# **Weed Control Trial**





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**Environmental Scrutiny Committee 12th January 2023** 



# **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 Ward

No 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**



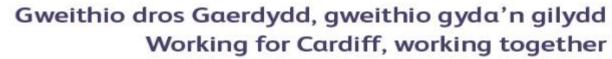


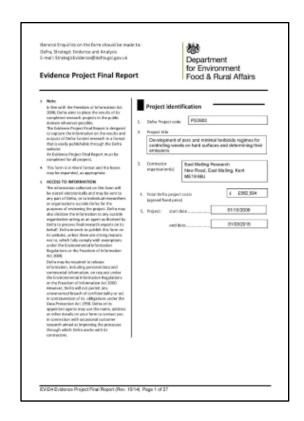
### **Analysis**

- 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)





Thanet Study (2015)











## **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.

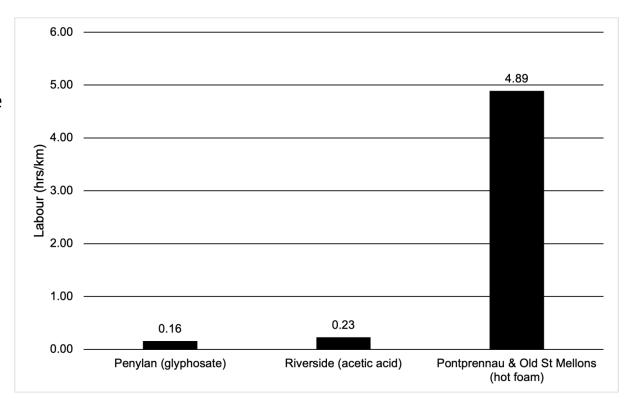


## Results - Cost





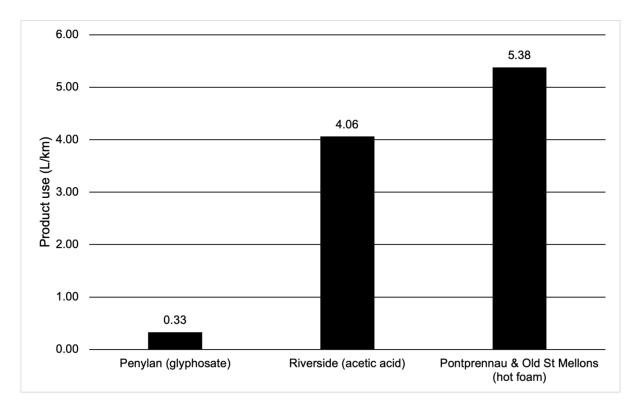
- Application of hot foam is 31 times more expensive than glyphosate
- Note: these methods were only tested on individual wards, these costs would rise substantially applied at the city scale (29 wards)
- Glyphosate = 2,000 km = 8 weeks labour (40 hr weeks)
  - 2 machines, 2 people
- Hot foam = 2,000 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



