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Research

Evaluation of Nursery Tree Stock Balance Parameters

Project NY15001

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The Project Team

WESTERN SYDNEY UNIVERSITY
Hawkesbury Institute for the Environment

Prof Mark Tjoelker
project leader

Courtney Campany
field researcher

Dr Mike Aspinwall
tree physiology

Dr Remko Duursma
biometry analyst

David Thompson
communications

Dr Sebastian Pfautsch
tree growth

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Project Activities

Initial steering committee meeting
- 29 October 2015 - meeting at Qantas Lounge

Appointment of a research associate
- 1 January 2016 - Court Campany commences as field researcher

Scoping visit to Alpine Nurseries
- 29 January 2016 - Western Sydney team visits with Ken Bevan

Project launch at NGIA conference
- *Share the Vision: The Road Ahead.* Nursery and Garden Industry National Conference, Adelaide, South Australia, 15 - 17 February

Field trial launch
- 26 – 29 April 2016 – field testing of protocols and measurement (Alpine Nurseries)

Photo: D Thompson

2016 Nursery & Garden Industry Conference
(Adelaide, South Australia)

20 April 2016

Nursery & Garden Industry Australia

Mark Tjoelker
University of Western Sydney
M.Tjoelker@westernsydney.edu.au

Dear Mark

2016 Nursery &Garden Industry National Conference & Exhibition
Adelaide, South Australia

On behalf of Nursery and Garden Industry Australia, I would like to thank you for your contribution to the success of the 2016 Nursery & Garden Industry Conference & Exhibition held in Adelaide during February.

Interesting, unique and enthusiastic speakers are an important and integral part of this event and we appreciate the time you invested to prepare and deliver an informative session to the delegates.

Feedback from the conference as a whole has been extremely positive, with many delegates commenting that this has been one of the best conferences to date. Based on the evaluation form responses, delegates felt your session was good and overall informative. Delegate concerns included propagation stock and southern species which are studied.

The destination for the next national conference in 2018 is yet to be confirmed and we will advise this information shortly.

Once again, thank you for your participation and support of the conference and we look hearing from you with any feedback on your partnership with us and your involvement in the conference.

Regards

Peter Vaughan
CEO

Project Website

Accessed via http://bit.ly/TreeStocks

Scoping visit to Alpine Nurseries

Ken Bevan hosts Western Sydney University project team at Alpine Nurseries, Dural, NSW (Photos: D Thompson)

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01. Literature Review

Aim 1 Acquire information on root to shoot balance of tree planting stock from the scientific and trade literature

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Acquire information from the literature

Data mining

- Extract and analyze literature data to determine root to shoot balance of containerized stock

Expert synthesis

- Review other standards and industry best practices
- August completion date?

Photo: D Thompson

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02.
Field Research

Aim 2 Quantify root to shoot balance in tree stock for contrasting regions in Australia

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Are there important species and regional differences in tree stock root to shoot balance?

Do species differ in root to shoot balance?

Do warmer vs. cooler climates result in shifts in optimal root to shoot balance?

Photo: D Thompson

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Production nursery visit schedule

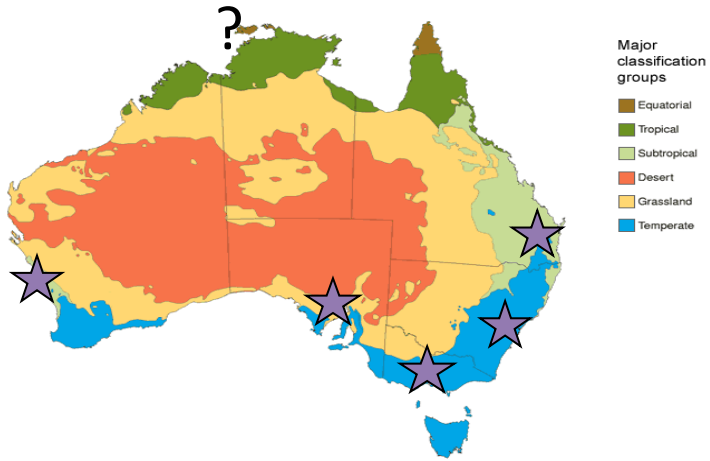
Confirmed nurseries

Alpine Nurseries (NSW) – Ken Bevan, 26 - 29 April
Andreasens Green (NSW) Tim Carroll, 23 – 27 May

Candidate nurseries

Specialty Trees (VIC) – Hamish Mitchell
Fleming's Nurseries (VIC) – Leanne Gillies
Heyne's Nurseries (SA)
Benara Nurseries (WA) – Carole Fudge
Trees Impact (NSW) – Ross Clark?
Darwin Wholesalers (NT)?
Greenstock (QLD)

Other suggestions?



