Glyphosate Weed Killer and the alternatives

Report by Kevin Anderson, Executive Director Place

1 Purpose of Report

This report is to inform Council of actions and options following the amended motion agreed on 7 May, 2019 and the subsequent report on 'Glyphosate Weed Killers' to Midlothian Council on 25 June, 2019. At this time the Council agreed to cease using glyphosate weed killers on Council-owned land with the exception of invasive species such as Giant Hogweed and Japanese Knotweed, etc., whilst honouring the contracts entered into regarding ground maintenance on non- Council owned land provided there is no net additional cost incurred.

The initial moratorium on the use of glyphosate in May, 2019 was agreed due to concerns for the environmental impact on bees.

2 Background

2.1 The Glyphosate product

Information sourced from the Health & Safety Executive details that Glyphosate is the active substance in many herbicides (weed killers) and is widely used around the world. It is a non-selective, systemic herbicide/weed killer and was first used in the UK in 1976.

Since it is approved for use in many countries, it has been subject to extensive testing and regulatory assessment in the EU, USA and elsewhere and by the World Health Organisation

Glyphosate is currently approved for use as a herbicide (weed killer) in the EU. Approval was granted in 2002, based on a review of mammalian toxicology, ecotoxicology and other data. Further detailed information about the EU regulatory process with respect to Glyphosate can be found on the Official Journal of the European Union

The UK Government considers that the regulatory process for authorising plant protection products is a robust system. The authorisation process takes into account all scientific knowledge available.

All products which contain glyphosate must be individually authorised in Member States. Applicants for authorisation must show that their products are effective, humane and pose no unacceptable risks to people or the environment. If their products were to pose such risks, they would not be authorised; or if such effects were discovered later, they would be withdrawn.

Neither the EU's assessment of glyphosate as an active substance nor the UK's assessments of applications for authorisation of products which contain it have found the substance unacceptable for use.

The risks associated with the use of pesticides in amenity areas such as parks are specifically considered as part of the authorisation process.

Legally enforceable conditions of use are imposed on the way products can be applied to ensure the public are not exposed to levels of pesticides that would harm health or have unacceptable effects on the environment. It is important that users (or those who cause or permit others to use pesticides) not only comply with the authorised conditions of use but also use products in a responsible and sustainable fashion. The responsible use of pesticides in amenity areas as part of an integrated programme of control can help deliver substantial benefits for society. These include: management of conservation areas, invasive species and flood risks; access to high quality sporting facilities; and safe public spaces (for example, by preventing weed growth on hard surfaces creating trip hazards), industrial sites and transport infrastructure

The weed killer products that the Council previously used may have varied however the main chemical used was glyphosate. This is not a poison but a trans-locative herbicide, which is a hormone weed killer. Glyphosate kills the roots as well as the foliage of the plant by translocation. (The movement of materials from leaves to other tissues throughout the plant)

Once the application has dried (e.g. about ten minutes after it has been sprayed) advice is that it is then safe for children and animals. The Council utilised products with a low hazard rating. The contractor we employ for streets and pavements also used a glyphosate with a low hazard rating. In fact the adjuvant (chemical carrier) in the weed killer is the most likely thing to affect dogs and this would only be in the period when it is still wet.

2.2 Previous working Practice

The previous working practice was to undertake two sprays of glyphosate per annum on:

- Streets and Pavements
- Hardstanding
- Grass edges
- Shrub Beds

In 2019 only one spray was completed prior to the ban in all areas with the exception of streets and pavements where no applications took place.

2.3 Herbicide usage

- The Land and Countryside section have halved the usage of Herbicides in the Past 4 years (mainly Glyphosate)
- There were plans to further limit applications on grass edges last season which would have reduced our herbicide usage further.

2.4 Issues

Issues arising from the lack of maintenance due to the Glyphosate ban have been as follows:

- Increase in complaints and enquiries received
- Accidents (slips and trips) caused by weed growth
- Damage to infrastructure
- Major deterioration of the visual aesthetics of Midlothian amenity space
- Relatives concerns expressed over the weed growth in Cemeteries, regarded as a lack of respect.

