



TreeNote

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Insect pests of eucalypts and pines in the greater than 450 mm rainfall zone of Western Australia

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DEPARTMENT OF CONSERVATION
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WESTERN AUSTRALIA

Introduction

This TreeNote describes the most significant insect pests for eucalypts and pines in southern Western Australia and lists insecticides to control them.

Insects can damage all parts of trees at every stage of tree development. However, most trees are host to a range of insects throughout their life and cope well with minor insect damage. Trees are attractive to insects because they can provide shelter, as well as a range of food sources for larvae and adults. Some insects feed on leaves, while others feed on new shoots, stem tissue, roots, sap, flowers or seeds. Some shelter in or between leaves, while others shelter in or under the bark, or bore holes in the wood.

Insect numbers are controlled by a number of factors, including availability of food, predators and parasites, environmental conditions (especially temperature and moisture), and the trees' own defences. Because these factors vary through time, insect numbers can fluctuate widely, occasionally producing a population explosion. When large numbers of insects attack trees, they can have a serious effect on tree growth or wood quality, and may even kill the trees.

Insect damage is often most severe on trees which are under stress, perhaps in response to high sugar levels in their sap. Healthy, vigorous trees are less prone to damaging insect attack. In other words, "The best insecticide is a healthy tree!"

Economics of insect control

Little is known about the economics of controlling most insects that damage trees. Decisions to spray insecticides often have to be made without a complete understanding of the economic benefits of spraying, or the economic consequences of not spraying. Some insects are probably not worth spraying because they do little or no harm to the tree's wood quality or growth rate.

To improve our decision making about when and how to spray, we need a better understanding of:

- Insect numbers;
- insect life cycles;
- the most effective time to intervene with insecticides;
- the effect of insect attack on commercial timber production;
- thresholds for economic damage or insect numbers which justify intervention; and
- alternative management options to reduce insect numbers or damage.

Common insecticides

Commonly used insecticides include:

- alpha-cypermethrin (examples, Dominex 100[®], Fastac 100[®]);
- maldison (example, Malathion[®]);
- carbaryl (example, Bugmaster[®]);
- chlorpyrifos (example, Lorsban 500[®]);
- dimethoate (example, Rogor 400[®]).

Addition of an emulsifiable, oil-based wetting agent and anti-evaporant such as D-C-Trate[®] often improves the effectiveness of insecticides.

Consult an adviser for advice on chemicals and application rates (see last page).

Caution – permits needed!

None of the insecticides named in this TreeNote are registered for forestry use against these specific insects. For 'off-label' use, obtain a permit from the National Registration Authority.

Contact Chris Sharpe, Senior Chemicals Adviser in Agriculture Western Australia's Chemical Services Section for advice on permits.

Phone (08) 9368 3815, fax (08) 9474 2408.

Continued overleaf...

Insects affecting both eucalypts and pines

Wingless grasshopper (*Phaulacridium vittatum*)

Wingless grasshoppers are a major pest of both broadleaved trees and pines. They feed on green leaves in late spring and early summer and can destroy all of a new planting in a few days.

Spray favoured egg-laying sites (well drained, sandy soils) in spring as the hoppers are emerging, to control their numbers. Once damage is noticed, spray among the trees using a boom spray or mister. Large areas of adjacent paddocks may also need to be treated and more than one application may be required to control new infestations. Organo-phosphate insecticides have been used to control this pest in the past, but some synthetic pyrethroids are now registered for this use and experience shows them to be more effective.

Baits (bran or poultry feed pellets treated with carbaryl or maldison insecticide) are also effective, but must be re-applied after rain. They may be laid around the boundaries of tree lots or at the base of individual trees, and work best when applied to bare ground, where weed control has been effective.

Insecticides: alpha-cypermethrin, maldison, carbaryl.

Rutherglen bug (*Nysius vinitor*)

This sap-sucking insect has caused severe damage to newly planted pines and eucalypts.

Spray with either an organo-phosphate or synthetic pyrethroid. More than one application may be required to control new infestations.

Insecticides: alpha-cypermethrin, dimethoate.

