# Appendix C - Alternative weed maintenance solutions

## Foam Stream

Foam Stream is a low-pressure process, combining heat with biodegradable foam. The highest output for Foam Stream is 700m2 per hour. This equivalates to 5,600m2 per day compared to 35,200m2 with Gallup.

One of the main issues the Highways Service would have with Foam Stream is the frequency the device needs to refill with water. And that either a tanker will need to follow the machine, or it will need to go back to a depot to refill.

| Negatives | Positives |
|---|---|
| • Frequent need to refill water<br>• The machine is expensive<br>• It is diesel operated (although LPG versions are possibly available)<br>• The machine is large – meaning it is difficult to access some areas. It comes with a 60m hose<br>• It is quite noisy – not appropriate around housing areas<br>• It is quite slow to use and set up | • It does not use chemicals<br>• It can be used all year round<br>• It can also be used for graffiti removal<br>• It is great for killing moss etc on hard surfaces / play area surfacing |

## Hand Weeding

Hand weeding is an option which requires an increased amount of resource for a slower process. It is also important the whole plant is pulled, if the area is dry it is more likely the plant could snap resulting in the root being left and the weed re-growing quickly.

It can also result in grout being removed, in turn causing trip hazards on the highway.

| Negatives | Positives |
|---|---|
| • Increased cost<br>• Increased resource<br>• Slower process<br>• Quicker regrowth<br>• Potential trip hazard | • It does not use chemicals<br>• It can be done all year round<br>• Immediate results |

# Acetic Acid (Vinegar)

Acetic acid causes rapid breakdown/desiccation of foliage tissue on contact. The acetic herbicides usually consist of between 10-20% vinegar.

Acetic acid (Vinegar) has been tested in a railway environment. It was seen to be effective at 12% concentration but required more treatment and higher doses compared to herbicide use.

From discussions with Kent County Council who trialled the method, they highlighted that it was not a success as it only treated the top growth with several visits, although they found it worked well on moss.

| Negatives | Positives |
|---|---|
| • Will kill or damage any plants they touch.<br>• Weeds must be small (timing is important – within 2 weeks of germination)<br>• Roots are not killed; repeat applications are needed for larger weeds and perennial weeds<br>• Sharp vinegar odour may be unpleasant<br>• Corrosion of equipment.<br>• Spray drift may damage desirable plants.<br>• Should not be applied to reactive metals.<br>• Spraying masonry sidewalks and structures can cause these surfaces to stain, mottle, harm the finishes or surfaces.<br>• Treatments must be delayed 24-48 hours or more after rain and should not be done any more than every two weeks.<br>• Severe eye / skin irritation, burns, and possible irreversible damage potential. Vinegars with acetic acid concentrations of 11% or greater can burn the skin and cause severe eye injury, including blindness. Prolonged or repeated exposure may cause dermatitis, chronic bronchitis, and erosion of teeth | • Excellent control when contacting very small annual broadleaf weeds<br>• Rapid kill rate (Over 90% of treated plants should die within 24hours).<br>• Acetic acid products break down quickly in the environment<br>• Most useful for managing weeds in gravel and on patios/sidewalks.<br>• These contact herbicides fit into an integrated pest management program, although weeds require monitoring for best control timing.<br>• Nonselective, but mainly kill broadleaf weeds. Burns back grasses temporarily. |

## Thermal

Infra-red and Flame treatment heats up the vegetative parts of the plant rapidly and mainly destroy the surface parts of the weed but not affecting the roots. These methods do not require a pesticide specified certificate as listed on the HSE website. However, operatives would need to be trained and competent in the use of these methods and equipment and in particular the health and safety implications.

Weeds vary in their response to such heat control, with newly emerged or small weeds, or weeds with small root reserves, being more likely to be killed by heat, but well-established weeds, perennial weeds and weeds with substantial root systems being less affected.

For the highways service, this method is not something that could be used around parked cars and would not be appropriate in populated urban areas.

| Negatives | Positives |
|---|---|
| • Tap rooted weeds can re-emerge after approximately two weeks.<br>• Repeated treatments necessary.<br>• Well established weeds less affected.<br>• Not able to treat all areas, e.g., around parked vehicles | • No pesticide used. |

## Mechanical

Mechanical methods consist of either brushing/weed ripping, mowing and strimming, can remove the root along with it, but requires cleaning up and sweeping once the work is done. Wire brushes are the most common mechanical method used; however, this requires access which might be challenging in urban areas.

| Negatives | Positives |
|---|---|
| • Tap rooted weeds can re-emerge after approximately two weeks.<br>• Access to weeds | • It does not use chemicals<br>• It can be done all year round |