2.3 Educational and participatory practices

2.3.2 Intensive training of landowners on aspects of stormwater management

Description

This best management practice typically involves a series of free intensive training workshops for volunteer residents involving lawn and garden care activities. The aim is to promote alternative lawn and garden care practices to minimise stormwater pollution.

Home gardens can have a significant adverse impact on stormwater and groundwater quality. Potential pollutants include nutrients, pesticides, sediments and organic matter (e.g. manure and grass clippings).

Intensive training programs may focus on water conservation, plant selection, fertiliser use, weed and pest management, irrigation practices, stormwater and shallow groundwater reuse, composting and soil amendment.

The Swan River Trust gardening workshops and the Living Smart sustainable living workshops are successful Western Australian examples. Other examples include the Master Gardener program in the United States. Refer to the Examples/Case Studies section for further information.

Applicability

These programs are applicable to all areas, however they are particularly applicable in the following situations:

- areas with sandy soils that have low nutrient and moisture retention capabilities;
- areas draining to sensitive water bodies (e.g. wetlands and waterways with conservation values, or catchments that are under stress from nutrient inputs, such as the Peel-Harvey and Swan-Canning);
- drinking water catchments;
- areas where gardens are close to water bodies;
- areas with large gardens and lawns; and
- areas subject to erosion (e.g. due to steep slopes).

Recommended Practices

Use proven *behaviour change* techniques, such as commitments/goal setting, prompts (to address forgetting), develop social norms and consider incentives. These techniques, particularly commitments/goal setting, have been used successfully in the Living Smart workshops in Western Australia and the Master Gardeners program in the United States. Refer to the Additional Information section for a list of recommended behaviour change resources.

For example, the Master Gardener program approach is outlined below:

Attendees who demonstrate an interest in environment-sensitive lawn and garden care can enrol their property as ‘volunteer gardens’ to demonstrate best practice techniques.

Participating landowners may sign an agreement to implement a variety of best management practices and keep a log of their activities over a full year.

Each volunteer may be assigned a personal Master Gardener, who is also a volunteer but has received prior training in alternative lawn and garden care techniques. The Master Gardener visits the landowner and sets aside regular times to discuss their progress.

Participants who successfully complete a year in the program can earn the title of 'demonstration garden', where they place a sign on the property to highlight that an alternative approach is being used. Participants are also encouraged to network within their local residential community to promote the practices they have learned and adopted. Participants may also undergo additional intensive training to become Master Gardeners themselves.

Changes in the knowledge and self-reported behaviour of participants are evaluated through regular surveys and through the logs kept by volunteers.

The training may also extend to water conservation, waste management practices and integrated pest management, where the application of insecticides and herbicides is minimised through alternative garden and lawn management techniques.

To engage the community, it may be advantageous for the program to address a range of *sustainable living* issues, e.g. stormwater management, water conservation, water sensitive gardening, waste minimisation and energy efficiency. Examples of sustainable living programs are provided in the Examples / Case Studies section.

Benefits and Effectiveness

These programs can specifically target key sources of pollution, audiences and landowners from geographic areas. The program can also evolve as new pollutant priorities and management practices emerge. The programs can be applied in established areas and are relatively cost effective to run. Unlike the equivalent structural measures, they are not associated with a maintenance requirement for several decades (although maintenance of the training program is needed over time).

Supporting earlier work by Schueler (2000), the US EPA (2001) reviewed the effectiveness of non-point source education programs and concluded 'from evaluations of several market surveys, it appears that media campaigns and intensive training can each produce up to a 10 to 20 percent (self reported) improvement in selected behaviours. A combination of both outreach techniques is probably needed in most watersheds, as each complements the other' (p. 29).

Taylor and Wong (2002c) reviewed a number of US case studies and reported that intensive training programs involving lawn and garden care practices can produce:

- 26% - 41% increase in knowledge[17].
- 17% increase in desirable attitudes.
- 10% - 75% (with the range 20% - 40% being common and an average of the most reliable data around 29%) increase in the number of people undertaking a specific desirable behaviour (based on *self-reported* data).
- 40% increase in the number of desirable practices adopted (based on *self-reported* data).
- For lawn care training, total nitrogen and pesticide loads applied to lawns can be reduced by approximately 40% and 25%, respectively.

