Alternative Herbicide Trial – Pinbarren and Kandanga site overview

Dr Tanzi Smith, MRCCC

MARY RIVER CATCHMENT COORDINATING COMMITTEE

BOS RURAL SUPPLIES

NOOSA & DISTRICT LANDCARE

in collaboration with the University of the Sunshine Coast

Purposes of the trial

1. Exploring alternatives to Glyphosate in revegetation
   - More tools in the toolkit
   - Options for organic properties
   - Concerns about health and environmental impacts
   - Improving knowledge of soil/herbicide interactions
2. Sharing experience
   - Field days
   - Academic publications
3. Creating of a community of practice
   - Success of any new product/technique requires practice
   - Limited body of work behind alternative herbicides

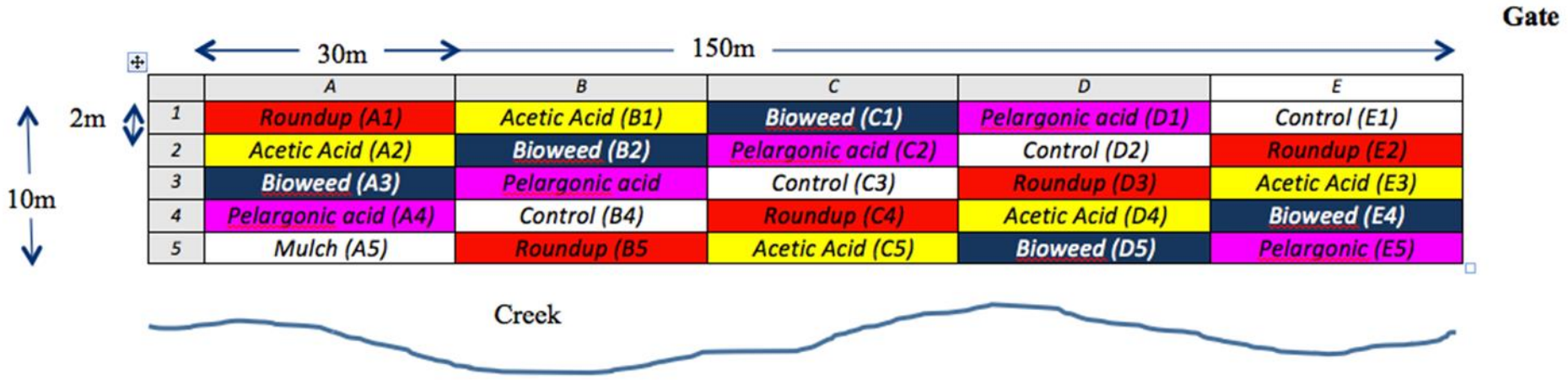
Trial has only been possible because everyone involved has gone "above and beyond"

Trial Design

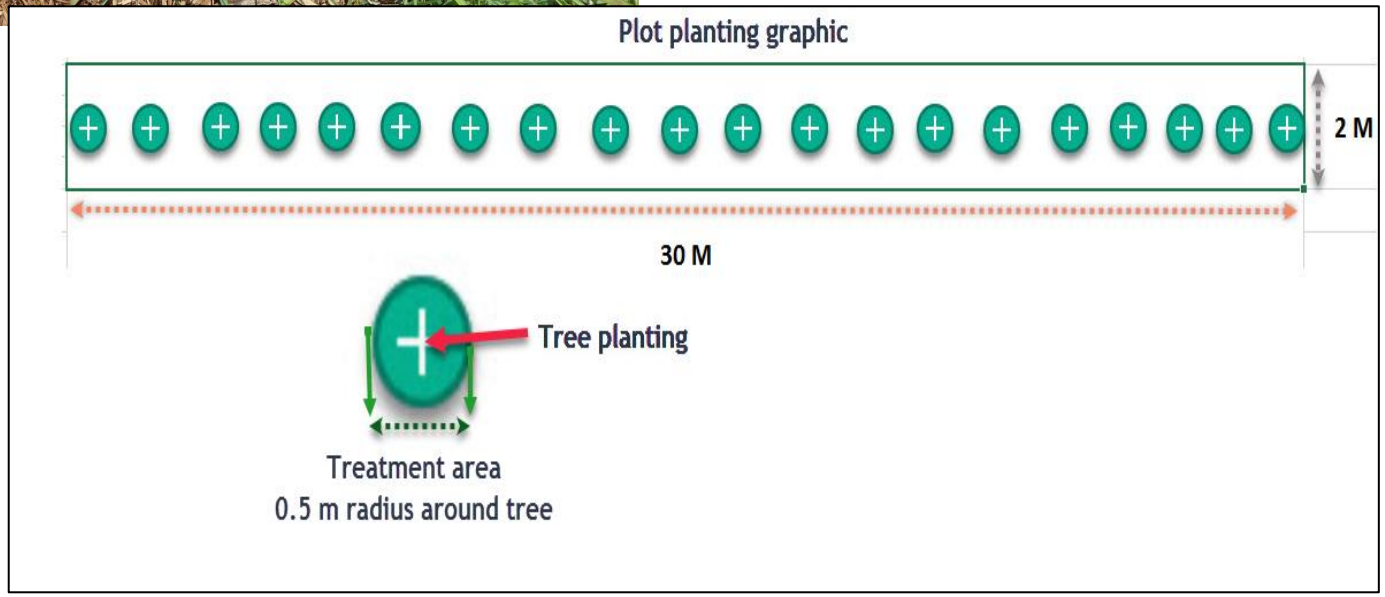
- 500 trees, with 100 trees per treatment

