when soil is dry. | DONT commence road construction unless correct selection procedure has been followed. |
| DO segregate machine work so that machines do not travel from dieback to healthy forest, as pegged, without washing down BEFORE leaving dieback. | DONT assume machinery is clean. Always inspect before allowing entry. |
| DO construct road to shed water and dry quickly. | DONT construct turn-off drains which result in ponding. |
| DO construct deep table drains to carry run-off swiftly and directly into nearest natural watercourse. | DONT forget to write dieback specifications into contracts. |

SECTION 6

ROAD GRADING

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| DO | peg roads before grading commences. | DONT | grade deeper or wider than prescribed. |
| DO | as much grading as possible in dry weather. | DONT | grade soil from dieback into healthy forest as pegged. |
| DO | clean out table drains when soil is dry. | | |
| DO | clean grader before leaving dieback forest. | | |
| DO | ensure dieback specifications are written into grading contracts and are strictly adhered to. | | |
| DO | include general specification on grading method and operation of the machine (angle of blade etc) to avoid carrying infected earth long distances into clean forest. | | |
| DO | include specification applicable to the individual job. | | |
| DO | provide grader tender with yard broom and small tank, pump and fungicide. | | |

SECTION 7

GRAVELLING

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| DO programme work for December, January, February and March, when soil is dry. | DONT use infected gravel on forest roads except where specified in diseased forest. |
| DO select gravel pits at least 100 m away and upslope from nearest visible dieback disease symptoms. | DONT allow water to pond in gravel pit. |
| | DONT leave infected pits open. Programme them for rehabilitation. |
| DO wash incoming plant before commencement of gravelling. | |
| DO plan haul routes from pit to job to avoid crossing dieback areas. | |
| DO remove vegetation and stumps from gravel pit before carting commences. | |
| DO arrange for sampling and testing of gravel where there is any doubt whether the disease is present. | |
| DO ensure dieback hygiene specifications are included in contracts and are strictly adhered to. | |

NOTE: The above rules should be applied to other materials such as shale and sand.

SECTION 8

PRESCRIBED BURNING

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|---|--|
| DO observe other sections of this manual for hygiene use and operation of machines. | DONT travel through boggy creeks. |
| DO select burn boundaries on well formed hard surfaced roads. | DONT move bulldozers from diseased to healthy forest without cleaning. |
| DO travel vehicles only on hard surfaced roads. | DONT grade roads unless absolutely necessary. |
| DO consider alternatives to grading (i.e. sweeping, slashing, handraking). | |

SECTION 9

FIRE SUPPRESSION

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| DO | complete Controller's Fire Suppression Guide (Dieback) F.D. form 613/77. | DONT | use bulldozers if fire can be suppressed with hand tools. |
| DO | despatch forces along hard-surfaced roads. | DONT | mop up with water from dieback creeks or water points unless copper sulphate is added. |
| DO | ensure plant and vehicles are clean before entry to healthy forest. | | |
| DO | use hand tools to suppress fire where this method will succeed. | | |
| DO | plan firelines to avoid crossing dieback boundaries if bulldozers are used. | | |
| DO | nominate washdown points for incoming and outgoing plant and vehicles. | | |
| DO | ensure washdown on fireline where vehicles are likely to move infected earth into clean forest. | | |

FOR DETAILS REFER TO FORESTS DEPARTMENT JOB SPECIFICATION

DIEBACK NO. 3.

FURTHER READING

1. Forest Focus No. 14.
2. Forests Department Information sheets No. 4 and No. 35.
3. Forests Department Research Papers No. 3 and No. 10.
4. Forests Department Bulletin 85.
5. Forests Department miscellaneous publication
No. 1. "Jarrah Root Rot".