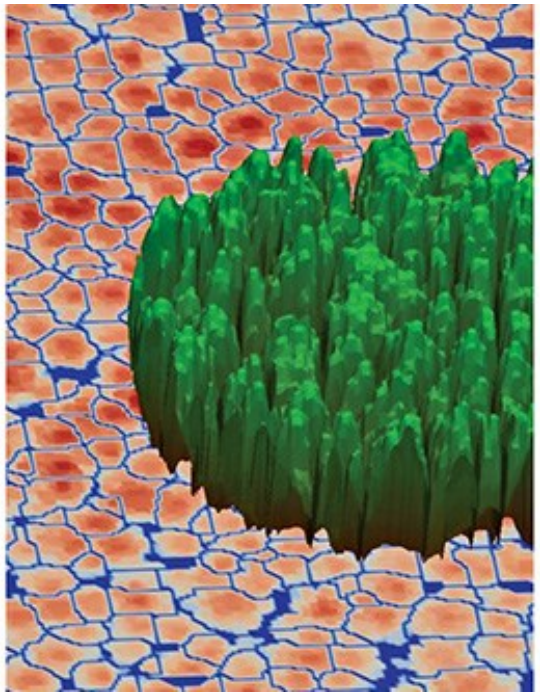
Growing confidence in forestry's future Research Programme

SCION forests · products · innovation

Maximising Value from Existing Forests

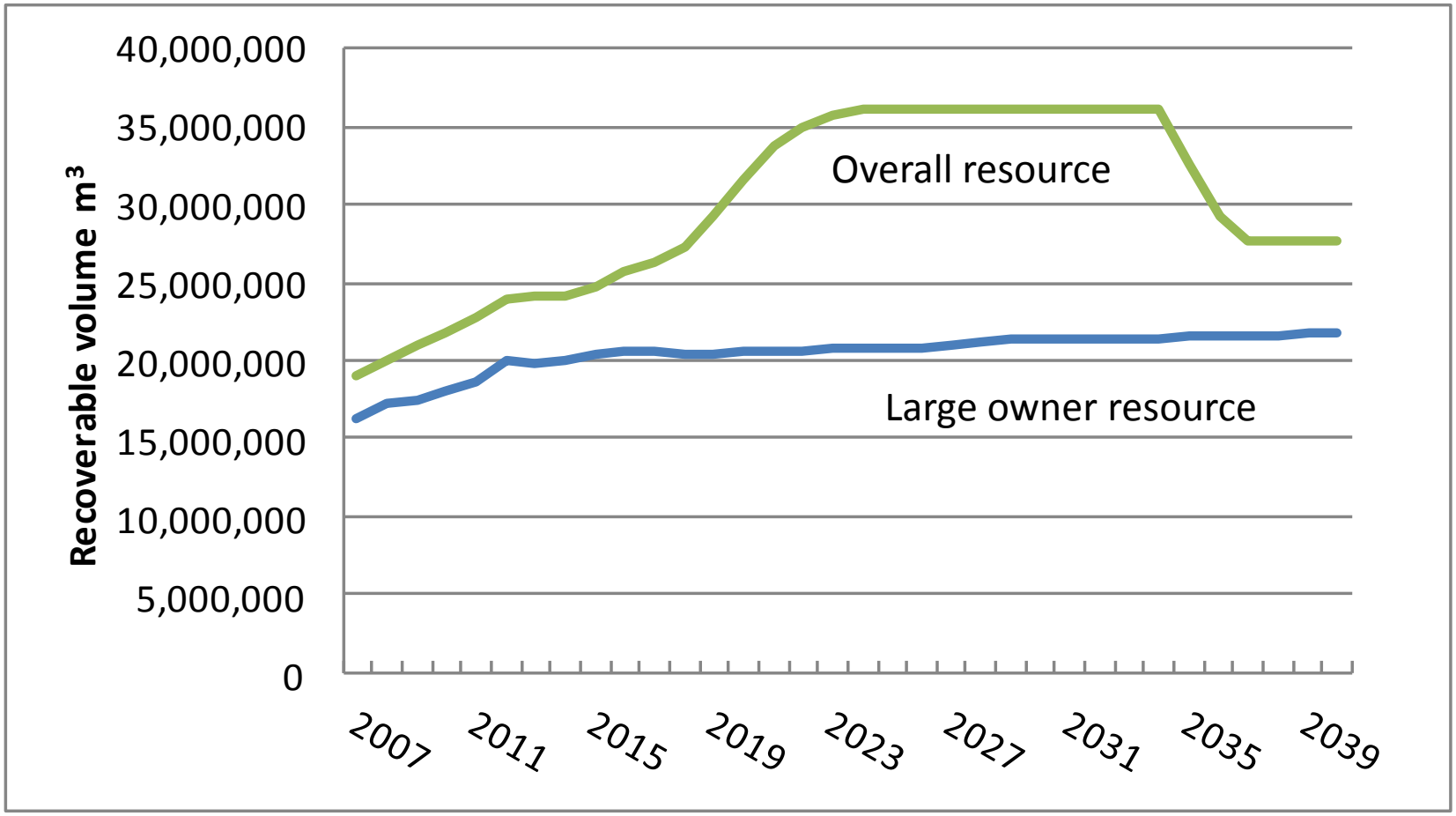
John Moore



forestgrowers levy trust inc Funding Support Provided by the Forest Growers Levy Trust