Treatments:

1. Roundup: 10ml/L (1ml/L Brushwet surfactant)
2. Bioweed – 200ml/L (2ml/L synetrol oil)
3. Pelargonic Acid – 70ml/L (2ml/L synetrol oil)
4. Acetic Acid: 125ml/L (2ml/L synetrol oil)
5. Control (with mulch and without mulch)



	A	B	C	D	E
1	Roundup (A1)	Acetic Acid (B1)	Bioweed (C1)	Pelargonic acid (D1)	Control (E1)
2	Acetic Acid (A2)	Bioweed (B2)	Pelargonic acid (C2)	Control (D2)	Roundup (E2)
3	Bioweed (A3)	Pelargonic acid	Control (C3)	Roundup (D3)	Acetic Acid (E3)
4	Pelargonic acid (A4)	Control (B4)	Roundup (C4)	Acetic Acid (D4)	Bioweed (E4)
5	Mulch (A5)	Roundup (B5	Acetic Acid (C5)	Bioweed (D5)	Pelargonic (E5)


Plot planting graphic
2 M
30 M
Tree planting
Treatment area
0.5 m radius around tree

Monitoring

- Tree survival, height and diameter at ground
- Soil pH and nutrient content
- Soil microorganisms

University of Sunshine Coast researchers taking soil samples

MRCCC staff measuring trees

Two sites

Kandanga – 2 years old

- Commenced August 2016
- Site of first two field days

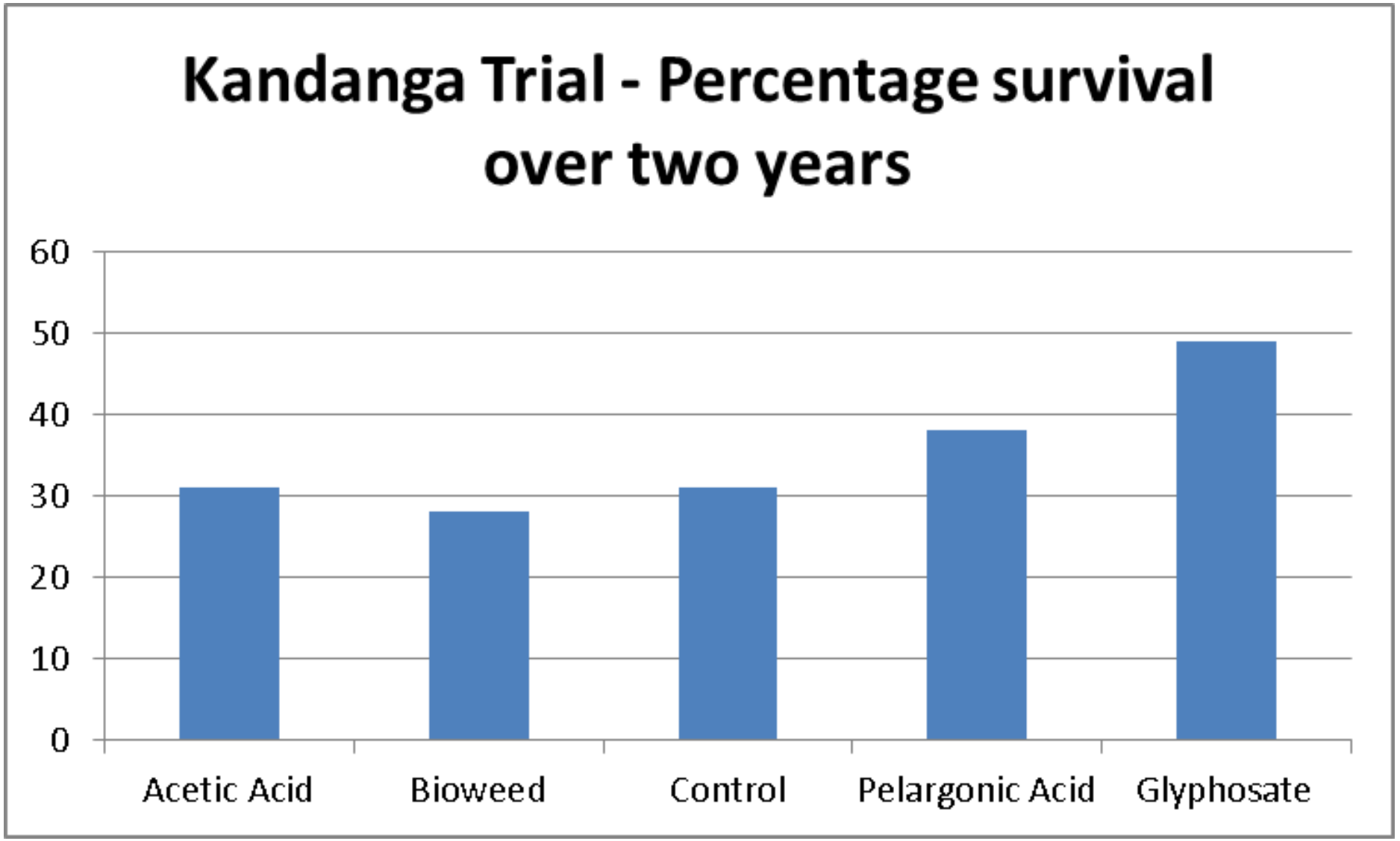
Pinbarren – 1 year old

- Commenced Nov 2017
- Today's site

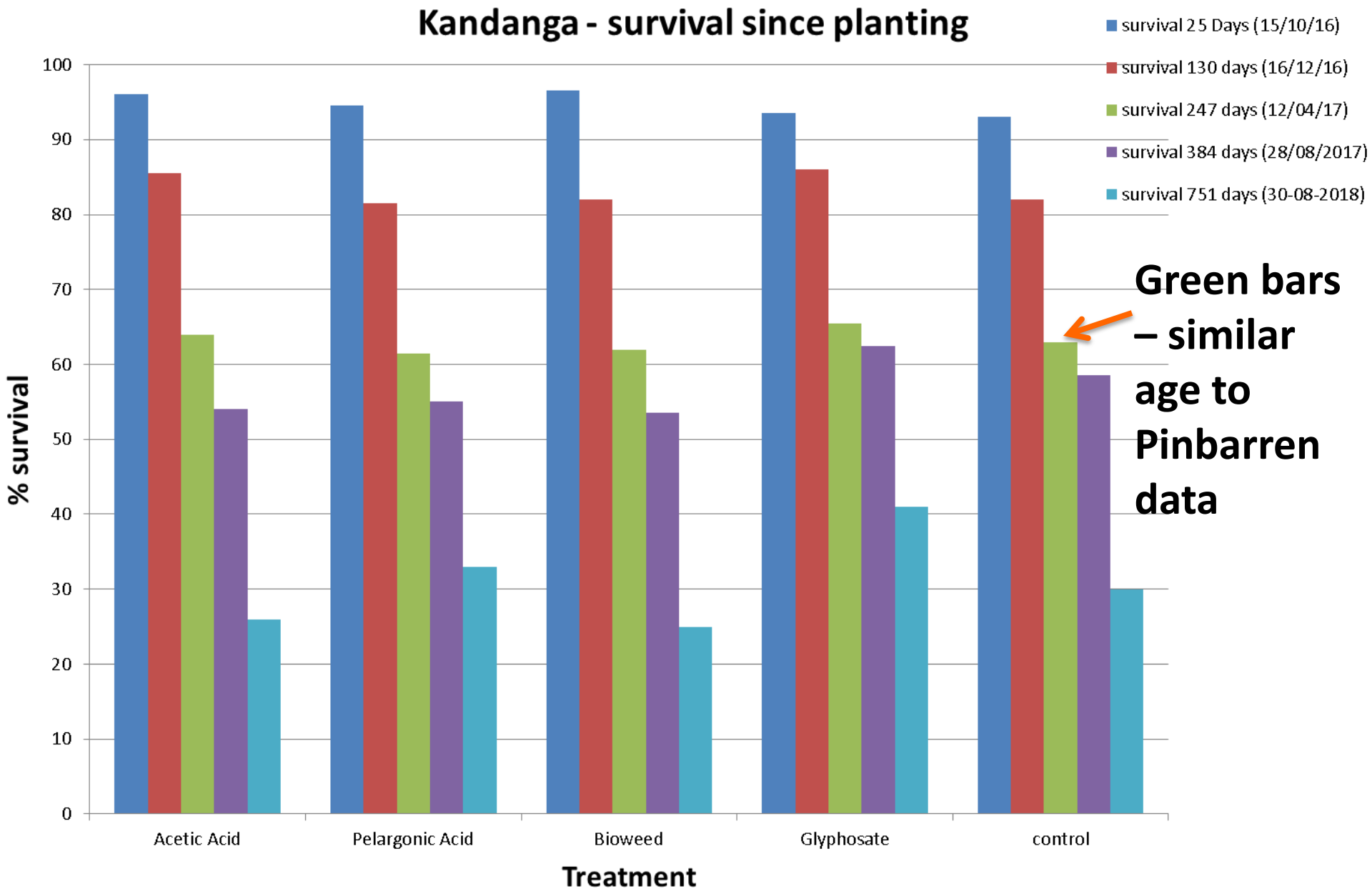
Kandanga – two years into the trial

