

Impact of fire on organisms and ecosystem processes

France-Australia Bushfire Science Workshop
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Optimisation of fuel reduction burning regimes for fuel reduction, carbon, water and vegetation outcomes



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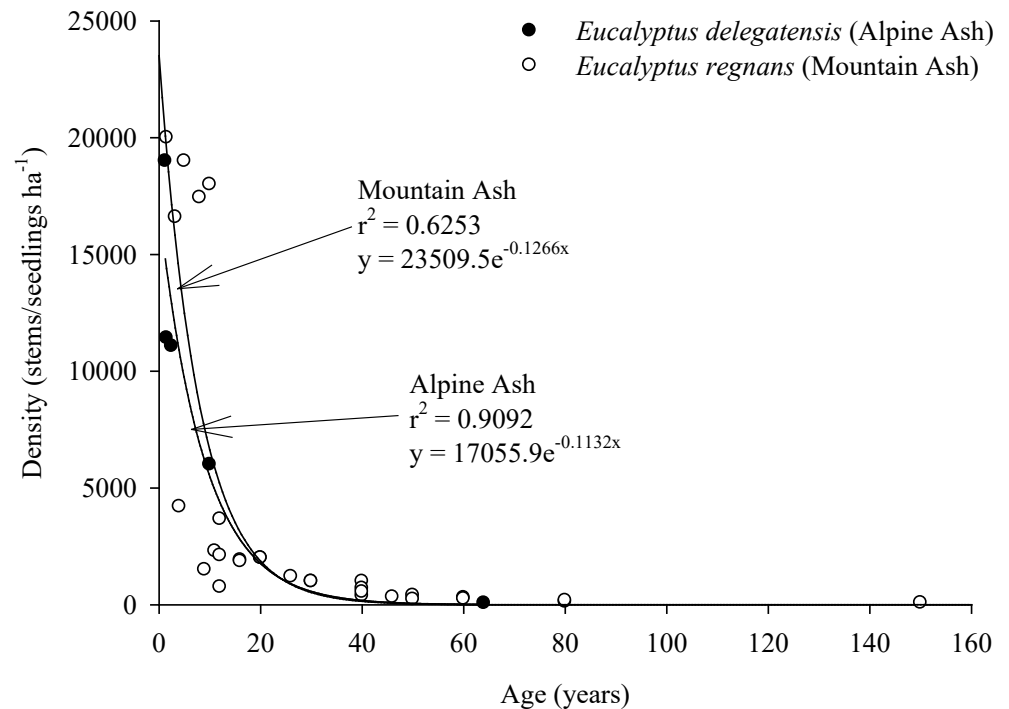
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Images M Jenkins

Gaining new knowledge – the classic response of fire-intolerant trees revisited

- Trees killed when >70% crown scorch
- **Mass germination** – after 2003 fires in Victoria we recorded >12,000 seedlings ha⁻¹; pre-fire densities of 70 stems ha⁻¹
- Fire-intolerant species produce even-aged stands after fire
- Water use by vegetation dictates water yield or run-off from forested sub-catchments



Gaining new knowledge – the classic response of fire-intolerant trees revisited

- Post-fire, a 5% change in water use may result in a 20% reduction in streamflow
- This effect may last for many years
- Forests and catchments are managed accordingly
- New research shows Tasmanian subspecies of *E. delegatensis* can recover by resprouting (Rodriguez-Cubillo *et al.*, 2020)
- Tree recovery is size-limited

