Alternatives to glyphosate & the challenges.

Ian Graham

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Who are we?

National application specialists serving the amenity sector.

Strong supporters of science leading best practice.

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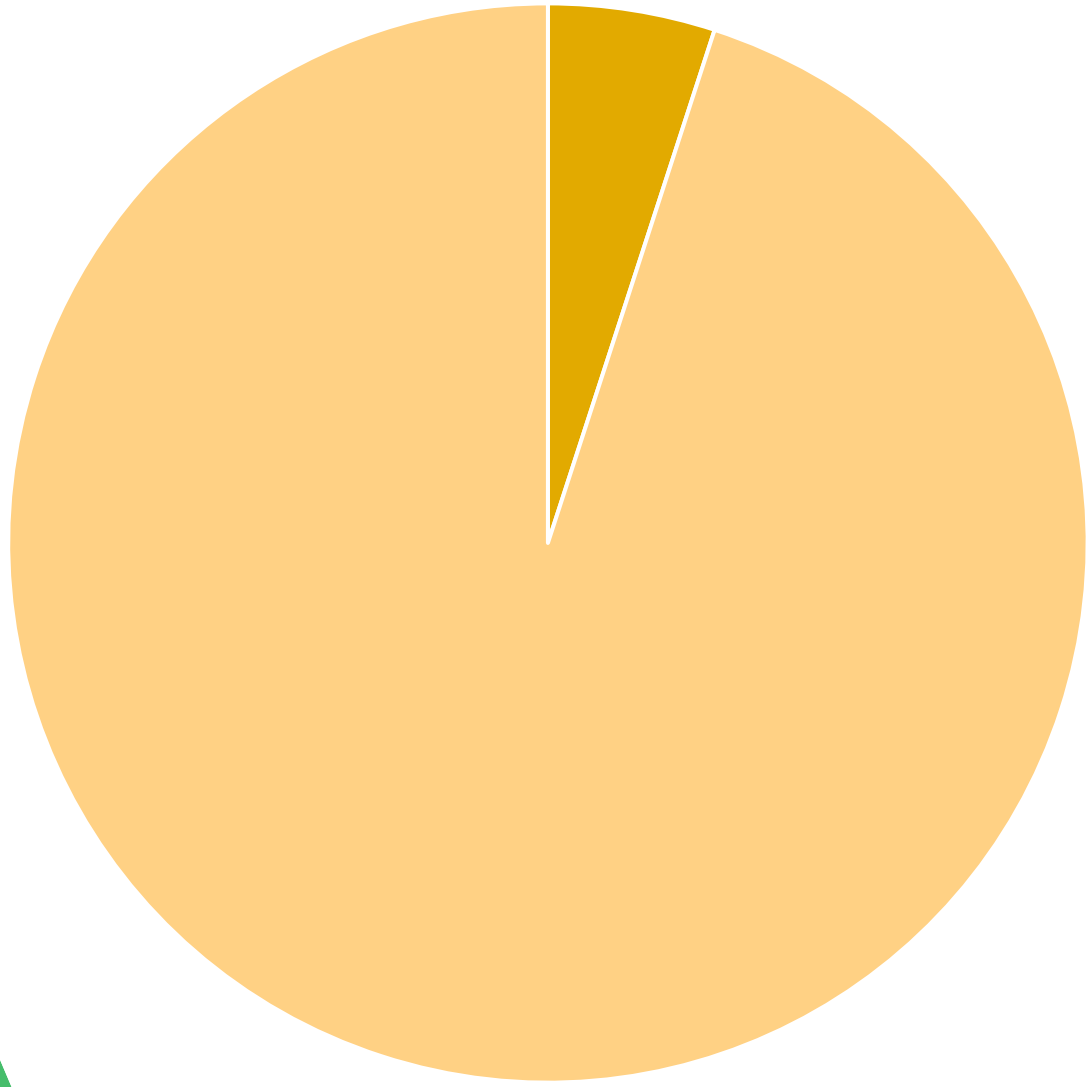
The alternatives to glyphosate & the challenges.



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Alternatives to glyphosate

- Do nothing
- Hand weeding
- Hot water
- Steam
- Infrared exposure
- Flame
- Hot foam
- Brushing
- Acetic acid

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Viable alternatives to glyphosate

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The Challenges

- Political
- Social
- Practical
- Labour
- Financial
- Environmental

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Cardiff Council Weed Control Trial

How did the trial come about?