- Site preparation (1 round)
- Planting on 9 August 2016
- 6 maintenance rounds
  - All but second where for all chemical treatments
- Landholder slashed and brushcut between rows

Difficult conditions for the site



Please note: This is preliminary data which is provided as a general guide only. Please do not draw conclusions from it. A statistical analysis is needed to enable any conclusions to be drawn.



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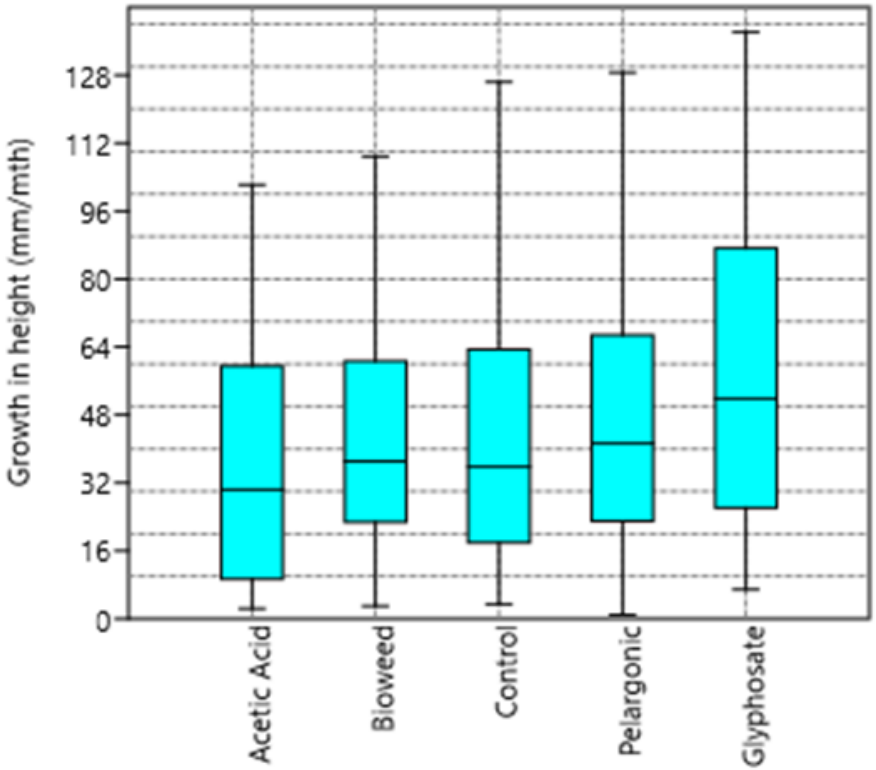
Growth rates for two years at Kandanga



Growth in height (mm/mth)

Median range:

