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Plant & Food RESEARCH
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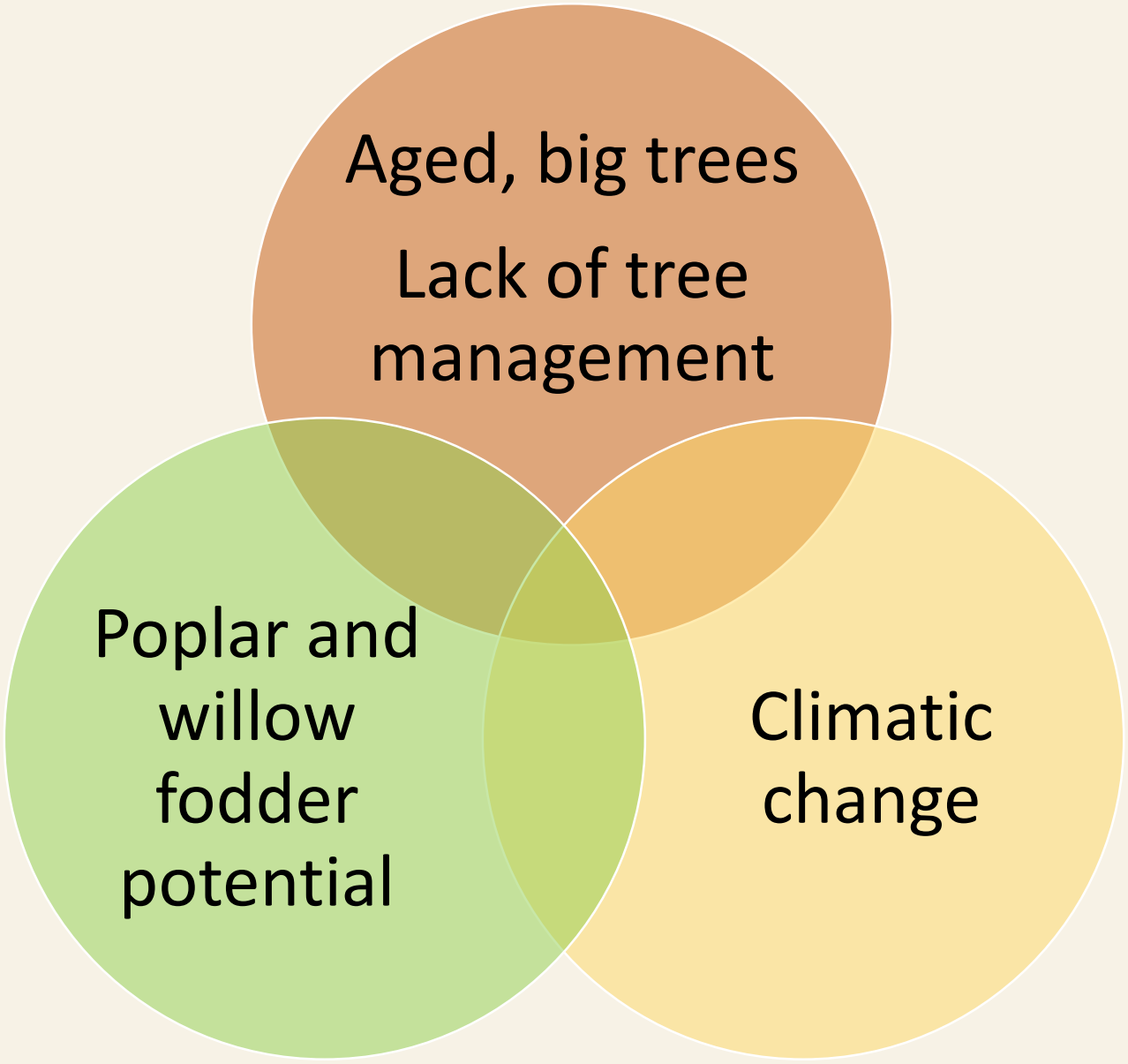
Root response to removal of shoots in cuttings of willow and poplar

