

Weed control on roads and pavements: Costs and environmental impact of different options

egeis

European Glyphosate Environmental Information Source

Important Notes to users:

This document is part of a toolbox which provides independent information on the sustainable use of glyphosate. It cannot however be definitive and users must ensure that they assess local factors and particularly take account of any national or regional legislative requirements. At the end of the document reference sources used in its preparation and links to other relevant documents are provided.

Summary

For reasons of safety, maintenance and appearance it is necessary to control weed growth on roads and pavements. There are a number of options for this including use of herbicides such as glyphosate. Herbicides usually provide the cheapest option, but unless used with great care, can pose a number of environmental risks to water due to the fast run-off after rain. This document summarises the range of available practicable weed control options and their relative costs based on experience using the SWEEP system in The Netherlands in 2005. Many of these approaches are being or could be adopted for use in other countries.

Detailed information

The responsibility for maintenance of roads and pavements will vary from country to country.

Good design of pavements can significantly reduce the extent of weed growth but inevitably some form of regular weed control will be necessary. Absolute weed control (no visible weeds for the majority of the time) is usually unnecessary, costly and environmentally damaging. Therefore it is important that the appropriate authorities determine a target level of acceptable weed growth taking account of local circumstances. The choice of weed control method will need to take into account a number of local factors including particularly relevant legislation and national guidance, environmental risks within the catchment (e.g. water supply intakes, sensitive ecosystems) and cost. Whilst herbicide use is the cheapest in simple cost terms, when environmental risk impact is taken into account other options may be more appropriate, although these options may also have environmental impacts as well.

Relative cost and frequency of different weed control options

In 2005, costs of weed control systems on pavements in municipalities in The Netherlands were studied. The systems represent the main control method applied during a season: brushing, flaming, hot water and herbicide weed control using obligatory selective application technology. The methods require different frequency of use to keep weed growth on pavements below a certain defined specification. Table 1 contains both frequencies and costs per year (2005 price level) for different systems and two specifications of acceptable weed growth.

Table 1.

System	Threshold weed growth specification			
	Little weed growth*		Very little weed growth*	
	Frequency/year	Costs (€ m ⁻²)	Frequency/year	Costs (€ m ⁻²)
1. Brushing	3	0,19 - 0,38	3,5 - 5	0,20 - 0,40
2. Flaming	Not applicable		5	0,15 - 0,35
3. Hot water	2,5	0,22 - 0,32	3 - 4	0,30 - 0,40
4. Herbicides	2	0,05 - 0,08	2,5	0,07 - 0,10

* For information on precise specification see reference 3.

However, as well as direct costs a few studies have also addressed the issue of the external costs, for instance the abatement costs incurred by drinking water suppliers to remove herbicides and other

impurities from raw water. The external costs can have a significant influence on the overall cost to the community of weed control.

The Dutch SWEEP system

The SWEEP system (Sustainable WEEd control on Pavements) is a new concept of hard surface weed management that aims to provide both cost-effective and environmentally sound weed control. The concept was tested from 2002 – 2004 in cooperation with Dutch municipalities, weed control contractors, water boards and other stakeholders. The aim was to see if herbicide use and losses could be reduced to a level that achieved specified surface water quality criteria while keeping costs, efficacy and ease of weed control to an acceptable level.

A summary of the main measures is given below, for details see shortlists in reference 1:

- o No herbicide use if the pavement is within 10-km of surface water that is used for drinking water production,
- o No herbicide use on 1-m wide zones of pavements bordering surface waters,
- o No herbicide spraying when weather forecasts are favourable for run-off (probability of rain > 40 % and > 1 mm – within the next 24 hours,
- o No or very restricted herbicide use near gully pots,
- o Implementation of best practice technology e.g. weed sensors for selective spraying and maximum herbicide use rates,
- o Professional management with clear specification of allowable maximum weed growth,
- o Improved measures to prevent weed growth,
- o Monitoring and certification of herbicide use.

The SWEEP concept was tested in residential urban areas of nine Municipalities in the Netherlands during the period 2002 - 2004. They were 5 – 25 ha in size with ca 30 % paved area to be managed. The following observations were carried out:

- o Type and frequency of weed control methods applied, and herbicide use,
- o Herbicide and metabolite run-off (glyphosate, AMPA, MCPA, glufosinate ammonium) to sewer, sewage purification facilities and surface water,
- o Efficacy of weed control,
- o Costs of weed control per quarter per m².

Table 1 Weed control parameters in test quarters of 9 municipalities in 2002, 2003 and 2004 under the SWEEP system.

Parameter	Result
Herbicide reduction in test quarters compared to previous years.	11 % to 66 %
Control methods on areas where herbicide could not be used in the test quarters	Flaming, hand mowing, brushing, sweeping
Surface water quality: Mean concentration glyphosate in surface water at sewage treatment work discharge points shortly after rain (137 samples)	0.8 µg/l
Efficacy of weed control	Moderate to good
Costs of weed control per year	0.05 – 0.15 € per m ²

Summary

The approach developed in The Netherlands has demonstrated that in sensitive areas, adequate levels of weed control can be secured at acceptable cost using an integrated approach and non chemical options. Such approaches might be adopted in other EU countries subject to any necessary modification to take account of local laws and practices.

Reference for further detailed information:

1. See general information and publications related to the SWEEP project ([Click here](#))
2. See also specific publications from 2005 and 2006 ([Click here](#))
3. Kempenaar, C. & Saft, R.J., 2006. Weed control in the public area: combining environmental and economical targets. In: Proceedings 'Policies on pesticide use by local and regional Authorities' op 25 April 2006 in Wageningen. DIAS report Plant Production no. 126. p. 17-26.
4. Kempenaar, C, Lotz, L.A.P., van der Horst, C.L.M., Beltman, W.H.J., Leemans, K.J.M., Bannink, A.D., 2007. Trade off between costs and environmental effects of weed control on pavements. Crop Protection 26: 430 – 435.
5. Bannink, A.D., 2004. How Dutch drinking water is affected by the use of herbicides on pavements. Water Science & Technology 49-3: 173-181.

See also:

- o Best practice for chemical weed control on hard surfaces.
- o Best practice for general handling of herbicides to minimise risks of point source pollution

Document status:

Author	Document status	
Corné Kempenaar Wageningen University and Research Centre - Plant Research International	Final	February 2010

Disclaimer

All reasonable steps have been taken to ensure that the information provided in this document is accurate but neither EGEIS nor the authors can be held responsible for any use to which it is put.