

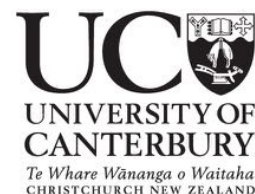
# Breeding durable eucalypts

Luis Apiolaza, Clemens Altaner, Jackley Li & Nick Davies

School of Forestry | Kura Ngahere

University of Canterbury, Christchurch

New Zealand | Aotearoa



# Where are we?

Madrid

Barcelona

Montpellier



Woodville trial

Lawson's trial



# Motivation





tamaidulensis

tricarpa

globoides

serotima

tamaidulensis

cladocalyx

tamaidulensis

tricarpa

quadrangulata

macrorrhyncha

eugenoides

bosistoana

quadrangulata

macrorrhyncha

eugenoides

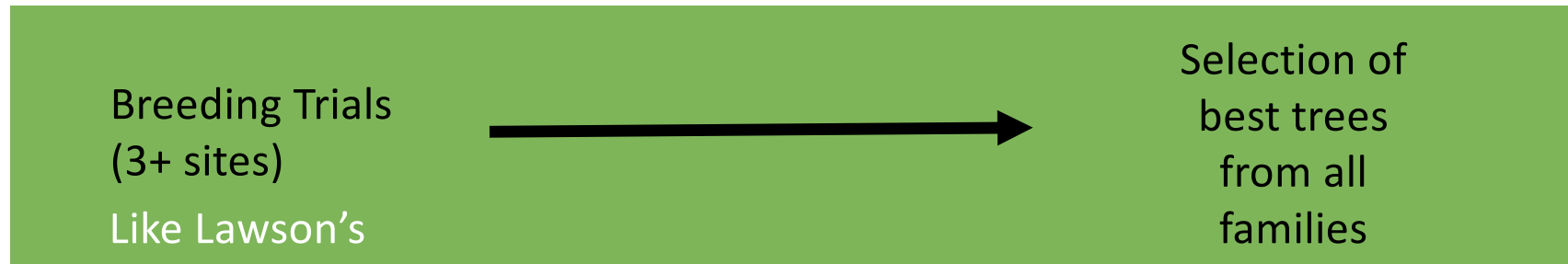
longitola

Demonstration trial  
(photo: Rick Alexander)

It can get fairly dry at times...



# How is our breeding programme structured (for each of 5 species)?



**Selections**

Based on individual  
tree assessment  
+  
family-level  
assessments



Lawson's Progeny Trial (*E. bosistoana*)

# Durability (using 3 criteria)



Heartwood variability ► Durability variability

Heartwood presence/absence

Heartwood quantity

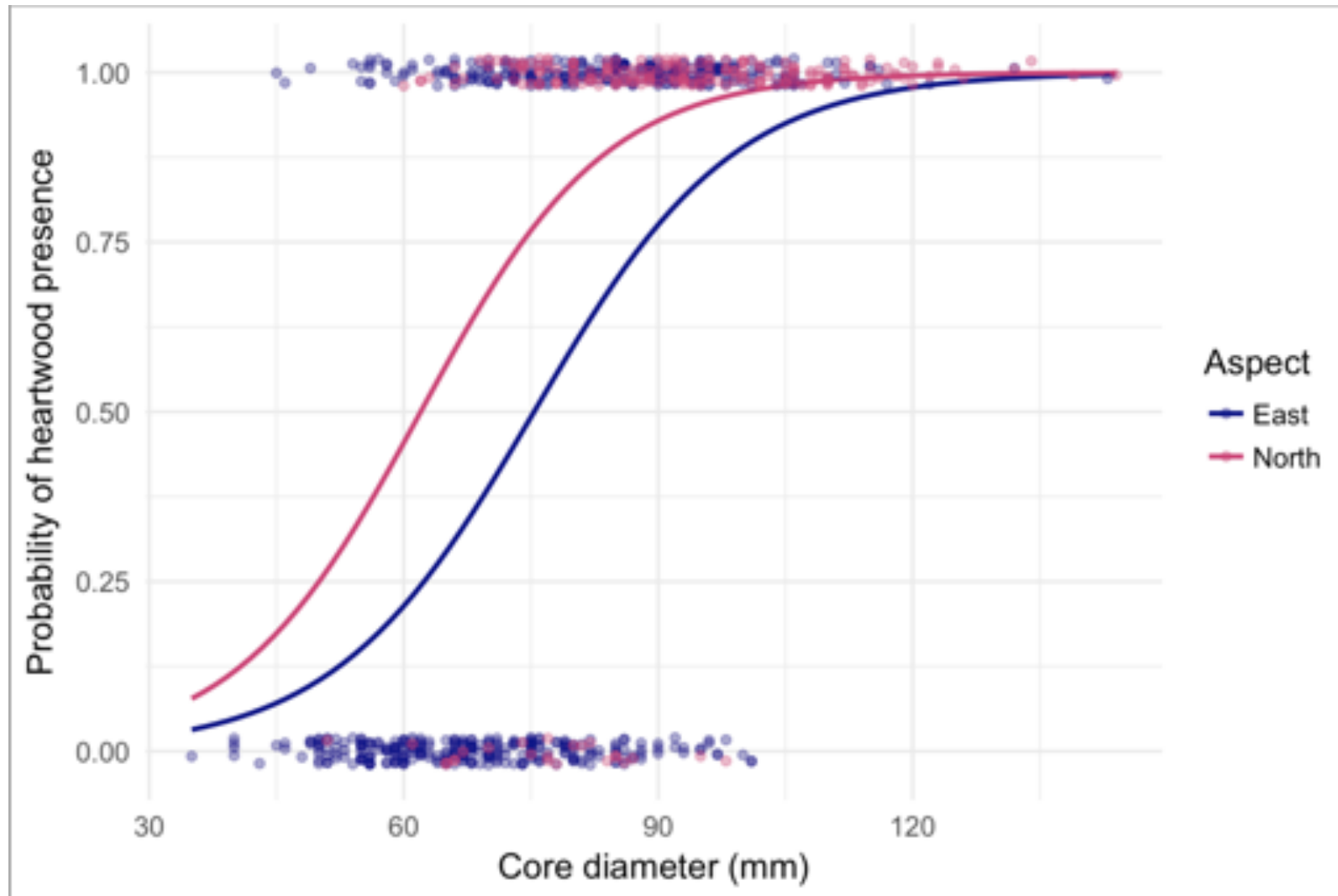
Heartwood quality (extractives content via NIR)