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Cardiff Council Weed Control Trial

Background

Cardiff Council commissioned an independent trial of alternative weed control treatments on pavement areas over a whole growing season

Trials work

- Advanced Invasives (design)
- Complete Weed Control Ltd (delivery)
- Advanced Invasives, Agri-EPI Centre & Swansea University (reporting)

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Trial design

Approach

- Large scale testing under 'real world' conditions
- Provide realistic data to underpin decision-making
    - 8 assessments were made at each monitoring site)
    - Data collection on 4 occasions so192 assessments made per treatment in total

Treatments

1. Acetic acid (contact herbicide)
2. Hot foam (contact herbicide)
3. Glyphosate (systemic herbicide) - used to benchmark alternative treatments
4. Scientific control (no weed treatment)

Data analysis

Cost

- Economic evaluation of all control treatments
- Treatment labour requirement to undertake each treatment per km pavement

Environmental

- Measure use of herbicide products, water and fuel
- Life Cycle Analysis (LCA) modelling of carbon dioxide (CO_2) emissions and other environmental burdens

Customer

- Complaint data collected and compared to previous years

Quality

- Weed level score assigned for each treatment and the untreated control

Criteria			Score	Level	Description
Height (mm)	Weed diameter/ length (mm)	Joint coverage (mm)			
<10	<50	<10	<3	1	No noticeable weeds
10-50	50-100	0-20	4-6	2	Occasional small weeds
50-100	100-150	20-30	7-9	3	Patchy weed growth with some flowering weeds
100-150	150-200	30-40	10-12	4	Numerous weeds, many flowering, view annoys/irritates public
150-200	200-300	40-50	13-15	5	Numerous large weeds presenting risk, slip and/or trip hazard
>200	>300	>50	16-18	6	Numerous large weeds, many tall and flowering causing an obstruction

Weed level scale: evaluation criteria adapted from East Malling Research (2015) and Bristol City Council (2017).

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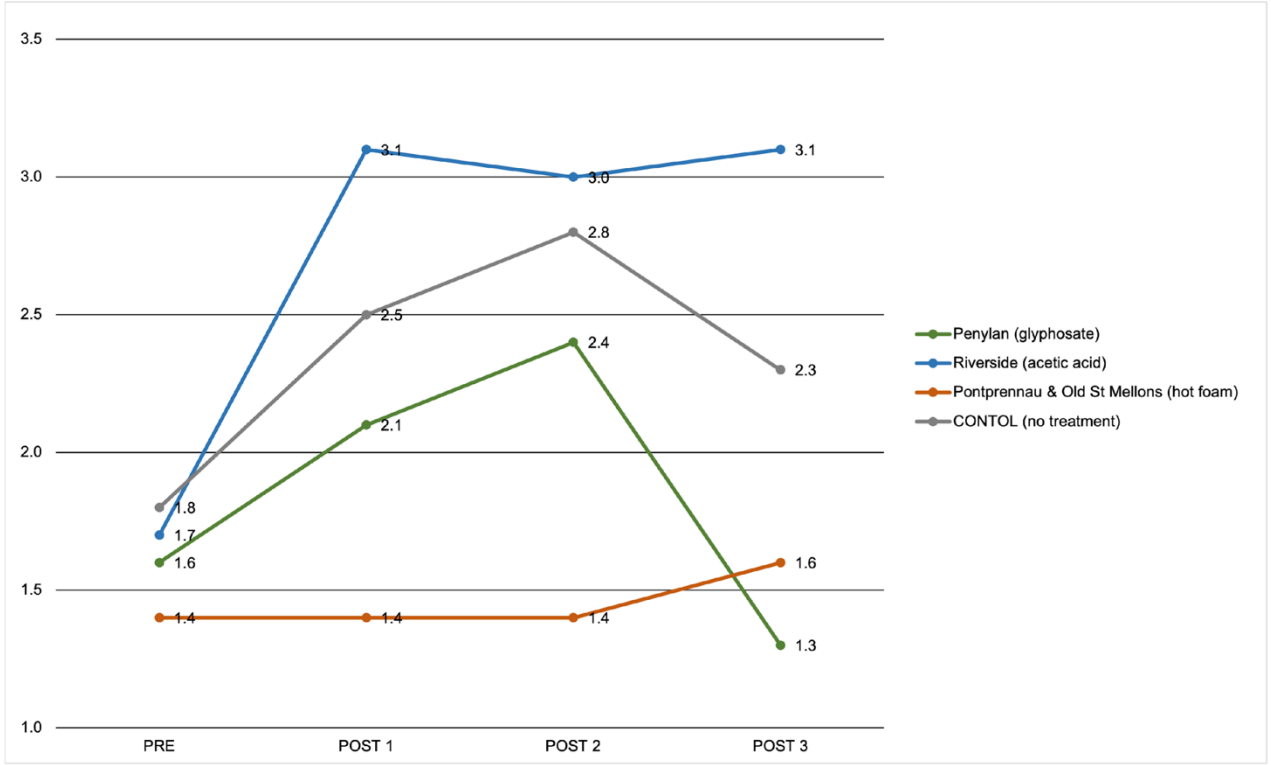
Results summary

Analysis

- Acetic acid was the least effective of the herbicides tested
- Glyphosate was the most effective of the herbicides tested
- Hot foam was effective, though this was trialled in a predominantly tarmacked area



Results - Quality: Weed scores, assigned 1-6.

