



Intelligent allocation – Directing the right material to the right end use



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Steering group meeting Kielder – 1/11/2006

Objective

- Assess internal properties as soon as possible in the wood chain

Stand



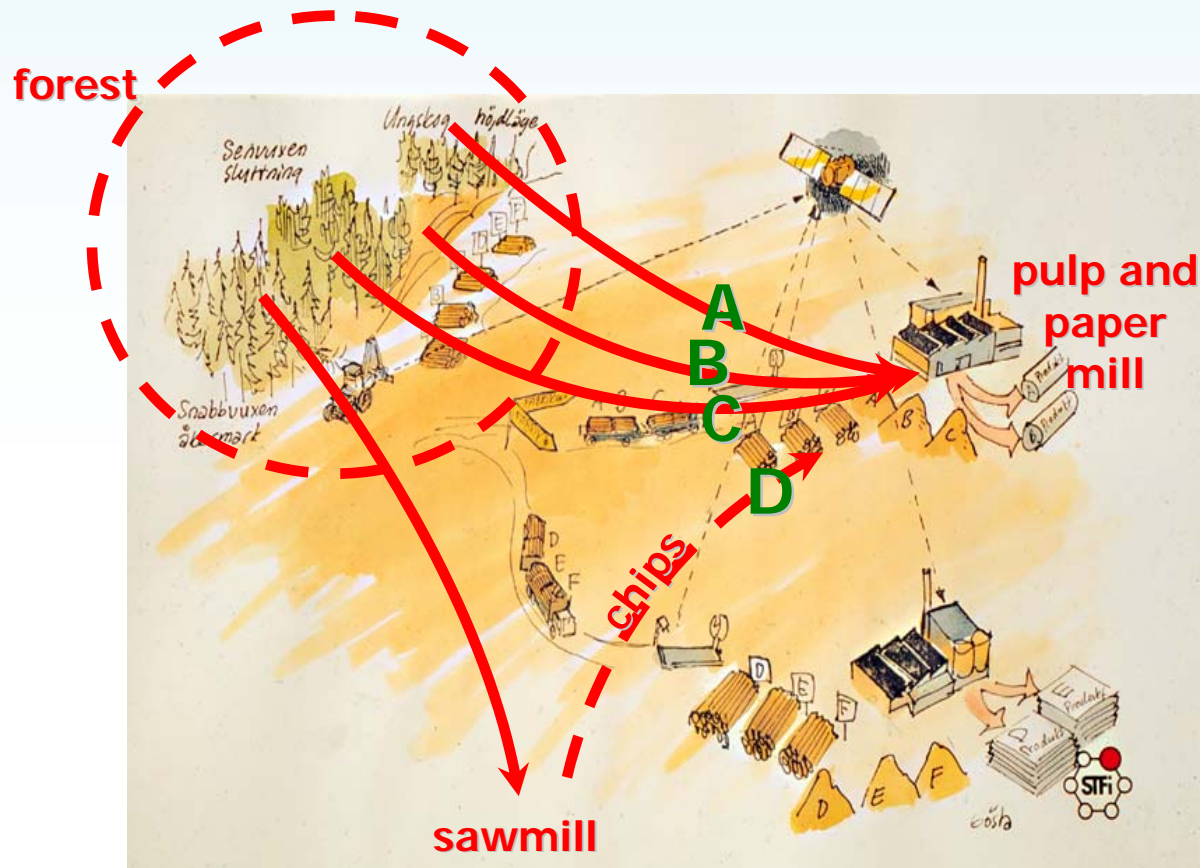
Road side



Sawmill



Understanding Property Variations in the Forest



Optimize the use of wood/fibres for and in each mill and product!