Gharun *et al.* (2013)
Forest Ecology & Management 304, 162-170

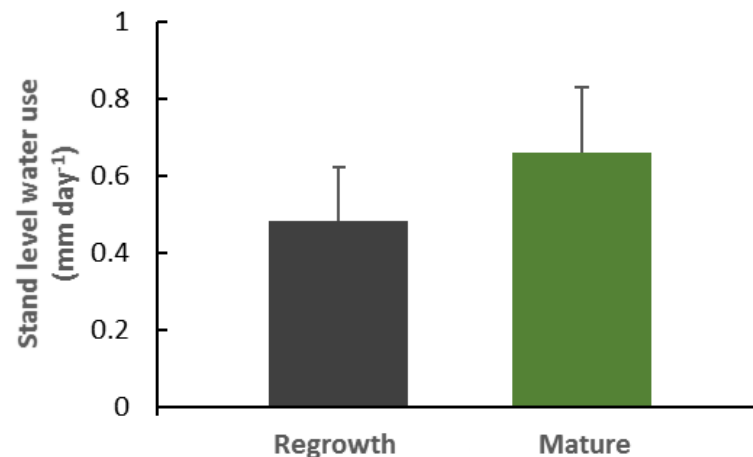
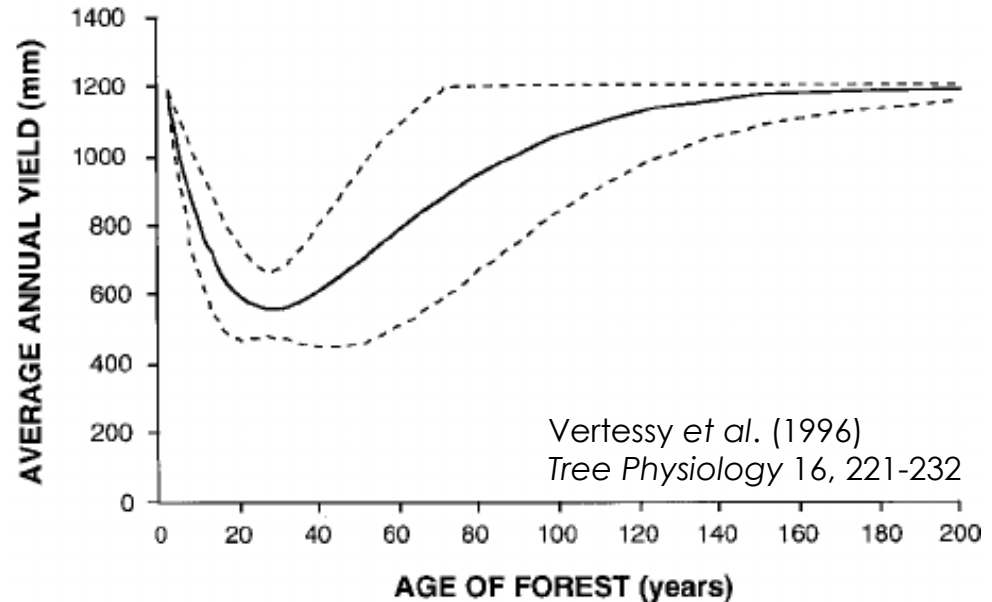


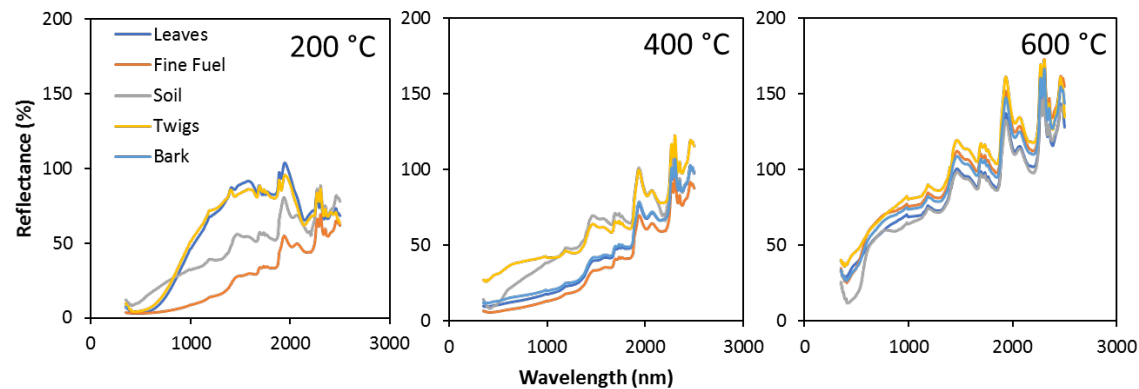
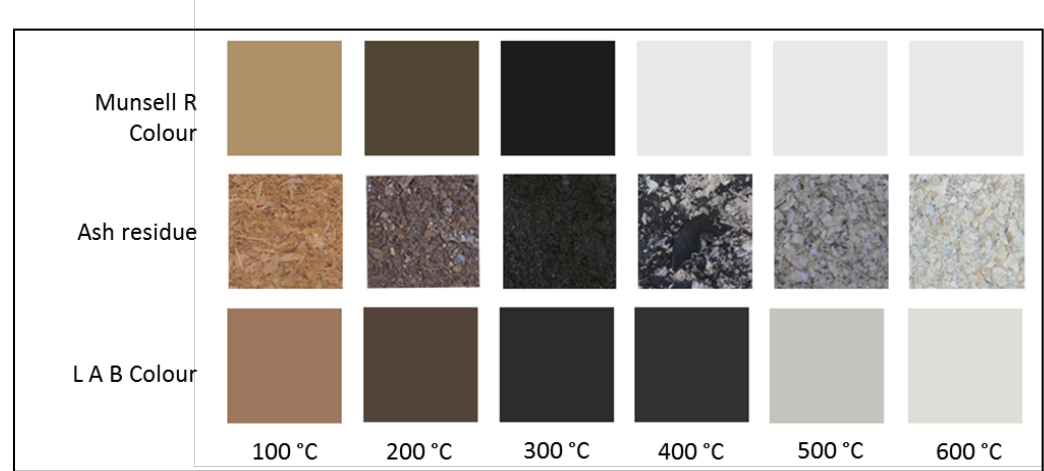


Image D Parnell



Using new technologies – measuring fire severity in multiple ways

- Burn severity mapping using multispectral imagery: satellite/aircraft/drone
- **Ground truthing** – burn edges, ash colour and depth; percentage of exposed mineral soil and litter cover; diameter of smallest stem; scorch height; water repellency
- Near infrared spectroscopy of ash as an indicator of temperature of formation



Parnell, Bell, Possell (*unpublished data*)