4.5 WEED CONTROL MANAGEMENT OPTIONS UPDATE

Responsible Director: Ossie Martinz

EXECUTIVE SUMMARY

The safe and effective management of weeds is an important aspect of Council's overall approach to maintaining a thriving and sustainable local environment for the community to enjoy its many benefits.

Horticulture services use a range of weed control methods to both control weeds and while non herbicide methods such as hand weeding and mulching are preferred, in certain situations glyphosate has been used to deliver effective control of weeds which may otherwise damage the landscape leading to negative environmental outcomes.

Council has acknowledged the community's genuine concern for the materials it uses to maintain the city and has required officers to review its approach and demonstrate the suitability of each method used and where possible seek to minimise the use of glyphosate.

Council has actively participated in a research project led by the Municipal Association Victoria and delivered by Deakin University which has concluded glyphosate remains a safe and cost effective weed control option when used appropriately as part of an integrated weed management approach.

The review and findings of the project have identified the importance of being proactive in minimising the need for weed control through smart design of public places, regular maintenance of desired vegetation and considered selection of the weed control method required when weeds are present and require treatment.

The use of glyphosate has been thoroughly tested to verify it remains one safe and effective option available to use however where practical other methods should prioritised.

PURPOSE

This report provides an update on the findings of the final report *Weed Management options for Victorian Councils – Alternatives to Glyphosate* (Refer Attachment 1) and based on this report and review by Horticulture services recommendations for ongoing weed management at Monash.

KEY CONSIDERATIONS/ISSUES

- Glyphosate has been the source of both social and environmental concerns leading to a review of Council's use.
- Council participated in a research project led by Deakin University to determine the feasibility of alternate options and the ability for Councils to use it safely and effectively.
- The project findings concluded glyphosate remains a safe and effective weed control option.
- Horticulture Services deploys an integrated weed management approach throughout its various open space settings which includes glyphosate as one its methods. (Refer to Attachment 2)
- There has been considered effort to scale back the use of glyphosate in preference for other methods such as hand weed and mechanical controls such as mowing and trimming.
- Opportunities to further reduce use will be sought including determining the feasibility of partnering with local social enterprise Waverley Industries who employ a cohort of local disabled gardeners to provide hand weeding services.
- The safe and effective use of any product or plant is paramount in the public realm and this review has further raised awareness and led to improved practices regarding the safe use of materials such as glyphosate.

FINANCIAL IMPLICATIONS

There are no financial implications based on the recommendation to continue with the current approach. Funding to support the recommended 'pilot' project for increased hand weeding is proposed to be sought from existing operational budgets. A budget nomination will be submitted if the approach has merit and can deliver benefits to the community such as decreased glyphosate use, increased weed control and meaningful employment for local people with disabilities who have an interest in gardening.

CONCLUSION/RECOMMENDATION

Council note the findings of the MAV/Deakin University Research project and endorse the ongoing the weed management approach currently deployed by Horticulture services including further investigation of opportunities to reduce herbicide use by determining the feasibility of a partnership with local social enterprise Waverley Industries who provide hand weeding services employing local disabled people.

WEED CONTROL MANAGEMENT OPTIONS UPDATE

Responsible Director: Ossie Martinz

RECOMMENDATION

That Council:

1. Notes the findings of the Weed Management options for Victorian Councils – Alternatives to Glyphosate report
2. Endorses the ongoing integrated weed management approach deployed by Horticulture Services including continuing to minimise the use of herbicides where practical,
3.Noting that the weed management approach includes that glyphosate is not used in sensitive and well patronised public spaces including the immediate surrounds of playgrounds and that the approach includes appropriate public signing and information.
and
4. Endorses commencing a 'pilot' project in partnership with local social enterprises such as, Waverley Industries to determine the feasibility of an increased hand weeding regime via its cohort of local employees which will have the added benefit of increased local employment for disabled residents .

INTRODUCTION

Herbicide, in particular glyphosate (Roundup) is used worldwide for the control of weeds in Municipal situations such as public parks, kerb and channel and car parks. It is freely available and used extensively in home gardens and the agriculture industry to control weeds in crops.