Current method: Stem Straightness Scoring System

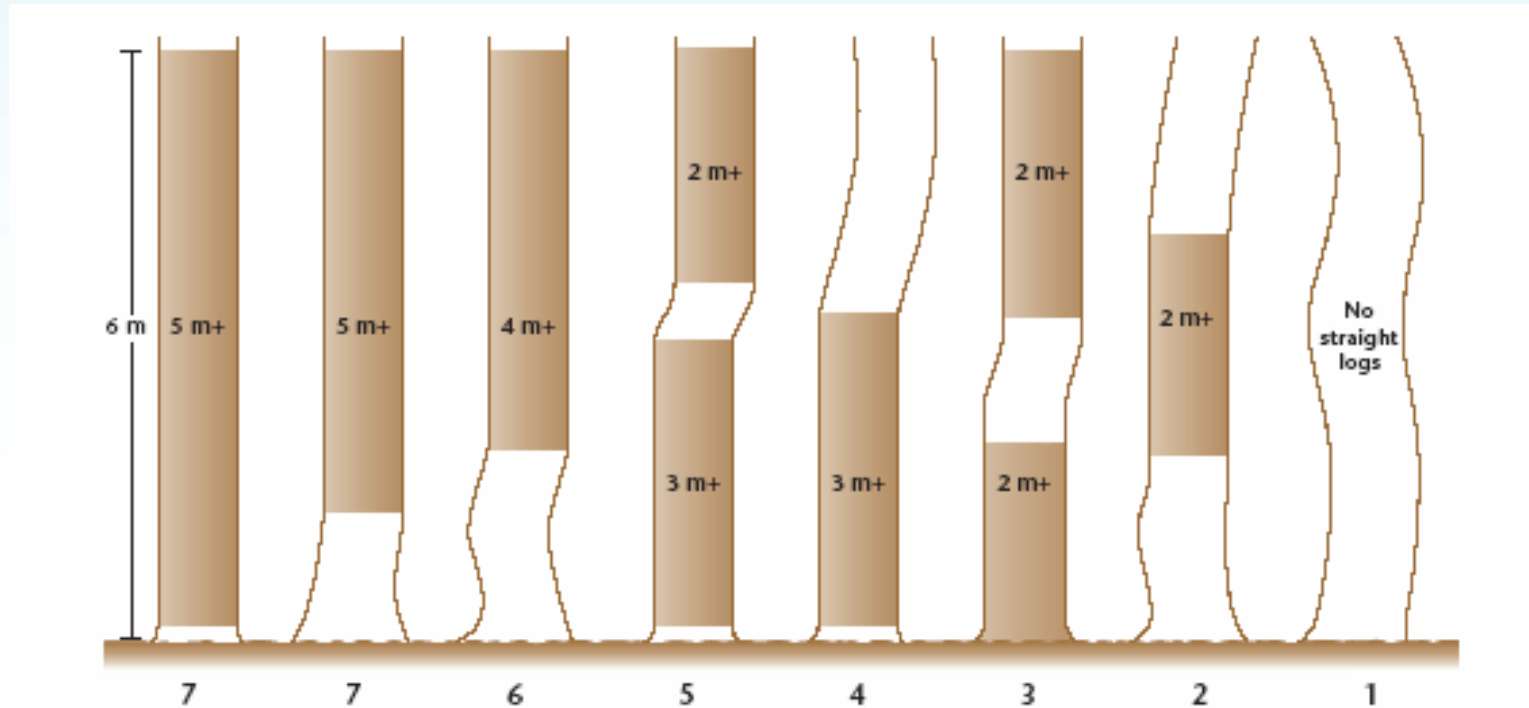


Figure 2

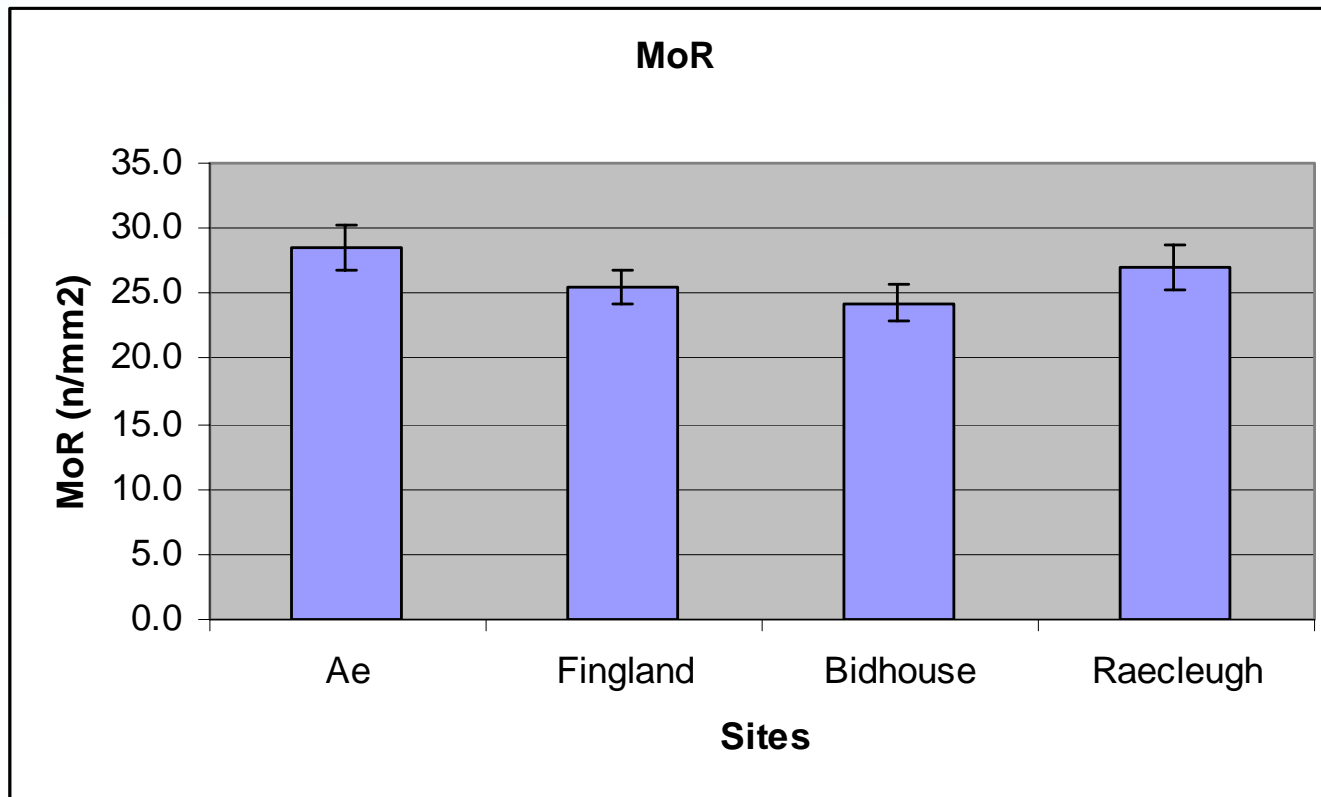
Straightness Score: different combinations of log lengths in first 6 m showing gradual reduction in quality from left to right (after Methley, 1998)

- Question : Are these scores related to internal wood properties?

Timber quality in South Scotland

- Exploratory analysis

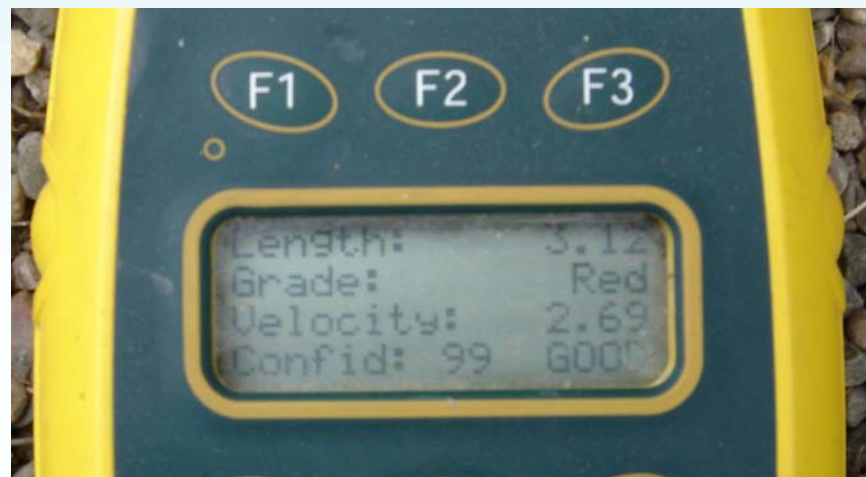
- Hypothesis : We can predict the internal properties of wood using stem straightness



