



Improving Lawn and Garden Management

Keeping Idaho's Water Clean

Idaho homeowners are rightly proud of their beautiful lawns and gardens, however, large quantities of fertilizers, pesticides, and water are often applied to obtain these results. Overuse or misapplication of chemicals can have a detrimental impact on ground water that supplies your well. Recent surveys in Idaho have found trace amounts of nitrates and pesticides in drinking water. Over watering can compound water quality problem by causing the chemicals to leach into the ground water or runoff into the surface water.

The material in this fact sheet provides information for the homeowner on management practices for lawns and gardens to reduce the potential for surface and ground-water contamination. The accompanying worksheet will allow you to assess the impact of your current management practices on the quality of your drinking water.

Pesticide concerns for lawns and gardens

Why should homeowners be concerned about pesticide use on their lawns and gardens?

Compared to a farmers field, some homeowners use a larger quantity of pesticides on their lawns and gardens. Pesticide over use or misapplication may cause the following:

- Harm or kill beneficial insect and earthworms associated with your lawn or garden;
- Harm wildlife and pets that come in contact with your lawn or garden;
- Result in chemical runoff during rainfall or irrigation into streams, rivers, lakes, and storm water sewers which may contaminate the ground water;
- Leach through the soil directly into ground water which is used for drinking water;
- Accumulate in the soil and become toxic to the plants you are growing; and
- Create pest resistance to the applied chemicals so that they will be very difficult to control in the future.

Fertilizer concerns for lawns and gardens

Why should homeowners be concerned about fertilizer use on lawns and gardens?

Some homeowners use a larger quantity of fertilizer on their lawns and gardens than is really needed. Fertilizer over use or misapplication may cause:

- Contaminate surfact water with nitrates through surface runoff or storm water sewers.
- Contaminate drinking water from ground water wells with nitrates, which is hazardous especially to pregnant women, infants, and small children.
- Contaminate surface water with nitrates through surface runoff or storm water sewers.

- Cause diseases, such as necrotic ring spot in lawns, if you are also watering too heavily or at the wrong time.
- Make some weeds more competitive with the plants you are trying to grow.

1. Lawns

Your lawn is something you should be proud of. It is an attractive part of your landscape. In fact, a well maintained lawn adds value to your property and helps to tie together your home and other landscape plants.

A healthy good looking lawn actually improves your living environment. On a hot day, your lawn reduces the glare of the sun, keeps surrounding areas cooler, and will attract birds and other wildlife. On windy days, your lawn protects the soil on your property from erosion.

Some Idaho homeowners intensively manage their lawns and gardens by using large quantities of chemicals. Pesticides, fertilizers, and water, when used incorrectly may adversely impact the quality of your drinking water. To protect your water quality and the environment, you should use best management practices (BMPs), which are defined as strategies that eliminate or minimize pollution. BMPs are designed to be compatible with good, sound lawn management but can also protect the quality of water from your drinking water well.

Pest management for lawns

Many pests attack lawns. These pests fall under four broad categories: weeds, insects, diseases, and other pests.

Weeds: Weeds simply are plants growing in the wrong place. In the case of your lawn, a weed is any plant that is not the variety of grass that was originally seeded to produce your lawn. There are over 30 weeds common to lawns in the Pacific Northwest. Most of these weeds can be easily eliminated from your lawn by using management options that discourage the competition from weeds. These options include mowing to the proper height, not over fertilizing or watering. Chemicals are also an option and the ones that kill weeds are called herbicides.

Insects: Several dozen different insects live in your lawn at any one time. Most of these insects are harmless and in fact, many insects are actually beneficial. These beneficial insects prey on insect pests that harm your lawn. Chemicals applied to lawns to kill insects are called insecticides.

Diseases: Lawns are susceptible to several different diseases. Many of the diseases that attack lawns are caused by improper management by the homeowner. Some potential management problems include improper watering and fertilization, lack of thatch removal, and choosing the wrong grass type for the climate. Chemicals that are applied to lawns to control disease problems are usually called fungicides.

Other pests: Several categories of non-insect pests attack lawns. These include rodents (moles and gophers), nematodes, snails, slugs, and ants. Chemicals used to kill rodents are called rodenticides. Chemicals used to kill nematodes are called nematocides.