An extract form a National level APSE report noted that the key issues appear to be:

Key Issues:

- Following the publication of a report from the International Agency for Research on Cancer (IARC) in 2015 which found that glyphosate was "a probable human carcinogen", there has been a great deal of debate across the world as to whether the herbicides which include glyphosate are safe to use.
- This debate has been heightened by recent court rulings in the United States which have awarded multi-million dollar damages to citizens who have claimed continued use of glyphosate has caused them to develop cancer.
- National agencies across the world have declared glyphosate to be safe to use, suggesting it poses no threat. However some countries have now decided to ban glyphosate or severely curtail its use.
- Regarding the UK, it continues to say glyphosate based products are safe to use, but local authorities now find themselves caught between legal advice and the moral question of knowing there have been successful claims that glyphosate has caused cancers.

2.5 Usage by other organisations

The only other Authority in Scotland with a ban on the use of Glyphosate appears to be 'Highland Council'. They also banned the use of this product in June 2019.

Edinburgh Council have restricted the use of Glyphosate however they still use Glyphosate to treat streets and pavement.

The Scottish Government has arranged a seminar on the use of Glyphosate and other herbicides for Amenity managers on the 4th of February that the Land and Countryside manage will attend.

3 Concerns Raised over bees

A new study published in a reputable journal finds that Monsanto's global weed killer harms honey bees. The paper 'Glyphosate perturbs the gut microbiota of honey bees' reports that bees fed glyphosate at concentrations chosen to mimic environmental levels lose beneficial gut bacteria, which then leaves them vulnerable to deadly infections. Glyphosate is, now facing fresh demands for a ban based on this new research.

The suggestion is that this new study is flawed and fails to address whether changes observed in the bees gut microbiome play any part in its health or that glyphosate is responsible for anything at all.

This is 1 study out of 800 studies that have been undertaken.
https://www.pnas.org/content/115/41/10305

The science and evidence shows that glyphosate is safe when used correctly.

The conclusion reached by regulatory bodies around the world, including the EU's two leading regulatory bodies – the European Food Safety Authority (EFSA) and the European Chemicals Agency (ECHA) is that glyphosate is safe when used correctly.

4 Operational issues

The suspension of the use of Glyphosate is causing the Council's Land and Countryside service operational issues as there is not a suitable herbicide alternative on the market.

5 Report Implications

5.1 Resource

Spend on weed control based on two glyphosate applications is approximately £112k per annum (22k streets and pavements, 90k Landscape Areas).

The following table represents the options open to Council for alternative methods to glyphosate application and sets out the additional cost requirement:

		Additional Revenue Cost					Capital Cost
Option	**Narrative**	**Total**	**Labour**	**Materials**	**Vehicle Costs**	**External Contractor**	**Plant & Machinery**
A) Glyphosate Applications	Revert to previous working practices, with planned limited use.	-					
B) Targeted Spraying of Streets & Pavements	Utilising the sole contractor in Britain to use infrared light detection to provide targeted as opposed to general application, on streets and pavements. This does not apply to other Landscaping areas. The additional £10k cost is subject to tender.	**10,000**				10,000	
C) Alternative Product Application	Replacing two glyphosate sprays annually with Five Katoun Gold sprays resulting in poorer maintenance standards, and are proven to kill Bees. Alternatives to glyphosate herbicide are limited and are considered less effective.	**163,227**	75,648	80,451	7,128		
D) Sweeping & Cleaning of Streets & Pavements	A trial was undertaken in the Gorebridge area for sweeping and cleaning pavements and streets. These are the costs pro rated up for the whole of Midlothian. The aesthetics of Midlothian would improve but would cause damage to infrastructure degradation i.e to sandstone walls. Annually, 5 sweeps would be required to achieve a good standard. This would also require the capital cost of a new sweeper. (2 Sweeps annually would cost £137k.)	**341,914**	303,331	10,000	28,583		98,250
E) Community Involvement	Encouraging community groups to maintain areas under the coordination of a full time Grade 6 employee. There would be additional £5k of costs for communications materials. This may require the removal of shrub bed areas to reduce the maintenance requirement.	**37,500**	32,500	5,000			
F) Other non-chemical Methods	Options such as Electric Weed Control, foam streaming and hot water treatment are all considered expensive, labour intensive and produce generally poor results of a limited duration, with West Lothian Council citing an increase in costs 18 fold. All would require capital expenditure. These additonal revenue and capital costs can be looked into for further details if required. Notably, these methods are also lethal to bees.	**1,800,000**					
G)Strim Grass Edges	Grass edges to be strimmed rather than weed killed. Two sprays would be replaced with seven strims, annually. This would provide for a good standard of aesthetics.	**92,547**	83,503	8,000	1,044		
F) Bark and mulching of Shrub Beds, and Hand Weeding	The requirement to bark would occur every three years, with the bark suppressing the weeds, allowing for more efficient hand weeding. The previous labour time spent spraying would instead be utilised to hand weed. The downside is that standards would be reduced compared to those previously achieved.	**53,069**				53,069	

5.2 Risk

There is a risk that banning the use of Glyphosate when the weight of scientific evidence and the guidance from National and International bodies suggest the product is safe to use may bring the Council into disrepute.