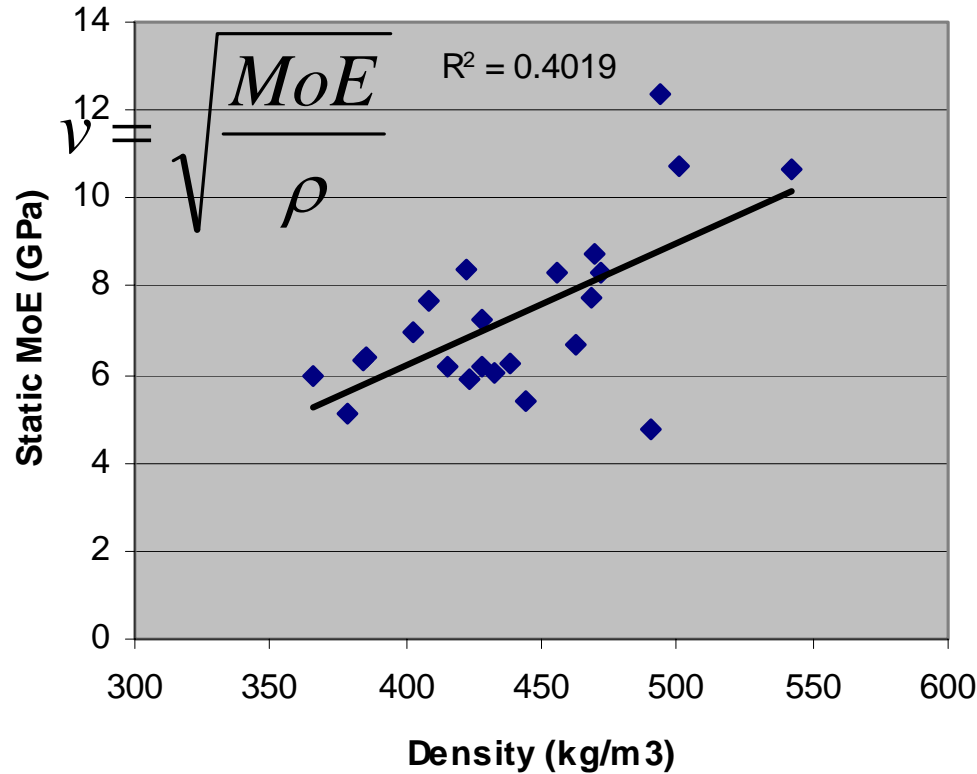
Log level acoustic tool

- HM200

- Developed by Fibre-Gen in New Zealand
- Resonance-based method
- Instant measurement
- Tool is widely used by the industry in New Zealand



Step 1 : Testing performance in UK context





Caution!

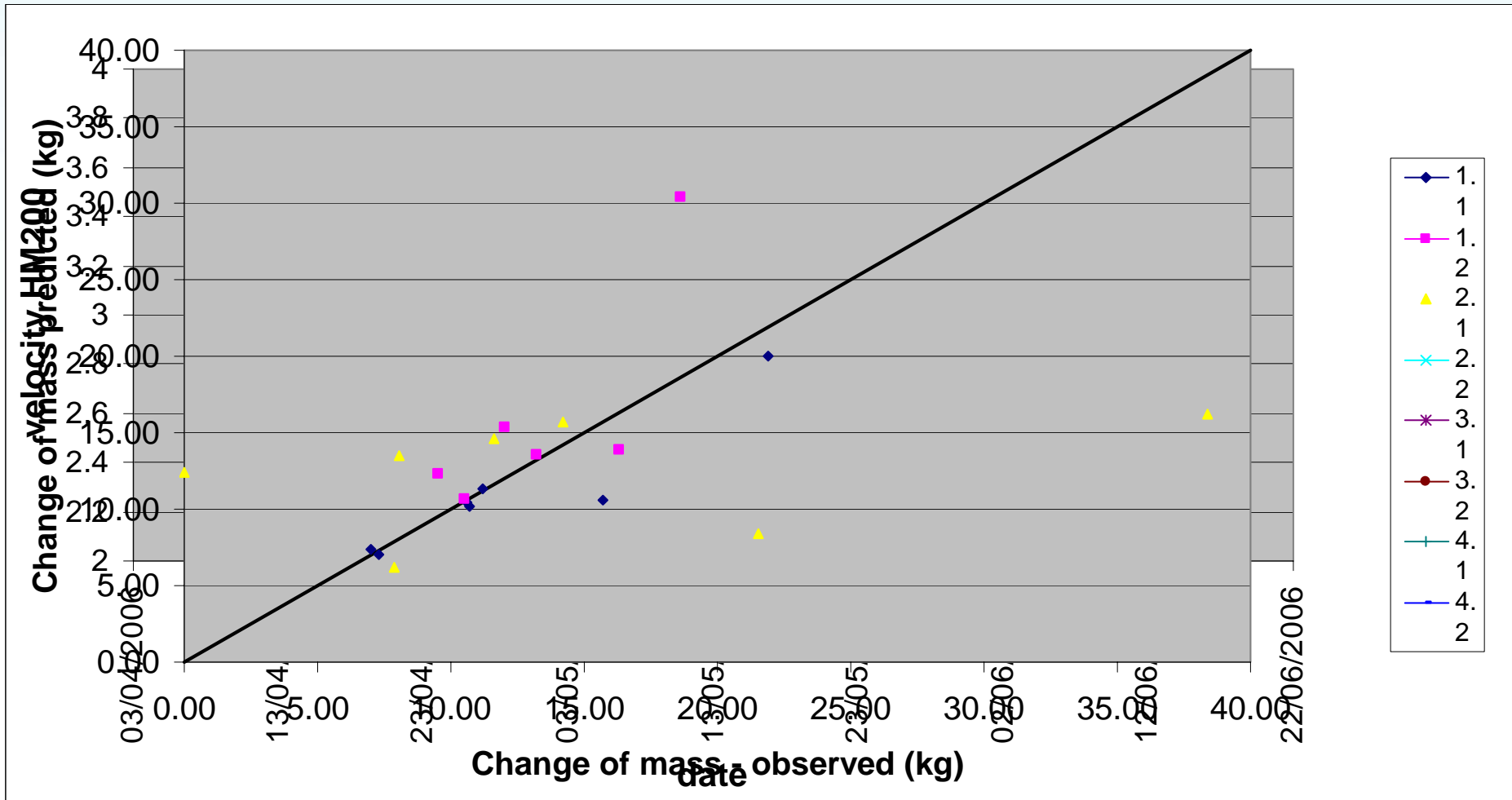
This ramp is used for calibrating scientific equipment

Please
do not lean or climb on it

Alma Mater 800



Step 2 : Testing fundamental aspects of the technique – Effect of moisture content