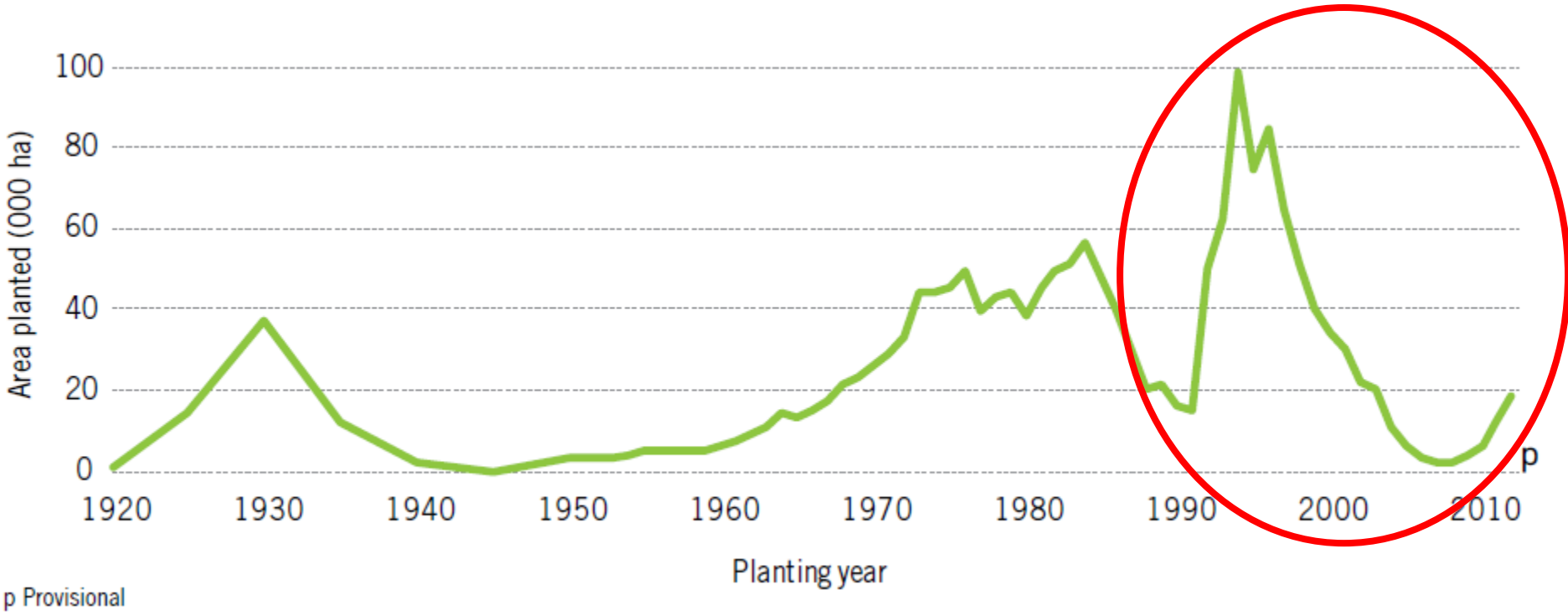
FOREST OWNERS ASSOCIATION

The Next 15 Years' Wood is Already in the Ground



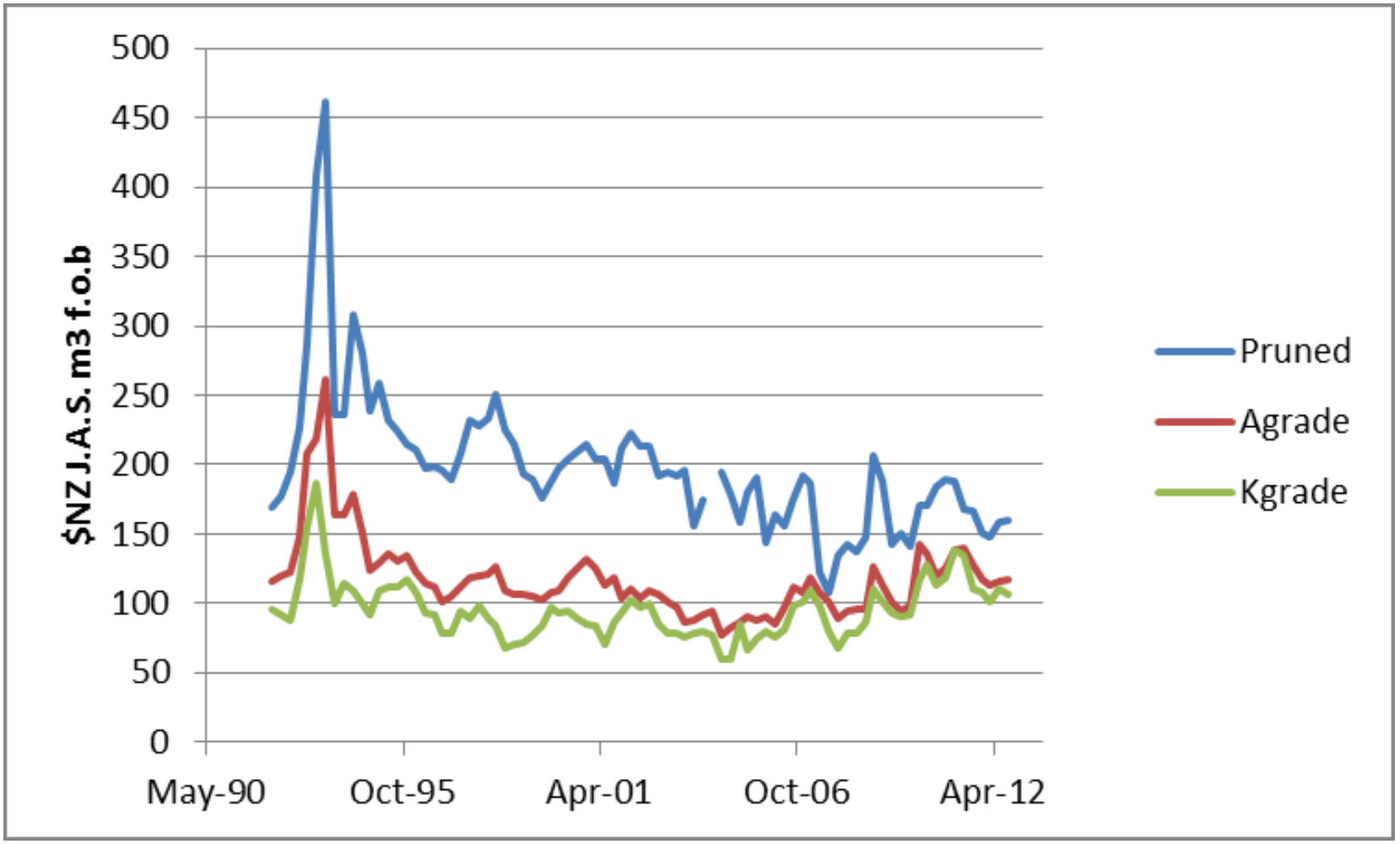
Source: Wood Availability Forecast (MPI)