The standards of maintenance particularly of shrub beds across Midlothian have and will continue to deteriorate without the use of glyphosate. There is a risk that the alternative weed killers will not work. The fact that they do kill bees may also bring us into disrepute.

Costs in manual operations will increase with a continued suspension on the use of Glyphosate.

The lack of additional funding to finance the alternative weed killing, bark mulching, hand weeding and sweeping required to replace the use of glyphosate will result in poorer standards, damage to infrastructure, additional claims for slips and falls and a very poor aesthetic image for Midlothian.

5.3 Single Midlothian Plan and Business Transformation

Themes addressed in this report:

☒ Community safety
☐ Adult health, care and housing
☐ Getting it right for every Midlothian child
☐ Improving opportunities in Midlothian
☒ Sustainable growth
☐ Business transformation and Best Value
☐ None of the above

5.4 Key Priorities within the Single Midlothian Plan

This report does not impact on the key priorities within the Single Midlothian Plan.

5.5 Impact on Performance and Outcomes

The report directly impacts on Midlothian Council's performance and outcomes. Failure to re instate glyphosate usage or fund alternative methods of maintenance will result in the aesthetics of Midlothian looking very poor and effect community safety and wellbeing.

5.6 Adopting a Preventative Approach

The report highlights the need for a preventative approach to stop the degradation of infrastructure and the removal of slip and trip hazards resulting in higher costs for the Council in the long term.

5.7 Involving Communities and Other Stakeholders

The lack of maintenance in 2019 has resulted in some gorilla gardening groups taking on some maintenance tasks and some cemetery visitors hand weeding around their family headstones. Community involvement and encouragement will prove beneficial even if alternative methods and funding of maintenance are adopted.

5.8 Ensuring Equalities

The frail, the very young, elderly and those with a disability can be impacted by a lack of weed maintenance of our streets and pavements as there have been associated reports of slips and trips becoming more common place.

5.9 Supporting Sustainable Development

Weeds need to be removed to stop damage to infrastructure, to avoid trip hazards for residents and maintain the aesthetics of Midlothian.

Failure to ensure this maintenance is carried out is not sustainable in the long term.

5.10 IT Issues

There are no IT issues arising from this report.

6 Summary

- Glyphosate most efficient, cost effective and effective weed killer available
- Our Glyphosate usage has been dramatically reduced and can be reduced further.
- Integrated approach most logical way forward
- Alternative weed killers provide no direct replacement to Glyphosate
- Alternative weed killers will kill bees and are potentially more harmful to staff if they come into contact with them
- Change to alternatives will be costly
- Sweeping of streets and pavements could replace glyphosate usage on streets and pavements however this will be costly
- Alternative weed control such as hot water or foaming treatments are very expensive and not as affective.
- Some community involvement in maintaining shrub beds may be possible.
- Strimming grass edges rather than weed killing is an option however this is costly
- Bark mulching shrub beds and hand weeding is an option however costs will increase and overall aesthetics will diminish.

7 Recommendations

Council is recommended to:

- Agree to the reintroduction of Glyphosate, and that the Council continues to use herbicides with a low hazard rating where possible to safe guard the Public, staff, insects and the environment.
- that Land and Countryside section is tasked with reducing the application levels
- that the Land and Countryside section reviews future best practice advising Council of alternative products that are more environmentally friendly as they become available in the future.
- That the land and Countryside section be tasked with trialling other methods such the use of edger's & mechanical weeders.

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Background information

Options

a) Glyphosate applications

Reverting to the previous working practices, with planned limited use. Alternatives to the use of Glyphosate herbicide are limited and there is no suitable alternative. Most other weed killers have been withdrawn from the market, as they are less environmentally friendly.