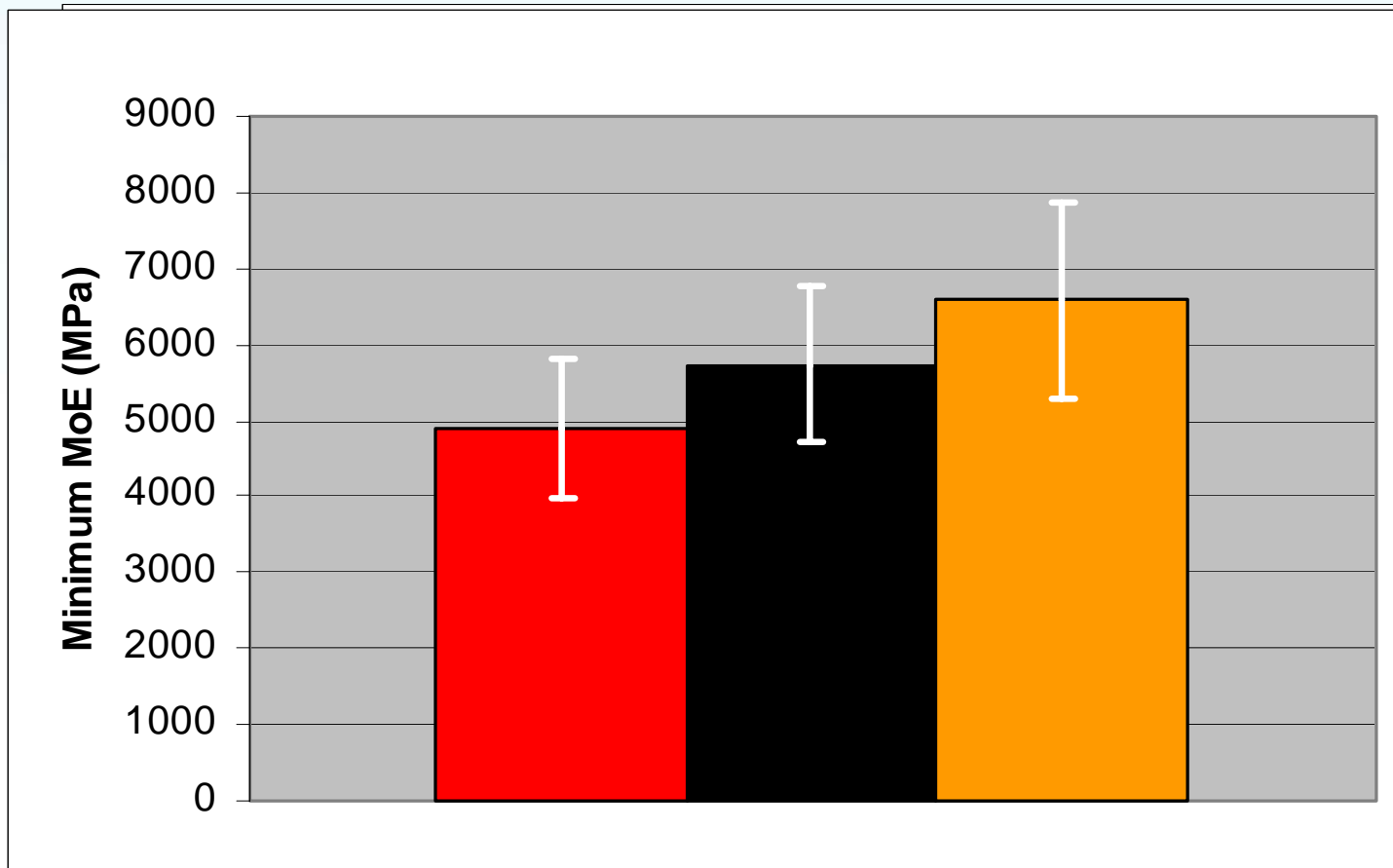


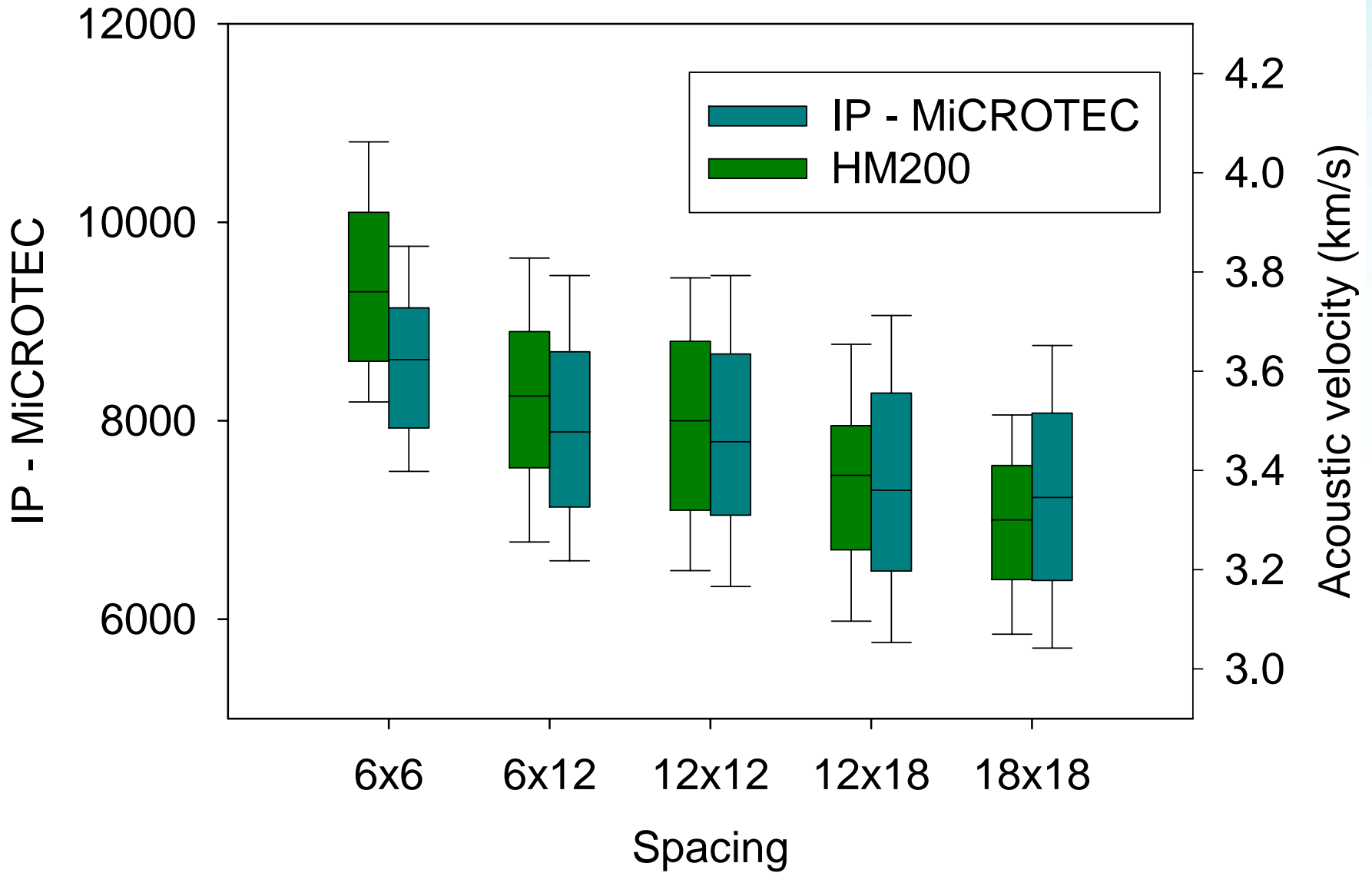
Step 3 : Testing industrial applications