Heartwood quality (mass loss for brown & white rot via NIR)



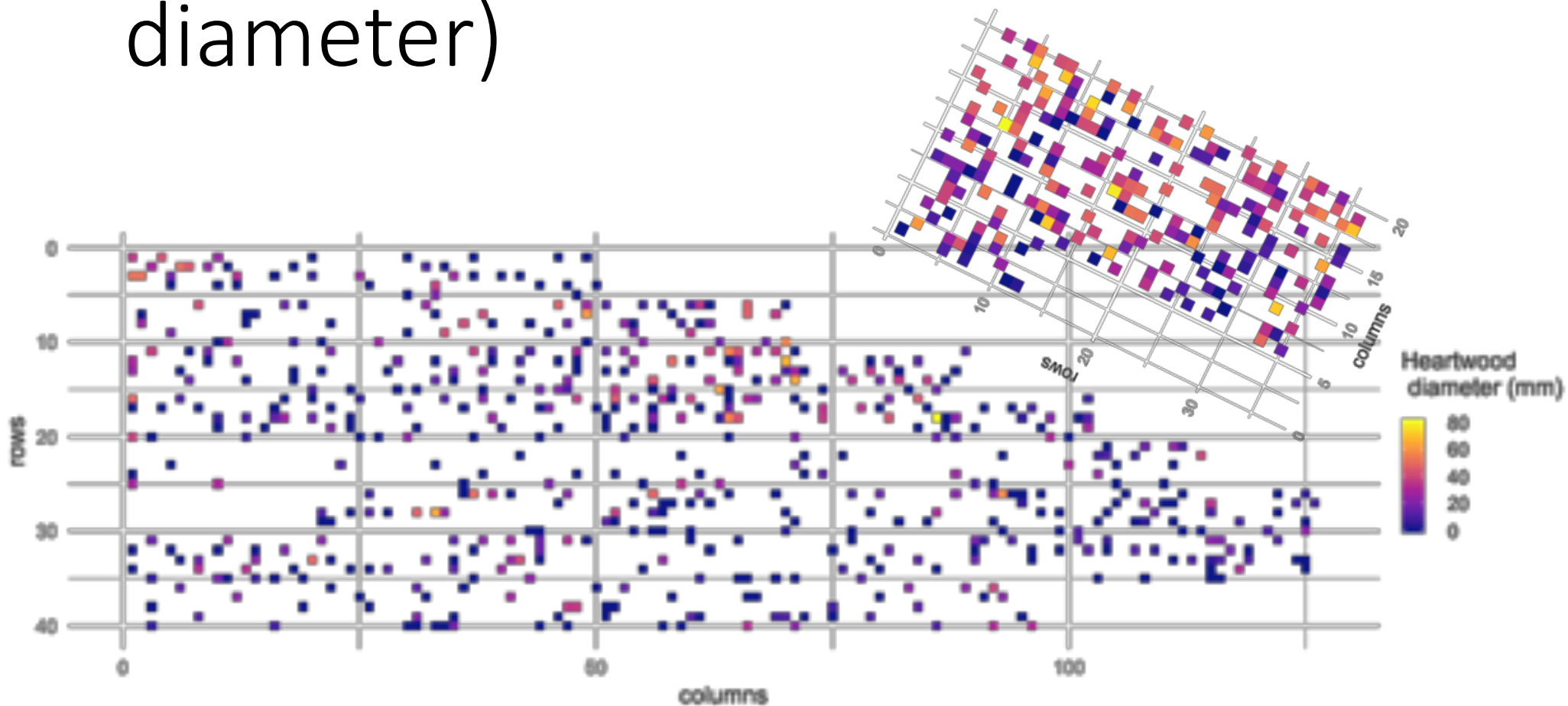


# Environmental effects