Harvest Profile Reflects New Planting Profile

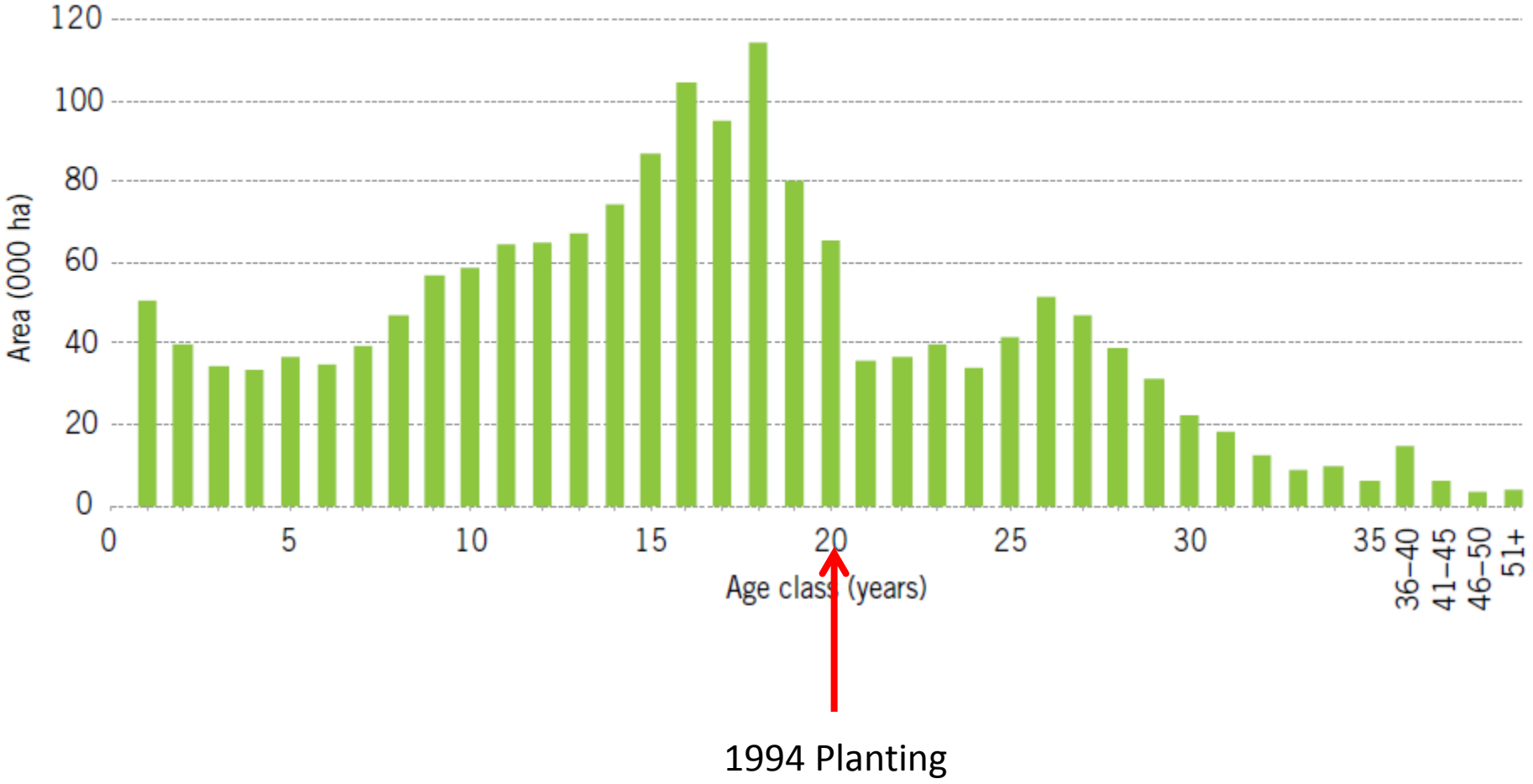


Source: National Exotic Forestry Description (MPI)