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Site visit protocol*

Pre-visit communication
Species list and batch selection

Site visit (Day 1)
Verify batch conformance to standards

Day 2-4
Measurement of tree stock

Day 5 (optional)
Data mining of batch production history

*Based on team of two persons from Western Sydney University

Photo: D Thompson

Working list of 28 tree species/cultivars for assessment

Species	Type	Origin	Growth Rate
Agathis robusta	Evergreen	Native	Fast
Agonis flexuosa	Evergreen	Native	Fast
Angophora costata	Evergreen	Native	Fast
Callistemon ‘Kings Park’	Evergreen	Native	Fast
Corymbia citriodora	Evergreen	Native	Fast
Corymbia ficifolia	Evergreen	Native	Moderate
Corymbia maculata	Evergreen	Native	Fast
Eleaocarpus reticulatus	Evergreen	Native	Fast
Eucalyptus caesia ‘Silver Princess’	Evergreen	Native	Slow
Eucalyptus leucoxylon ‘Rosea’	Evergreen	Native	Fast
Eucalyptus sideroxlyon	Evergreen	Native	Moderate
Eucalyptus torquata	Evergreen	Native	Moderate
Ficus hilii ‘Flash’	Evergreen	Native	Moderate
Lophostemon confertus	Evergreen	Native	Fast
Tristaniopsis ‘Luscious’	Evergreen	Native	Slow
Waterhousia floribunda	Evergreen	Native	Fast
Brachychiton acerifolia	Deciduous	Native	Slow
Melia azedarach	Deciduous	Native	Fast
Magnolia grandiflora ‘Little Gem’	Evergreen	Non Native	Slow
Olea europa	Evergreen	Non Native	Slow
Acer ‘Autumn Blaze’	Deciduous	Non Native	Moderate
Jacaranda mimosifolia	Deciduous	Non Native	Fast
Lagerstroemia ‘Natchez’	Deciduous	Non Native	Fast
Lagerstroemia ‘Sioux’	Deciduous	Non Native	Fast
Pyrus ‘Chanticleer’ or ‘Cleveland Select’	Deciduous	Non Native	Moderate
Araucaria heterophylla	Evergreen	Non-Native	Fast
Platanus x acerifolia	Deciduous	Non-Native	Moderate
Ulmus parvifolia	Deciduous	Non-Native	Fast

