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## SUPPLEMENTARY PAPERS

<b>Committee</b>	ENVIRONMENTAL SCRUTINY COMMITTEE
<b>Date and Time of Meeting</b>	THURSDAY, 12 JANUARY 2023, 4.30 PM
<b>Venue</b>	CR 4, COUNTY HALL - MULTI LOCATION MEETING
<b>Membership</b>	Councillor Owen Jones (Chair) Councillors Derbyshire, Gibson, Green, Lancaster, Lewis, Lloyd Jones, Jackie Parry and Wood

### 3 **Weed Control Trial** (*Pages 3 - 20*)

**Davina Fiore**  
**Director Governance & Legal Services**  
Date: Friday, 6 January 2023  
Contact: Graham Porter, 02920 873401, [g.porter@cardiff.gov.uk](mailto:g.porter@cardiff.gov.uk)

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# Weed Control Trial



**Jon Maidment – Operational Manager  
(Head of Parks & Harbour Authority)**

**Dr Dan Jones – Independent Consultant  
(Managing Director, Advanced Invasives Ltd)**

**Environmental Scrutiny Committee 12<sup>th</sup> January 2023**



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# Background



- The Cabinet agreed to 'Recommendation 5 - Herbicides & Pesticides – Glyphosate' to undertake a trial of two approved alternatives weed control treatments on pavement areas over a whole growing season
- FRM was provided to undertake the trial, which was delivered by our specialist weed control contractor
- An independent consultant was engaged to develop the monitoring model and to analyse the data collected during the trial period
- The key factors for measurement/assessment were:
  1. Cost
  2. Environmental
  3. Customer Satisfaction
  4. Quality



# Trial Design



## Approach

- Large scale testing under 'real world' conditions
- Provides realistic data to underpin decision-making

## Treatments

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

There are currently no other weed control treatments are approved for use on hard surfaces in the public realm



# Trial Design



## Monitoring sites

- Each of the 3 treatments has been assigned to a specific ward across the city:
  1. Acetic acid - Riverside Ward
  2. Hot foam - St Mellons & Pontprennau Ward
  3. Glyphosate - Penylan WardNo weed treatment (scientific control)
- 6 monitoring sites were established within each ward these included:
  1. Main thoroughfare routes
  2. Representative residential street routes
  3. Residential street routes in close proximity to an open space/parkland
- 8 assessments were made in each monitoring site (48 assessments made per treatment)
- Data collection on 4 occasions (192 assessment made per treatment in total)



# Analysis & Reporting



## Analysis

- **COST**- Economic evaluation of all control treatments based on the labour requirement to undertake each treatment per km pavement
- **ENVIRONMENTAL** - Life Cycle Analysis (LCA) treatment modelling to provide full quantification of carbon dioxide (CO2) emissions and other environmental burdens (e.g. water use, primary energy)
- **CUSTOMER SATISFACTION** – complaint data was collected and compared to previous years
- **QUALITY** - Weed score given for each assessment for all treatments and the untreated control

## Reporting

- Summary of treatment sustainability
- Scale-dependant considerations around treatment deployment
- Comparison of results with previous UK trials and other relevant literature (particularly from the Netherlands)

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General Enquiries on this form should be made to:  
Defra, Strategic Evidence and Analysis  
E-mail: StrategicEvidence@defra.gov.uk

**Evidence Project Final Report**

**Department for Environment Food & Rural Affairs**

**1 Note**  
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3. Contractor organisation(s):

4. Total Defra project costs (approved final price):

5. Project start date:

end date:

EVID4 Evidence Project Final Report (Rev. 15/14) Page 1 of 27

**Thanet Study (2015)**  
Defra & Kent County Council

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**Weeds, treatment of unwanted vegetation**

Trial and comparison for glyphosate free weed treatment in Bristol parks and highway surfaces



Bristol City Council  
28/01/2017

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**Cotham Trial (2017)**  
Bristol City Council



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# Results Overview



- Cost – per kilometre to treat the weeds
- Environmental – i.e. carbon footprint of the work undertaken
- Customer satisfaction - measured using complaints received
- Quality – measured by sampled assessments on 4 occasions

Treatment \ Factors	Cost	Environmental	Customer	Quality
Glyphosate	Low	Low	Low	Low
Acetic acid	Medium	Medium	Low	Low
Hot foam	High	High	High	High

Figure: Summary of pavement weed control results evaluated against four key criteria (cost, environmental, customer satisfaction and quality). Where: **red** = negative outcome vs. key criteria; **orange** = intermediate outcome vs. key criteria; **green** = positive outcome vs. key criteria. Environmental criteria include: product use (total), water use (total), fuel use (total) and Life Cycle Analysis (LCA) outputs.