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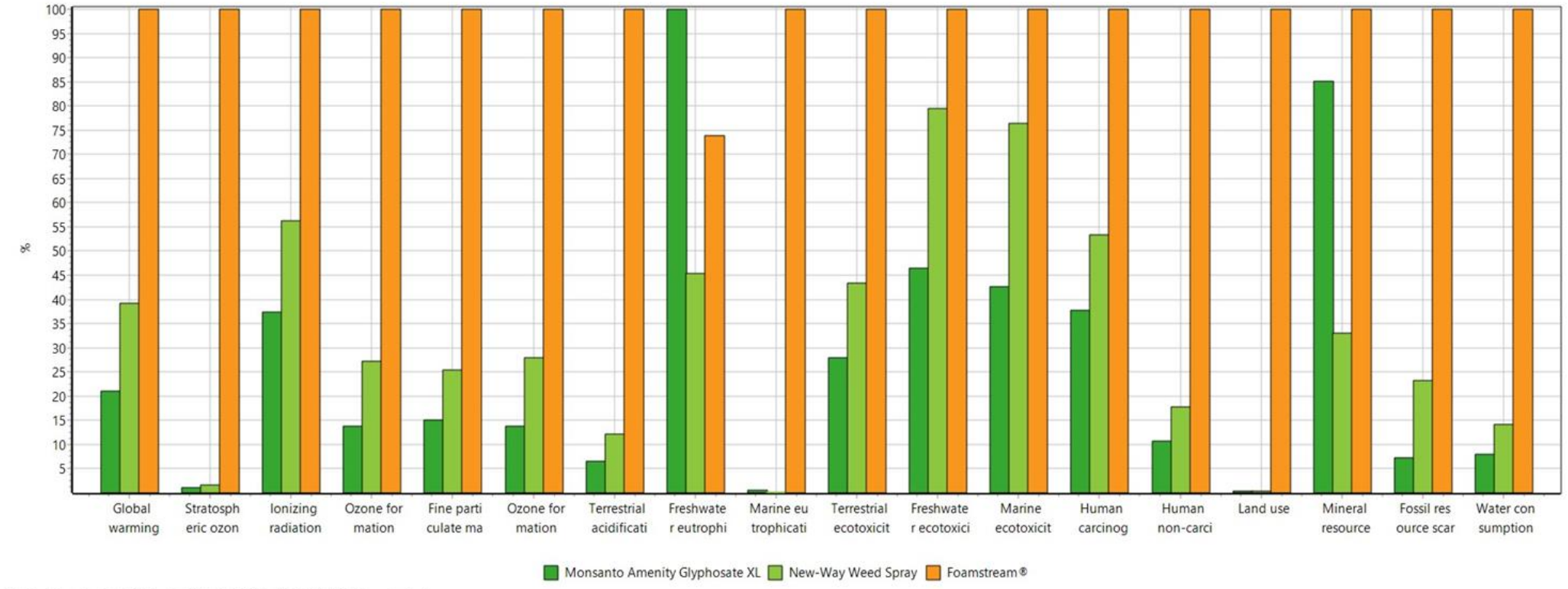
Life cycle analysis



Results - Environmental, LCA: comparison of the environmental impacts of 3 pavement weed control methods. Relative percentage (%) contribution of each treatment to assessed impact categories is shown (Dr Trisha Toop, Agri-EPI Centre).