on heartwood presence/absence



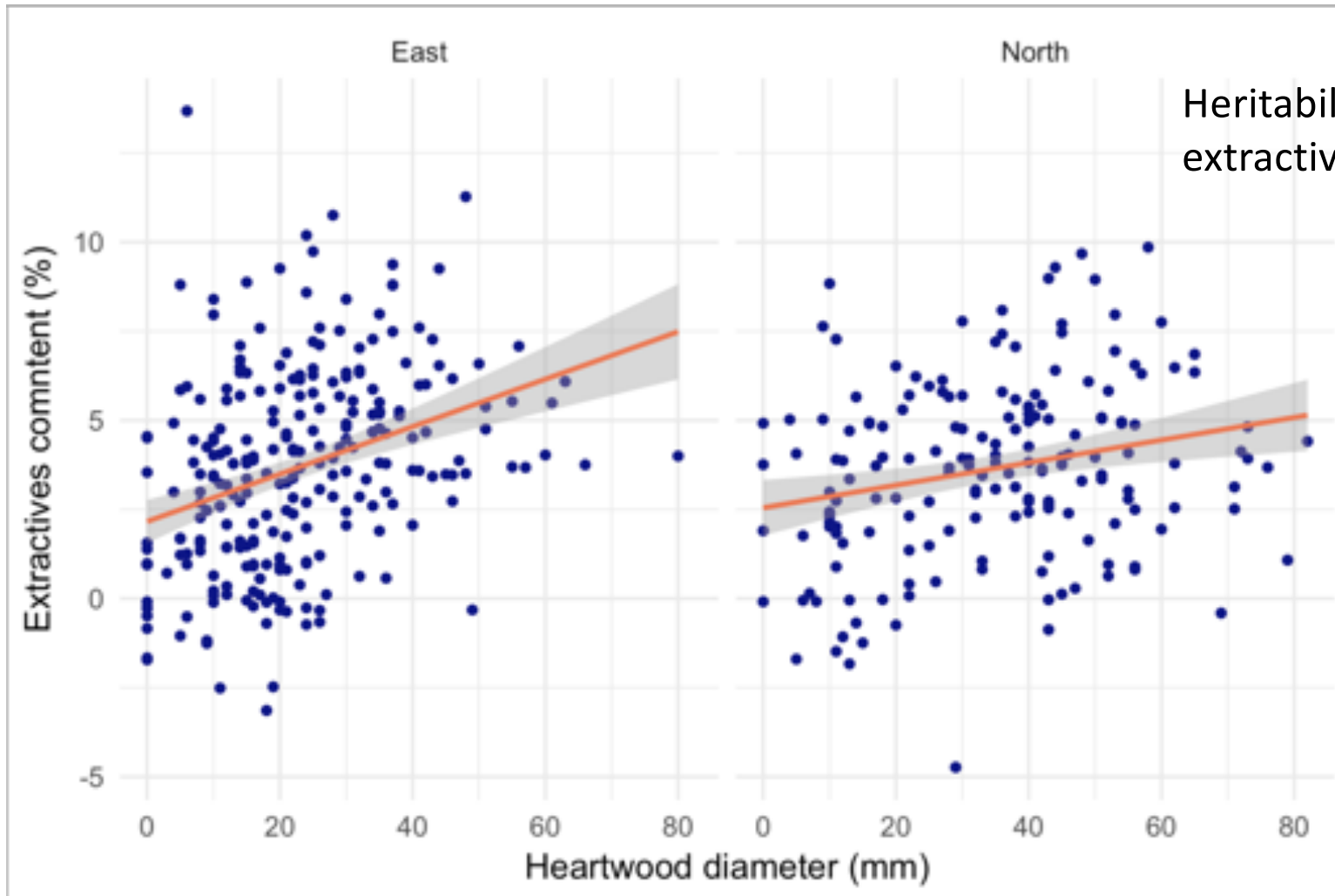
Heritability for heartwood presence  $\sim 0.2-0.3$