# Results – Cost



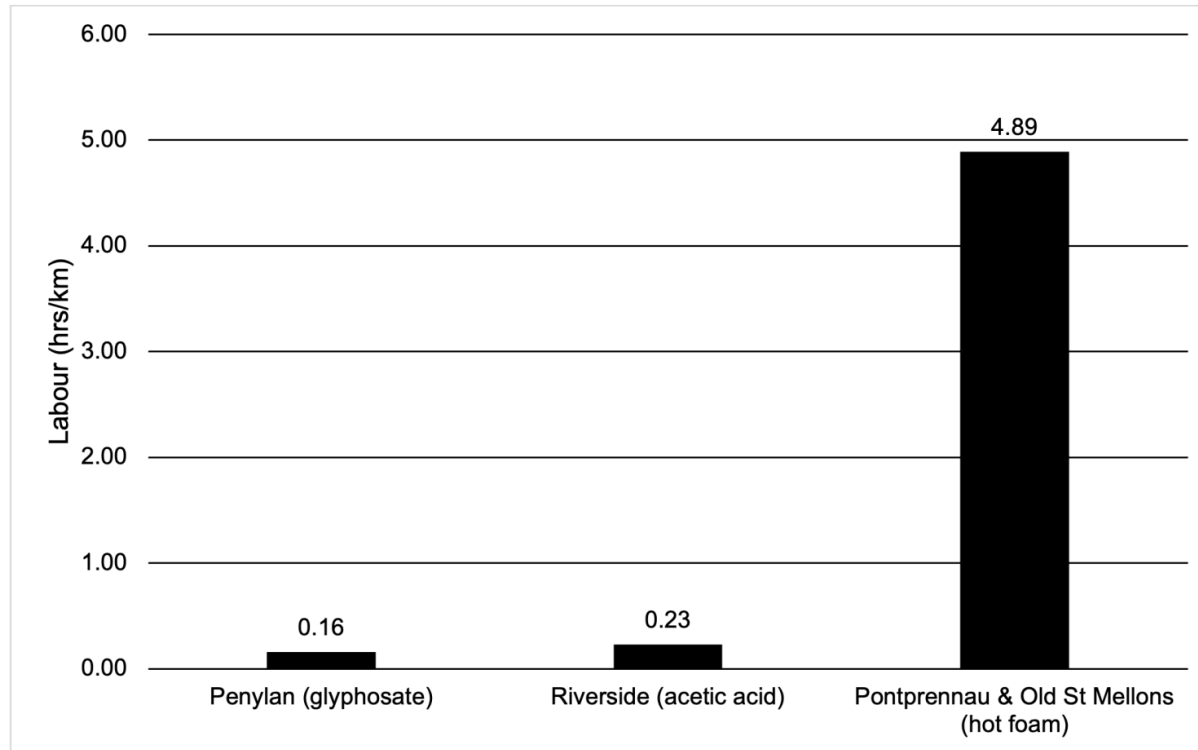
- Application of hot foam is 31 times more expensive than glyphosate
- **Note:** these methods were only tested on individual wards, these costs would rise substantially applied at the city scale (29 wards)

Glyphosate = 2,000 km = 8 weeks labour (40 hr weeks)