Sawmill trial
on 300
logs



Step 3 : Testing industrial applications





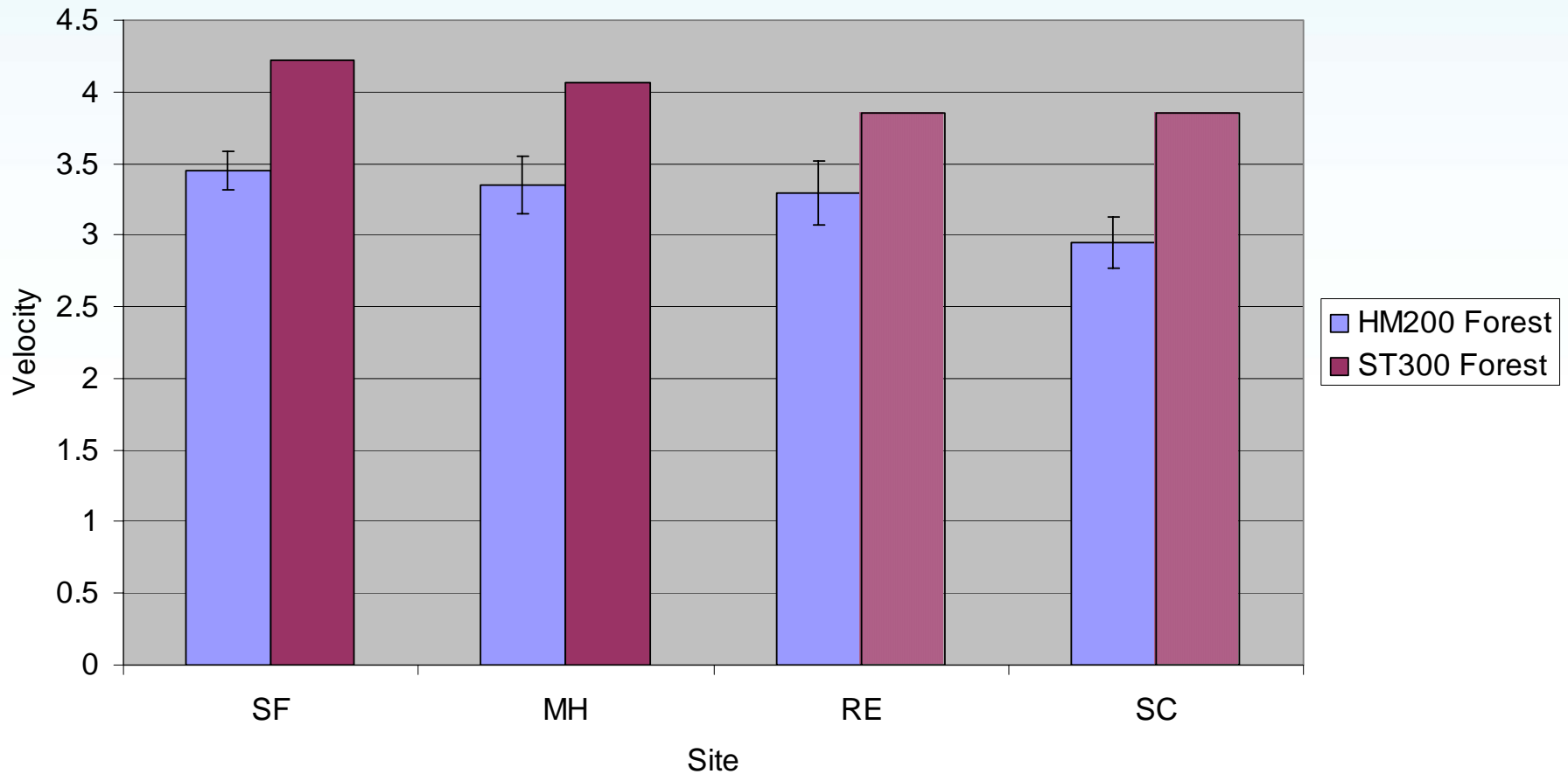
Tree level acoustic tool

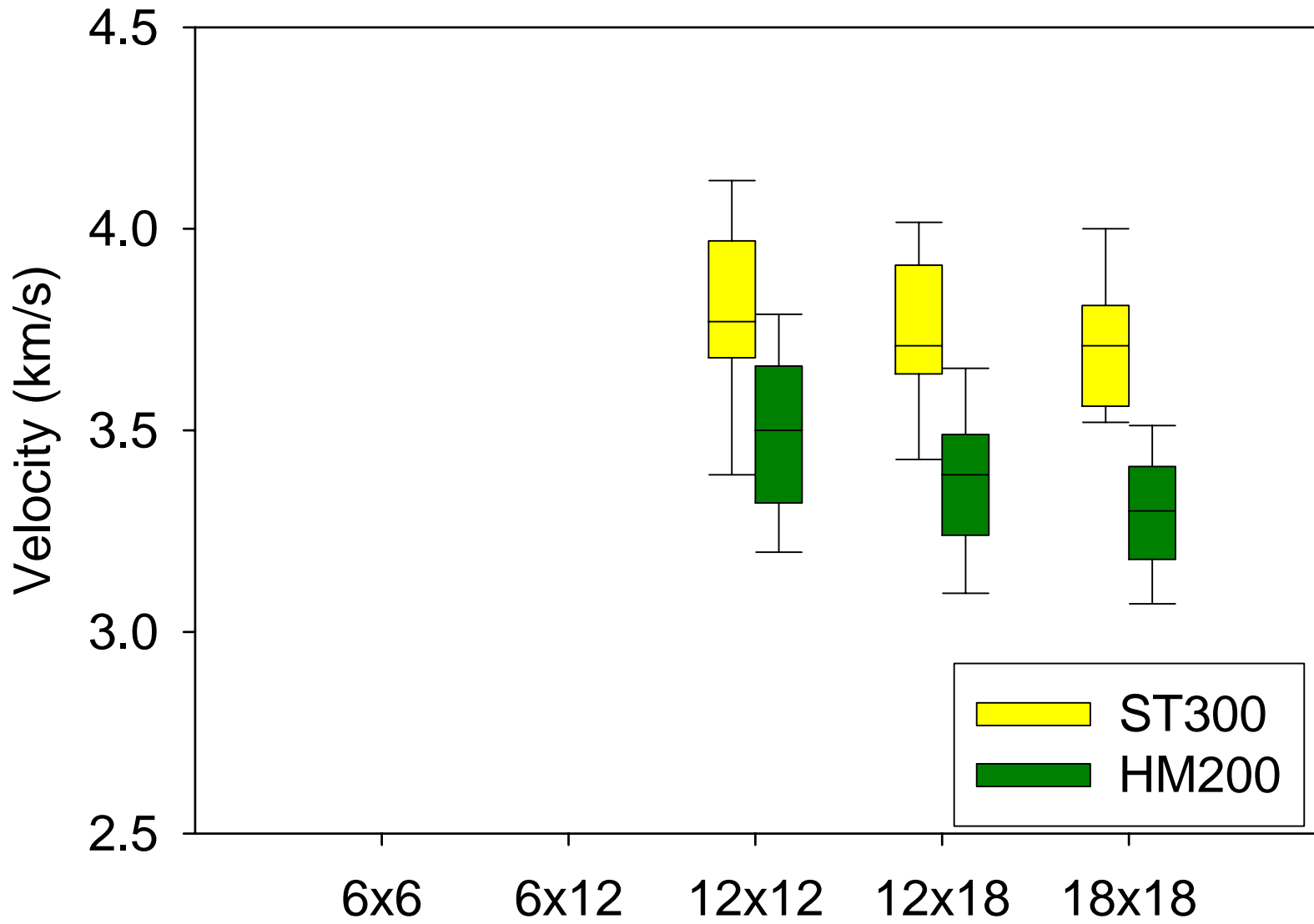
- ST300

- Developed by Fibre-Gen in New Zealand
- “Time of flight” method
- 1 – 2 minutes/ measurement
- Tool is still a prototype