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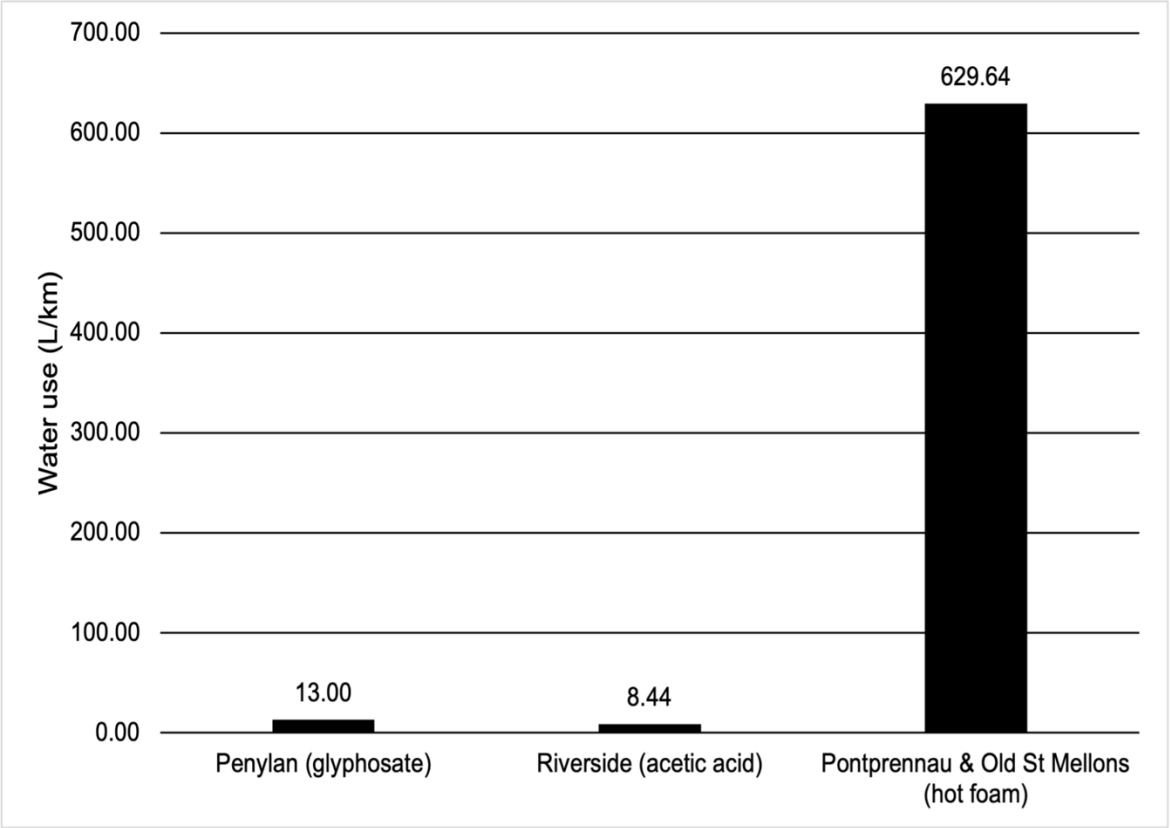
Water Consumption

Results

Environmental – water use

- Less water used applying acetic acid as the product volume is significantly greater than that of glyphosate
- Hot foam uses 48 times more water than glyphosate application



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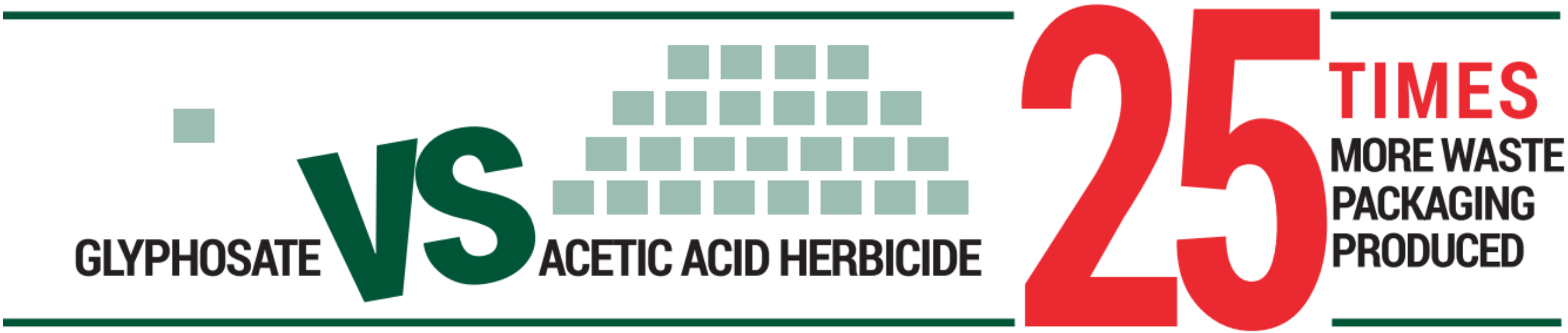
Water Consumption



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Results summary

Control treatment	Cost	Environmental	Customer	Quality
Glyphosate	Low	Low	High	High
Acetic acid	Medium	Medium	Low	Low
Hot foam	High	High	High	High

Results summary: weed control treatment results evaluated against four key criteria.

Conclusions

- Hot foam has higher environmental impacts in all categories calculated except for freshwater eutrophication in which glyphosate had a higher impact
- The treatment which has the lowest overall environmental impact was glyphosate
- **Glyphosate-based control methods used the least materials, had the lowest environmental impacts and also the lowest economic costs**
- Objectively, glyphosate was the most sustainable treatment.

Untreated control – Duty of care, infrastructure maintenance & maintain cleanliness

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Summing up

- Balancing the cost of weed control against results is vital
- If we are serious about controlling knotweed in particular, **annual foliar glyphosate application is currently by far our best option**
- We need to think carefully about how we evaluate sustainability
- **New/alternative approaches must be rigorously tested** before we consider adopting them as best practice

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