# Heartwood quantity (heart diameter)



Heritability for heartwood diameter  $\sim 0.4-0.5$

# Relationship between the durability criteria



Heritability for predicted extractive contents  $\sim 0.3$ — $0.6$

# Growth strain: nursery trial





Larger opening ► Higher growth strain

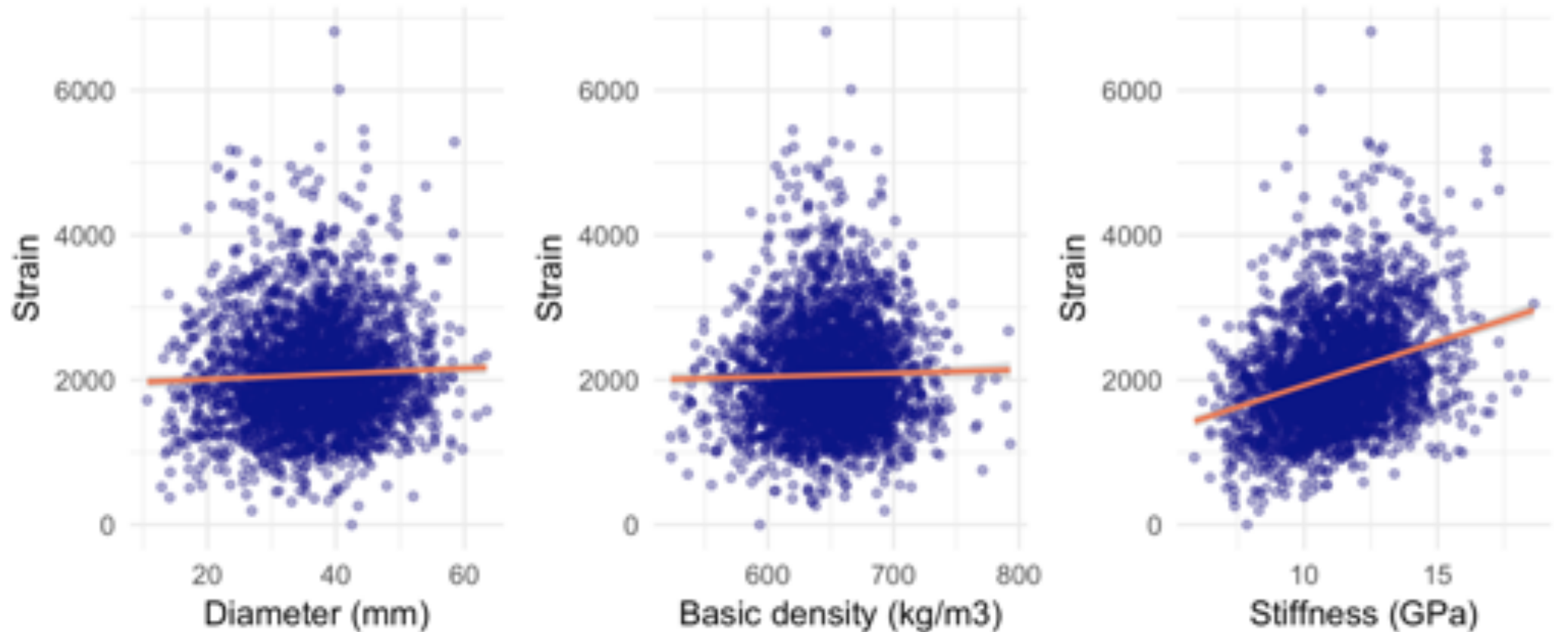


Chauhan & Entwistle. 2010. Measurement of surface growth stress in *Eucalyptus nitens* Maiden by splitting a log along its axis. *Holzforschung*, 64(2).

DOI:10.1515/hf.2010.022

Davies, Apiolaza & Sharma. 2017 Heritability of growth strain in *Eucalyptus bosistoana*: a Bayesian approach with left-censored data. *New Zealand Journal of Forestry Science* 47:5 DOI: 10.1186/s40490-017-0086-

# Growth strain: some results



Growth strain heritability  $\sim 0.3$

Our most disappointing trait: right now the resolution is only enough to discriminate between best and worst families

# In summary

- We are domesticating 5 species, focusing on the quality of solid-products.
- We assess early 2 to 7 years.
- We match trees to environments: niche products for niche sites.
- Durability split into three traits: 1/0, heartwood diameter and extractives content.
- Growth strain is much harder to deal with; right now can tell between best & worst families, but not at the tree level.





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