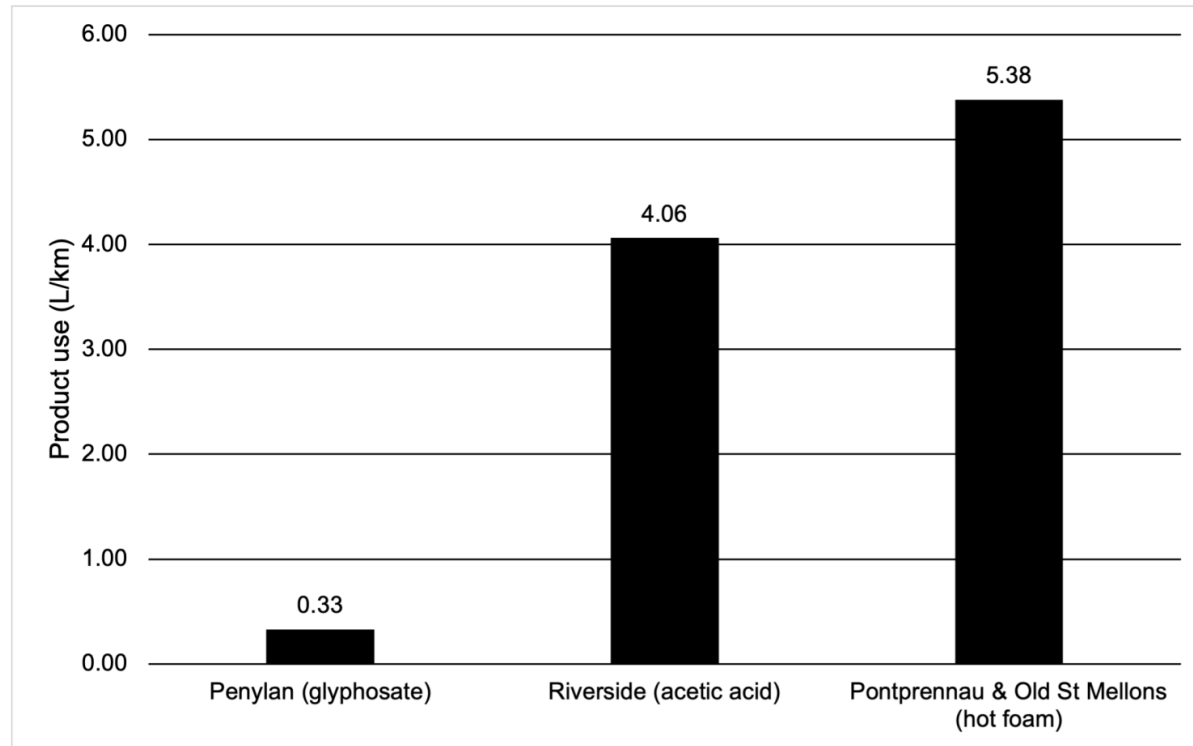
- 2 machines, 2 people

- Hot foam = 2,000 km = 248 weeks labour (40 hr weeks)