Log Prices Drive Investment and Silviculture



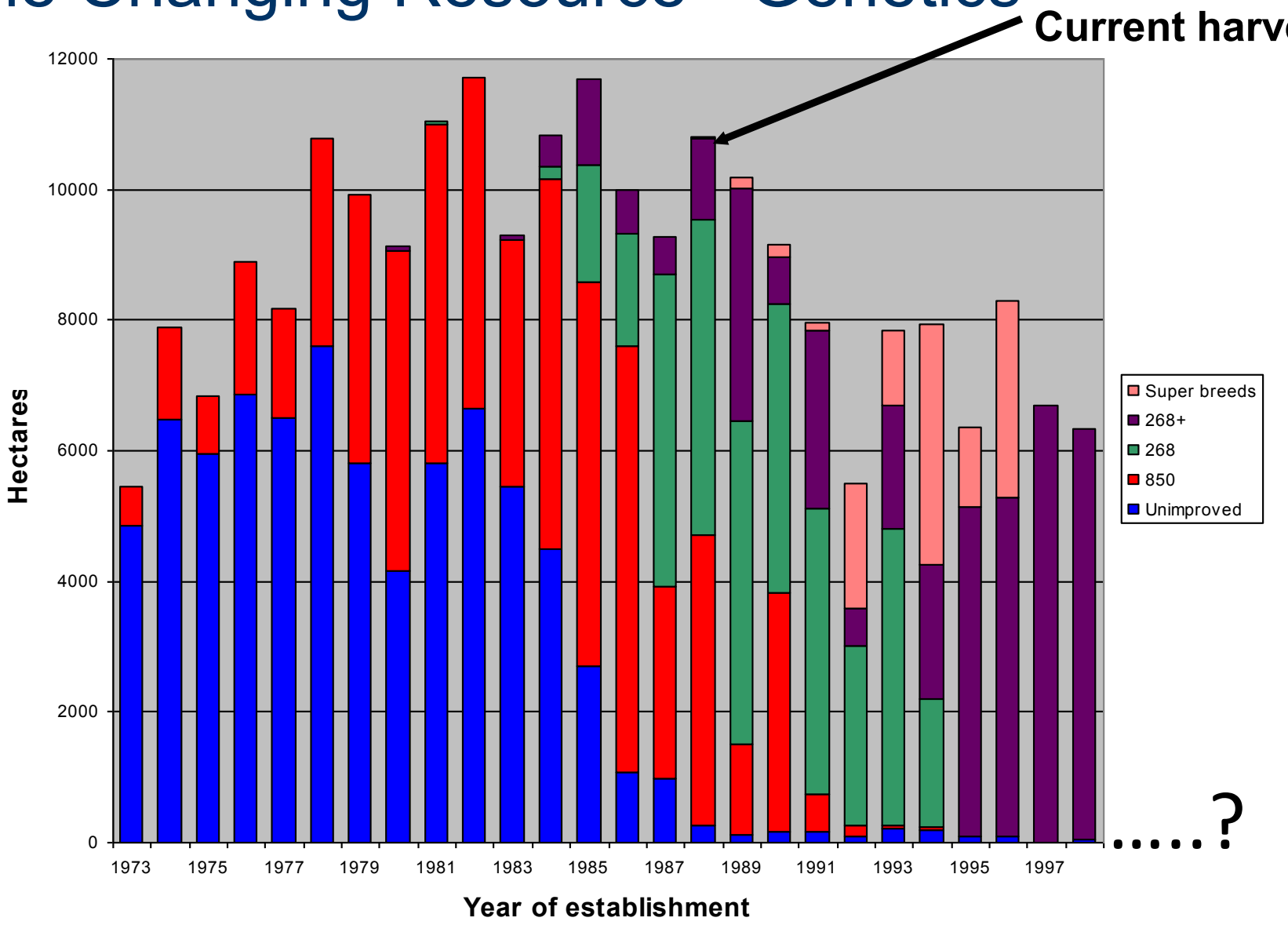
We Have an Irregular Age-Class Distribution



The Shifting Resource Base - Sites

- 1990s planting spike due to high prices
- Fertile pasture sites
- Toppling occurred in some stands
- Small woodlots biggest ownership group
- Often on steep sites with no road access
- Less well characterised compared with the large owner resource

The Changing Resource - Genetics



Courtesy of Graeme Young (Tenon)