Step 1 : Testing performance in UK context



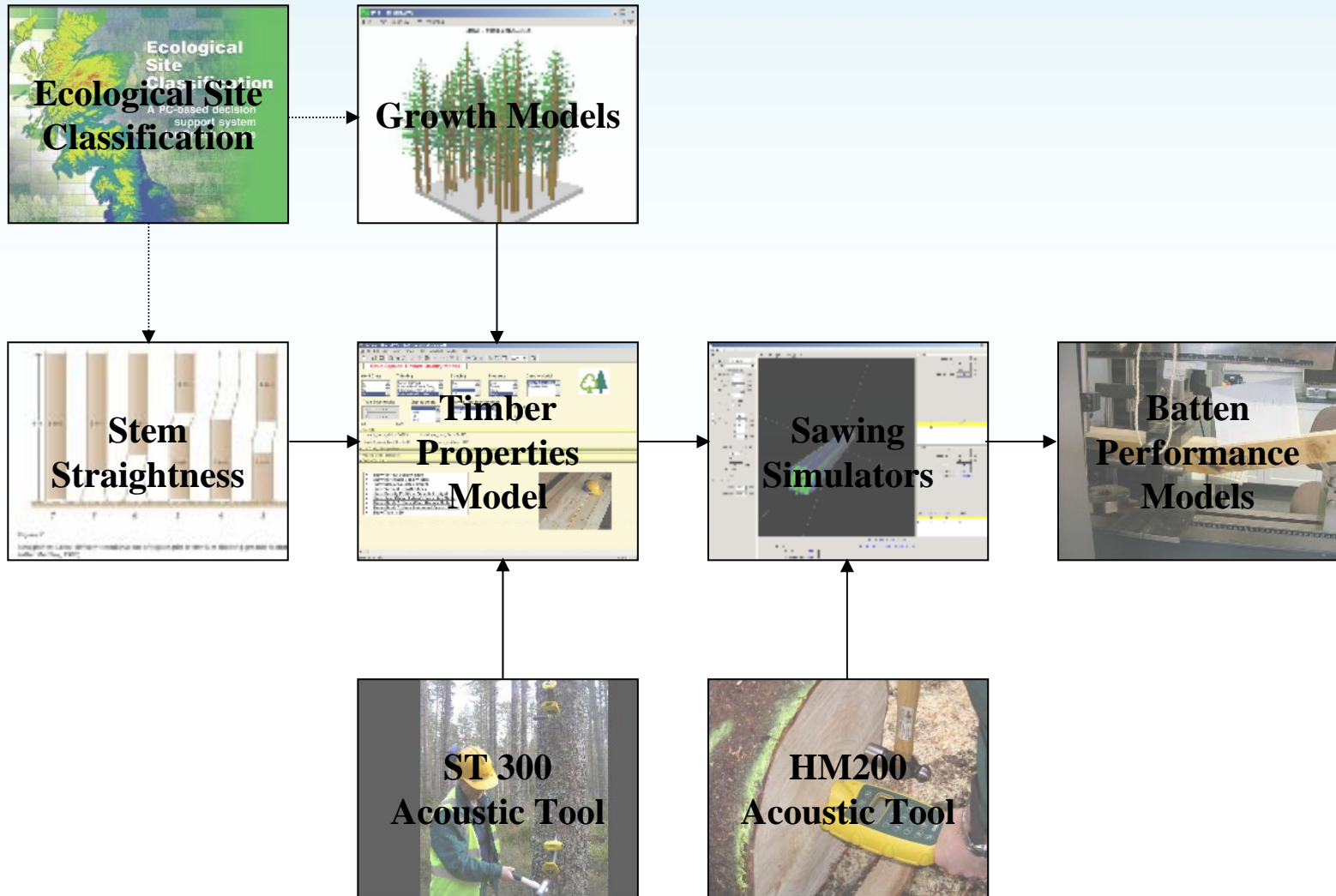


Step 2 : Testing fundamental aspects of the technique

- Factors which will influence the relationship between velocity and MOE of the whole tree:
 - Tree age
 - Tree size
 - Competition?
 - Time of the year?