Alternatives to Glyphosate, which we are aware of, are more likely to be hazardous to wildlife and particularly bees foraging on weeds. They are also far less effective and more expensive. Hot water, Foam, steam procedures are all lethal to bees and the chemical alternatives to glyphosate all also have a bee warning on the labelling.

b) Targeted spraying of streets and pavements

Reduced application to streets and pavements with the use of equipment with infrared light detection that only apply the herbicide to weeds present is possible rather than making a general application to all surfaces and edges.

There is currently one contractor in Britain offering this service.

c) Alternative Herbicide Products

There are no direct weed killer replacements for Glyphosate. Other weed killers only burn or damage the foliage of weeds and fail to control perennial weeds with a tuberous root such as docks and dandelions.
According to product label information of these herbicide products they are far more hazardous to staff, the public and to bees.

Issues with organic products:
Pungent smell
Good Personal Protective Equipment is essential
Repeated applications required i.e. 5 applications rather than 2
Regrowth from unaffected root system
These products will harm insect life they come into contact with

The Spraying options currently are:
Kurtail Gold (glufosinate-ammonium to be discontinued)
Finale (glufosinate-ammonium to be discontinued)
Katoun Gold (Pelargonic Acid)
New Wave (Horticultural vinegar)
Garlon ultra (hazard rating!)

We have trialled the Pelargonic acid and the horticultural vinegar and found that their effects are very limited as they provide limited initial kill and no lasting control of established weeds.

Trial Areas were treated with Katoun Gold & Vador (Horticultural Vinegar)
Operational staff reported:

- Limited signs of the Katoun Gold having much effect.
- Needs temperatures above 15 degrees to be effective
- The product will kill bees
- Standards would also be poor in comparison to previous maintenance standards.

Alternative weed killer product costs are high

Product	Cost	container size	Cost Ha	
New Way	£28.00	5litre	£560.00	Alternative product
Katoun Gold	£140.00	5 Litre	£630.00	Alternative product
Galup	£24.50	5 Litre	£24.50	Glyphosate
CDA Glyde	£29.20	5 Litre	£58.40	Glyphosate

Alternatives to the use of herbicides

d) Sweeping and cleaning of streets and pavements

A trial has been undertaken of sweeping and cleaning of pavements and streets in the Gorebridge area. This improved the aesthetics of the area and removed a few years' worth of detritus build up.
We would recommend that this task is undertaken on 5 occasions per annum. This is costly in comparison to previous glyphosate applications.

This would improve the aesthetics of Midlothian but cause some infrastructure degradation e.g. to sandstone walls.

e) Community involvement

Encourage gorilla gardening groups and other community groups to maintain areas. We can continue to ask cemetery visitors to hand weed the channels around headstones. This may require the introduction of best kept area competitions etc. This may also require the removal of some shrub areas to reduce the maintenance requirement.

If this was to be developed across Midlothian then there would be a requirement to have an additional staff post to coordinate and promote this.

f) Other non-chemical Methods

There are options including:

- Electric weed control
- Foam streaming
- Hot water treatment

These options are very costly and would require a very large capital investment in equipment. This is not considered a viable option at this time.

g) Strim grass edges

Grass edges could be strimmed rather than weed killed. The two spays would ideally need replaced by seven strims a season. i.e. once a fortnight . Aesthetically this would look much better.

However if the frequency was dropped the aesthetics would deteriorate and standards would drop with areas only looking neat immediately after they have been strimmed.

h) Bark mulch the shrub beds and hand weed.

Barked beds will provide some weed suppression and make hand weeding more practical and less time consuming.
The previous 586 hours per annum spent spraying could be utilised to hand weed. Please note that standards would be poorer than those previously achieved. Bark mulch could be applied on a three year cycle.

Background Papers:

Key links:

HSE 'Frequently Asked Questions about Glyphosate'
http://www.hse.gov.uk/pesticides/topics/using-pesticides/general/glyphosate-faqs.htm

Bayer's 'Let's talk about glyphosate' pages:
https://www.bayer.com/en/glyphosate-roundup.aspx and these lead on to more pages and resources

European Food Safety Authority
https://www.efsa.europa.eu/en/topics/topic/glyphosate

EFSA on 'Facebook Science'
https://www.youtube.com/watch?v=ivQ0Ph9OWZU

Glyphosate Task Force www.glyphosate.eu

Amenity Forum www.amenityforum.co.uk

Edinburgh Council report **1 November 2016**
https://democracy.edinburgh.gov.uk/CeListDocuments.aspx?CommitteeId=136&MeetingId=4747&DF=01%2f11%2f2016&Ver=2