BOTRYOSPHAERIA CANKER AND DIE-BACK OF *EUCALYPTUS*

INTRODUCTION

Botryosphaeria canker and die-back is one of the most important diseases of *Eucalyptus* spp. in South Africa. This disease is caused by the fungal pathogen *Botryosphaeria dothidea*. It is known in many parts of the world and is commonly associated with canker and die-back symptoms on woody plants. The fungus is best known as an opportunistic pathogen that manifests itself under conditions of environmental stress. In South Africa, these stress symptoms include drought, late frosts, cold and hot winds, branch pruning and insect damage.

SYMPTOMS AND OCCURRENCE

A wide range of symptoms have been associated with *B. dothidea* infection on *Eucalyptus* species. A common manifestation of infection is death of tree tops. This can lead to infection of the pith and a core of discoloured wood surrounded by a healthy sheath of outer wood that often extends throughout the entire length of the tree. This symptom is common on *E. grandis* or clones of this species and often develops after trees have been exposed to hot winds. A similar symptom is found in *E. nitens* after growing tips of young (one to two year-old) trees have been damaged by late frost.

One of the most serious symptoms associated with *B. dothidea* infection is the development of stem cankers. These cankers are most common on trees stressed by drought and are characterised by stem swelling, bark cracks and exudation of copious amounts of black kino. In severe situations, similar symptoms are found on lateral branches and stems often break at the sites of the cankers.

Trees under stress and showing signs of *Botryosphaeria* cankers are also often infected by the mild pathogen *Endothia gyrosa*. Typical symptoms of *E. gyrosa* are cracks in the bark, partcularly at the bases of trees. On closer examination and particularly under moist conditions, these cracks have a yellow/orange colour and a raised surface due to the presence of the fruiting structures of the fungus. Bark cracks associated with *E. gyrosa*, in some cases, appear to penetrate to the cambium and to result in kino exudation. These cracks are often also sites for secondary infection by *B. dothidea*.

MANAGEMENT STRATEGIES

Management of losses due to *B. dothidea* are complicated by the fact that the pathogen manifests itself when associated with a wide variety of stress factors. There is also substantial contemporary evidence to show that the pathogen infects healthy leaf and stem tissue without giving rise to any symptoms, and that it remains in a latent phase until this tissue becomes stressed. There is, however, also good evidence to suggest that different clones of *E. grandis*

Lesion associated with infection of young tissue.

HOST RANGE

Botryosphaeria dothidea has a wide host range amongst woody plants and has been recorded on all species of *Eucalyptus* commonly propagated in South Africa. One of the most susceptible species appears to be *E. camaldulensis* that is commonly used as a parent species in hybridisation with the most commonly planted species, *E. grandis*. Clones of *E. grandis* also appear to differ in their susceptibility to *B. dothidea*, although the basis of this susceptibility is not understood.


Infection and die-back after frost.


Dead wood at centre of infected tree.

Some *Eucalyptus* trees and clones develop *Botryosphaeria* cankers around branch knots. In these cases, trees fail to heal at sites of branch abscission and soft pockets of kino develop around the bases of the branches. These kino pockets persist in the wood and render it unacceptable for saw timber production.

Insect damage is also associated with infections of *B. dothidea*. One of the most serious occurrences of this association is between the fungus and a native ambrosia beetle. In this situation, the insect bores into the wood of susceptible clones and provides an entry site for *B. dothidea*. The fungus then causes a dark discolouration of the wood and kino pocket development.

differ in their susceptibility to *B. dothidea* and considerable opportunity exists to select clones that have a high degree of tolerance to it. Losses can be reduced by early detection of disease and the planting of disease tolerant species or clones.


Differences in the susceptibility of clones.


Rough bark and fruiting structures associated with *Endothia*.

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