

16-016

INTRODUCTION OF NATURAL ENEMIES FOR BIOLOGICAL CONTROL OF THE EUCALYPTUS LONGHORNED BORER (COLEOPTERA: CERAMBYCIDAE) IN CALIFORNIA

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An encyrtid egg parasitoid, *Avetianella longoi*, and four braconid larval parasitoids, *Syngaster lepidus*, *Callibracon limbatus*, *Jarra phoracantha*, and *Jarra maculipennis*, have been imported into California from Australia and established in rearing colonies for mass production and release. Releases of *A. longoi* and *S. lepidus* have been conducted in coastal and inland areas and it appears that *A. longoi* has become established in several sites. This parasitoid can be reared in large numbers in laboratory colonies; female fecundity is ca. 200 eggs and development from egg to adult takes < 17 days at 25 °C. Females are very efficient at finding suitable beetle egg masses in the field with a mean parasitism rate of >90%. There are indications that *S. lepidus* has also established in at least one site but research releases of the larval parasitoids will continue to be made. Progress is slower with the larval parasitoids than with *A. longoi* because of more labor-intensive rearing procedures, longer developmental times, and more difficult field detection and evaluation methods. Once the natural enemies are established, the combined effect of improved cultural management of established trees, planting of more resistant *Eucalyptus* species, and biological control should reduce the amount of tree mortality caused by the beetle.

16-018

PESTS AND DISEASES IN PLANTATION *EUCALYPTUS*: A GLOBAL PERSPECTIVE

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The intensive propagation of various *Eucalyptus* species as exotics in plantations is a growing trend in many parts of the world. Currently, in excess of 8 million hectares have been planted to these trees outside their native range. These plantations have thus become a major source of timber and particularly pulpwood, internationally. Numerous insect pests and diseases have resulted in serious losses to these plantings in many parts of the world. These include both pests that are known to occur on eucalypts where they are native, and others that are endemic to areas where these trees are being planted as exotics.

All indications are that losses due to pests and diseases in plantation eucalypts will continue to increase substantially in the future. Many factors will contribute to this situation which, in the longer term, will significantly complicate the propagation of these trees. New introductions of pests and pathogens are being recorded regularly. This trend will most likely continue due to increased international trade and tourism and the difficulties associated with the application of effective quarantine. Fascinating examples are also beginning to emerge, where relatively host specific pathogens of other myrtaceous genera have apparently adapted to virulence on *Eucalyptus*. These "new" pathogens not only threaten exotic plantation trees, but also *Eucalyptus* species in their native range. In this presentation, I will outline examples of these emerging trends that, in my view, not only threaten commercial forestry, but also global forest biodiversity.

16-017

CONTROL OF THE EUCALYPTUS SNOUT BEETLE *GONIPTERUS SCUTELLATUS* GYLLENHAL IN CALIFORNIA BY THE EGG PARASITOID *ANAPHES NITENS* (GIRAULT) (COLEOPTERA: CURCULIONIDAE - HYMENOPTERA: MYMARIDAE).
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The Eucalyptus snout beetle *Gonipterus scutellatus* Gyllenhal is a serious pest of Eucalyptus in many areas of the world. It was first detected in California in spring of 1994, and, as in other countries, it spread quickly from the original site of infestation. A biological control program was rapidly developed, using the egg parasitoid *Anaphes nitens* (Girault), with the first parasitoid releases occurring in early fall of 1994. One year later, densities of all life stages of the beetle at release sites had decreased dramatically, to the extent that beetles were difficult or impossible to find. Furthermore, defoliation levels had decreased from greater than 80% before releases to less than 10%, and are still dropping. Further work in 1996 will concentrate on releasing parasitoids at new sites of infestation. The high efficiency of the parasitoid and its rapid deployment once beetle populations were detected may prevent the beetle from becoming a serious pest in California.

16-019

POTENTIAL ROLE OF ENTOMOPATHOGENS IN THE CONTROL OF EUCALYPT DEFOLIATORS.

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Commercial utilization of *Eucalyptus* spp. is a major component of the Australian rural economy. Historically, commercial eucalypts have been defoliated by a complex of leaf feeding beetles and moths which results in reduced growth and yields and delayed harvest.

Current control relies on the use of insecticides which, though effective, destroy natural enemies and other biota. Furthermore, aerial spraying of forests adds to public concerns about human health and the environment.

We report on the natural occurrence of entomopathogenic nematodes and fungi as components in the natural biocontrol of paropsine chrysomelids and the potential deployment of strains of local *Beauveria* and exotic *Metarrhizium* as biocides for the control of adults and larvae of a major pest, *Chrysophtharta bimaculata*.