Horticulture has used glyphosate to maintain weeds since it became available in Australia in the late 1970's early 1980's. Council's Horticulture teams managing open space areas have used an integrated weed management approach deploying the one or more methods to achieve effective weed control based on the situation.

Over the last four years Horticulture have continued to make a series of changes to minimise the use of herbicides in preference for non-chemical methods such as;

- Increased hand weeding in and around play grounds
- Mechanical trimming around bollards and along path edges in parks and gardens (Refer to Figure 3 below)
- Installation and renewal of mulch

Figure 3 – Path edging in Local Park

While these changes have been aimed at reducing chemical use they have also resulted in improvements to the amenity of open space areas such as trimmed edges vs dead grass around bollards or path edges.

An integrated weed management approach is deployed utilising a range of methods to control weeds across a range of open space situations such as bushland reserves, sports grounds and ornamental gardens. A detailed breakdown of the type of methods used across Council's open space areas is provided in Attachment 2 – Integrated Weed Management Approach.

This approach includes;

- Proactive maintenance for desirable species of turf and plants to out compete weed species.
- Change the surface type of areas to prevent weed growth e.g. mulch, granitic sand, synthetic grass or natural turf.
- Mowing, edging and trimming of weed species
- Spot application of herbicides such as Round Up which are designed to control specific weeds.
- Hand weeding by Council staff and volunteer groups (Friends of Damper and Scotchman's Creeks)
- Use of gas weed burners to control and re-generate target native and indigenous plants in high ecological value conservation reserves
- Consideration of impact of treatments on soil health.

The graphs below indicates the estimated percentage of use of each weed control method. Refer to Figure 1 Parks and Gardens and Figure 2 Bushland & Wetlands

