

Shortlist 0. Guidelines for multi-year plan Sustainable Weed Control on Pavements

Version 2009-1: February 1, 2009.

© Plant Research International b.v., Wageningen University and Research Center, Droevendaalsesteeg 1, 6708 PB Wageningen, the Netherlands.

Contact: Dr Ir C. Kempenaar or C. van Dijk

email: corne.kempenaar@wur.nl telephone: + 31 317 480 498

websites: www.dob-verhardingen.nl, www.weedcontrol.eu

User group Shortlist 0: Policy makers and managers of hardsurfaces in public areas and on industrial sites.

Objective: To improve the sustainability of weed control on hardsurfaces, by integrating effectiveness, environmental criteria, labour conditions, social aspects and budget (Triple P, People, Planet & Profit, of sustainability), by drawing up a multi-year weed management plan within the SWEEP guidelines and legal frameworks, provisions and criteria.

1.1 General

A Weed Management Plan is recommended – mandatory in SWEEP - for situations where weed control is to be done on large areas of hardsurfaces (> 1 ha). Such a plan contains the policy and objectives for several years to come, and should express the ambition level of the organisation as regards weed preventive constructions and measures, the acceptable weed infestation level, environmental and financial targets, preferred organisation, communication activities, etc. The plan could be part of a larger multi-year Integrated Terrain Management Plan.

A multi-year Weed Management Plan has a clear added value; the document is available to account for the policy covering an important topic. It also makes the weed management less reactive. It gives weed prevention a better chance, and management costs may be reduced in the long term.

Objectives regarding the following topics should be formulated in a multi-year Weed Management Plan:

* **Weed prevention;**

optimum design and construction of the public area,
optimum use of preventive methods,
renovation unfavourable situations.

* **Weed control;**

acceptable level of weed infestation,
which methods are to be used in which system,
which boundary conditions are applicable for the environment, for people involved and for costs.

* **Organisation, registration, evaluation and communication;**

legal frameworks are of course leading,
training of staff/people involved,
period covered by the plan (about 5 years),
consultations with citizens/society,
consultations with environmental organisations (including district water board

authorities).

Options and suggestions for arriving at a balanced plan as regards the desired objectives are discussed below.

1.2 Weed prevention

When designing and constructing pavements it is important to take into account the weed-preventing or weed-reducing possibilities. "Prevention is better than cure" also applies in this case; preventive measures may result in less intensive management in the future. Indicate in the multi-year plan which ambition level is set for preventive weed control methods (e.g. high priority, average priority, low priority). When doing so, distinguish between weed prevention when constructing new pavements and weed prevention on existing problem locations. Finally, indicate which problem locations need to be converted. Brushing also plays an important role in preventing weed growth; indicate therefore in the plan how the brushing regime is linked to weed control. Detailed information and examples regarding preventive weed control on pavements are given on www.dob-verhardingen.nl/nl/Algemeen/Preventie.htm DOB Preventiedocument.

Prevention of weed growth for new pavements

Pay attention to the following points when planning new pavements:

- Functionality of the pavement. Weed growth rapidly increases when pavements are hardly used.
- Restrict the number of obstacle as much as possible. These hinder practical weed control operations.
- Type of pavement. Weed growth occurs in joints. Smaller joint areas by applying larger elements restricts weed growth. Joint filling may reduce weed growth when smaller or irregular elements are used.
- Planting. Tree roots may push pavements upwards enabling weed establishment.

Prevention of weed growth in existing situations

Pay attention to preventive weed control when planning renovation of problem locations. A problem location may, e.g., be formed by obstacles on pavements. This means that weed control machinery cannot reach certain parts of the pavement. This problem can, e.g., be solved by joint filling or by combining functions (such as the use of several traffic signs at one post). Additional budget will be required for implementing renovations. These investments are expected to yield savings in the long term.

Indicate in the map:

- places with high weed pressure,
- measure to be taken to deal with those problem areas.

Prevention by cleaning of pavements (sweeping and/or brushing)

Describe cleaning operations to be carried out. Cleaning is often done by sweeping or brushing machines. Attention should be paid to:

- Weed management should be geared to brushing.
- Brushing removes accumulated material that may form a seed bed for weeds (prevention). Brushing also removes small weeds.
- No brushing immediately before or after weed control. Spreading results in a better general weed control. Absorption of herbicides by weeds is, e.g., reduced after damage by brushing.

1.3 Weed control methods

Before deciding about the weed control method to be applied it is important to establish which weed situation is acceptable (desired view and maximum level of weed growth). This may be different per town district or area. The available budget of course also plays a role in this.

The budget

The available budget is often determinative in deciding about the weed control system. Broadly speaking, fully non-chemical (non-herbicide) control is about 10 times more expensive than fully chemical (herbicide) control.

Costs of weed control according to the SWEEP method is maximally 30% more expensive than fully chemical control. This is the result of emission reducing measures, local use of more expensive non-chemical methods and costs of fewer days on which herbicides can be applied.