Pest management BMPs that should be implemented for lawns include:

- Know what is in your lawn. Identify weeds, insects, pests, disease problems, and your grass type (bluegrass, fescue, etc.) so you can choose the proper solution to your problem.
- Use the least toxic solution to your problem. For example, consider hand pulling weeds, change water management practices instead of using fungicides to control diseases, and live with a low level of plant damage.
- Use pesticides carefully. Be sure to match the pesticides with the problem, follow label directions, use the correct application rates, buy only what you need, and if possible spot treat rather than treat the entire lawn.
- Store and dispose of pesticides properly. Buy pesticides in small quantities, store it in a secured area away from your water well and dispose of the material safely through your locally organized household hazardous waste collection. The Pesticide Disposal Program, Idaho Department of Agriculture, (208) 332-8500, targets pesticide users at agriculture rater, but in some cases may be able to provide assistance for rural home owners.
- Use water wisely on lawns. Over-watering may cause pesticides to leach and contaminate the ground water you use for drinking water.

Fertilizer management for lawns

Lawns in Idaho generally need additions of only four nutrients: nitrogen (N), phosphorus (P), potassium (K), and sulfur (S). However, if your soil pH exceeds 6.8, your lawn may also require additions of iron (Fe). Most soils in Idaho have adequate amounts of trace elements, such as copper, manganese, nickel, and zinc to meet lawn needs. BMPs for fertilizer management should include the following:

- Test your soil. The results of the test will help you determine what kind and how much fertilizer you need to apply to keep your lawn healthy. Soil testing kits are available at most lawn and garden shops for a small cost or assistance may be provided by your county Cooperative Extension System agent.
- Use fertilizers that slowly release the nutrients. By using slow release fertilizers, the lawn is fed slowly so there is no excess fertilizer to leach to the ground water that you use for drinking water. Also, using slow release fertilizer eliminates the risk of burning the grass.

Irrigation water management for lawns

Water is a precious, limited resource and we need to not only watch how we water lawns to prevent the leaching of chemicals into the ground water, but we also need to be sure we do not waste it by over watering. Both your lawn and water bill can benefit by using the following BMPs for lawn watering:

- Apply water only when it needs it. The lawn needs water when it begins to wilt from dryness (color dulls and footprints stay compressed for more than a few seconds) or about a couple times a week. When you do water, water slowly and apply about an inch of water, then let the lawn dry out before watering again. Be sure to water during times when evaporation is lowest, for example, in the early morning.
- Avoid over watering. Avoid this at all times, but especially after applying fertilizers and pesticides. Too much water will push the fertilizer past the grass root zone into ground water or cause the applied pesticide to runoff into surface water or leach into ground water.

2. Gardens

Your garden is a complex ecosystem of plants, animals, insects, birds, fungi, worms, and microorganisms such as bacteria. All ecosystems have three basic interacting categories of organisms:

- Producers, which are green plants that convert sunlight, carbon dioxide, and water into energy for plant growth.
- Consumers, which are organisms that feed on live plant or animal material.
- Decomposers, which use dead plant and animal material for energy.

A healthy garden ecosystem will have a balance between producers, consumers, and decomposers. If there is an imbalance, symptoms such as plant disease or an increase of damaging pests may result.

An imbalance in the ecosystem can be caused by improper applications of pesticides, fertilizers, and water or by removing organic matter, such as leaves, from the garden. By using gardening BMPs, you will reduce the potential for gardening problems and thus the need for chemical controls. By reducing the use of chemicals, the risk of contaminating your drinking water is also reduced.

Pest management for gardens

It is best to try to not use pesticides as both beneficial insects and pests may be killed. The following pest management BMPs will help keep your garden ecosystem healthy.

- Create a garden with diversity. Plant a combination of different types of plants to create a balanced ecosystem and in general, rotate plants each year to outsmart potential pests and minimize the threat of soil borne diseases.
- Maximize conditions for healthy plant growth. Choose plants that are suited for your climate and are resistant to diseases in the area. Group plants according to water and light requirements and space them to allow ample root and top growth at maturity.
- Protect and use beneficial insects. Develop garden habitats to ensure a healthy environment for beneficial insects. Also, learn to recognize the eggs and larvae of beneficial insects so as to not harm them.
- Use the least toxic solution for your problems. Some low toxic methods to solve problems include biological controls, insect traps, or mechanical means to remove pests. Also, learn to live with a low level of plant damage.
- If you do use herbicides or pesticides, use them carefully. Identify the insect and weed pests and select the appropriate chemical. Also, buy only what you need and be sure to follow label directions.
- Store and dispose of herbicides and pesticides properly. Store any extra in a secured area, and if you need to dispose of these chemicals, take it to your locally organized household hazardous waste collection. The Pesticide Disposal Program, Idaho Department of Agriculture, (208) 332-8500, targets pesticide users at agricultural rates, but in some cases may be able to provide assistance for rural homeowners.

