

Mundulla Yellows – Solving a thirty year riddle

Multi-Regional Projects in Victoria

Project 202247

Project Background

Mundulla Yellows (MY) is a progressive dieback syndrome of *Eucalyptus* and other native species, first reported in the 1970s, in *Eucalyptus camaldulensis* near Mundulla, SA (1).

The first symptom is interveinal chlorosis. This is initially observed in immature leaves on a single branch, and spreads to mature leaves. Symptoms gradually spread throughout the tree, causing the whole canopy to die back over several years or decades, killing the tree. Symptoms predominantly occur in disturbed vegetation, particularly near roadsides and paths (2).

Mundulla Yellows is thought to affect hundreds of thousands of native trees across Australia, having adverse effects on native animals that feed on nectar, pollen and seeds. There is a real risk of irreversible losses of ecosystems and the deaths of irreplaceable iconic river redgums.

After more than a decade of research, the causal agent has not yet been determined.



Close-up of interveinal chlorosis in *E. camaldulensis* foliage, Mundulla, South Australia.

Project Aims

The project is intended to determine the causal factors of the fatal plant dieback syndrome Mundulla Yellows.

It will also work to provide management solutions that will maintain and protect remnant native vegetation, enable the rehabilitation of degraded landscapes and enable successful revegetation.

Key elements of Approach

The role of biotic and abiotic factors in the dieback syndrome, Mundulla Yellows (MY), was investigated by analysing 40 *Eucalyptus camaldulensis*, *E. leucoxylon* or *E. cladocalyx* trees, and soil samples, from ten study sites in South Australia and Victoria, Australia. The team sampled 20 trees from five symptomatic sites, and 20 from five asymptomatic sites.

All 40 trees were tested for the presence of fungi, nematodes, bacteria, phytoplasmas, viruses and virus-like organisms. Insects were collected from tree foliage and understorey vegetation to investigate the presence of pests and disease vectors at each site. Topsoil and subsoil was collected from each individual tree, as well as a bulk topsoil sample from each site, and soil properties and chemistry were assessed. Foliage chemistry from all 40 trees was also investigated. To determine the possible cause of MY, the results of biotic and abiotic testing were compared between the 20 symptomatic and 20 asymptomatic trees selected for this study.

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Achievements

The work has determined that the causal agents of MY are abiotic and linked to soil.

Preliminary management strategies are now being trialed and working successfully. This is the first time that symptoms have been reversed and indicates that treatment of MY is possible.

Geelong City Council and some private landholders have adopted preliminary management strategies to control MY-affected trees.

The first manuscript resulting from the preliminary work on MY "*Investigating the presence of biotic agents associated with Mundulla Yellows*" has been published in the international journal *Plant Disease* (3).

The second manuscript resulting from the work on MY, *Soil properties associated with the tree decline 'Mundulla Yellows'*, has been accepted by the international journal *Plant and Soil* (4).

ABC Television's *Landline* covered the Mundulla Yellows project on 25 September 05. The transcript is available at:
www.abc.net.au/landline/content/2005/s1464473.htm

The bigger picture

Over the next year the MY research team will investigate the role of water in MY and test the hypothesis that increasing atmospheric carbon dioxide is associated with MY and possibly with other tree declines.

References

- (1). Hanold D, Stukely M and Randles, J. W. (2002). Mundulla Yellows – a new tree-dieback threat. *Landscape magazine*. (Winter): 1-8.
- (2). Mundulla Yellows Task Group. (2004). A Report on MY in Australia. (NRPPC NRMCM). The Natural Resource Policies and Programs Committee. Natural Resources Management Ministerial Council.
- (3). Luck E, Crnov R, Czerniakowski B, Smith I W and Moran J R. Investigating the presence of biotic agents associated with Mundulla Yellows (*in press*, *Plant Disease*, 2006).
- (4). Czerniakowski B, Crnov R, Smith I W and Luck J. Soil properties associated with the tree decline 'Mundulla Yellows'. (*accepted*, *Plant and Soil*, 2006).

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Severely MY-affected *E. leucoxylon* (foreground), near Mundulla, South Australia.



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