Mauricio Maldonado, Peter D. Kemp, Ian R. McIvor, Grant B. Douglas

Management and Research on Tree-pasture systems in New Zealand



Tree size management

Today's Weather **Dunedin**

19 12
HIGH LOW
Forecast

Otago Daily Times

Online Edition | Tuesday, 11 February 2014 | 14:20:44

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Crane topples during attempt to remove dangerous poplar

LATEST QUEENSTOWN LAKES NEWS

Video: Visitors caught with hands in lolly jar

Home » News » Queenstown Lakes

By Joe Dodgshun on Tue, 15 Nov 2011

News: Queenstown Lakes

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A huge black poplar tree toppled a crane near Arrowtown yesterday morning, trapping the operator who was later taken to hospital with minor injuries.

The 80- to 100-year-old tree came down at about 10am during removal works on Speargrass Flat Rd, taking the 55-tonne capacity machine with it, and closing the road.

Constable Terry Erceg, of Queenstown, said the "very, very lucky" operator - a 51-

- **Extensive planting 1960's - 1970's**
- **Fences**
- **Water courses**
- **Stock**
- **Pasture overshading**

Climatic Change

Pollarding Practical Management

- Pollarding is confined to the summer or late summer on intense and lasting drought conditions

Short rotation forestry

When is the best harvesting time

- Root CHO dynamics
- Root CHO reserves **are at maximum after bud set**
- Root CHO reserves **are at minimum on late summer before bud set**
- Higher coppice sprout production when plants are cut ***in a dormant stage*** than ***in the summer***

?

- **High Root CHO reserves after bud set : Better root response after pollarding**

Purpose of the trial:

- *To evaluate root CHO dynamics and **root mass response** on willow and poplar plants decapitated at different phenological stages*

Glasshouse trial

- **Cuttings 15-20cm long**
  2-4cm diameter
- **Pot 8 lt**
  50:50 Top soil and sand
- **48 Willow plants (*Salix matsudana x alba* “Tangoio”)**
- **18 Poplar (*P.deltoides x nigra* “Dudley”)**
- **Plants were 4 and a half months old at the beginning of the trial**

Willow plants

Treatments	2013 Sampling sequence				
	Late Summer (15th March)	**Early Autumn (8th April)**	**Winter (dormant plants) (20th July)**	**Late Spring (10th December)**	**TOTAL PLANTS**
Late Summer Decapitated	18 plants decapitated	6	6	6	18
Dormant Decapitated			6 plants decapitated	6	6
Non decapitated (control)	6	6	6	6	24