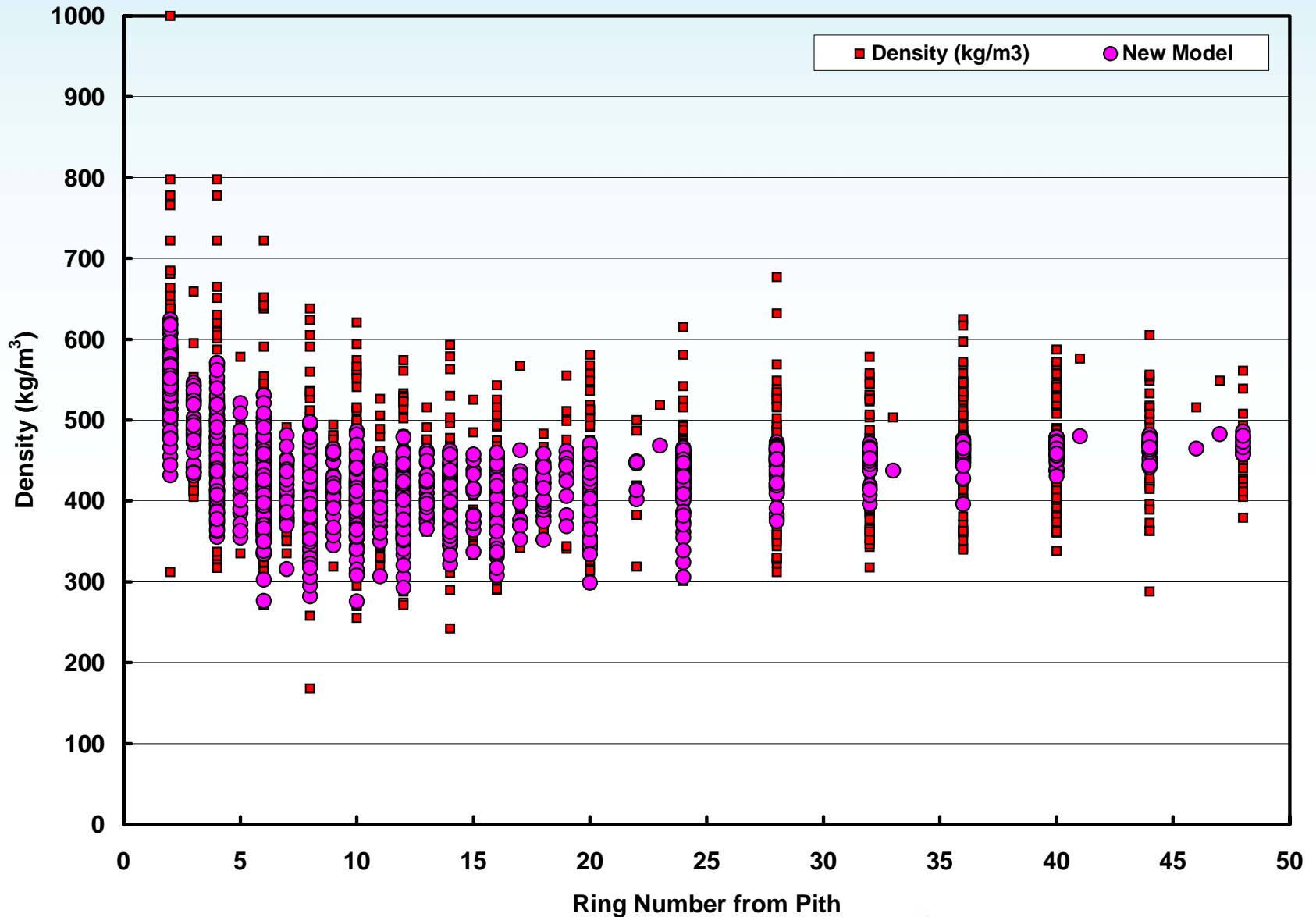
Linking Models & Measurements Together



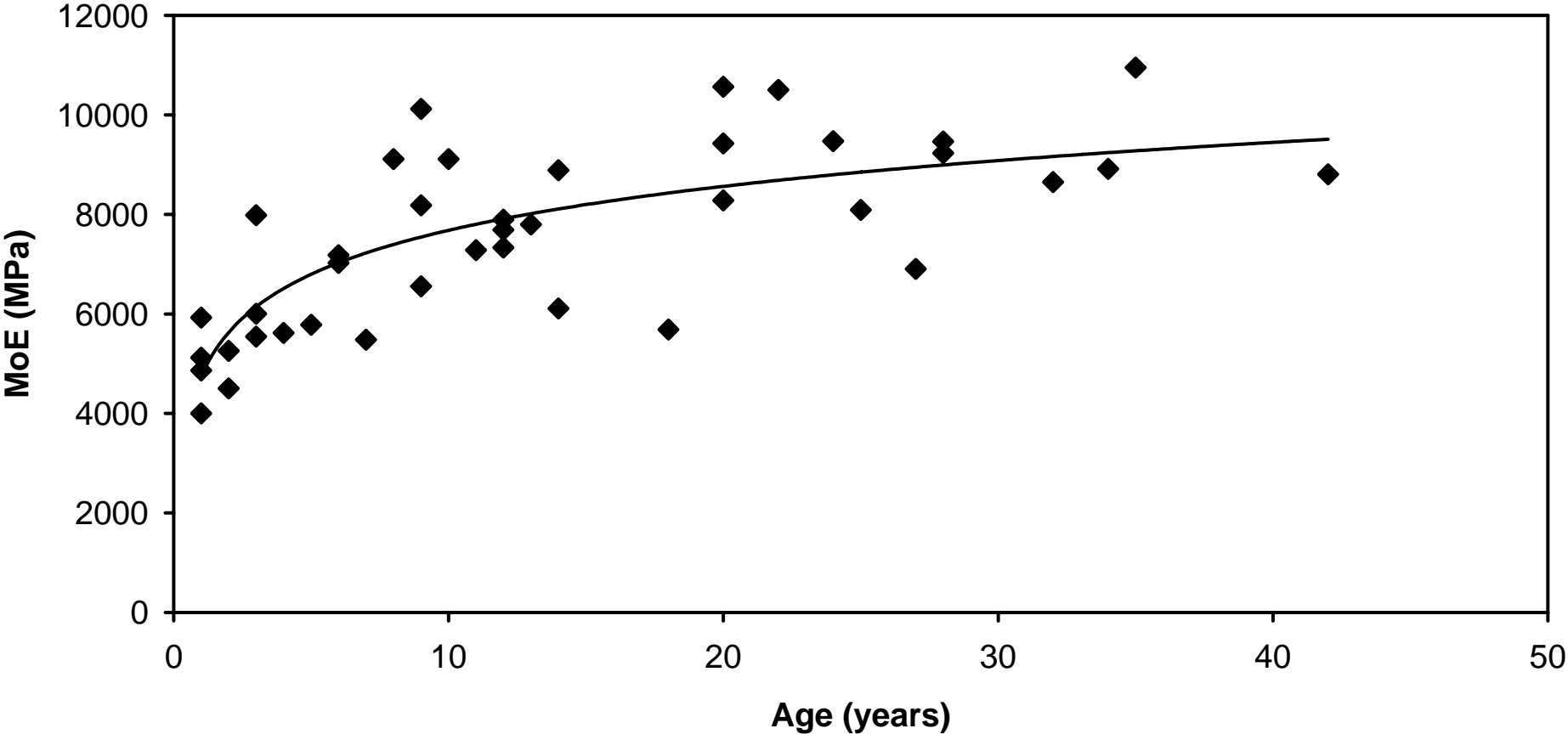
Step 3 : Linking ST300 results with a timber properties model