- 5 machines, 3 people per machine
- **Machines would be working constantly**



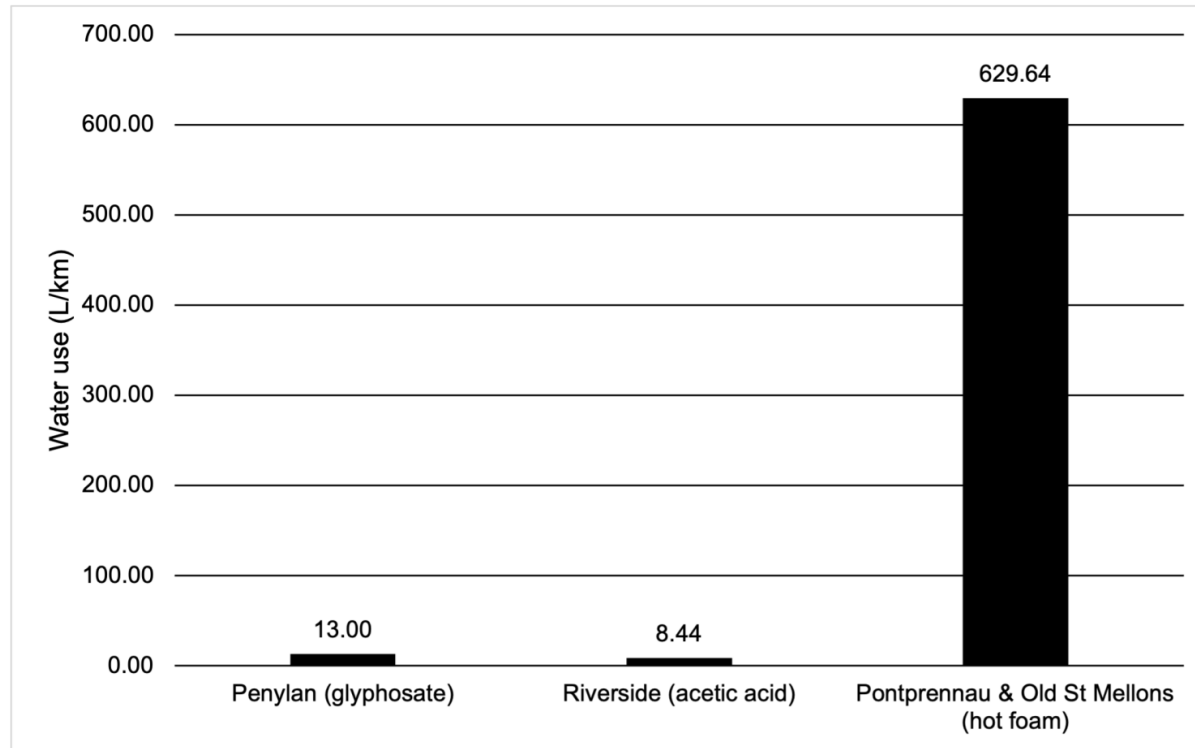
# Results – Environmental, Product Use



- 16x more product used in the hot foam system compared with glyphosate application
- 12x more acetic acid used compared with glyphosate application



# Results – Environmental, Water Use

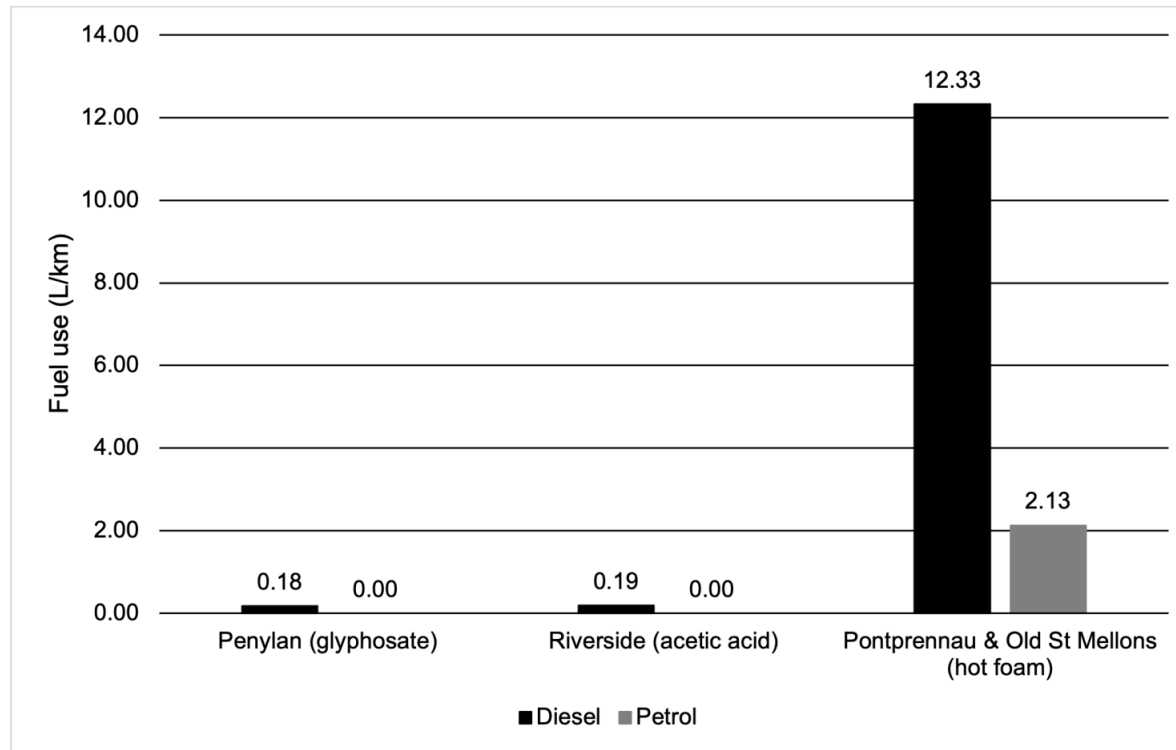


- Less water used applying acetic acid as the product volume is greater than that of glyphosate
- Hot foam uses 48 times more water than glyphosate application