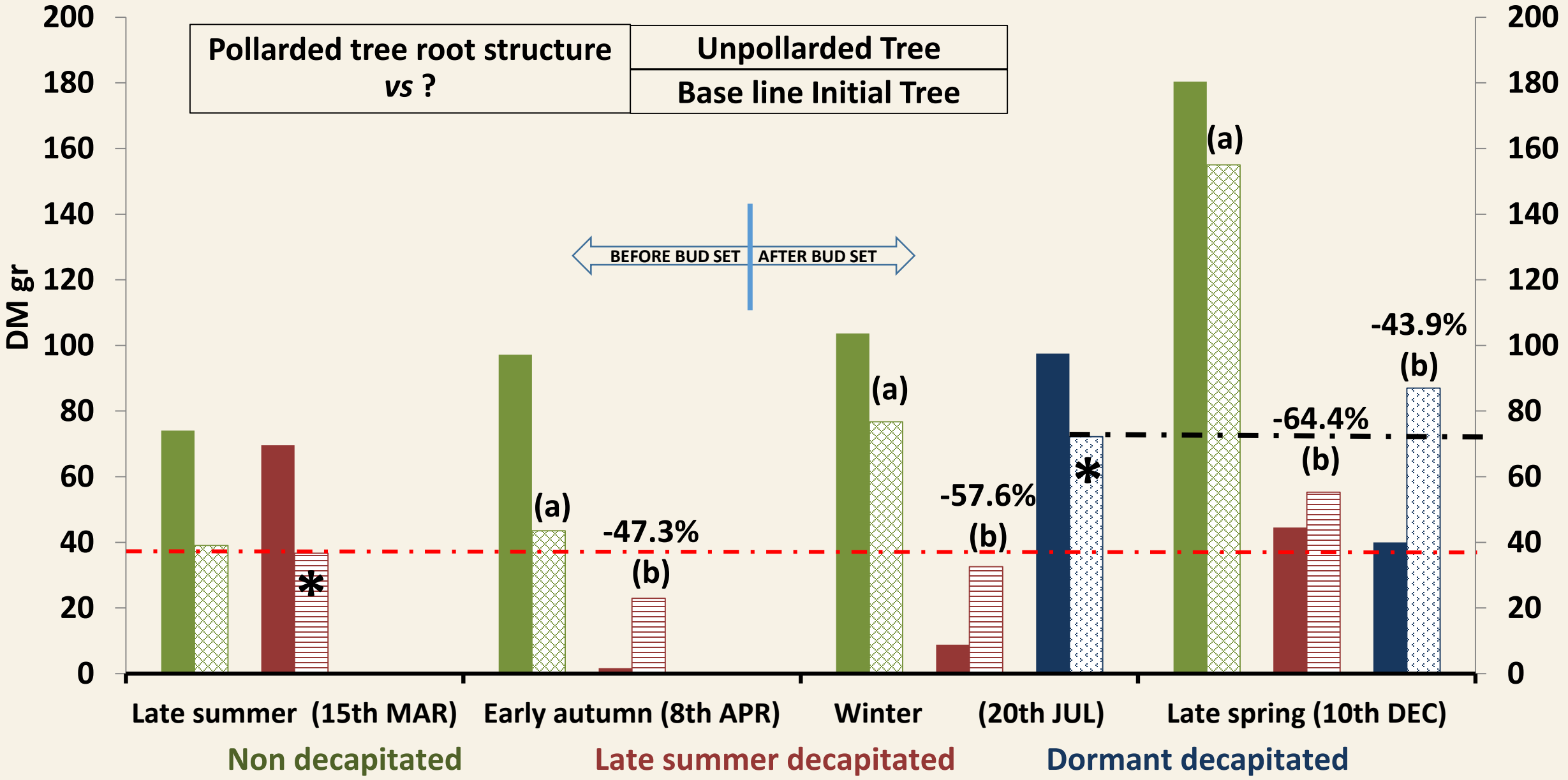
Poplar plants

Treatments	2013 Sampling sequence			
	Late Summer (15^{th} March)	Winter (dormant plants) (20^{th} July)	Late Spring (20^{th} November)	TOTAL PLANTS
Late Summer Decapitated	6 plants decapitated	3	3	6
Dormant Decapitated		3 plants decapitated	3	3
Non decapitated	3	3	3	9