[17] That is, 26% – 41% of the surveyed population increased their knowledge in a certain area (e.g. they knew the best season and weather conditions to apply fertiliser).

Taylor and Wong (2002c) also reported that combined awareness and training programs (e.g. catchment-wide awareness and intensive lawn care training initiatives) are capable of producing:

- A 20% - 29% increase in the number of participants undertaking a desirable behaviour (again based on *self-reported* data).
- Event mean concentrations of common lawn herbicides in stormwater may be reduced by 56% - 86% over several years.

Taylor and Wong (2002c) concluded that there is strong evidence that intensive and interactive training is a superior method for changing lawn and garden care behaviour compared with seminars and publications. For example, an independent investigation was undertaken on the effectiveness of these three extension methods as part of the Florida Yards and Neighbourhoods Program. Intensive training involving interactive workshops and mentoring (e.g. consistent with the Master Gardener Program) increased the number of desirable lawn care practices adopted by participants by approximately 36%, compared to 24% for seminars and 15% for publications. The relative difference between the effects of these three methods is unlikely to be distorted by any bias associated with self-reported behavioural change.

The Examples/Case Studies section outlines the benefits and effectiveness of particular programs.

Challenges

The primary challenge with this BMP is that it is a voluntary measure, relying upon individuals to volunteer their time to participate in the program. Significant effort would be required to communicate the needs for participation in such a program (e.g. why nutrient management on residential properties is an issue on the Swan Coastal Plain), and the benefits of doing so, both in terms of the broader community and the individual.

The programs should be delivered free of charge to attract a significant number of participants, so funding must be sourced from government agencies (i.e. rather than a 'polluter pays' arrangement).

Cost

Taylor and Wong (2002c) reported that intensive training programs such as the US Master Gardener Programs cost approximately AUD$15,326 - AUD$19,157 per year to run, or AUD$0.23 per person per year (when the costs are spread over the entire population of the programs' area of influence), or AUD$7.76 - AUD$15.52 per hectare of lawn managed through the programs.[18]

Equivalent Australian estimates are not available, but could be calculated during the design of a program.

Additional Information

Chapter 8: *Education and awareness for stormwater management* provides additional case studies and guidance on how to design a community education and awareness program.

The following *behaviour change* resources are recommended when designing the program:

- Community Change (Victoria, Australia) via <www.communitychange.com.au>.
- Social Change Media (New South Wales, Australia), the home page is available via <http://media.socialchange.net.au> and *The Seven Door Social Marketing Approach* (Robinson, undated) is available via <http://media.socialchange.net.au/strategy>.

[18] Based on a currency conversion rate of US$1 = AUD$1.92.

- Community Based Social Marketing (Canada) via <www.cbsm.com>.
- *Fostering Sustainable Behaviour: An Introduction to Community-Based Social Marketing* (McKenzie-Mohr & Smith, 1999). Further information is available from Community Based Social Marketing via <www.cbsm.com>.

The *Facilitation Toolkit: A practical guide for working more effectively with people and groups* (Keating, 2003) is a recommended resource about facilitating workshops, seminars or group meetings. The toolkit is available via <www.environment.wa.gov.au> or by telephoning (08) 9278 0300. See also the Coastal Cooperative Research Centre's *Citizen Science Toolbox* (Australia) for advice about particular facilitation techniques (available via <www.coastal.crc.org.au/toolbox/index.asp>).

The *Sustainable Living in Western Australia* website, available via <www.sustainableliving.wa.gov.au>) (Government of Western Australia, 2004-2005), contains links to Western Australian resources for sustainable practices including water conservation, household waste management and gardening.

Refer to Section 2.2.7 for further information about recommended best management practices for gardens. The following guidelines, programs and sources of information are some of the recommended resources:

- *Free gardening workshops* - Swan River Trust. These feature information and guidance on fertilise wise and sustainable gardening practices. Telephone (08) 9278 0900 for further information, or refer to <www.swanrivertrust.wa.gov.au>.
- *Fertilise Wise Guides* – The Phosphorus Action Group's Fertilise Wise Guides advise gardeners on appropriate fertiliser types and application rates for soils in the Perth region. For further information and advice about the guides and other available resources, please telephone the Phosphorus Awareness Project Coordinator on (08) 9458 5564. You may also access Fertilise Wise information via the South East Regional Centre for Urban Landcare website <www.sercul.org.au/pag.html>.
- *Local Plants Guides* – The North Metropolitan Catchment Group's (formerly the North East Catchment Committee, NECC) *Local Plants Community Education Strategy* provides strategies that local government authorities can undertake to promote and encourage the use of local plants within their communities, as well as providing information and resources to the community to aid in its implementation. This includes a set of Grow Local Plants brochures covering suitable species for five soil regions on the Swan Coastal Plain (matching the Fertilise Wise Guide brochures). Comprehensive lists of plants that are suitable for particular uses, such as street trees and hedging, will also be available. Local government authorities will be able to print the relevant brochures for their region in conjunction with conducting one or more activities outlined in the strategy. For further information, telephone the Biodiversity Coordinator at the North Metropolitan Catchment Group (NMCG) on (08) 9271 7922.
- Guidelines on various aspects of saving water when designing and maintaining lawns and gardens (e.g. *Waterwise Garden Centres*, *Waterwise Garden Irrigators*, *New Gardens, New Lawns*, *Waterwise Guide to Irrigation*, *Watering Zones*, *Waterwise Guide to Lawns*, *Waterwise Garden Designs*, *Common Plants*) posted on the Being Waterwise page of the WA Water Corporation's website <www.watercorporation.com.au/savingwater>.
- Section 3.19 – Landscaping, Gardens, Turf and Grassed Areas in the *Environmental Management and Cleaner Production Directory for Small and Medium Businesses* (DoE and SRT, 2004). The directory is designed for small and medium businesses. However, many of the resources are applicable to home gardens. Available via <www.environment.wa.gov.au>, <www.swanrivertrust.wa.gov.au> or by telephoning (08) 9278 0300.

Growing local plants may protect water resources, as they require minimal water, pesticides and fertilisers. Further information is available from the following resources:

- To *select Perth plants suitable for your soil type*, go to the APACE WA website <http://web.argo.net.au/apace/soiltypes.htm> or by telephoning APACE on (08) 9336 1262.
- *Purchasing Local Native Plants* – Go to the Everlasting Concepts website (<www.everlastingconcepts.com.au>), which provides contact details for nurseries throughout WA that stock WA native plants. The website also provides information on how to grow native plants. In addition, the Friends of Kings Park hold several native plant sales throughout the year. Information about the Friends of Kings Park and plant sales is available via <www.kpbg.wa.gov.au>. Select 'Growing Plants' / 'Community Involvement' / 'Friends of Kings Park' / 'Coming Events'.
- *Wildflower Society of Western Australia* – The Society provides a range of resources (e.g. books) and advice about planting local native plants. Refer to their website at <http://members.ozemail.com.au/~wildflowers>.
- *Growing Locals – Gardening with Local Plants in Perth* by Robert Powell and Jane Emberson (1996). This book can be purchased by telephoning the WA Naturalists Club on (08) 9228 2495 or via <www.wanats.iinet.net.au>.
- *Free Gardening Advisory Service* - Botanic Gardens and Parks Authority (08) 9480 3672 <www.bgpa.wa.gov.au>. Select 'Growing Plants' / 'Community Involvement' / 'Master Gardeners'. Note: this service is different to the United States Master Gardeners program, referred to in the Recommended Practices section.
- *Designing and maintaining gardens* - Advice about how to grow local native plants, deal with pests and diseases effectively and responsibly, use less water and fertiliser, save time and money and attract Western Australian wildlife into your garden. Available via <www.greatgardens.info>.
- Section 3.16 - Growing Local Plants to Protect Water Resources in the *Environmental Management and Cleaner Production Directory for Small and Medium Businesses* (DoE and SRT, 2004). Available via <www.environment.wa.gov.au>, <www.swanrivertrust.wa.gov.au> or by telephoning the Department of Environment on (08) 9278 0300.

Section 2.3.4 has useful information about the benefits of community participation programs versus traditional education programs.