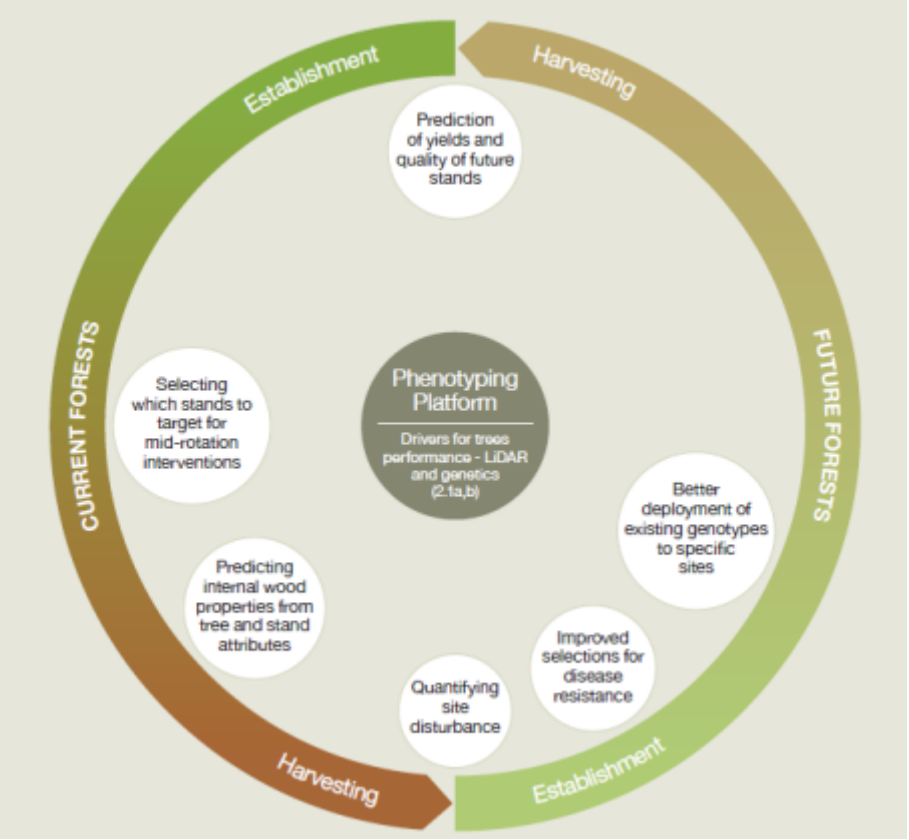
Value Maximisation Challenges

- Silvicultural tending normally completed by age 15
  - No further interventions until harvest (except asset protection)
  - Production thinning has a number of challenges
    - Financial
    - Increased risk of wind damage

- We can still increase productivity of existing stands
  - Productivity = Value of outputs derived per unit of inputs

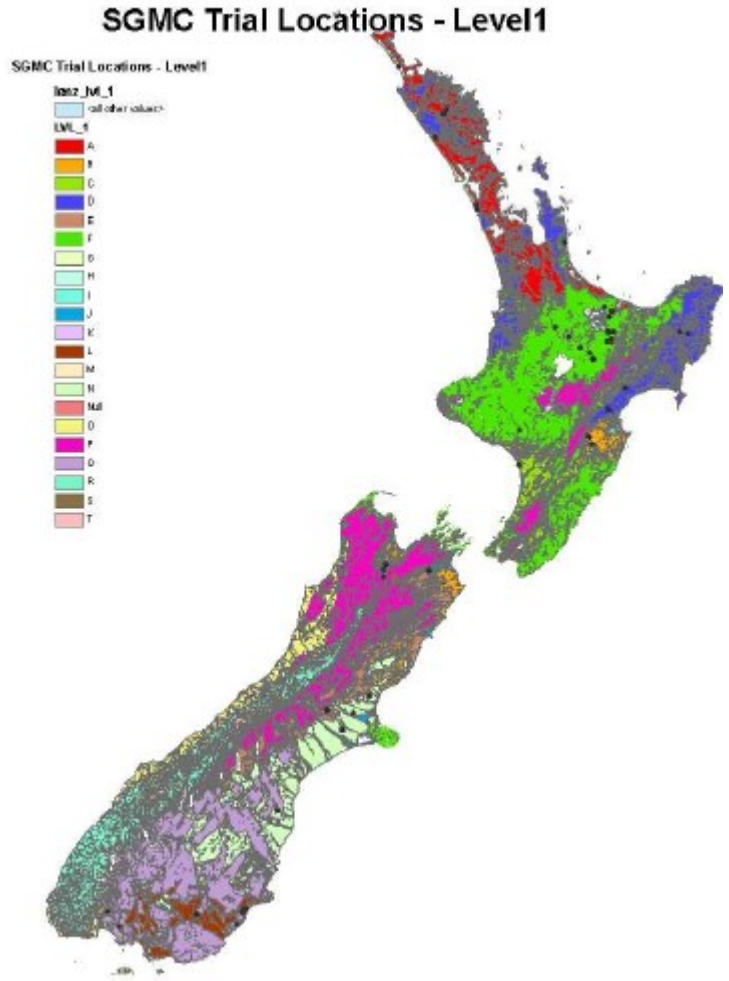
Potential Intervention Points in the Growing Cycle

- Mid-rotation
  - Enhancing growth
- End-of-rotation
  - Characterisation of the resource
  - Segregation based on properties



End of Rotation Interventions

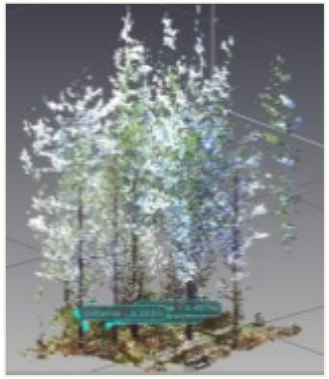
- Characterise the resource to enable it to be best utilised
  - How do different combinations of site, silviculture and genetics affect growth and wood properties?
  - Key experiments can help to provide data
    - Silvicultural-breeds trials
    - Improved breeds trials
    - Silviculture x traits trials