Root recovery

RESULTS

Willow root mass changes after decapitation



Solid columns: Aboveground (Shoots + Branches) / Pattern columns: Root mass

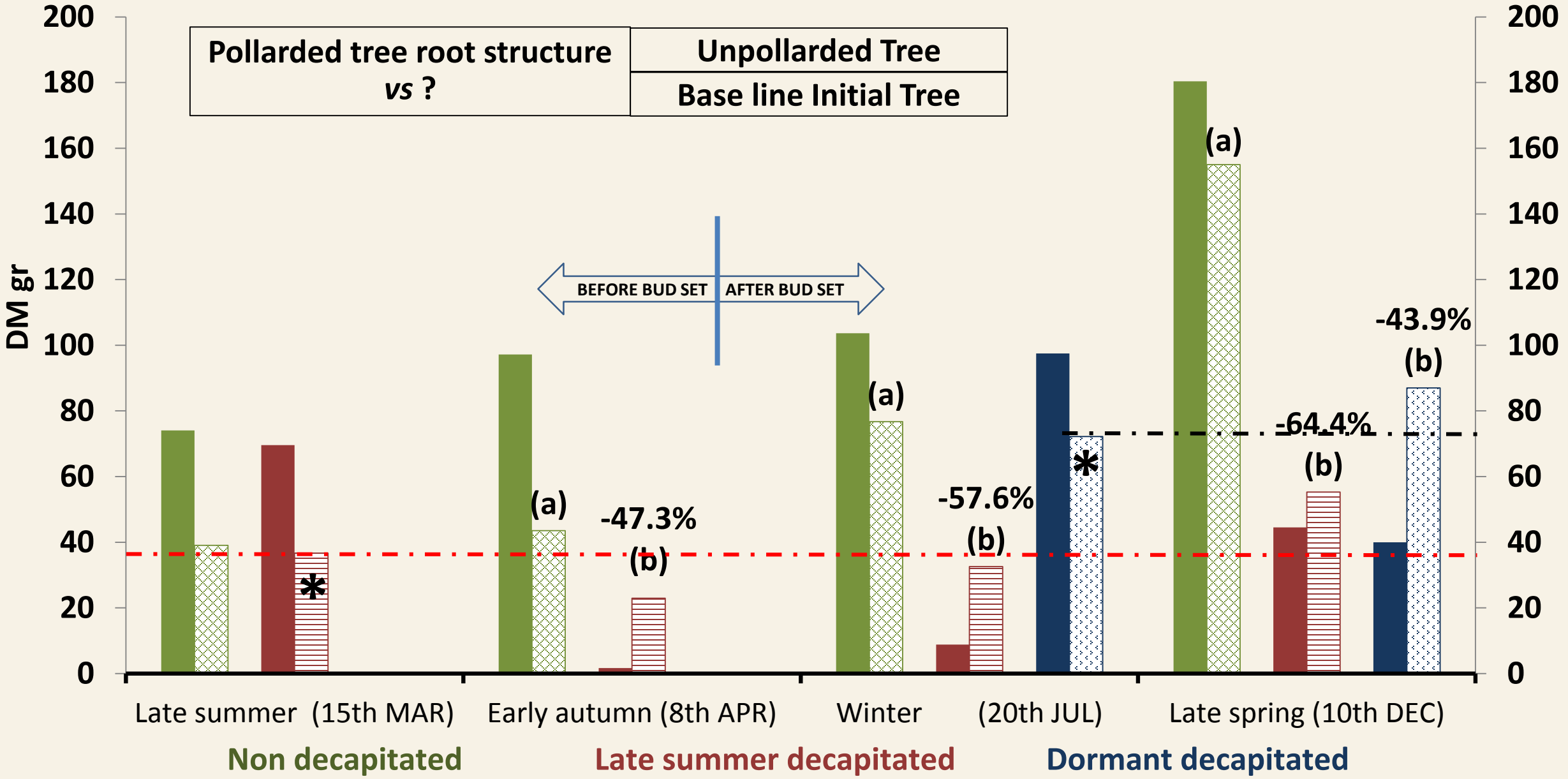
Pollarded tree root structure *vs* ?	Unpollarded Tree
	Initial Base line Tree

- **Pollarding tree as a way to control the size of the trees**

- **Pollarding practice should start when the tree or the tree stand have reached such age/size that they have developed a interlocked root protective network with the neighbouring trees.**