Fertilizer management for gardens

Fertilizer should be added only in the amounts needed, at the appropriate time, and in a form that makes the nutrients available to plants. Nutrient management BMPs to implement in your garden include:

- Test your soil. Test your soil for nitrogen (N), phosphorus (P), potassium (K), sulfur (S), pH, and organic matter. Soil samples should be taken to a depth of 12 inches.
- Build a healthy soil. Add organic matter, such as compost to enhance the structure, aeration, and nutrient and water holding capacity of the soil. Organic matter can also be added by growing cover crops. Also, try to supply needed nutrients using organic fertilizers, such as composted manure, cottonseed meal, bone meal, blood meal, and greensand. Most gardening shops have these types of fertilizers. If not, you can order from gardening retailers that specialize in providing organic fertilizers and pesticides.
- Apply fertilizers properly. Based on your soil test and plant needs, apply the proper rate of nutrients and apply it at the correct growth stage of the plant. Overfeeding plants can be as detrimental as underfeeding, but this risk can be reduced if organic fertilizers are used, because the nutrients are released slowly. Synthetic fertilizers are also useful, as they can provide readily needed nutrients. Be sure not to over apply.

Irrigation water management for gardens

Excess water use may result in nutrients leaching below the root zones into the ground water that is used for drinking water. Excess watering can also leach pesticides into ground water. Some water management BMPs are:

- Reduce the need for watering by mulching. Mulches not only show the evaporation of water from the soil surface but also can improve a soil's water holding capacity, keep the soil cooler on hot summer days, reduce weed growth, and help prevent soil erosion. Examples of organic mulches include grass clippings, leaves, and straw. Inorganic mulches may also be used and examples are permeable sheeting and/or rock. Keep in mind that rocks can form undesirable heatsinks.
- Reduce the need for watering by improving soil structure. Each year be sure to add organic matter such as compost, grass clippings, tilled in cover crops, and other dead plant materials.
- Irrigate only when the plants need water. Check whether the soil is dry several inches below the surface. If it is dry, then water, but water slow enough so that it soaks into the root zone and does not run off the soil surface. The depth of the root zone depends on the plant, but in general this is 6 to 18 inches deep. If possible, use a drip irrigation system to conserve water.

3. Summary

To help protect the quality of your drinking water for your family and future generations, it is important to implement BMPs for pest, fertilizer, and water management for your lawn and garden.

Contacts and References

Who to call about...

Soil testing and interpretation:

- Cooperative Extension System serving your county
- Local Soil Conservation Districts
- Local gardening centers

Pesticide information:

- Cooperative Extension System serving your county
- Idaho Department of Agriculture, Agriculture Technology, (208) 332-8500
- Local Soil Conservation Districts
- Local gardening centers
- National Pesticide Telecommunications Network, (800) 858-7378

Fertilizer information:

- Cooperative Extension System serving your county
- Idaho Department of Agriculture, Agriculture Technology, (208) 332-8500
- Local Soil Conservation Districts
- Local gardening centers

Least toxic methods for lawn and garden problems:

- Cooperative Extension System serving your county
- Bio-Integral Resource Center, P.O. Box 7414, Berkeley, CA 94707
- Libraries, bookstores, garden centers

What to read about...

- *EPA Citizens Guide to Pesticides*, EPA Office of Pesticide Programs, Field Operations Division, H7506C, 401 M Street, SW Washington, D.C. 20460
- *Healthy Lawn, Healthy Environment*, U.S. Environmental Protection Agency, June 1992.
- *Nitrate and Groundwater*, Idaho Cooperative Extension System, Current Information Series #872.
- *Pesticide Handling Practices to Protect Groundwater*, Idaho Cooperative Extension System, Current Information Series #861.
- *Pesticides and Their Movement in Soil and Water*, Idaho Cooperative Extension System, Current Information Series #865.
- *Pests of the Garden and Small Farm, A Growers Guide to Using Less Pesticides*, Division of Agriculture and Natural Resources, University of California, 6701 San Pablo Avenue, Oakland, California 94608-1239, (413)642-2431.