Vineyard trellis posts from treated eucalypts

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Introduction

There are over 100,000 hectares of vineyards in Australia with approximately 10,000 hectares of new plantations installed each year. Typically, a vineyard will utilise 500-800 posts per hectare installed in-line as trellising. A significant number of these posts (as high as 15%) require annual replacement due to breakage by mechanical harvesters and fungal decay. Therefore, the annual demand for posts is in excess of 10 million.

In recent years, the conventional CCA and high temperature creosote (HTC) treated *Pinus radiata* post for grapevine trellising has been in short supply. Suitable new pine posts are available as a by-product from the smaller diameter trees when plantations are thinned or clear-felled. Consequently, their availability is governed by other timber demands. Post manufacturers forecast that this shortage will continue for the foreseeable future. Subsequently, vine growers and manufacturers have been forced to look for alternatives.

A number of eucalypt woodlots in the Mallee region and other areas of Victoria and New South Wales have been established to utilise industrial wastewater, treated sewage effluent or irrigation drainage water. These woodlots are grown for the safe disposal of wastewater, which would otherwise cause environmental degradation and water pollution. They have often been planted in wine growing regions, and as the wine industry continues to grow they could be used to supply posts to the local industry for use in grapevine trellises.

To test the suitability of eucalypt species as trellis posts, a number of trees from each species of *Eucalyptus grandis*, *E. globulus* and *E. camaldulensis*, fitting the diameter range for in-line posts, were harvested.

Manufacture of eucalypt posts

Trees were selected from seven year old *E. camaldulensis* woodlots in the Sunraysia\Riverland region of northwest Victoria (Mildura), five year old *E. globulus* woodlot in northern Victoria (Shepparton) and a three year old *E. grandis* woodlot in the Murray Riverina region of southern New South Wales (Deniliquin).

Selected trees were felled using a chainsaw and then docked to the required post length. The posts were then debarked by hand after bruising with the back of an axe.

The posts were removed from the woodlots as soon as possible after debarking and stacked in piles under cover to air-dry slowly. The stacks were covered with hessian to further slow drying. Young fast grown eucalypts need to be treated with preservative before they are suitable for in-ground application and drying of posts is required to facilitate preservative penetration. In addition, slow drying minimises splitting and checking prior to preservative treatment.

Preservative treatment

After three months air drying, the posts were transported to Koppers Timber Preservation Pty Ltd, Grafton, NSW and impregnated with pigment emulsified creosote (PEC). PEC is a highly stable emulsion of high temperature creosote and is capable of withstanding much of the stressing a preservative undergoes during its use for vacuum pressure impregnation of timber. It contains creosote, water, emulsifiers, stabilisers and a micronised pigment. The pigment, which is dispersed through both the oil and water phases of the emulsion, locks the creosote component into the wood structure. PEC-treated timbers usually exhibit dry, oil-free surfaces, making them more acceptable from a health and safety point-of-view (1). This treatment would be desirable in vineyard trellis where the mechanical arms of harvesting equipment can become contaminated by exudates on the posts.

After preservative treatment the posts were air dried for three months and then transported to Mildura. A sample of posts from each species were strength tested at Sunraysia Horticultural Centre and the remainder used to construct grapevine trellises at Lindeman's Winery, Karadoc, Mildura.

Strength testing and evaluation of surface defects

A portable test rig was used with a fixed post clamping facility to measure the strength of individual PEC-treated posts and then compare with the strength of CCA and HTC-treated pine posts (tested in a separate trial). The mean bending strength of *E. globulus* was significantly (at 5% level) higher than that for the CCA and HTC-treated pine posts and the two other eucalypt species (2). All eucalypt species tested were much stronger than CCA-treated pine posts.

Assessment of surface defects showed that no eucalypt post was rejected because of unacceptable knots, however 10% of *E. camaldulensis* and 7% of *E. globulus* posts were rejected due to unacceptable splits. Posts made of *E. grandis* were uniform with no rejections arising from splitting. Considering its age (only 3 years compared with a minimum of 5 years for others), quality and strength, *E. grandis* seems to be the most suitable eucalypt species for vineyard trellis posts amongst species tested.

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L Cookson

26^{th} Forest Products Research Conference

"Research Developments and Industrial Applications"

and

Wood Waste Forum

19^{th}-21^{st} June 2000

Proceedings

CSIRO Forestry and Forest Products
Forest Products Laboratory
Bayview Avenue, Clayton, Victoria, Australia

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(Front Cover: Easton Images - Tel: (03)9873 1073)

ISBN 0 643 06318 8