Connect with CRC Wood Innovations

Digital growth stress meters

Devices for measurement of strain release in standing trees and logs, with potential to add value and improve efficiencies in sawmilling, hardwood plantation management, or arboriculture.

The opportunity

Existing stress meters are sold for use in research, measure only surface tension strain release, supply single digital readouts which must be recorded by hand, and are suitable for single measurements on standing trees only.

Our prototypes use digital probes to measure both surface tension relief and inner core compression release, can be used both on standing trees and on sawlogs, and can be downloaded to computer or stored to a memory chip. These increased capabilities provide commercial potential for the instrument as a tool for use in sawmilling, in plantation management, or arboriculture.

Comparison with the industry standard method (CIRAD-Forêt France) show that the growth stress meter is accurate and simpler to operate. New digital electronics permit recording of results so that a number of trees or logs can be tested rapidly and identify those with higher stress levels likely to cause splitting. This makes the growth stress meter suitable for measuring strain in milling situations.

Potential commercial uses for growth stress meters:

Add value and reduce losses during sawlog milling:
- Reduce warping of sawn product by identifying logs with higher internal stress prior to milling, allowing choice of appropriate sawing methods.
- Minimise end splits by monitoring internal stresses during milling. Our prototypes have been used to show that strain within logs can change dramatically during milling, and to obtain accurate measurements of overall strain relief.

Management of hardwood plantations (e.g., eucalypts, beech, ash) more efficiently for increased yields:
- During thinning, the meter can be used to identify standing trees with higher levels of internal growth stress for thinning, leaving the best to grow
- Minimise development of end splits during felling by using internal stress measurements to choose appropriate felling methods
- Manage plantations for generation of superior sawn timber product and increased return on investment in comparison with pulp product.

Advantages over existing methods:
- Easy and convenient to use, accurate and rapid
- Capable of recording multiple digital measurements in the field
- Can be used on cut logs as well as on standing trees
- Enables measurements to be recorded in real time up to 10 times per second, allowing measurement of dynamic response of growth stress release during cutting; this is not possible with existing instruments.

What the CRC seeks:

A collaborator who can supply market knowledge, resources and funds to allow further investigation of the market potential for the instruments, and development of a commercial product for sale.