Forest Health Bulletin

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Stem Boring caterpillars

The caterpillars of some species of swift moth bore into the cambium of Eucalypts, which often results in stem defect and breakage. The most common species found in the drier areas of Tasmania is the Splendid ghost moth, A*enetus paradiseus.* The caterpillars form vertical tunnels in the centre of stems and trunks with a horizontal tunnel connecting it to the entrance so that it forms an inverted hockey stick in shape.

The entrance is often located close to a branch fork. Larvae feed on the bark regrowth around the tunnel entrance where they form a plate-like cavity. The entrance to the tunnel is covered with coarse-grained frass (sawdust) and bark pellets on a silken webbing.

Fig 1 webbing covering hole

Fig 2 hole exposed

Wood moths are currently minor pests. However they have the potential to become more important pests of *E. nitens* and *E.globulus* plantations. The tunnelling can cause structural weakness and may also have major adverse effects on wood quality, particularly in plantations managed for sawlog / veneer. Severe attack can result in tree mortality. However such attack is very uncommon in Tasmania.

Phosphorus deficiency in pines

Symptoms of phosphorus deficiency in pines are widespread throughout Tasmania, and once phosphorus levels in the foliage drop below about 0.1%, symptoms become visible.

In older trees, crowns are often thin and narrow as normal height growth occurs while the stem diameter is retarded. Generally only 1-2 seasons needles are retained, and where deficiency is severe, the foliage takes on a grey-green colour, and top dieback is common.

Fig 3 comparison of thin and healthy crowns

Younger trees usually have yellowed and shortened tip needles at the ends of shoots. This makes them look as though the ends of the shoots have been pruned.

Fig 4 young P def pines

FIG 5 close-up of shortened needles

Fused needles are commonly observed in phosphorus deficient stands. Fused needles are thought to result from a nutrient imbalance with a range of nutrients including calcium, copper and boron, and are not specific to phosphorus deficiency. Individual needles in a fascicle fail to separate.

Phosphatic fertilisers should be applied within 2-3 months of planting, and in areas with low soil phosphorus the plantations usually require an additional application mid-rotation.

Fig 6 close-up of fused needles

Hot topics in Forest Research

Artificial Defoliation Trial

The insect pests group has been busy over the summer trying to imitate insect defoliation of young trees with juvenile foliage by *Chrysophtharta agricola* so they can measure the impact of defoliation on tree growth. An *E. nitens* plantation in Swanport, planted in 1999 was selected for the trial. The response of these one-year-old trees to defoliation will be used to model the impact of populations of autumn gum moth, *Mnesampela privata*, and the southern leaf beetle, *Chrysophtharta agricola*, on growth of plantation *E. nitens*. A similar study is being carried out in Victoria on *E. globulus.*

Trees were selected between 1.5 and 2 m tall, and initial measurements of diameter and height taken. They were defoliated at five different levels: 25%, 25% plus disbudding (removal of regrown foliage 6 weeks later), 50%, 50% plus disbudding and 100%. One set of trees was defoliated in December to mimic early season defoliation. Another set was defoliated in February to mimic late season defoliation. Extra 25% defoliations were carried out so they can be defoliated again next summer. The 100% defoliation was done in stages and the leaves weighed and some leaf areas measured to confirm the actual percentage of total foliage removed.

Forestry Tasmania

Fig 7 100% defoliated tree

Fig 8 recovery 6 weeks later

Before and after the February defoliation, the rates of photosynthesis were measured on a selection of trees. Although we do not yet have any results of the effect of defoliation on tree growth, we have some interesting preliminary results of the photosynthetic response of the trees to the different levels of defoliation. The 25% defoliated trees had the same photosynthetic level as the undefoliated (control) trees, while the 50% and particularly the new leaves on the 100% defoliated trees increased their