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# Results – Environmental, Fuel Use

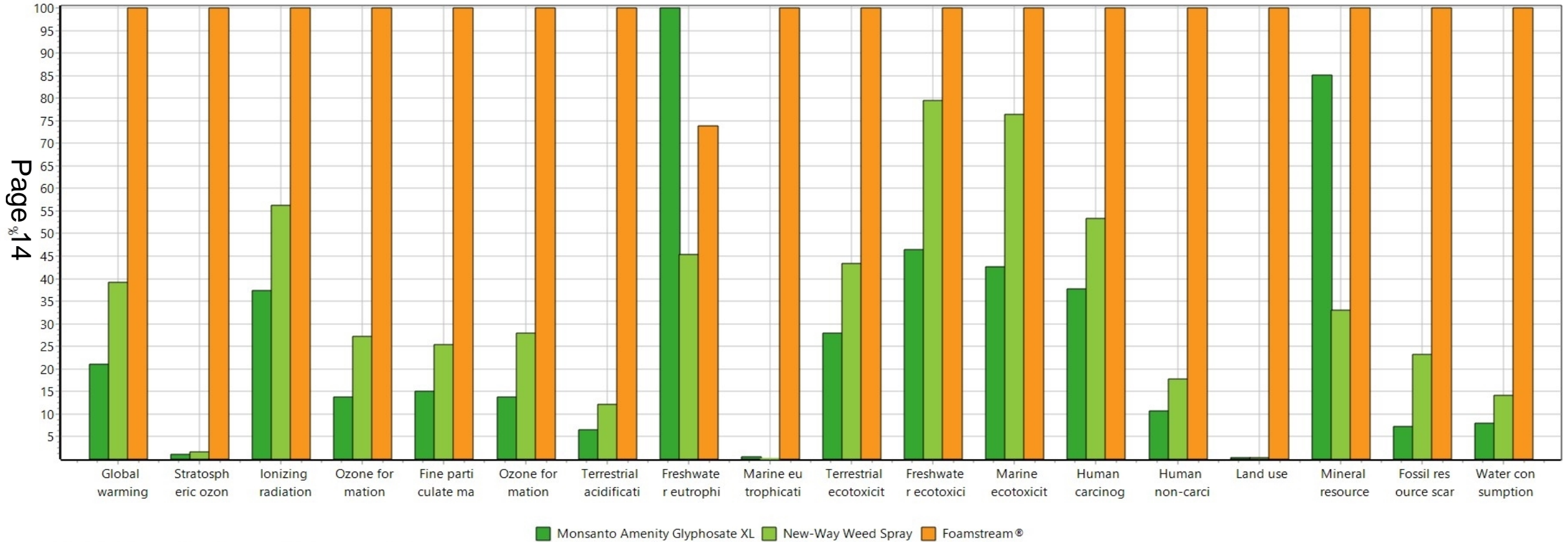


- Hot foam uses 63 times more diesel than glyphosate application
- Hot foam uses 100 % more petrol than glyphosate or acetic acid application



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# Results – Environmental, LCA



