

## IC8. NURSERIES AND GREENHOUSES

### Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner<sup>1</sup>. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	
Bacteria	x
Oil & Grease	
Organics & Toxicants	
Pesticides	
Oxygen Demanding	x

#### MINIMUM BEST MANAGEMENT PRACTICES

##### Pollution Prevention/Good Housekeeping

- Properly manage irrigation and runoff.
- Properly store and dispose of gardening wastes.
- Properly store and dispose of chemicals.
- Properly manage pesticide and herbicide use.
- Properly manage fertilizer use.

##### Stencil storm drains

##### Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

### 1. Properly manage irrigation and runoff.

- Utilize intermittent (pulse) irrigation or drip irrigation so the infiltration rate of the soil is not exceeded.
- Regularly inspect irrigation systems for leaks and to ensure that excessive runoff is not occurring.
- Convert paved or bare soil areas to vegetation that will retard runoff (turf grasses or other comparable plant materials) wherever possible.
- Group plants with similar water needs together to improve irrigation efficiency.
- Establish plant buffer zones between production areas and ditches, creeks, ponds, lakes, or wetlands.
- Install and use moisture sensors and automatic sprinklers for more accurate scheduling of irrigation.
- Recycle runoff, blend with fresh water as necessary.

<sup>1</sup> EPA " Preliminary Data Summary of Urban Stormwater Best Management Practices"

2. **Properly store and dispose of gardening wastes.**
  - Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage at a permitted landfill or by composting.
  - Do not dispose of gardening wastes in streets, waterways, or storm drainage systems.
  - Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm and/or cover.
3. **Properly store and dispose of chemicals.**
  - Implement storage requirements for pesticide products with guidance from the local fire department and/or County Agricultural Commissioner.
  - Provide secondary containment for chemical storage.
  - Dispose of empty containers according to the instructions on the container label.
  - Triple rinse containers and use rinse water as product.
4. **Properly manage pesticide and herbicide use.**
  - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of pesticides and herbicides and training of applicators and pest control advisors.
  - Follow manufacturers' recommendations and label directions.
  - Use pesticides only if there is an actual pest problem (not on a regular preventative schedule). When applicable use less toxic pesticides that will do the job. Avoid use of copper-based pesticides if possible. Use the minimum amount of chemicals needed for the job.
  - Do not apply pesticides if rain is expected or if wind speeds are above 5 mph.
  - Do not mix or prepare pesticides for application near storm drains. Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
  - Do not mix, prepare, or spray pesticides within 100 feet of any well, stream, or pond.
  - Do not get rid of unused pesticides by washing them down drains.
  - Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
  - Sweep pavement and sidewalk if chemicals are spilled on these surfaces before applying irrigation water
  - Careful soil mixing and layering techniques using a topsoil mix or composted organic material can be used as an effective measure to reduce herbicide use and watering.
5. **Properly manage fertilizer use.**
  - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers.
  - Follow manufacturers' recommendations and label directions.
  - Employ techniques to minimize off-target application (e.g. spray drift) of fertilizer, including consideration of alternative application techniques. Calibrate fertilizer distributors to avoid excessive application.
  - Periodically test soils for determining proper fertilizer use.
  - Whenever feasible, spread out applications of controlled-release fertilizers and use split applications of soluble fertilizers over the growing season.
  - Work fertilizers into the soil rather than dumping or broadcasting them.
  - Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
  - Transition from the use of soluble fertilizers to controlled-release fertilizers. Use slow release fertilizers whenever possible to minimize leaching.
  - Reduce or eliminate routine leaching of crops.

6. **Incorporate the following integrated pest management techniques where appropriate:**
- Remove insects by hand and place in soapy water or vegetable oil. Alternatively, remove insects with water or vacuum them off the plants.
  - Use species-specific traps (e.g. pheromone-based traps or colored sticky cards).
  - Sprinkle the ground surface with abrasive diatomaceous earth to prevent infestations by soft-bodied insects and slugs. Slugs also can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, and tree trunk guards.
  - Promote beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seedhead weevils, and spiders that prey on detrimental pest species.

### Training

1. **Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.**
2. **Educate and train employees on the use of pesticides and pesticide application techniques.**
3. **Train and encourage maintenance crews to use integrated pest management techniques.**
4. **Train employees on proper spill containment and cleanup.**
  - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
  - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
  - Fact sheet IC17 discusses Spill Prevention and Control in detail.
5. **Establish a regular training schedule, train all new employees, and conduct annual refresher training.**
6. **Use a training log or similar method to document training.**

### Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

### References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. [www.cabmphandbooks.com](http://www.cabmphandbooks.com)

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

Water Quality Handbook for Nurseries. Oklahoma Cooperative Extension Service. Division of Agricultural Sciences and Natural Resources. Oklahoma State University. E-951. September 1999.

**For additional information contact:**

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or visit our website at [www.ocwatersheds.com](http://www.ocwatersheds.com)