27mm/mth – Acetic Acid

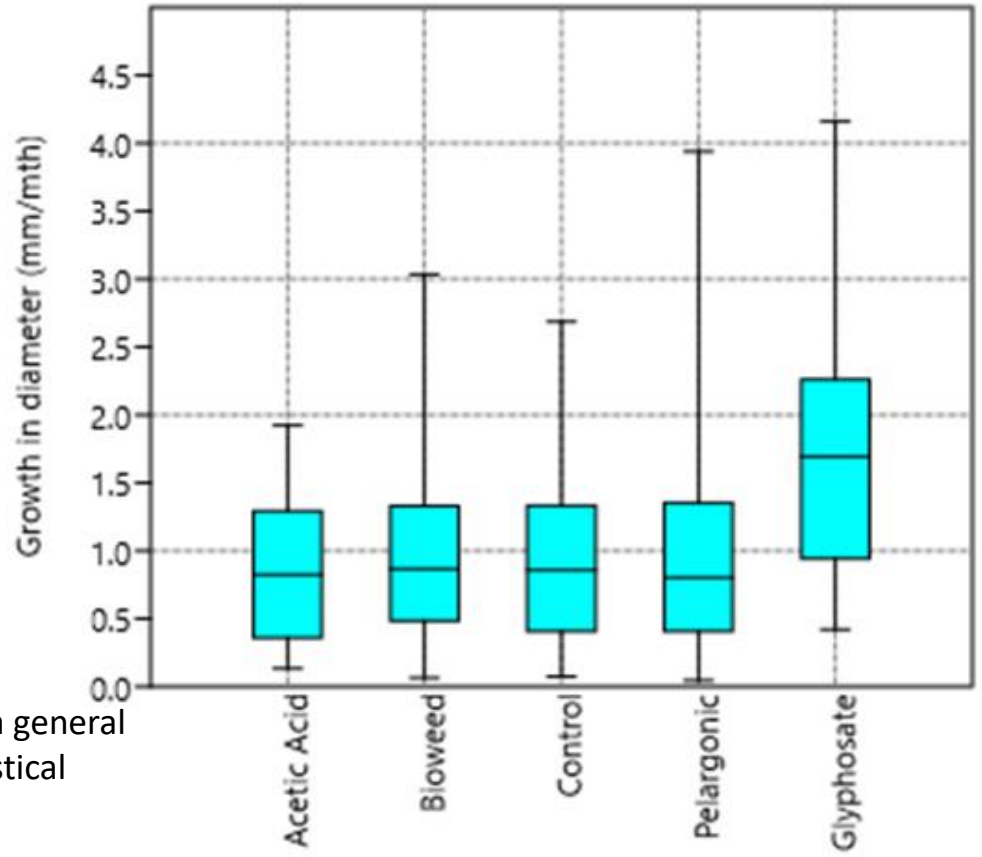
52 mm/mth - Glyphosate

Growth in diameter (mm/mth)

Median range:

0.8mm/mth – Acetic Acid

1.7 mm/mth - Glyphosate



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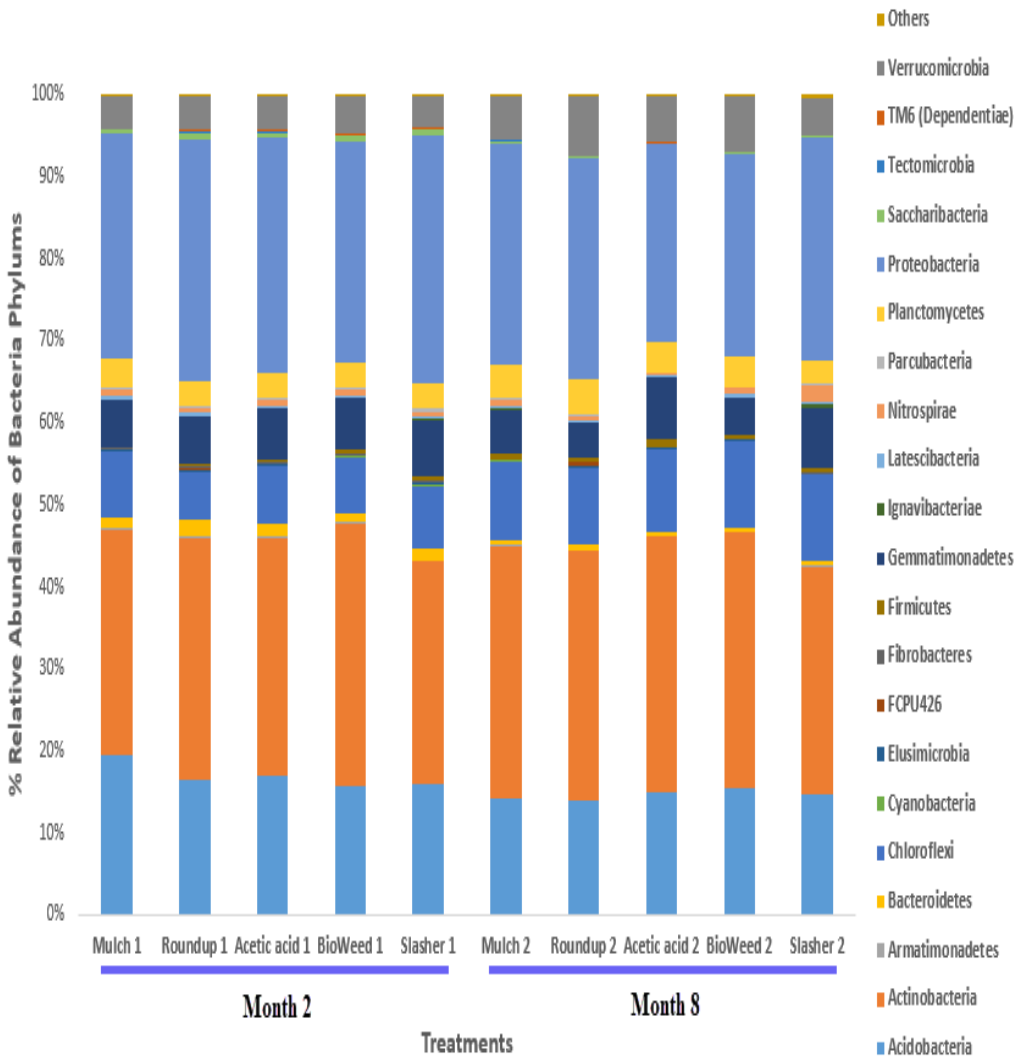


Preliminary results

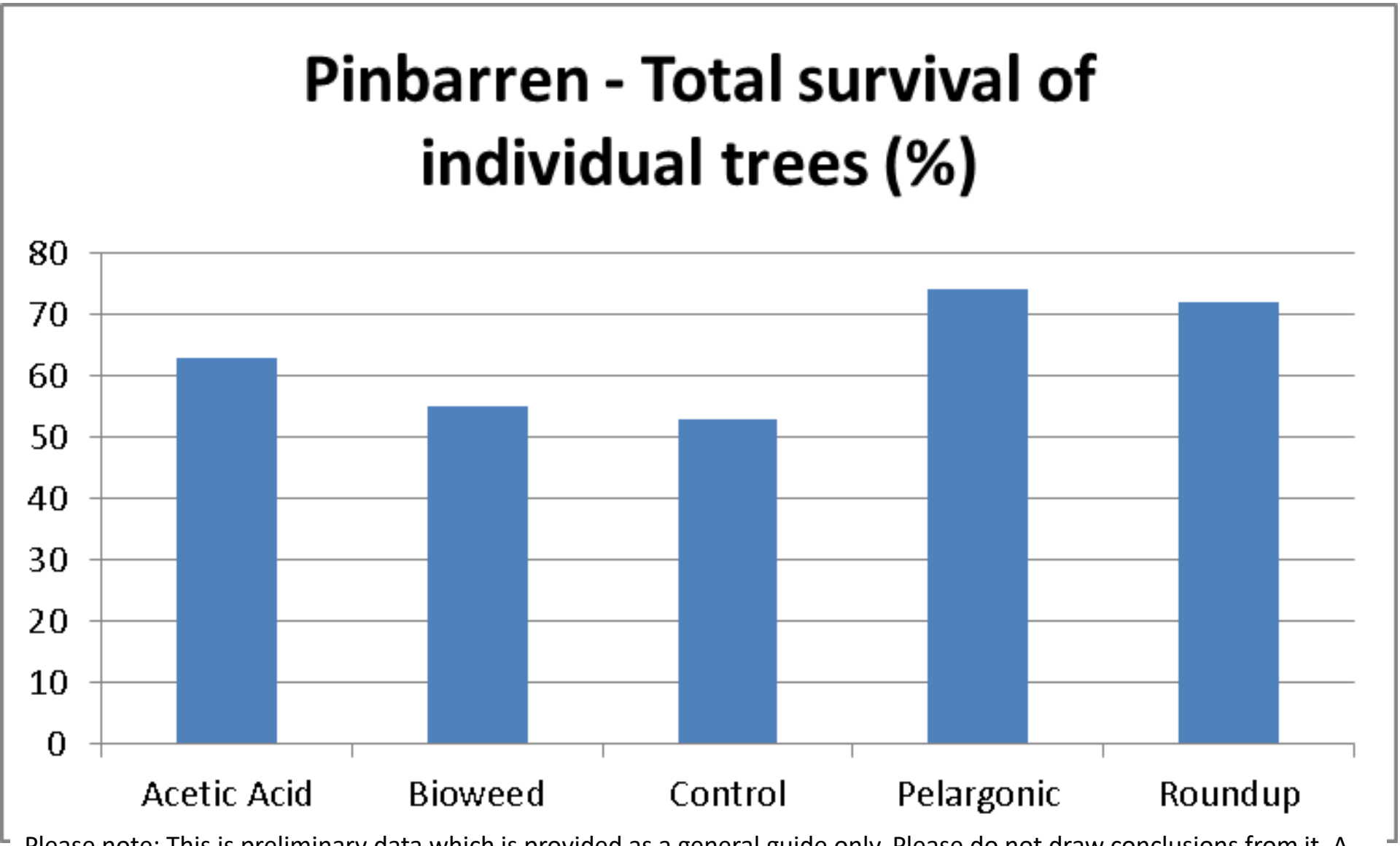
- Soil C:N ratio
- Soil Bacteria
- Soil Fungi