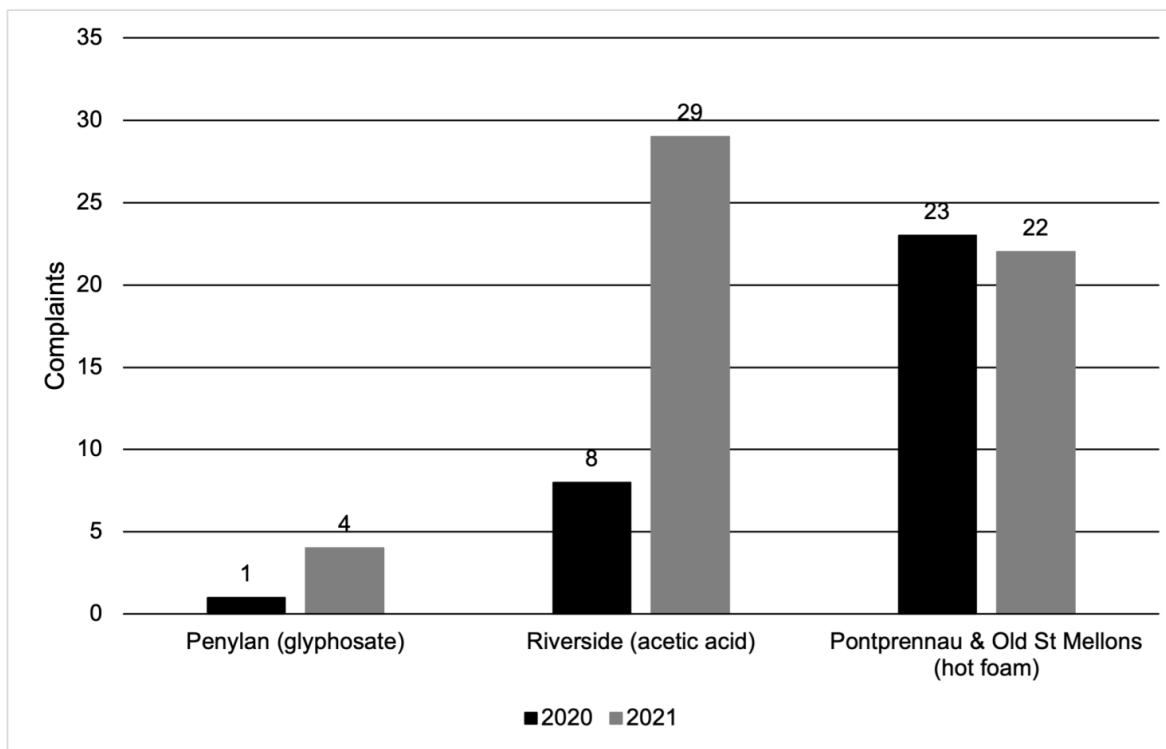
Method: ReCiPe 2016 Midpoint (H) V1.04 / World (2010) H / Characterisation  
 Comparing 1 p 'Monsanto Amenity Glyphosate XL', 1 p 'New-Way Weed Spray' and 1 p 'Foamstream®';

LCA comparison of three pavement weed control method (glyphosate, acetic acid and hot foam) environmental impacts across three electoral wards in the City of Cardiff. Relative percentage (%) contribution of each treatment to assessed impact categories is shown.