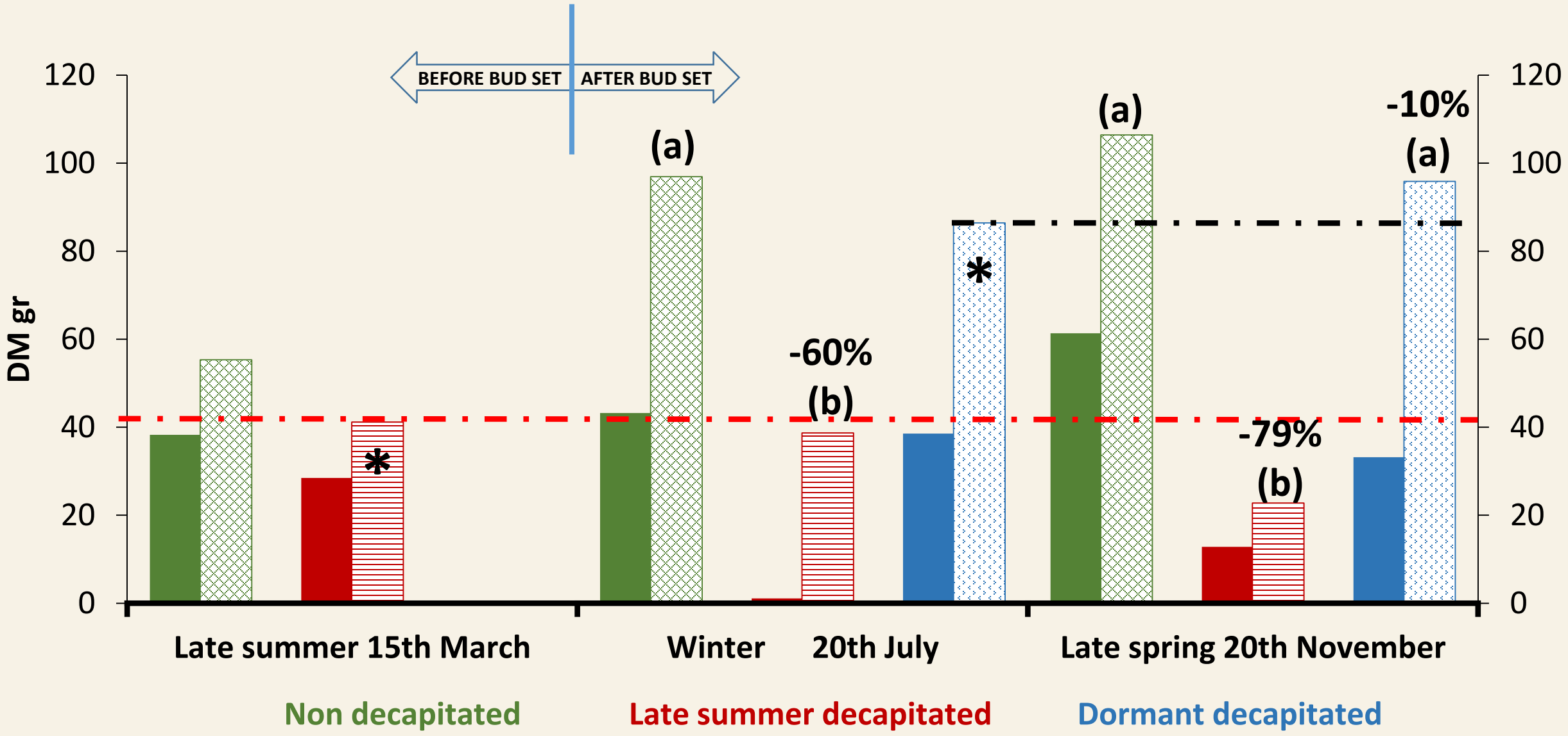
Root pictures (Stokes et al; 2009 Plant and Soil)

Willow root mass changes after decapitation



Solid columns: Aboveground (Shoots + Branches) / Pattern columns: Root mass

Poplar root mass changes after decapitation



SOLID COLUMNS: Above ground (Shoots + Branches) / PATTERN COLUMNS: (Root mass)

Conclusions

When comparing with the base line root mass:

- **Plants decapitated at the dormant stage showed a positive higher root response in comparison with the late summer decapitated plants**
- **Willow late summer and dormant decapitated plants recovered in the short term the base line root mass but not the poplar late summer decapitated plants**
- **Data require verification with mature trees growing in the harsh conditions of the Hill country environment**

Thank you!