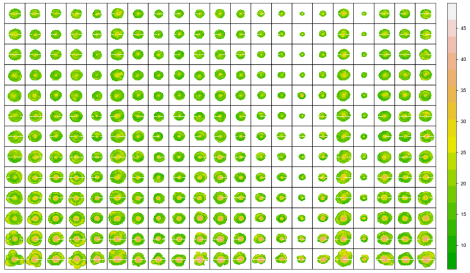
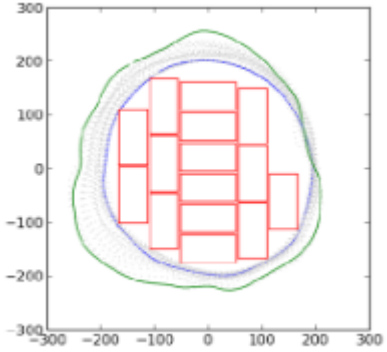


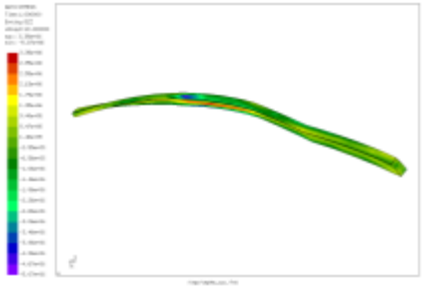
Linking end product performance back to the forest




Tree → Board





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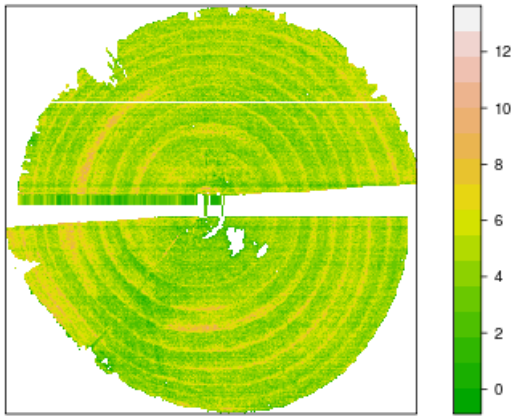

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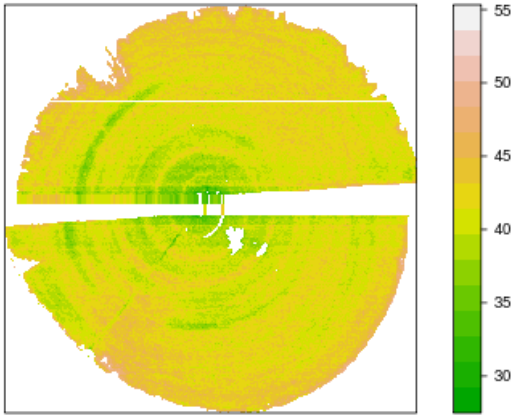

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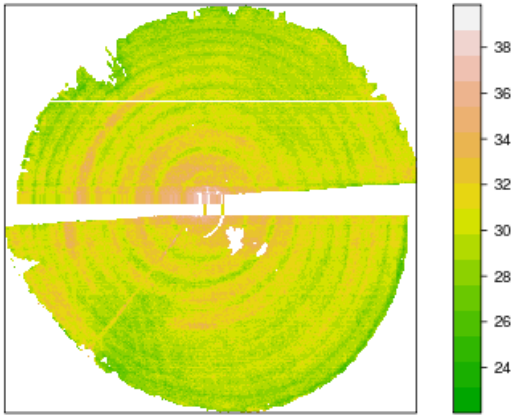
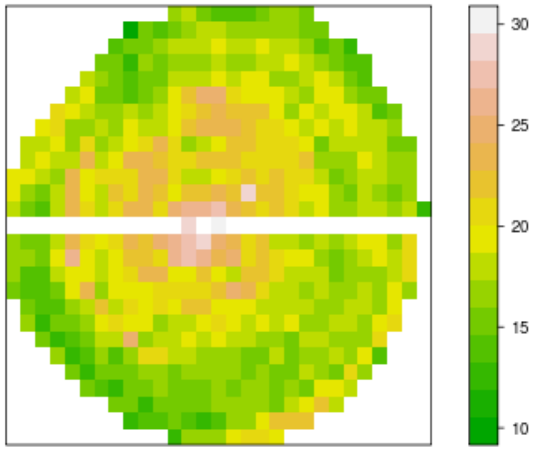
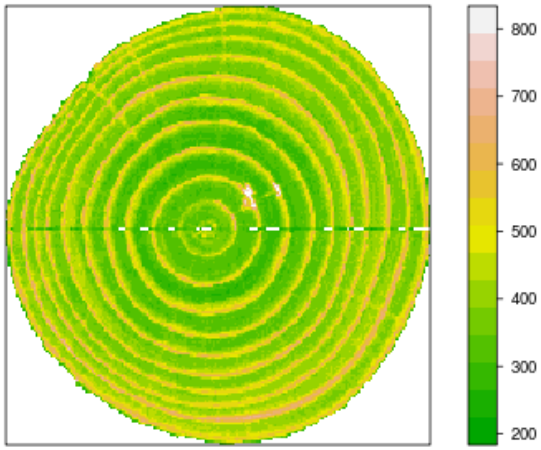
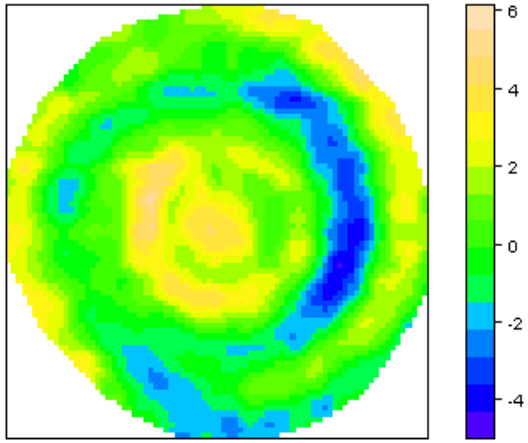