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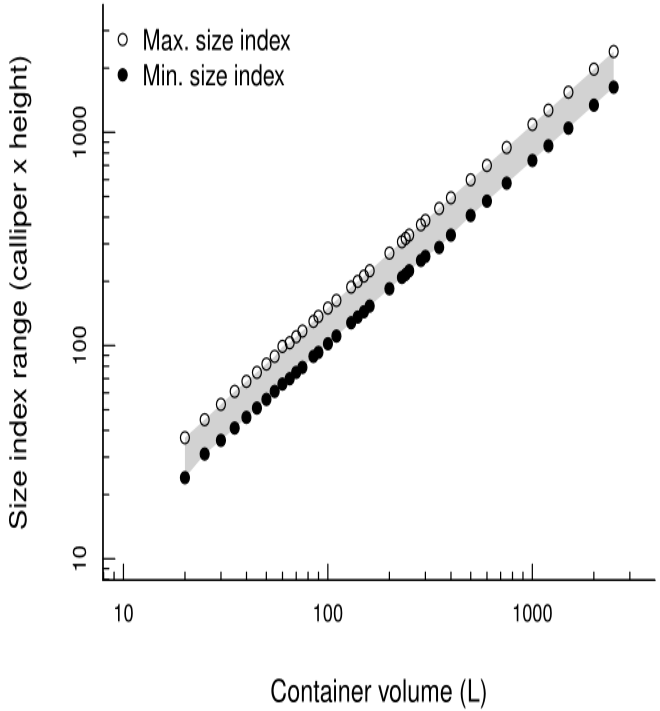
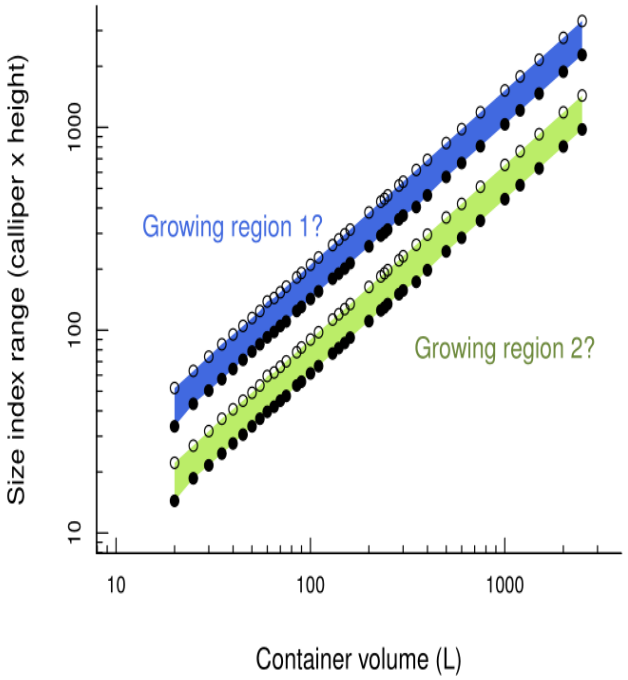
Current standard



Test for regional/species differences



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Aggregation of species into stock types

Species groups

- Type A: tall, slender, typically faster growing
- Type B: average form and growth rate
- Type C: stockier, thick-stemmed or branchy species, typically slower growing

Additional measured traits*

- Specific leaf area (leaf area/leaf dry mass)
- Crown spread, height
- Branching density
- Apical dominance
- Slenderness index

*Trialing at present in NSW

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Data policy discussion

Discuss security and sharing of field trial data

- Availability of data (released to whom, when?)
- Ensuring protection of any proprietary information (Which data are proprietary?)

Project NY15001 Evaluation of Nursery Tree Stock Balance Parameters

Horticulture Innovation Australia

Milestones

No	Due Date	Total Amount	Description
101	**25/08/2015**	**$80,000.00**	**Agreement signed, R&D Strategic Co-Investment funds (if required) received and IP arrangements in place**
Achievement Criteria	Agreement signed and returned to Horticulture Innovation Australia Ltd Steering committee meeting 1 at Hawkesbury Institute for the Environment		
Milestone Funding	*Source*	*Source Type*	*Amount*
	Nursery (R&D Levy)	R&D Levy matchable	$80,000.00

No	Due Date	Total Amount	Description
102	**25/02/2016**	**$60,000.00**	**Progress Report 1**
Achievement Criteria	Initial stakeholder meeting Steering committee meeting 2 at Hawkesbury Institute for the Environment Field trial work, phase 1 Literature review report Stakeholder briefing notes 1		
Milestone Funding	*Source*	*Source Type*	*Amount*
	Nursery (R&D Levy)	R&D Levy matchable	$60,000.00

No	Due Date	Total Amount	Description
103	**25/08/2016**	**$81,120.00**	**Progress Report 2**
Achievement Criteria	Steering committee meeting 3 at Hawkesbury Institute for the Environment Field trial work, phase 2 (completion) Submission of literature review manuscript for publication Stakeholder briefing notes 2		
Milestone Funding	*Source*	*Source Type*	*Amount*
	Nursery (R&D Levy)	R&D Levy matchable	$81,120.00

No	Due Date	Total Amount	Description
190	**25/04/2017**	**$55,280.00**	**Final report received by Horticulture Innovation Australia Ltd**
Achievement Criteria	All necessary reports complying with Horticulture Innovation Australia's requirements received and approved by Horticulture Innovation Australia Ltd Final stakeholder workshop at Hawkesbury Institute for the Environment Stakeholder briefing notes 3 Report on tree stock balance parameters (including lookup tables) Online tool and application		
Milestone Funding	*Source*	*Source Type*	*Amount*
	Nursery (R&D Levy)	R&D Levy matchable	$55,280.00