Examples / Case Studies

Gardening Workshops in Western Australia

The Swan River Trust, Water Corporation and Nursery and Garden Industry WA sponsored free gardening workshops throughout the Swan and Canning Catchment during spring 2003 and autumn and spring 2004. These featured information and guidance on fertilise wise and sustainable gardening practices. During spring 2003, over 1900 people attended one of 21 workshops (Landcare Solutions, 2004). Another 15 workshops were held in Autumn 2004, which were attended by 1235 people. The age range of workshop participants in the Autumn 2004 series was 32-35% were more than 50 years old, 56-57% were 30-50 years old and 8-12% were less than 30 years old (Landcare Solutions, 2004). Surveys conducted at the end of each Autumn 2004 workshop demonstrated a considerable increase in participant understanding of catchment friendly gardening (Landcare Solutions, 2004). For more information, go to the Swan River Trust website <www.swanrivertrust.wa.gov.au> or contact the Trust office during work hours on (08) 9278 0900. In addition, four workshops were held in the Peel Catchment during autumn 2004. These workshops were sponsored by the Shires of Augusta-Margaret River and Busselton, Town of Kwinana and City of Mandurah, with assistance from Water Corporation and Natural Heritage Trust.

Figure 1. A display garden is set up at each Great Gardens workshop to promote local native plants. (Photograph: Garry Heady, Heady Enterprises.)

Figure 2. The mayor of South Perth opening a Great Gardens workshop. Local governments host all Great Gardens workshops to maximise local ownership. (Photograph: Garry Heady, Heady Enterprises.)

Sustainable Living Programs in Western Australia

Examples of sustainable living programs in Western Australia include: the Living Smart Program developed by The Meeting Place Community Centre, City of Fremantle, Murdoch University and Southern Metropolitan Regional Council (SMRC) (contact (08) 9432 9914 or <www.freofocus.com/projects/html/living_smart.cfm>); the Creating Communities program (contact (08) 9284 0910 or <www.creatingcommunities.com.au>); and the Green Houses Program (energy and water conservation only) by SMRC and Murdoch University (contact (08) 9316 3988 or <www.smrc.com.au/greenhouses>).

The Living Smart and Green Houses programs use proven goal-setting techniques and recognise that information alone is not enough to achieve sustained behaviour change. For example, as a result of attending the Living Smart pilot program:

- Participants significantly increased their environmental knowledge and the number and frequency of sustainable behaviours.
- 63% of participants said it was very important for them to reach their goal and the majority thought setting goals increased their motivation and made them more likely to act.
- In all topics (including Simple Smart Lifestyles, Goal Setting, Waste Smart, Smart Gardens, Power Smart, Water Smart, Health Smart, Move Smart and Take Action), participants increased their effort towards sustainable practices by 17-22%.
- 68% said that the program changed the way they think about lifestyle and environmental issues.
- Half of the participants felt that what they learned in the program would influence them for a very long time and 41% said it would influence them forever (Sheehy, 2004).

Sustainable living programs provide additional benefits for communities. For example, as a result of attending the Living Smart pilot program, 91% of participants felt more a part of the community, 95% increased their knowledge of community resources and services and 82% increased their sense of wellbeing (Sheehy, 2004).

Communication techniques include workshops, self-paced learning via booklets, ongoing dialogue (newsletters and meetings) and/or websites.

Chesapeake Bay Residential Watershed Program (United States)

The Chesapeake Bay Residential Watershed Water Quality Management Program (Virginia Cooperative Extension, 2001) was an intensive training program that involved recruitment of residents from selected neighbourhoods, lawn care seminars by trained extension agents, home visits and data collection by trained Master Gardener volunteers, and demonstration lawns. The program included pre- and post-participation surveys to assess changes in people's attitudes, knowledge and self-reported behaviour.

From 1990 to 2001, approximately 3,600 residents participated in the program in 18 counties and cities in Virginia, with an estimated area of lawn managed through the program in 2001 of 158 hectares.

Results reported by Virginia Cooperative Extension (2001) and Aveni (2002) included the following:

- Soil testing by participants increased from 25% to almost 100% following participation in the program.
- Composting grass clippings increased from 22% - 54% to 50% - 71% following participation.
- The proportion of people who knew how much fertiliser they applied to their lawn each year increased from 25% to 66% following participation.
- The proportion of people fertilising their lawn during autumn (as promoted) increased from 55% to 77% following participation.
- The proportion of people who aerated their lawns increased from 12% - 50% to 75% - 100% following participation.
- Estimates derived from self-reported behavioural change data indicated that the load of total nitrogen and total phosphorus applied to residential lawns was reduced by approximately 49 – 98 kg/ha/year as a result of participation in the program.

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