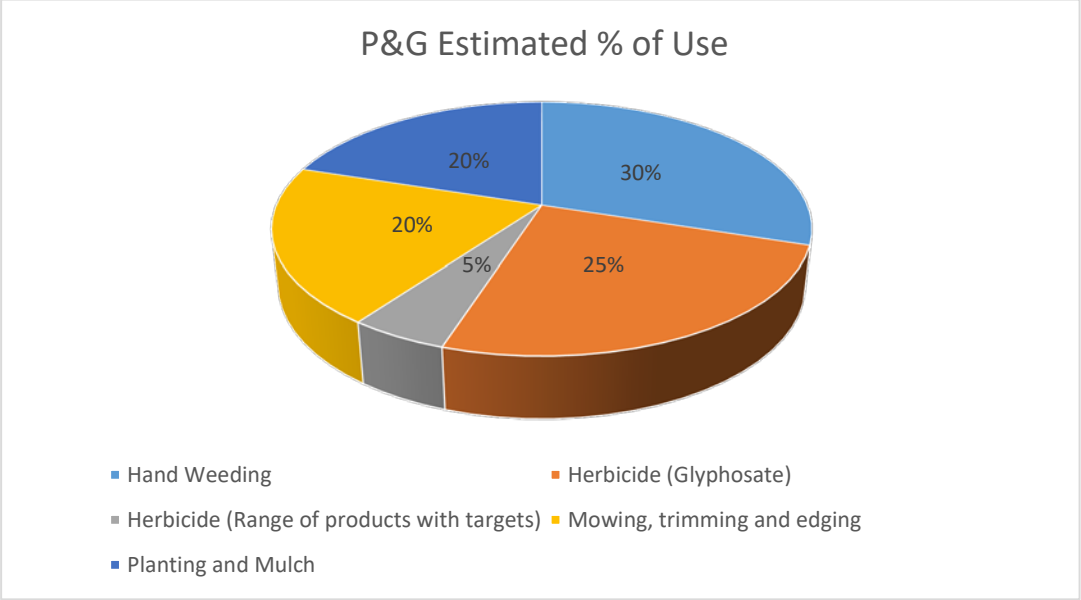

Figure 1 Parks and Gardens

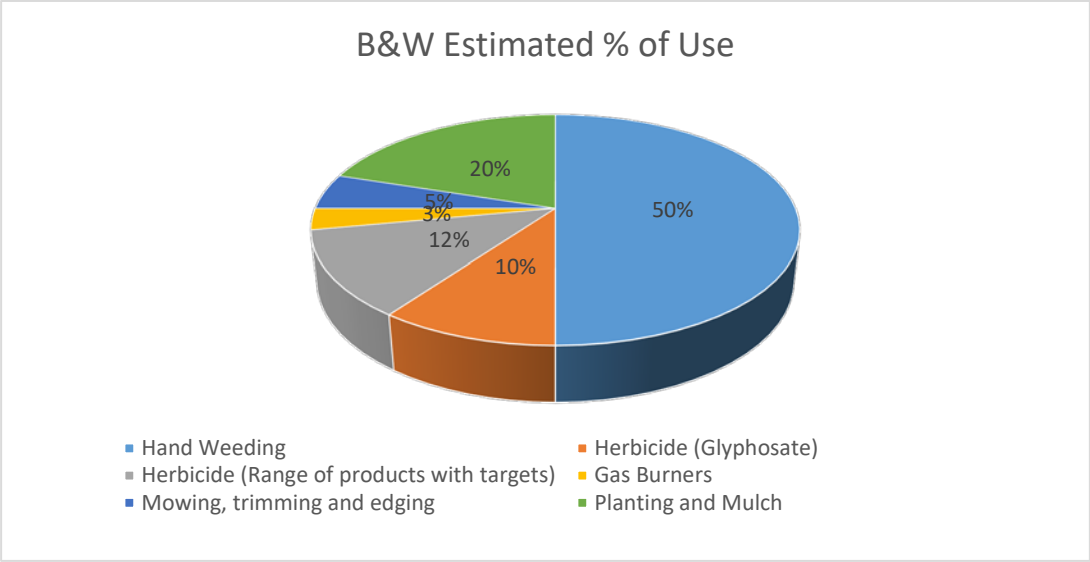

Figure 2 Bushland and Wetlands

An important aspect of any weed management program is the ability to apply each method in a safe and effective way to maximise the control while minimising the risk to the community, staff and environment.

Horticulture officers are aware that our open space maintenance operations especially herbicide application may cause concern for the community and therefore our approach must prioritise the communities safety and use of the area at all times. This may result in the re-scheduling or ceasing of some tasks due to noise, proximity of community etc.

Herbicide applications are planned and delivered with the objective to comply with all OH&S regulations

Safe and effective application is achieved via the following;

- All operations are guided by the completion and monitoring of the following OH&S management system activities;
    - Maintain a task based risk assessment to identify risk/s and controls
    - Maintain a Safe Operating Procedure (SOP) – step by step guidance on safe and effective operation
    - Maintain Safe Work Method Statements – detailed guidance on safe operation
    - Risk assessments as part of chemical purchases to determine product suitability for target/situation.
    - Maintenance of online chemical register to access current Safety Data Sheets (SDS) - manufacturer guidance on safe use
    - Regular internal audits to verify compliance with safety and quality standards e.g. personal protective equipment condition and use audits
    - Annual external audit to verify compliance with safety requirements (Safety Audit Standards)
- Applications are prescribed by qualified gardeners, greens keepers etc. to target weeds that are detrimental to the environment and amenity of the public open space areas. Supervisors monitor applications in the field to ensure safe and effective application.
- Application timing and location is considered carefully including monitoring current weather. If conditions change or use of area increases the operation will cease. Signage is erected at sites where herbicide application is undertaken to notify the community.

- Assignment to officers/contractors who have verified current Horticulture qualifications and/or Chemical Users certification e.g. Agvet Chemical Users Course (Level 111)
- Fit for purpose plant and equipment is acquired and used with a proactive maintenance regime to ensure safe and effective operation. Day to day operation involves pre start checks to assess condition prior to use.

BACKGROUND

At the Council meeting on January 28th 2020, a Notice of Motion, noted the social and environmental concerns relating to the use of glyphosate and endorsed Council's participation in a research project led by the Municipal Association Victoria (MAV) and Deakin University to provide findings on the feasibility of alternates to glyphosate. The findings would be used to inform Council's position on the ongoing management of weeds.

Officers have been involved in monitoring the projects progress and understanding the results as the trial progressed leading to the final report presented in June 2021.