Long term effects of herbicides on soil bacteria and fungi remain to be seen

Pinbarren – 1 year into the trial

- Planted 9 November 2019
- Two site preparations required for non-roundup treatment
- Maintenance
  - **4 runs – Chemical applications of ALL 4 chemicals**
  - 2 Brushcutting within the rows
  - 1 Mulch reapplication
- Landholder has hand weeded *Ipomea* and slashed grass between plots

After 10 months at Pinbarren



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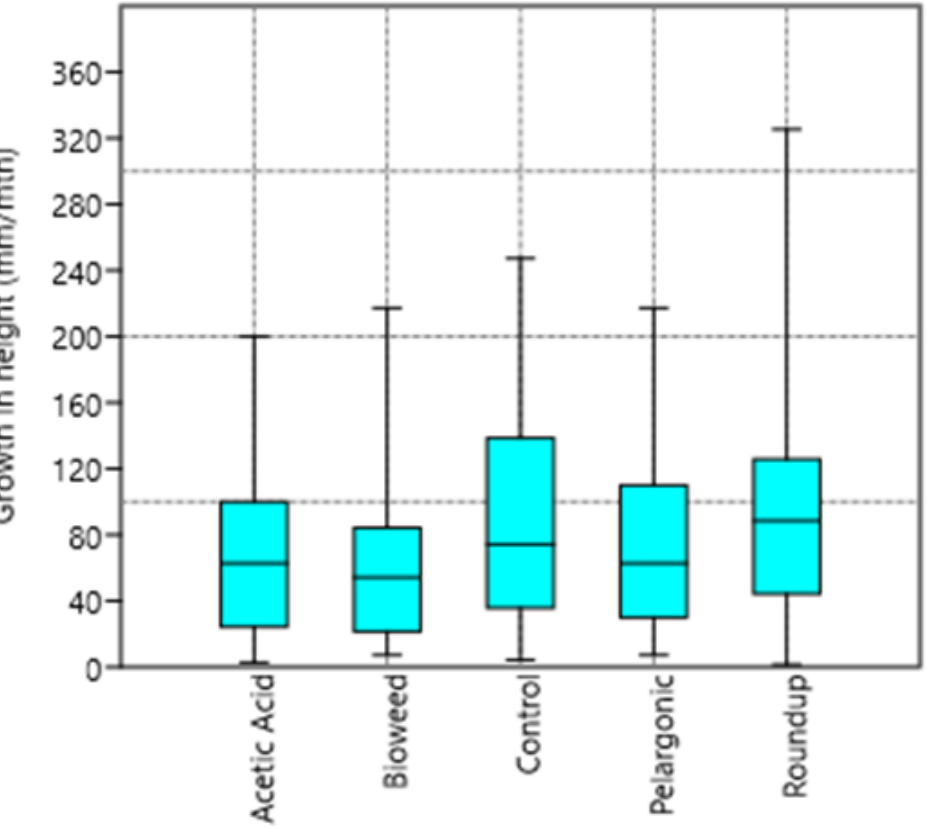
Growth rates for first year at Pinbarren