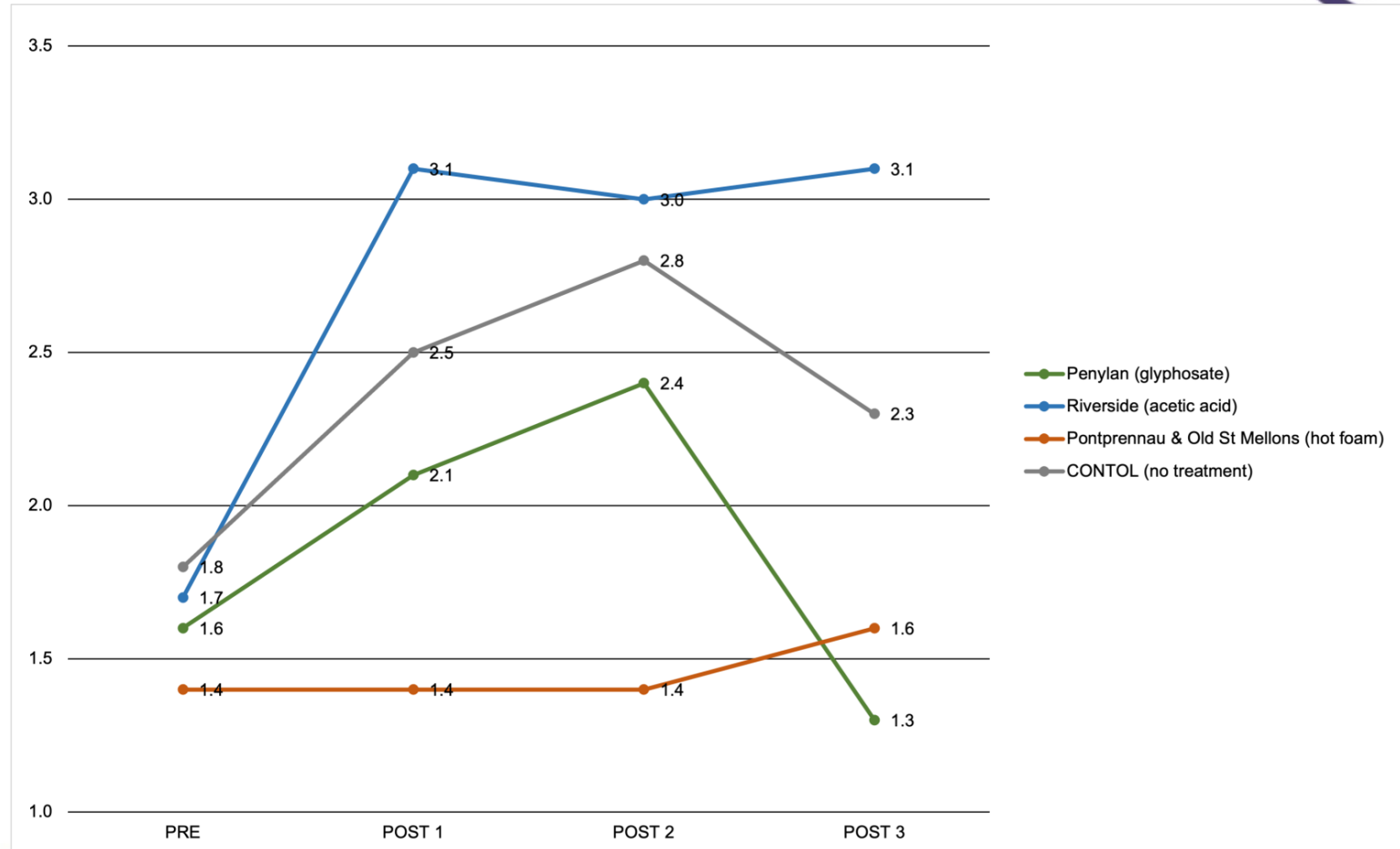
# Results – Customer Satisfaction



- Public complaints RE quality of weed control – **no missed streets**
- Application of acetic acid more than tripled public complaints between 2020 and 2021
- Public complaints increased substantially for glyphosate, though these remained low
- Public complaints declined a little following hot foam treatment



# Results – Quality, Weed Scores (1-6)





# Conclusions



## Cost

- Application of hot foam is 31 times more expensive than glyphosate

## Environmental

- 16x more product used in the hot foam system compared with glyphosate application
- Hot foam uses 62 times more water than glyphosate application
- Hot foam uses 63 times more diesel than glyphosate application
- Hot foam uses 100 % more petrol than glyphosate or acetic acid application

## Customer Satisfaction

- Application of acetic acid more than tripled public complaints between 2020 and 2021



# Conclusions



## Quality

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

## LCA

- Hot Foam has higher environmental impacts in all categories calculated except for that of freshwater eutrophication in which Monsanto Amenity Glyphosate XL had a higher impact
- The treatment that has the lowest overall environmental impact is Monsanto Amenity Glyphosate XL
- The results from the impact assessment were not surprising given the higher number of inputs into the Hot Foam system



# Conclusions



## Glyphosate-based herbicides

- Consensus amongst scientists that glyphosate is safe i.e., few risks to human health, animals (including livestock) and the environment – glyphosate molecule only acts in plants (it is highly specific)
- Any risk is further reduced through regulated use of pesticides (application rates and methods, PPE and training) – *this is consistent with the approach taken for some years by Cardiff Council*
- Misconception that glyphosate has been ‘banned’ in a number of EU countries – this is not the case
- Impacts of pesticides on pollinators in non-agricultural settings is likely to be limited
- Physical weed control methods (e.g. flaming) more likely to kill insects on contact





# Questions ?



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