On the 22nd of June 2021 MAV hosted an online forum for Deakin University to present the findings and to give councils the opportunity to ask questions and share experiences. This forum was attended by a range of key stakeholders from the participating Councils including Councillors, Chief Executive Officers, senior management and Horticulture field based staff.

DISCUSSION

In February 2020, the Municipal Association of Victoria (MAV) engaged Deakin University to undertake a research project to assess non-glyphosate-based weed management approaches.

The project goal was to provide comparable data on the safety aspects (including increased or decreased risk), effectiveness, financial implications and potential long-term soil impacts of a range of products and/or methods available to manage weeds.

The key project deliverable was a final report (Refer Attachment 1), including a section on the current best alternative practice weed management strategies, a section on OHS risk assessment on the various weed management methods, and a section on the pros and cons of the different approaches considered.

The project involved *in situ* trials of shortlisted weed control products over a period of 12 months. Those trials were conducted at two sites, targeting soil types that enable the results to be considered applicable state-wide.

One site was in Vermont South in the City of Whitehorse, with a heavy clay soil type. The second site was in Aspendale in the City of Kingston, with a sandy soil type.

The research project was intended to build councils' understanding and evidence base for decision-making. The final report for the project was provided in June 2021.

The cost for the project was shared across councils that opted to support the project. A project steering committee comprising representatives of the MAV, Deakin University and several councils guided the project.

The MAV's position on council use of glyphosate remains as previously advised. The MAV is guided by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and WorkSafe who are the regulatory authorities in this space. APVMA has clearly stated that APVMA-approved products containing glyphosate can continue to be used safely following the directions in the Safety Data Sheet and the labels.

For this project, a comprehensive desktop study was performed to identify possible weed management alternatives that could replace glyphosate use on land managed by councils. Based on a multifaceted selection criterion of cost, availability, ease of use, any known off-target toxic effects and known hazards for use, storage and negative environmental impacts, a shortlist of 10 strategies were selected in conjunction with the project steering committee for trialling.

The chemical alternatives selected for testing were:

- Imazapyr
- Glufosinate
- MCPA + dicamba
- Prodiamine

The organic plant oil-based alternatives selected for testing were:

- pine oil
- clove oil

The organic acid-based alternatives selected for testing were:

- nonanoic acid
- acetic acid + hydrochloric acid

Steaming of weeds was selected as a non-chemical, physical weed eradication strategy.

The efficacy of these weed control strategies were compared to untreated (negative) and glyphosate treated (positive) controls at two sites with different soil types. The Vermont South trial site represented a heavy clay profile and the Aspendale site a sandy loam profile. At each site, three blocks

of 10 m x 20 m were selected and within each block 11 transects were measured out for treatment. The treatments occurred over winter, spring, summer and autumn.

Key findings from the project were as follows:

- Glyphosate was observed to significantly reduce weed coverage for up to 12 weeks with no evidence of negative impacts on soil profile, arthropod or microbial populations.

- Glufosinate significantly reduced weed coverage for up to 12 weeks with no evidence of negative impacts on soil profile, arthropod or microbial populations. The efficacy of glufosinate compared to glyphosate varied and was not as effective as glyphosate across all seasons. Compared to glyphosate, glufosinate is approximately twice as costly and seasonal application rates may need to be higher and/or more frequent.

- Imazapyr has shown to be an effective broad-spectrum herbicide that kills established weeds and has preemergence effects. Imazapyr significantly reduced weed coverage 12 weeks and beyond from the first application at both sites. There were no notable alterations to the soil microbiome or arthropod communities associated with imazapyr treatment. There are potential issues with off-target effects due to its ability to readily diffuse through soil, residual activity and cost. Imazapyr use would require large buffer zones from waterways, plant life that is to be retained and wait times of over three months before planting.

- Steam was found to be an effective short term to long term weed reduction strategy based on cumulative effects observed. However, the steam treatment caused alterations in soil microbe populations, reducing overall microbial diversity. Based on this, steam would be recommended as a chemical-free alternative for small-scale targeted applications where the environment is altered in such a way that soil microbial ecosystem services are of minor significance, such as concrete walkways, kerb and channel guttering, asphalt driveways and car parks. Accessibility also needs to be taken into account for steaming due to the size of the steam units (width up to 2.52 m, weight of up to 2.6 tonnes).

