

Appendix 2: pesticide reduction – alternatives to glyphosate

Treatment	Description	Benefits	Risks	Estimated costs	Officer feedback
Hot foam	Combines heat with biodegradable foam made from natural plant oils and sugars. The heat is used to kill the weed while the foam acts as a thermal blanket keeping the heat applied for long enough to kill the root.	<ul style="list-style-type: none"> • Pesticide-free • Can be used in all weather • Claims to kill 95% of targeted weeds 	<ul style="list-style-type: none"> • Relatively new technology • Expensive • Additional cost of olive oil rather than palm oil • Diesel (used in vehicles) consumption and pollution • Host vehicle could impede traffic flow on many narrow city streets • Parked vehicles could prevent access to pavements • Requires several intensive treatments to remove roots 	£0.540m (two treatments per year)	<p>Officers received a demonstration of this in September 2019</p> <p>Lewes District Council carried out a six month trial of using hot foam to remove weeds around playgrounds. They are now considering extending this to areas around schools. They have found it less effective than glyphosate, but it does work on most types of weeds after a few applications. It is more expensive.</p> <p>Would probably still need operatives with wand / Knapsack, or manual weeding, to reach some areas.</p> <p>Not necessarily a cost effective solution for a city like Brighton & Hove.</p>
Flame throwing	Flamers are portable gas torches that produce intense heat that quickly boils the water in plant	<ul style="list-style-type: none"> • Pesticide-free • Throwers relatively cheap to purchase 	<ul style="list-style-type: none"> • Not very effective on perennial weeds • Brings health and safety risks (banned in the 	Did not pursue as not considered a viable option.	Concerns about insurance and health and safety.

Treatment	Description	Benefits	Risks	Estimated costs	Officer feedback
	cells, causing them to burst. This approach has been around for a while.	<ul style="list-style-type: none"> • Suitable for weeds on hard surfaces 	<ul style="list-style-type: none"> • domestic market) • Not particularly effective 		
Infra-red	The system consists of a shrouded spraying head mounted on the front of a purpose-built vehicle. Within the shrouded head are sensor units and spray nozzles. The sensor units detect the presence of weeds and triggers the appropriate spray nozzles to accurately apply the correct amount of herbicide just to those weeds and their immediate surroundings.	<ul style="list-style-type: none"> • Claim is up to 80% reduction in glyphosate • Vehicle can mount pavement • No blanket spraying • Targets weeds only 	<ul style="list-style-type: none"> • Still contains glyphosate • Diesel (used in vehicles) consumption and pollution • Host vehicle could impede traffic flow on many narrow city streets/pavements • Parked vehicles could prevent access to pavements • Hard to see benefit of using infra red over normal vision to identify locations to spray. 	£0.056m	<p>Large vehicle on pavement but impressive if can target weeds.</p> <p>Would probably still need operatives with wand / Knapsack, or manual weeding, to reach some areas.</p>
Manual weeding	Using manual techniques such as hoeing, brushing, ripping, mowing and pulling.	<ul style="list-style-type: none"> • Pesticide-free • Very effective if done well • Low set up costs (excluding labour) • Avoid risks associated with pesticide use • Increased employment opportunities 	<ul style="list-style-type: none"> • Labour intensive and time consuming • Use of manual equipment such as strimmers and rippers need to be careful managed to avoid harm from vibration to users. • Trees susceptible to damage • Requires large amount of labour • Above surface growth treated and not root system therefore short term • Higher cost than glyphosate spray 	£0.070m for 6 month programme	Additional funding has already been provided and this option is recommended for a years trial as the most cost effective method of eliminated the use of pesticides.

Treatment	Description	Benefits	Risks	Estimated costs	Officer feedback
			<ul style="list-style-type: none"> There will be likely to be more weed growth in some areas as treatment will need to be targeted 		
Pelargonic Acid Katoun Gold	Vehicle and knapsack used to spray weeds.	<ul style="list-style-type: none"> Naturally Occuring substance extracted from plants No licence required for application Could be applied by hand / Knapsack sprayer 	<ul style="list-style-type: none"> Only effective for a short period Producers recommend using in conjunction with other herbicides Above surface growth only and not root system Expensive 	Did not pursue as established as ineffective	
Vinegar	Vehicle and knapsack used to spray weeds.	<ul style="list-style-type: none"> Pesticide-free No licence required for application Could be applied by hand / Knapsack sprayer 	<ul style="list-style-type: none"> Has been trialled, but feedback from PAN UK is it has not been effective Strong smell, can give operator headache Above surface growth only and not root system Expensive 	£0.740m for two yearly sprays	
Weed spraying with conventional herbicides	Glyphosate spray to all roads and pavements using small vehicle and knapsack	<ul style="list-style-type: none"> Tried and tested effective method of weed removal Quick Cheap Cost effective Fixed number of treatments per growing season 	<ul style="list-style-type: none"> Uses synthetic chemicals Sprays whole area and not just weeds If windy can spread Risks to public, environment and operators Reduces habitats for bees and other insects High level of public concern about the use of this product 	£0.036m for two yearly sprays	Increasing number of complaints from residents on blanket spraying of glyphosate.

