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Tuart decline

RESEARCH FINDINGS

Eucalyptus gomphocephala

Tuart Bulletin No.4 A series outlining key research findings associated with tuart health in south-west Western Australia

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The impact of a foliar pathogen on tuart revegetation

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Tuart is regarded as one of the eucalypts that relies largely upon fire for successful recruitment in native stands. As mature stands of tuart at Yalgorup continue to decline, successful recruitment in the remaining stands will become increasingly important.

In the last two years, one of the most common and destructive foliar pathogens of eucalypt plantations in the south-east of Australia, *Mycosphaerella cryptica*, has been observed in many regenerating stands of tuart. Occasionally the disease is so severe that it contributes to the death of individual seedlings. Has this pathogen always been present in young stands of tuart or is it a recent introduction?

Research carried out on tuart seedlings (Keene and Cracknell 1972, Fox and Curry 1980) did not mention foliar damage attributed to *M. cryptica* or any other fungal pathogen. Keene and Cracknell (1972) made note of malformation of seedlings due to insect attack. Fox and Curry (1980) examined young stands of tuart at a number of localities and listed damage to leaves from a range of insects, including the tuart miner (*Nepticula* sp.), leaf blister sawfly (*Phylacteophaga froggatti*), and sawfly larvae (*Perga* spp.).

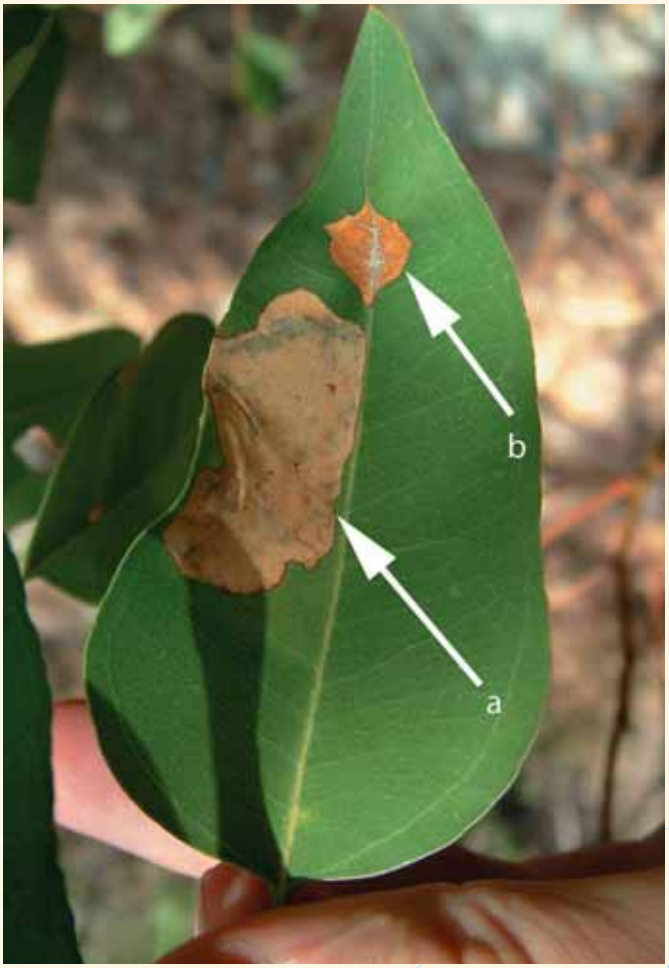

Figure 1: Foliar damage to tuart caused by (a) Leaf Blister Sawfly (Phylacteophaga frogattii) and (b) Mycosphaerella cryptica.

They noted that leaf damage from insects was present at most sites with epicormic shoots most affected. It is likely that some of these observations were in fact of damage caused by *M. cryptica* as the damage can appear somewhat similar to that caused by insects (Fig. 1). *Mycosphaerella cryptica* causes extensive necrosis, particularly on young, soft, juvenile foliage, and is characterised by a distinctive buckling of the leaf (Fig. 2).

The presence of *Mycosphaerella* on eucalypts in Western Australia was first recorded by Abbott *et al*. (1993). They assessed damage caused by insects and fungi to foliage of *E. marginata* (Jarrah). Disease symptoms described for this fungus were characteristic of those produced by *M. cryptica*. Carnegie *et al*. (1997) carried out surveys of plantations and natural and coppice regrowth forests of south-western Australia to collect leaf spot fungi. They found new records of three species, *M. marksii*, *M. suberosa* and *M. cryptica* during these surveys. *Mycosphaerella cryptica* was collected from *E. diversicolor* (Karri), *E. marginata* and *E. patens* in native forests, and was observed to cause moderate levels of damage in the latter two species.

Surveys and isolation

Tuart regeneration at sites in Ludlow, Yalgorup National Park and Yanchep, were intensively surveyed for the presence and impact of *M. cryptica* in 2006. *Mycosphaerella cryptica* was the only species isolated from the diseased leaves at all three sites. The most severely impacted site was Yalgorup National Park with up to 25 per cent incidence (percentage of leaves infected) and severity (percentage of leaf area infected). The level of disease was lowest at the Ludlow site, where the lowest desity of tuart stems were present. Dense growth creates a favourable microclimate for the spread and infection of the fungus which can occur by rain splash or wind.

Figure 2: Damage to the leader of a regenerating tuart caused by Mycosphaerella cryptica.

Assessment on ash bed trial

The presence of *M.cryptica* was confirmed from foliar lesions on seedlings that had only been growing in the field for 12 weeks. Over the subsequent 12 month period the severity of *M. cryptica* increased across the trial and in some cases reduced seedling growth (Fig. 3). A range of phytophagous insects were also detected during the 14 months. However, during the final assessments crinkle leaf was the most dominant category of damage.

Figure 3: Main stem of a young tuart seedling damaged (arrowed) by M. cryptica*, resulting in loss of apical dominance.*

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