- Clove oil, pine oil, nonanoic acid, acetic acid + hydrochloric acid, prodiamine, and MCPA + dicamba treatments had varying short term effects on percentage weed coverage and showed no capacity to significantly reduce weed coverage at 12 weeks and beyond. There were no notable alterations to soil profile, microbial communities or arthropod communities associated with these products.

Based on the results of field trials, and taking into consideration cost, safety information and off-target impacts, glyphosate is considered to be the most effective weed management strategy from the approaches scrutinised by this study.

For the chemical-based weed management strategies, all were classified as either schedule 5 or 6 poisons and were specified as needing to be used with caution. Glyphosate, glufosinate, imazapyr, nonanoic acid and clove oil are currently identified as schedule 5. Acetic acid + hydrochloric acid (organic acid), pine oil (organic plant-based oil) and MCPA + dicamba (chemical) weed killers tested in the study are currently classified as schedule 6. Prodiamine is currently classified as "exempt". This classification schedule is important, as all the alternatives selected are not highly toxic to the public or suspected to cause major environmental impact due to runoff, and they pose a relatively low-risk hazard to the workers administering the weed killer.

The project report largely focuses on the safety implications of glyphosate, glufosinate, imazapyr and steam because, based on the trial results, the MCPA + dicamba, prodiamine, acetic acid and plant oil-based products were not shown to be effective weed control alternatives.

In 2016, the International Agency for Research on Cancer (IARC) published a report that classified glyphosate as a Group 2A agent (probable carcinogens), classifying glyphosate as being probably carcinogenic to humans. Classification of agents as Group 2A (probable carcinogen) agents is applied when there is limited evidence of carcinogenicity in humans as well as sufficient evidence of carcinogenicity in experimental animals. Agents (substances and exposure circumstances that pose a risk) may also be classified as Group 2A if there is inadequate evidence of carcinogenicity in humans along with sufficient evidence of carcinogenicity in experimental animals and strong evidence that the carcinogenesis is mediated by a mechanism that also operates in humans. Agents may also be classified as Group 2A based solely on limited evidence of carcinogenicity in humans.

In 2016, following the outcomes of the IARC assessment for glyphosate use, the Australian Pesticides and Veterinary Medicines Authority (APVMA) reviewed the IARC assessment report and other relevant scientific information and concluded that there is currently no scientific reason to reconsider the registration of glyphosate. This means at present the APVMA advises that "Glyphosate is registered for use in Australia, and APVMA approved products containing glyphosate can continue to be used safely according to label directions".

Glufosinate and imazapyr are not classified as carcinogens or probable carcinogens by the IARC. This may be due to glufosinate and imazapyr not being reviewed for classification due to low or no reported incidences, no evidence presented or only low-risk evidence obtained from toxicity testing.

To date, chronic toxicity tests for imazapyr indicate that it is not carcinogenic, mutagenic, or neurotoxic. It also not known to cause reproductive or developmental toxicity and is not a suspected endocrine disrupter. Available information suggests imazapyr has low acute toxicity on the skin or if ingested but is harmful if inhaled and may cause irreversible damage if it gets in the eyes. Applicators must follow the protective control measures outlined in the safety data sheet (SDS) as detailed in the example information below. The break-down products from imazapyr are not suspected as being any more toxic than imazapyr itself and are likely to be excreted faster than imazapyr when ingested.

For glufosinate, testing of foetuses during pregnancy in rats and rabbits indicated no teratogenic potential (birth abnormalities). Mutagenicity tests have also indicated glufosinate to be non-genotoxic. Chronic toxicity testing in rats and dogs yielded no-observable-effect levels of 2 and 5 mg/kg body weight/day, respectively. Oncogenicity studies in rats and mice revealed no carcinogenic potential. On the basis of this toxicity data it was concluded that this herbicide is safe under conditions of recommended use (Ebert et al 1990).

