

THE 'BROWN LINE' AND THE RESPONSE OF BARK TO FIRE

Burning Under Young Eucalypts Project

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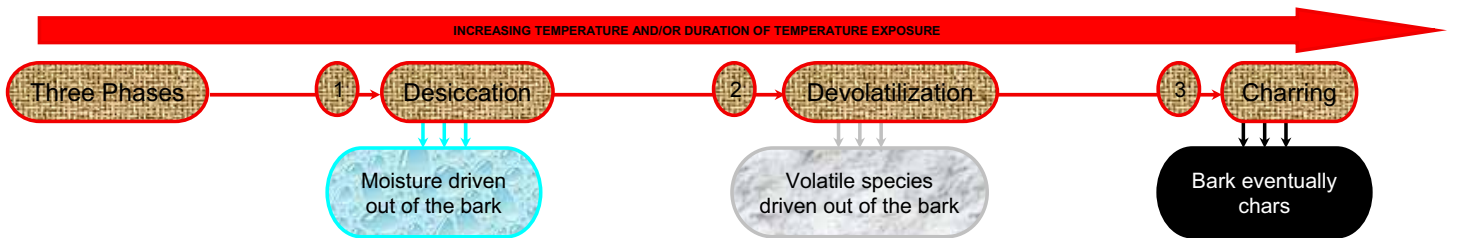
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How does bark respond to elevated temperatures?



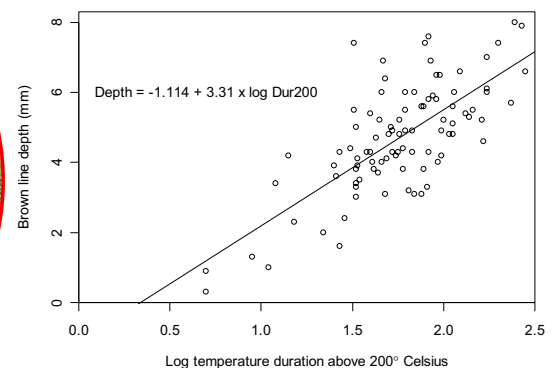
What is the 'brown line'?



The 'brown line' has been personally observed in numerous Eucalypt and Corymbia species that have been exposed to higher than ambient temperatures, such as wild and prescribed fire. This line indicates the depth of cell death in living bark tissue.

Is there a relationship between the depth of the brown line and elevated temperatures?

Experiments were conducted using four thermocouples attached to four trees within a series of plots of young eucalypts due to be burnt. A data logger recorded temperature for each thermocouple at one second intervals. Various parameters of the generated temperature-time curves (max. temp., temp. exposure, & temp. duration) were correlated with the depth of the brown line. The greatest correlation is between brown line depth and log temperature duration above 200°C ($r^2=0.52$). This corresponds to the temperature of devolatilization as described above. Both gum barked and fibrous barked eucalypt species responded in the same way.



What could the brown line be used for?

Post fire analysis: determine intensity and direction of fire front

Predict stem damage/mortality within weeks of fire: aid for forest managers to decide early on the best management option for burnt stand (clearfall v's retain)