



*A Manual for Planted Farm Forestry for the
Northern Inland of New South Wales*

Appendix F

Shane Andrews

Dave Carr

Helen Ward

May 2004



Appendix F. Common defects of logs and wood

Information is derived largely from (Hillis and Brown, 1984)

Growth stresses are caused by different tensions on different sides of tree cells, which can cause logs to split after harvesting, when some of these stresses are released. It is more pronounced in young trees of small diameter, and trees in which different parts grow at different rates, such as 'edge' trees. The major defects caused by growth stresses are 'popping' of the ends of logs prior to sawing and 'spring' and 'bow' in boards after sawing both of which are accentuated during drying. Growth stresses can vary enormously within one tree, between trees of the same stand and between trees of different ages.

There is no direct evidence that trees which have grown quickly have greater growth stresses than trees grown slowly. There are several techniques which can minimise or reduce growth stresses in logs and the subsequent products recovered from them. These include, harvesting when growth is slow, harvesting when available soil-moisture is low, girdling prior to harvest (some species), air-drying debarked logs under shade prior to sawing, retaining a 300 mm bark collar at the ends while drying, coating the log ends with bitumen, drying the logs under a constant water spray and even storing in warm, moist manure for several months. Sawing techniques, such as using twin, parallel band saws which release growth stresses on both sides of the log simultaneously, can also minimise the defect caused by growth stresses.

Tension wood

Tension wood is wood growing on branches or trunks growing at an angle away from vertical. The tops of branches often contain tension wood, as does the trunks of "edge" trees leaning out from woodlots or timberbelts. Tension wood can behave differently to surrounding wood when sawn and dried and is prone to high levels of longitudinal shrinkage.

Brittle heart

This is a region of brittle, low strength wood in the central area of the tree. It is caused by differential growth stresses within the tree and can result in a region of weak wood which behaves differently to surrounding tissue.

Kino veins

Kino is a reddish gum that is exuded from Eucalypts. It often runs in veins in the wood leaving large gum-filled spaces in sawn boards. Small veins degrade the appearance value of the timber while larger veins can affect structural strength.

Knots

Knots are the remains of branches that have fallen off or been pruned during growth. They can be "live" or "dead" referring to their state when encased in the wood. Dead knots are often loose. Knots, while a feature in some timbers, can weaken the timber and affect its appearance.

Discolouration and decay

This is usually caused by fungal infection of living or dead wood. Bluestain is a discolouring fungi affecting sapwood and heartwood in some species and is especially prevalent in humid weather. Fungi may enter through wounds in the bark, including pruning wounds. It is advisable to minimise damage to trees when undertaking maintenance operations in the plantation. Pruning operations should not be undertaken within three days of wet weather .

Pinholes

Small holes left by borers in the wood of certain Eucalypts. While not usually a structural problem, pinholes can affect the appearance of the sawn timber. Other wood boring insects such as longicorn beetles can result in large holes in the wood with subsequent structural weaknesses.

Shakes

Shakes occur where the timber separates around the growth rings. It can result in longitudinal splits in sawn boards. Shakes are often caused by different growth stresses in adjacent parts of the wood. Shakes can sometimes be accounted for in sawing.

Collapse and checking

Checking is the splitting along the grain of timber due to differential moisture loss and shrinkage during drying. Collapse involves the collapse of cells during drying which results in an uneven surface on the sawn wood. Collapse can sometimes be corrected by steaming.

Spring

High growth stresses, particularly in fast grown Eucalypts, can cause the end of logs to split and spring back when cross cut. Spring can sometimes be corrected by judicious sawing practice including face cuts and backsawing rather than quarter sawing.