For any herbicide or agent being used to control weeds, local area management plans need to be developed that details the appropriate personal protective equipment (gloves, protective clothing, eye protection and face protection), ventilation requirements and ways to minimise vapours and risk of exposure. All applicators need to be informed and aware of the risks of working with agents. This is best done by reviewing the information and operating in accordance with the information specified by the product manufacturers and in accordance with Safe Work Australia (SWA), Work Health and Safety (WHS) (Managing Risks of Hazardous Chemicals in the Workplace) Code of Practice, Global Harmonised System (GHS) and the Australian Dangerous Goods (ADG) code, which are detailed in the product safety data sheets. When applying herbicides workflow patterns need to be predetermined to eliminate the need for the applicators to revisit or come in contact treated areas.

In considering physical weed control strategies such as steam, risks assessments need to be performed and risks associated with hot water or steam, fuel (unleaded petrol and/or diesel) and exhaust fumes accounted for (operate up wind from steamer unit). Applicator exposure time increases risk (exposure time to agents); where environmental factors such as heat, fatigue, noise, and sun need to be accounted for. Protective measures such as hearing protection, safety glasses, heat proof gloves, and clothing that covers bare skin should be worn.

A considerable risk associated with operating the steamer unit is the use of fuels, unleaded petrol, and diesel. For the water pump, petrol (unleaded) is required, which is a Schedule 5 poison and the exhaust fumes generated

considered as "possibly carcinogenic" (Group 2B) (IARC, 2012). The generator associated with the boiler that generates the steam uses diesel, which is a Schedule 5 poison. Diesel exhaust emissions are classified as carcinogenic to humans (Group 1).

Based on the findings of the project it has been established that due to its effectiveness and ability to be used safely, Glyphosate should continue to form part of Council's weed management approach.

Council should continue to provide adequate funding to support the adequate design, delivery and maintenance of natural and hard surface landscapes which in turn reduce the ability for weeds to germinate and therefore require control.

Council has already taken action to reduce the use of herbicides over the last four years and should continue to act on opportunities to further reduce the need for chemical use and where required ensure application is completed to meet safety standards.

It is recommended that officers investigate the feasibility of further increasing its capacity to use hand weeding as a non chemical alternate via the services of a local social enterprise Waverley Industries which employs local people with disabilities to perform hand weeding. This service also provides additional litter collection and general upkeep upon each visit.

This approach would result in reduced weeds and litter within these areas through their work. The overall amenity of these areas would be lifted while providing a way for this cohort of local community members to make a meaningful contribution to the environment and community.

A pilot program is recommended to be commenced within the 2021/22 financial year to validate the approach with a business case submitted for the required ongoing funding as part of the 2022/23 annual budget process. The pilot will be funded via existing operational budgets

POLICY IMPLICATIONS

There are no policy implications related to this report.

CONSULTATION

Councillors and officers were invited to attend a briefing on the final research project report hosted by the MAV and delivered by Deakin University. The reports and findings included within the attachments of this report have been provided to key stakeholders at Monash City Council.

SOCIAL IMPLICATIONS

The safe and effective use of glyphosate has been the key driver of this review which has clearly indicated community safety is a key guiding principle that must be considered in all maintenance activities undertaken.

Effective weed management will improve open space environments which in turn provides inviting places for the community to enjoy.

HUMAN RIGHTS CONSIDERATIONS

This report is in line with the Charter of Human Rights and responsibilities ACT 2006 and does not raise any specific considerations.

GENDER EQUITY ASSESSMENT

A gender impact assessment has not be undertaken as part of this report due to its relevance to the specific subject matter.

FINANCIAL IMPLICATIONS

There are no financial implications based on the recommendation to continue with the current approach. Funding to support the recommended 'pilot' project for increased hand weeding is proposed to be sought from existing operational budgets. A budget nomination will be submitted if the approach has merit and can deliver benefits to the community such as decreased glyphosate use, increased weed control and meaningful employment for local people with disabilities who have an interest in gardening.

CONCLUSION

Council note the findings of the MAV/Deakin University Research project and endorse the ongoing the weed management approach currently deployed by Horticulture services including further investigation of opportunities to reduce herbicide use by determining the feasibility of a partnership with local social enterprise Waverley Industries who provide hand weeding services employing local disabled people.

ATTACHMENTS

Attachment 1 – Weed Management options for Victorian Councils – Alternatives to Glyphosate
Attachment 2 – Integrated Weed Management Approach