Fig 9 recovery 12 weeks later

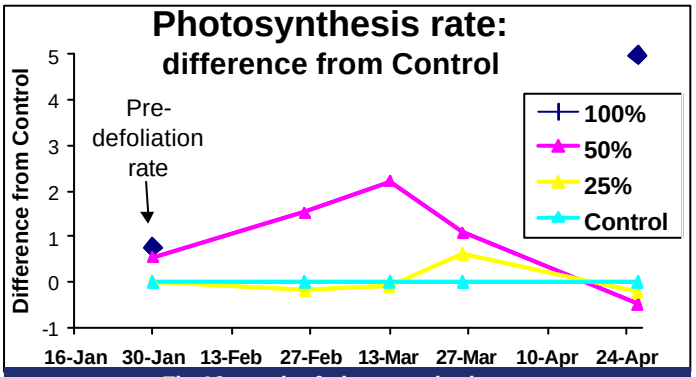

Fig 10 graph of photosynthetic rate

We expect this increase in photosynthetic rate to partially but not completely compensate for the loss of leaf area, resulting in a net loss of growth in diameter and height of the trees. Over the next few years these growth parameters will be recorded.

A previous defoliation trial in 2 – 3 year old *E. nitens* trees found that the more severe defoliation levels reduced the growth rate of the trees for fours years following the defoliation. Although the rate of growth recovered after four years, the defoliated trees never made up the lost growth so they were always one or two seasons behind the undefoliated trees. Contact: Jane.Elek@forestrytas.com.au

Forest Health Surveillance Update

The intensive health status surveys of the 1999-planted eucalypts have been completed in all Districts except Derwent. An increased incidence of stem forks were noticed in the high altitude compartments in Bass, which was attributed to wind exposure. In the far north-west, *E. globulus* plantations were all infected with *Mycosphaerella nubilosa* at varying levels. Fungicide trials and on-site management (early weed control and secondary fertilising) will be carried out during the next 12 months to develop a management regime that will keep infection levels below that where economic damage occurs.

What to Look for this Autumn/Winter

Jane Elek - Moths of the Gum leaf skeletoniser start laying their eggs from February and those of the autumn gum moth from about March in the warmer areas of the state. The eggs are usually laid on leaves in the lower crown of eucalypt trees.

Eggs of the skeletoniser are tiny and circular in shape. They form large rafts of 50 - 300 eggs with a metallic sheen; often several females lay their eggs right next to one another forming one huge raft.

Autumn gum moth eggs are slightly larger, more cylindrical in shape, and are laid in smaller rafts of 10 – 150 eggs; the eggs darken from pale green as they mature and often spread out a bit as the leaf expands. Eggs that are parasitised by tiny wasps turn black and hatch later than the others.

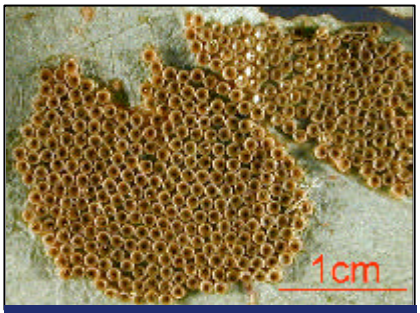

Fig 11 skeletoniser eggs

Fig 12: healthy and parasitised eggs

Both species may start hatching in about April, depending on the weather, often with a burst of hatching after a good rainfall. The skeletoniser larvae are tiny, forming a furry surface on the leaf, and start feeding in their batches skeletonising the leaf surface (see FHB no 4 for illustration and more details). The autumn gum moth larvae which are smooth, brown-green in colour, with a pair of cream spots on their back, also start skeletonising the leaves (see FHB no 3 for illustration and more details). If you want to protect your trees from damage, it is important to recognise and monitor the numbers of eggs and young larvae on your trees during the early stages of their attack, before they do too much damage. By the time the damage is obvious in the spring, most of the damage has been done and it is not cost effective to control the population.

References

Elliott, H. J., Ohmart, C.P., Wylie, F.R. (1998) *Insect Pests of Australian Forests: Ecology and Management.* Inkata Press, Melbourne

Will, G. (1985) FRI Bulletin No. 97 *Nutrient Deficiencies and Fertiliser Use in New Zealand Exotic Forests.* Forest Research Institute, NZ Forest Service, Rotorua

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