MFA / [deg]



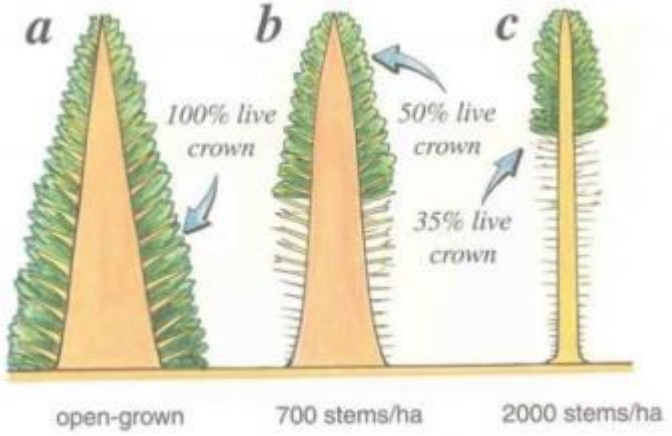
DEN / [kg/m³]

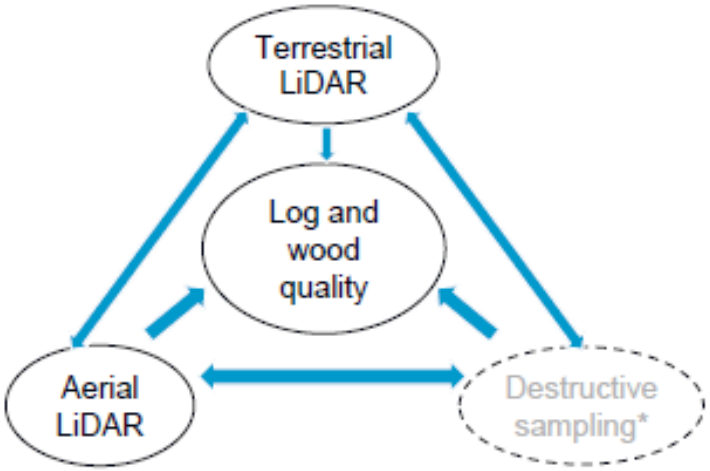


SGA / [deg]

Cost-Effective Segregation

- Segregation to ensure that material is directed to the most appropriate end use
- Benefits must exceed cost for segregation to be viable
- New technologies such as LiDAR may provide more cost-effective segregation
- H0: Wood properties are linked to crown size and shape





Contents lists available at ScienceDirect

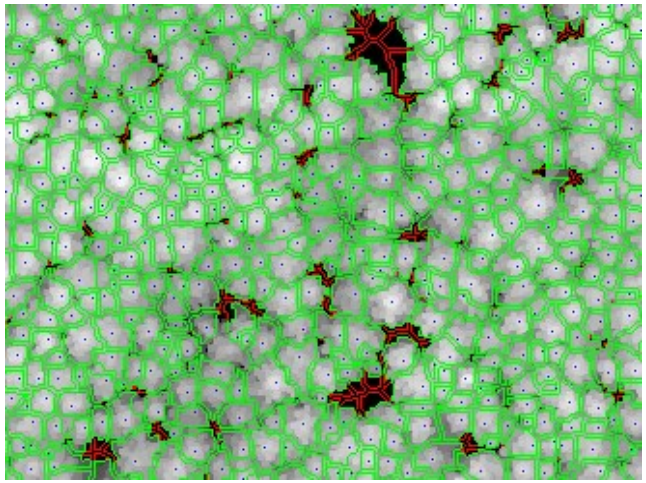
Forest Ecology and Management

journal homepage: www.elsevier.com/locate/foreco

Review

Assessment of standing wood and fiber quality using ground and airborne laser scanning: A review

Martin van Leeuwen[a,*], Thomas Hilker[a], Nicholas C. Coops[a], Gordon Frazer[b], Michael A. Wulder[b], Glenn J. Newnham[c], Darius S. Culvenor[c]



	Crown Area	Crown Volume	Crown circularity	Net bending moment (Nm)	Net water-transport distance	Crown density (returns m^{-3})
DBH	0.48	0.26	0.00	0.11	0.13	0.05
Stem volume	0.15	0.04	0.02	0.03	0.03	0.01
Form Value	0.02	0.05	0.09	0.01	0.03	0.00
Sweep (m)	0.43	0.39	0.15	0.00	0.49	0.32
Lean (°)	0.16	0.11	0.08	0.01	0.03	0.04
Stem circularity	0.06	0.00	0.58	0.59	0.21	0.47
Internode distance	0.01	0.04	0.16	0.04	0.05	0.43