Weevils: vegetable weevil (*Listroderes difficilis*) and garden weevil (*Phlyctinus callosus*). Apple weevil (*Otiorynchus cribricollis*) also affects pines.

There are several introduced species and at least 40 native weevil species in Western Australia. Serious foliage damage has been recorded on a wide variety of trees, in spring and summer.

Synthetic pyrethroids are effective against weevils. For species that hide during the day and feed at night, spray in the late evening or at night to ensure they come in contact with the insecticide.

Insecticides: alpha-cypermethrin.

Cutworm (*Agrotis* spp.)

Western Australia has several species of cutworm. They can cause severe damage to newly planted seedlings by chewing through the stem at ground level. Most damage occurs at night when the cutworms emerge from just beneath the soil surface.

Insecticides: alpha-cypermethrin.

Insects affecting eucalypts

Spring beetles (*Liparetrus* spp., *Calpochila* spp., *Heteronyx* spp.)

The general name spring beetle includes several leaf-eating scarab beetle species that are active in spring and early summer. Heavy infestations have caused complete defoliation of established trees. Most of these beetles, if not all, are highly mobile, making control difficult, as the insects are able to re-infest after spraying.

Synthetic pyrethroids have been successful in controlling this group of insects. Adding dimethoate to the spray provides some residual activity.

Insecticides: alpha-cypermethrin + dimethoate.

African black beetle (*Heteronychus arator*)

African black beetle can cause high mortality in eucalypts. However, it is confined to moist areas where perennial grasses occur and sites where annual ryegrass (*Lolium rigidum*) predominates. Adult beetles eat bark from the base of trees; larvae (less commonly) eat the roots. The adult is most active from July to the end of September.

Successful control has been achieved by mixing chlorpyrifos and alpha-cypermethrin or chlorpyrifos and dimethoate and spraying with high water rates (more than 200 L/ha) along the rows of trees.

Insecticides: chlorpyrifos + alpha-cypermethrin, chlorpyrifos + dimethoate.

Autumn gum moth (*Mnesampela privata*)

This insect is responsible for widespread and commercially significant damage to *E. globulus* plantations in eastern Australia. It can be identified by its habit of joining two or more apical leaves together with a web-like secretion to make shelters, in which it congregates by day. In a severe infestation trees are totally defoliated, leaving only the shelters. The larvae, which cause the damage, are active from April-May through winter into spring. Control of autumn gum moth must occur when larvae are small (1st, 2nd and 3rd instar, or growth period). However, 80 per cent of damage occurs in the 4th and 5th instar stages, by which time treatment is ineffective.

Although autumn gum moth has been recorded in all areas where *E. globulus* is grown, it has caused significant damage to only isolated *E. globulus* plantations in Western Australia. However, there are signs that populations may be increasing to the extent that widespread defoliation could occur in south coast plantations.

Spray with a mixture of dimethoate and alpha-cypermethrin.

Insecticides: dimethoate + alpha-cypermethrin.

Leaf blister sawfly (*Phylacteophaga froggatti*)

This small wasp, with an orange head and thorax and black abdomen, was first found in Western Australia in 1978, but is now spread throughout the South-West. Its larvae damage certain species of eucalypt by mining beneath the upper leaf surface and pupating in the blister. Serious defoliation of *E. globulus* has occurred in recent years.

Control by spraying with a mixture of dimethoate and alpha-cypermethrin.

Insecticides: dimethoate + alpha-cypermethrin.

Chrysomelid beetles (*Paropsis* spp., *Cadmus* sp., *Chrysopharta* spp., *Trachymela* sp.)

Several species of *Paropsis* and *Chrysopharta* occur in Western Australia. Although they are significant pests of eucalypts in Tasmania, the first significant defoliation in Western Australia was in 1996, by one of the *Chrysopharta* species.

Spraying with a synthetic pyrethroid is effective.

Insecticides: alpha-cypermethrin.

Weevils (*Gonipterus* spp., *Catasarcus* spp., *Oxyops* spp.)

Native weevils have recently been recorded causing significant damage to *E. globulus* plantations. There are two generations a year: spring and summer.

