Plantation forest species for steep slopes

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Steep slopes:

The reality

1. Difficult – shallow, dry soil, windswept
2. High harvesting costs

Management to prevent erosion

1. Long rotations
2. Species that root graft
3. Species with slow root decay rates
4. High initial stockings
5. Continuous cover?

Achievable by growing…

High value timber species.

But… how do we predict high timber “value”?

An example: Treated vs untreated?

The “timber value” crystal ball…

- Appearance
- Surface hardness
- Strength and stiffness
- Durability

But the construction market requires chemical treatment.

Internal applications: Boron
External applications: CCA

“treatable” species

Radiata pine

- 25 year rotation (750 tonnes/ha)
- Fast growing

Grand fir

- 50 year rotation (1500 tonnes/ha)
- Very healthy

Would industry be willing to shift to a longer rotation if this mitigated erosion on steeplands?

Grand fir

Abies grandis, Gwavas forest (50 years old):

What do we know?

1. Enormous volume
2. Good branch index
3. Healthy
4. Wind hardy
5. Treatable

What do we not know?

1. Grade recoveries
2. Log value
3. Stiffness and strength
4. Siting requirements

“Naturally durable” species:

- Redwood
- Eucalyptus
- Cypress
- Totara

Economic constraint: Most value comes from heartwood, especially “clear” heartwood

Redwood

1. Site limited – requires some shelter, some soil depth and some soil moisture
2. Export market to USA available
3. Improved genetic material available
4. Well suited to continuous cover
5. Coppicing

But… wood properties limit applications.

Eucalyptus

- Reputational issue (poor historical species selection)
- Perception of insect issues

Conditional on appropriate species selection, *Eucalyptus* is:

1. Healthy
2. Very high heartwood content
3. Durable timber
4. Productive
5. Adaptable and Resilient to site conditions
6. Coppicing

The timber is:

1. Hard
2. Strong
3. Durable
4. Valuable

Cypress

Reputational issue (canker disease)

Conditional on appropriate species/clone selection:

1. Disease free
2. Good form
3. Productive
4. Adaptable to site
5. Exceptional timber properties
6. Suitable for short or long rotations

Totara

- Well suited to steeplands
- Low cost seedlings
- Comparatively slower growing
- Poor form
- Stock proof
- Good root system
- Long rotation
- Suitable for continuous cover
- Good timber properties…

… but not the totara we know from history.

But what do we know about economic value from “alternative” species?

Constraints – realising value

1. Scale

Is this a hurdle…
or a brick wall?

For example: Export logs or process locally?

Constraints – realising value

2. Market development

Generating demand - A new product requires effort in marketing

“Hasn’t been done” or “Can’t be done?”

Constraints – realising value

3. Rotation Length

Should industry continue to focus only on internal rate of return?

What about slope stability? There is a tradeoff between ecosystem services offered by improved plantation forestry and economic outcomes.

Do we know enough?

- Historical focus on radiata only
- Long time frames for research outcomes

A gamble?

- Can our slopes be managed for ***grade recoveries***?

Success measured by

- Quantity of logs.

  But also…

- Quality of logs.

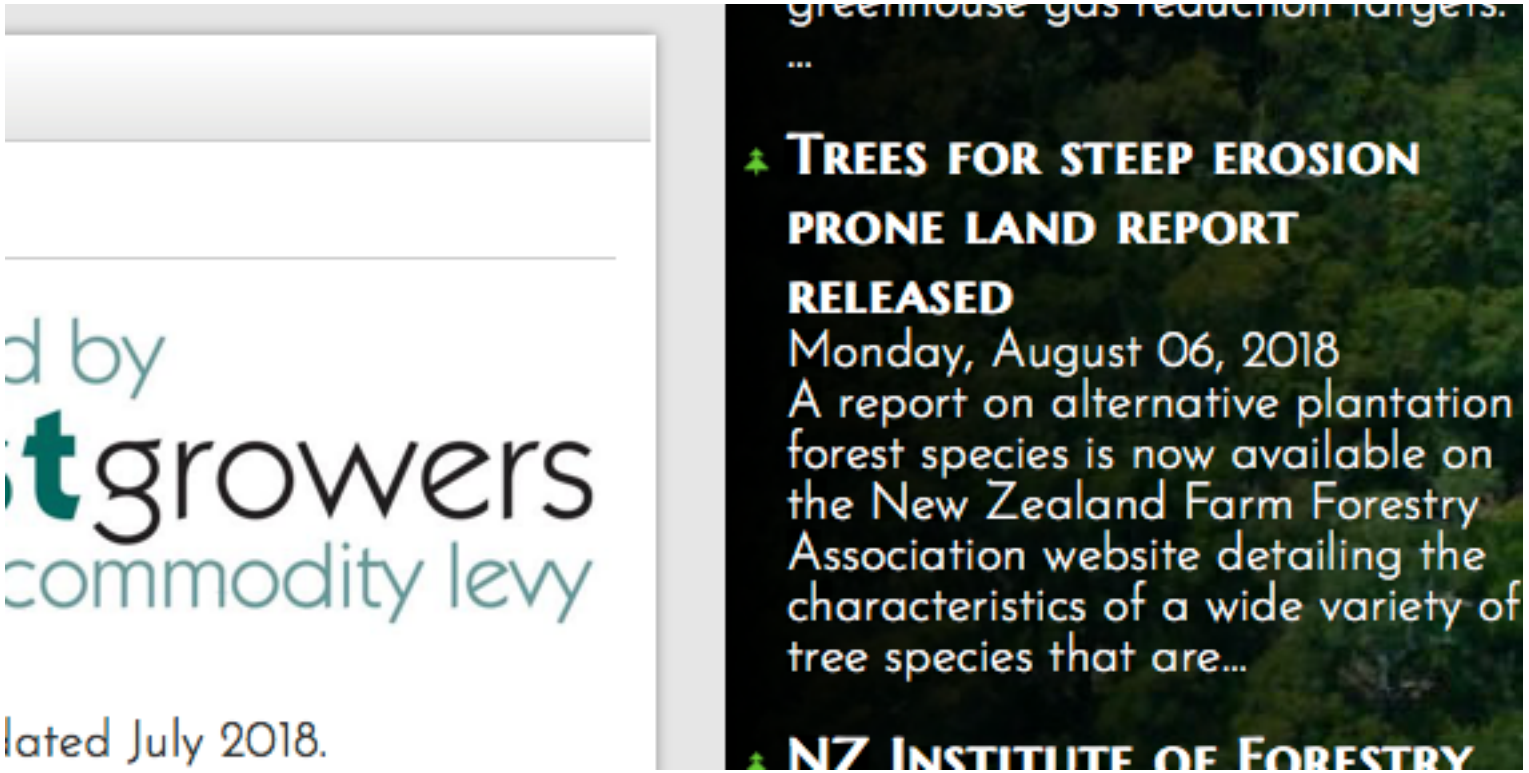
  Quality is measured as grade recoveries.

How can our slopes be managed for high ***grade recoveries***?

Success… achievable by:

- Good siting of species
- Good genetic material
- High initial stocking rates
- Adequate thinning interventions

Report: Trees for steep slopes



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