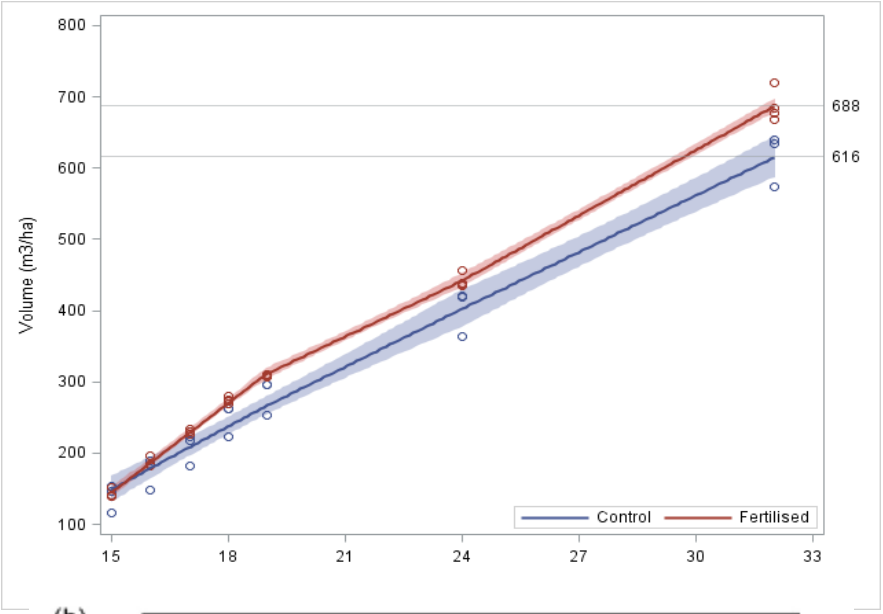
Segregation Research

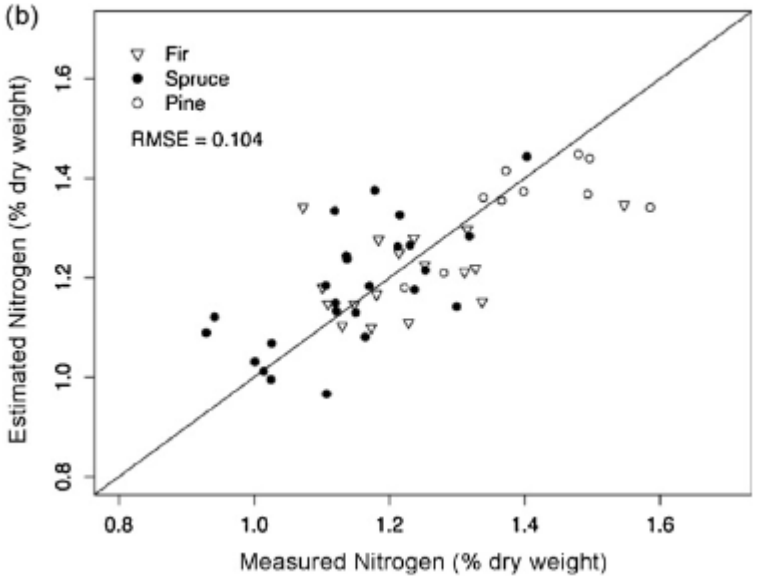
- Techno-economic review of segregation technologies
  - (Prof. Glen Murphy – Waiariki Institute of Technology)

- Evaluation of acoustic imaging for defect detection in wood
  - (Dr Mathew Legg & Prof. Stuart Bradley – University of Auckland)

Mid-Rotation Interventions

- Fertilisation, weed control, fertigation
- How to determine which stands will respond?
- How do we quantify the benefits of these interventions?
- What are the impacts on wood quality?
- New trials will be established to test most promising interventions

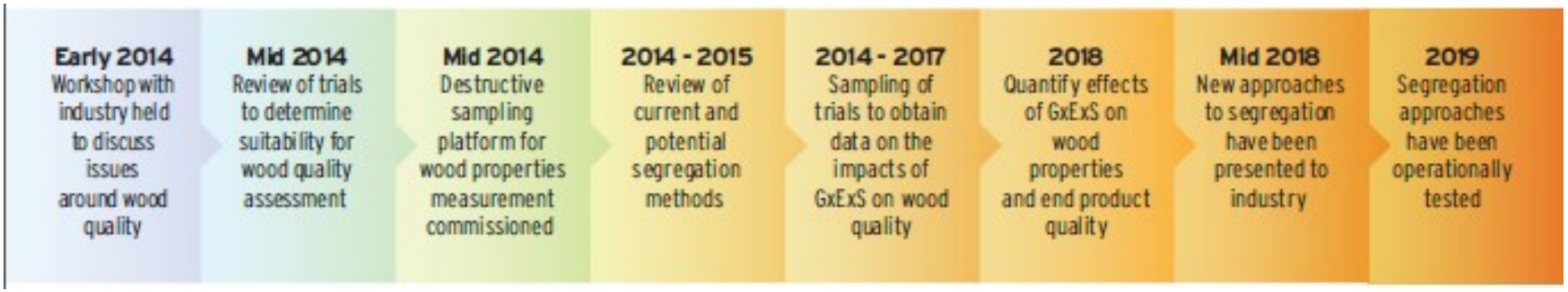




Protect the Investment

- Key to maintaining previous investment is ensuring that losses due to biotic and abiotic factors are minimised

Research Timelines



Concluding Comments

- The resource that will be harvested in the next 15 years will differ from that harvested now
- New knowledge will be required on its characteristics in order to make best use of it
  - Historical knowledge may give us some insights
  - Trial infrastructure exists to provide some of this information
- Mid- and end-of-rotation interventions are possible to add value to these forests
  - Will only be implemented if the benefits outweigh the cost
  - Need to target those stands where this will be the case

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FOREST OWNERS ASSOCIATION