Gonipterus is a major pest of eucalypts in many overseas countries. Both the adults and larvae of *Gonipterus* are leaf feeders, preferring newly expanded leaves. Adults chew the edges of leaves, but larvae cause most damage by eating one surface of a leaf, leaving a characteristic track. In *Catasarcus* weevils it is the adult that causes damage.

Control with a synthetic pyrethroid.

Insecticides: alpha-cypermethrin.

Pasture day moth (*Apina callisto*)

The larval stage of the pasture day moth has been known to cause foliar damage to eucalypts.

Spraying with a synthetic pyrethroid is effective.

Insecticides: alpha-cypermethrin.

Leaf tier moth (Family: Decophoridae)

This insect is commonly found on eucalypt species and feeds on the growing tips, especially in spring and summer. The small caterpillars are found inside shelters made by rolling or joining the uppermost leaves. Although there has been no mortality of trees recorded, this insect has the potential to deform trees, reducing their commercial value.

Leaf tier moth can be controlled with a mixture of dimethoate and alpha-cypermethrin, but spraying is only partially effective because some of the insects are shielded from the spray.

Insecticides: dimethoate + alpha-cypermethrin.

Blue gum psyllid (*Ctenarytaina eucalypti*)

Blue gum psyllids are widespread, feeding on the tips of *E. globulus*. However, since no tree deaths have been recorded so far, it is not known how serious a pest it is. Trees that are stressed appear to suffer larger infestations than trees that are growing vigorously.

Insecticides: Under evaluation. Alpha-cypermethrin mixed with dimethoate is likely to give control.

Insects affecting pines

Native budworm (*Helicoverpa punctigera*)

Heavy infestations of the larval stage of native budworm can cause severe damage to pines. Damage to eucalypts is uncommon, but has been reported in *Corymbia maculata*. As annual plants dry off in spring and early summer the caterpillars move onto the stems of young trees. They eat the foliage and strip the bark, often killing the trees.

Insecticides: alpha-cypermethrin.

Things to note

- Use application rates specified on the label, or on your permit for off-label use.
- Follow label recommendations for handling and environmental care.
- Avoid contaminating waterways as most insecticides are highly toxic to crustaceans and fish. Don't spray within 20 m of a dam, lake, stream or river.
- Avoid spraying near apiaries as insecticides will kill bees.
- Notify your neighbours before spraying. If you intend spraying within 15 m of your boundary, give neighbours at least 24 hours notice of your intention to spray and seek their permission before proceeding.
- Avoid spraying in conditions that result in spray drift.
- Training in chemical application (mandatory for commercial operators) is available through Farmcare Australia. Phone/fax Terry O'Beime (08) 9341 5325 or course coordinator Rick Madin and Associates: phone (08) 9647 1060, fax (08) 9647 1096.
- Where possible, use Integrated Pest Management to control pests by means other than insecticides alone. For example, some management practices can stop insect populations building up to levels that cause damage. Occasional selective spraying is less damaging to the environment than frequent broad scale spraying.

Things to Note *continued*

- Guidelines for insect control are contained in the Code of Practice for Timber Plantations in Western Australia (released July 1997), available from CALM and Australian Forest Growers.

Further reading

- 'Insect pests of eucalypts - on farmland and in plantations in south-eastern Australia'. CSIRO Publishing, 150 Oxford Street, Collingwood Victoria 3066. Tel. 1800 645 051 Fax (03) 9662 7555. Cost: \$24.95 plus \$8 postage and handling.
- Farmnote No. 62/90 'Wingless grasshoppers and their control'. Agriculture Western Australia.
- Farmnote No. 116/84 'Insect pests of eucalypts and other native plants'. Agriculture Western Australia.
- 'Insects, diseases and deficiencies associated with eucalypts in South Australia' by Charlma Philips. Book: colour, 160 pages. Forestry SA, PO Box 162, Mount Gambier, South Australia 5290. Tel. (08) 8724 2888 Fax (08) 8724 2870. Cost: \$25 plus \$1 postage and handling.

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Other TreeNote titles

Other TreeNote titles are available from south-west and south coast offices of Agriculture Western Australia, and the Department of Conservation and Land Management. You may also access them on the Internet (see front page) or by AgFax (dial 1902 990 506, and choose subject number 30899).

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