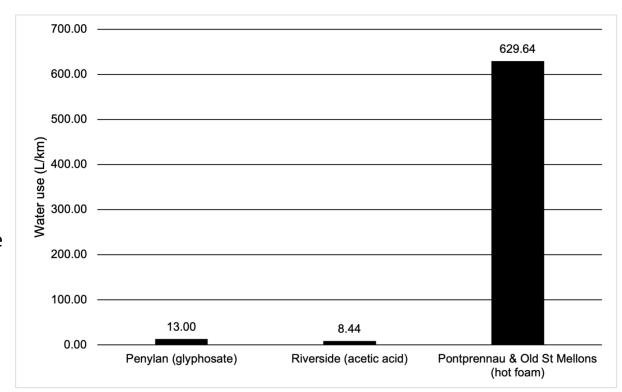


# Results – Environmental, Water Use





- 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



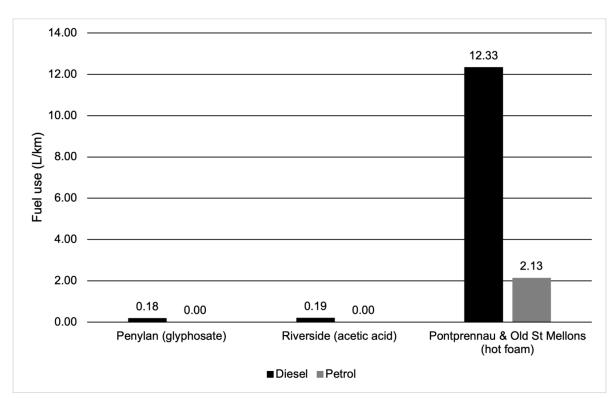


# Results – Environmental, Fuel Use





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

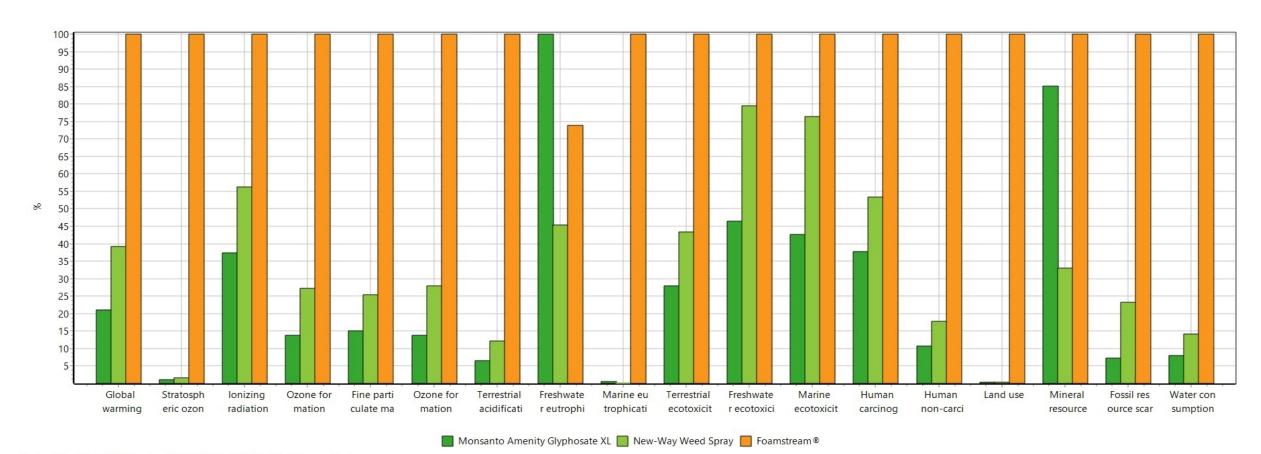




## Results – Environmental, LCA







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®';

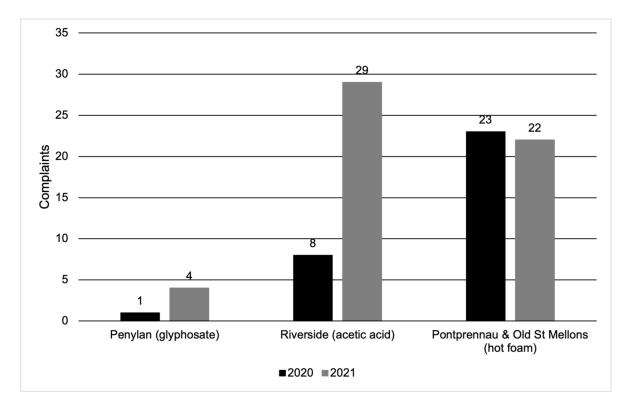
LCA comparison of three pavement weed control method (glyphosate, acetic acid and hot foam) environmental impacts across three electoral wards in the City of Cardiff. Relative percentage (%) contribution of each treatment to assessed impact categories is shown.

## **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

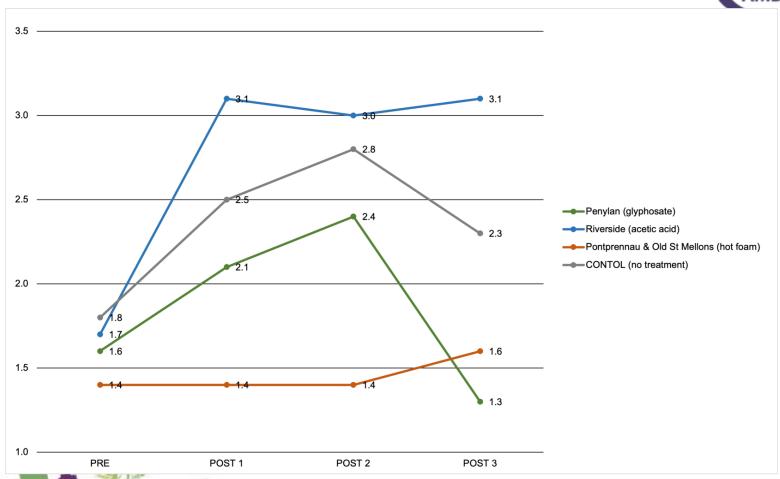




# Results – Quality, Weed Scores (1-6)







## **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?**