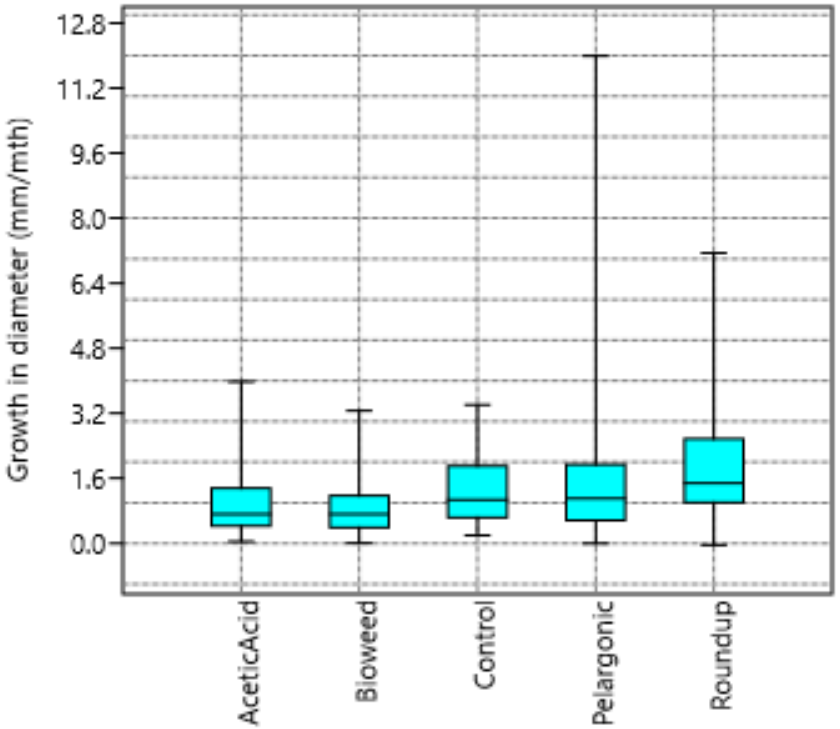


Growth in diameter (mm/mth)

Median range:

0.72 mm/mth - Acetic Acic, Bioweed

1.5 mm/mth - Glyphosate



Growth in height (mm/mth)

Median range:

54mm/mth – Pelargonic

89 mm/mth - Glyphosate

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Research projects and publications

Research Projects:

- Nadine Citerne (USC, Special Research Project) - weed regrowth after herbicide application
- Dee Bottril (USC, Honours)- Soil microbial diversity after herbicide application
- Negar Omidvar (Griffith, PhD candidate)- Nitrogen availability after herbicide application
- Dr Trong Tran, USC (Post Doctoral Researcher) - Assessment of glyphosate residues on riparian zones

Key researchers

- Dr Shahla Hosseini Bai, USC and now CQU (Central Queensland Uni), Dr Joanne Burton, DSITI, Dr Tanzi Smith, MRCCC, Dr Steve Ogbourne, USC

Publication in preparation:

- Bottril et al (in preparation) Effects of mulch, roundup and organic based herbicides on soil biochemical properties

Observations from trial to date

- Two sites might be responding quite differently
- Use of new products associated with a learning curve with techniques and maintenance scheduling
- More frequent application of non-synthetic products may have got better results
- Practical concerns - smell and safety of Acetic Acid (concentrate), need to agitate Bioweed, weather affects efficacy
- Mulch treatment worth further exploration

What's next for the trial?

- Need to secure funding for further maintenance
- Continue monitoring
- Complete research projects
- A huge thank you to landholders and everyone else involved

You can join the email list if you would like updates

Contact:

Bec.Watson@mrccc.org.au

Kandanga Trial site on 12 April 2017

Program for rest of today

11:45-11:00 **The effect of different management practices on soil N availability**, Negar Omidvar, Griffith University

11:00-11:15 **Investigating the efficacy of pine oil (Bioweed) on two natural area weeds**, Alana Trott, AborCare Qld and University of Queensland.

11:15-11:30 **New ideas, practical experience in alternative weed control**

11:30-12:00pm **Q&A Panel**