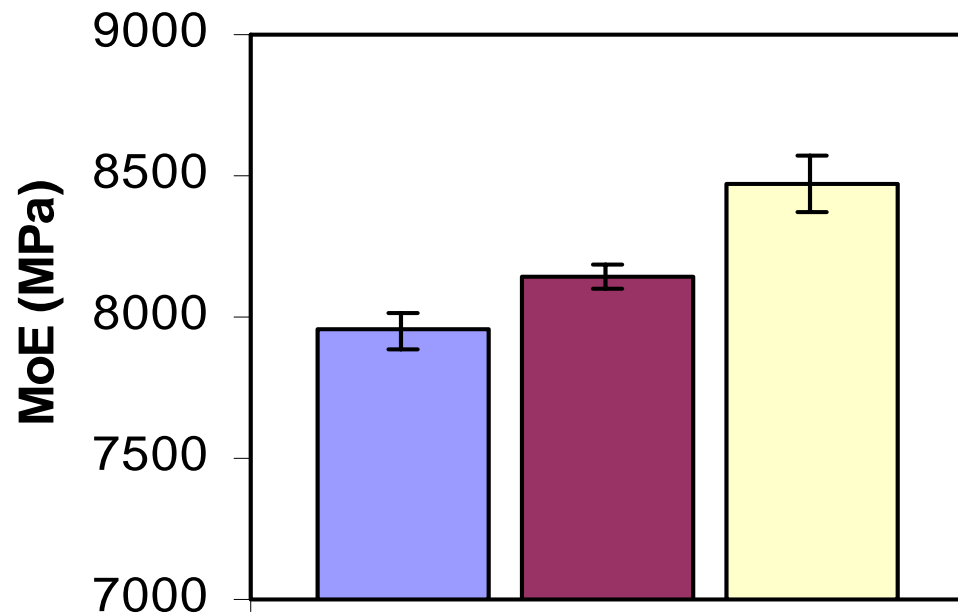
Density versus Ring Number



MoE vs Age with fitted logarithmic curve



9(b) Mean corrected MoE at age 60



Legend:  Seafield (age 72)  Mount High (age 66)  Glengarry (mean age 45)



What does this imply for the industry?

- Acoustic tools can contribute to the economic viability of the UK forestry woodchain
 - Waste reduction
 - Better allocation of the resource
- HM200
 - Performance has been demonstrated
 - Ready for use in the industry at road side or in the log yard
 - Can complement green/red log system
- ST300
 - Performance also demonstrated
 - Interpretation of results needs more research
 - Could be used to complement stem straightness and tariff measurements in assessing the value of standing sales

In conclusion:

- We have models and tools available to assist the industry in evaluating the quality of the resources in the forest, at the road side and in the log yard.

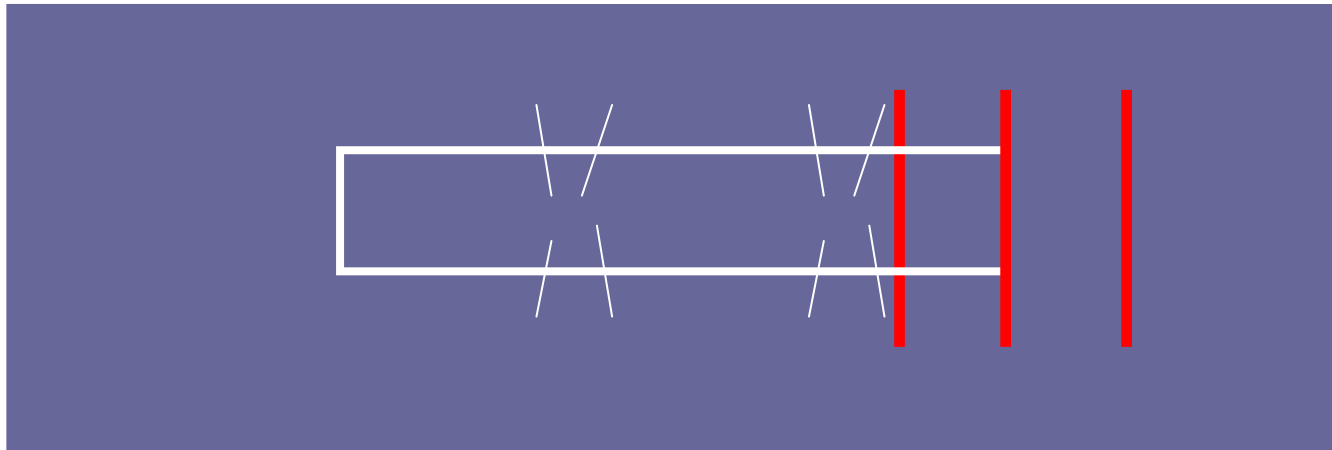
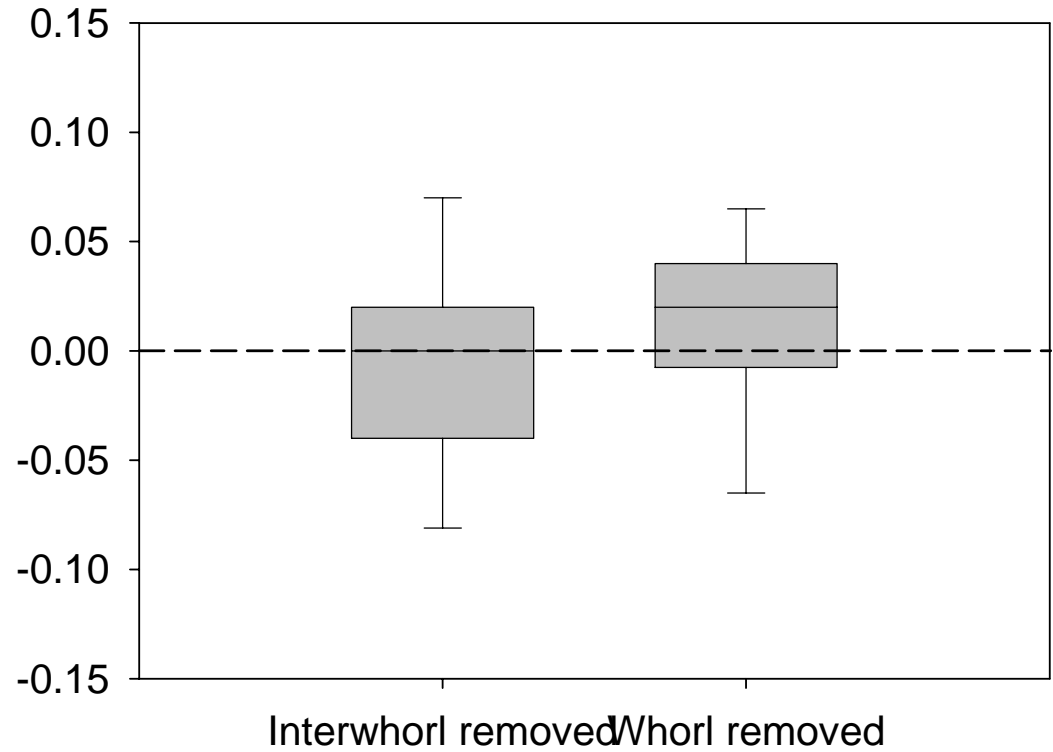
Any Questions?





Step 2 : Testing fundamental aspects of the technique – Effect of knots

Change in acoustic speed after removing
a part of the stem (km/s)



Step 2 : Testing fundamental aspects of the technique - How many samples do we need to have an accurate representation of the stand average?

Seafield estate