Terrain map

A map on which locations of pavements and surface water are indicated should be available. A variety of types of pavements exist (see www.dob-verhardingen.nl/nl/Publicaties/ 2005 Davies et al, 2005, Hard surfaces and weed infestation). Planning takes into account these types and possible run off of herbicides to surface water.

Zoning per function and acceptable weed infestation level

Classify the area into zones with a comparable function. E.g., city centre, shopping area, residential area, industrial area. Decide for each zone/function which weed situation is maximally acceptable on the basis of Table 1 or another classification scheme. You can also use more simple classes like high quality, standard quality and moderate quality.

Class	Weed infestation level on the pavement
1	No weeds
2	Very few small weeds, less than 5% cover of bare soil by weeds
3	Few small weeds, 5-25% cover of bare soil by weeds
4	Some weeds higher than 10 cm or some clumps of weeds, 25-50% cover of bare soil by weeds
5	Many weeds higher than 10 cm or clumps of weeds, soil cover more than 50% by weeds
6	Pavement nearly invisible because of weed cover

Weed control method

Indicate in the multi-year plan which weed control method will be used. Here, a choice can be made from a fully non-chemical method, a fully chemical method or a combination of both (integrated method).

Non-chemical techniques are, e.g., steaming/hot water, burning, mowing and brushing. These techniques only remove the above-ground parts of the weeds. This means fairly rapid regrowth. Generally, these techniques need to be applied two-monthly, depending on the extent of weed growth and season. These methods are only suitable in case of low to moderate weed growth. The mower, however, can also

remove heavy weed growth. Steaming and burning are most effective in case of dry weather. In case of burning, however, there is a risk of roadside fire. The other methods can be used under all weather conditions.

Chemical herbicides may by Dutch law only be applied by means of a selective application technique, such as the SelectSpray and the Weed IT. These techniques have sensors that detect weed growth which results in only the weed being sprayed. Weeds are fully killed by this technique. One to two treatments with chemical products per season are generally sufficient for an effective weed control. Chemical control is effective in case of low to heavy weed growth.

The final choice often depends on the applicable criteria and standards. The SWEEP system fits into the integrated policy and ensures the best possible match between effectiveness, costs and side effects. Within the SWEEP system, mechanical, thermal, chemical and biological weed control methods can be deployed provided that these are legally permitted, have been demonstrated to be effective and environmentally sound. The owner of the terrain decides where, when, and how often which methods are used within the boundary conditions laid down in SWEEP. SWEEP only gives specific restrictions for the use of chemical products which enables restriction of the emission of chemical products to surface water to an acceptable level. Chapters 2 and 3 deal with the specific SWEEP guidelines.

1.4 Organisation

For a good implementation of the weed management system it is vital that it is clear within the organisation along which guidelines work should be carried out. This requires a description of the procedures, who is responsible for implementation of the policy (who is managing who), and should formulate clear instructions in which it is indicated how tasks need to be carried out.

Time span of the plan

Determine the period to be covered by the plan (advice: period of 5 years).

Organisation and weed control operations:

- Determine whether the municipality itself carries out weed control or a contractor.
- Determine whether the organisation who carries out the work is entering into a result commitment or whether work is carried out under state control (or a combination).
- Determine the applicable boundary conditions:
 - available methods;
 - the system to be applied (chemical, non-chemical or integrated SWEEP approach);
 - other boundary conditions, such as, e.g., application of non-chemical means on schoolyards and playgrounds or non-burning on places with a fire risk;
 - certification under Milieukeur Duurzaam Terreinbeheer (hall mark, Environmentally Sustainable Terrain Management).

Indicate in an organogram those who are involved in weed management.

- Who are stakeholders in the construction of pavements, (preventive) weed control, brushing management, surface water quality, evaluation of the management, etc.
- Indicate the responsibilities and tasks per position and indicate communication lines. Positions to be addressed are e.g., Head Public Works, Controller/evaluation, Buyer, Policy maker, planner, Foreman, contractor,

Communication

Indicate which parties need to be informed, when, about what, and how. The communication paragraph indicates how and when consultations between the departments involved takes place, what needs to be discussed (e.g. in consultation with the foreman), how internal and external information are going to be organized (newspaper message, letter to citizens, meetings) etc. Also indicate how reports regarding weed management are going to be dealt with (reporting procedure, handling etc.).

Registration

Registration of herbicide use is essential to gain more insight in total chemical use per area. In the SWEEP system foremen can enter data about the application of chemicals per district into the registration module via internet (see Chapter 4) or by means of a registration form.

Later, the entered data enable colleagues to compare use and to establish under which conditions control has been carried out. The data can also be used for policy evaluation and –if necessary- adjustment.

Indicate in the multi-year Plan if, and if so how, you intend to register the use of chemicals.

Evaluation

Evaluate weed management at the end of the year; take into account the obtained weed perception in the different zones and the costs that have been made. Policy and/or budget can be adjusted on the basis of this.

In case the obtained level of weed control is insufficient, it is possible to decide on the use of different methods or a combination of methods, or a more frequent use of the deployed methods. These choices may of course affect the budget.

Also evaluate whether communication between stakeholders has been sufficient. Evaluation can take place against the targets that have been formulated in the communication paragraph of the multi-year Plan.