

If yours is like most homes, it is surrounded by lawns, gardens, shrubs, and trees that require regular maintenance. This chapter examines the potential impact of yard and garden care on the environment and your health. Topics covered include the following:

- Soil testing
- Lawn type and maintenance
- Fertilizers and pesticides
- Ground covers and erosion protection
- Composting
- Water conservation

Completing this chapter will help you identify and evaluate pollution risks and give tips for reducing those risks.

What are the environmental concerns?

Your yard and garden—the natural settings of your home and property—might be the last places you would look for pollution problems. Although a properly cared for landscape benefits the environment, a lush, green lawn can signal environmental woes. Enthusiastic misapplication or overuse of chemical fertilizers and pesticides causes the most harm. If applied improperly, these chemicals can find their way into drinking water wells and pollute nearby lakes and streams. Closer to home, children are particularly vulnerable to pesticides used or stored without proper safety precautions.

Other problems occur when exposed soil washes away during a storm, harming wildlife habitat and choking waterways. Indiscriminate watering of lawns and gardens wastes large amounts of water. While it may seem that your contribution to pollution is minor, effects of chemicals, soil loss, and wasted water from hundreds or thousands of homes in your region can really add up. Collectively, lawns constitute the largest single crop in the United States.

Are you using your time and money effectively?

Americans spend a lot of money on garden gadgets, flowers, seeds, and chemical products. They also dedicate many hours of leisure time to caring for their yards and gardens. Valuable time and money may be wasted, however, if homeowners manage their lawns and gardens in an environmentally unsound way.

Think about the cost, time, and effort it would take to replace a lawn or garden damaged by over-fertilization or misuse of pesticides. Consider the hard work required to return unsightly, eroded areas back to productive use. Imagine how much less time lawn care would take if grass clippings were left on the lawn instead of being raked and bagged.

You can have a low-maintenance lawn without losing the well-kept appearance of your home. Good management practices not only benefit the environment—they can save you time and money as well.

Do not forget about safe storage and handling of pesticides and fertilizers. (Chapter 5 discusses good storage practices.) Spills can occur anywhere you handle hazardous liquids. Areas where potentially dangerous spills could occur is a good place to put up the local and state spill response numbers and these reminders:

- ALWAYS read the label and follow directions
- think about how you would handle a spill should it occur
- avoid spills by using care
- place the receiving container in a larger pan or on an absorbant pad that can be discarded

Solid pesticides and fertilizers can usually be cleaned up and applied to their intended target. Liquid lawn and garden chemicals can be soaked up with soil or sawdust and then applied where intended. Questions about pesticide use or spills? Kansas Department of Agriculture, Plant Health Division (785) 296-3786 has the answers.

Managing Your Lawns, Gardens, and Landscaping

Most homeowners desire a well-kept home landscape with attractive flowers, woody plants, and often a green lawn. A lot of time and money is spent to achieve this ideal, and the number of products and lawn-care services increases each year to meet the demand.

Normal applications of lawn and garden products generally pose few problems. A properly maintained home landscape, in fact, can help reduce soil erosion and increase water retention and soil fertility. Poor maintenance—either through neglect or excessive chemical use—can lead to soil problems, polluted runoff, and unsafe well water.

Look over the topics below, and read the ones that will help you better understand your yard and garden practices. Fill out the assessment table at the end to see where you might need to make improvements.

Has your soil been tested?

Adding fertilizer without first testing your soil is like taking medicine without knowing if you need it. Your soil already has some of the nutrients needed for good plant growth, such as nitrogen, phosphorus, and potassium. It is important to find out how much of each nutrient is present. Soil testing takes the guesswork out of how much fertilizer to use. Check with your county Extension office for information on how to test your soil.

Testing involves collecting small soil samples (8 inches deep) from several places in your yard and garden. Mix all the samples together, collect a half-cup of the mixture, and take it to your county Extension office. The soil will be analyzed, and you will receive a lab report that lists amounts of each nutrient in each sample. Because of local differences, some parts of your property may need regular applications of fertilizer while other areas may need few or no applications. Soil tests should be conducted every three to five years.

What fertilizers are needed for your lawn?

Your soil tests will let you know if your lawn needs fertilizer and if so, how much and where. Nitrogen is the key plant nutrient for building a thick, green lawn. Applied at the right time and in the right amount, fertilizers will supply the nitrogen your soil needs. If you apply fertilizer at the wrong time or in the wrong amount, you may make conditions worse, and insect and disease problems can increase. Excess fertilizer is likely to wash away before the grass takes it up. Fertilizer in runoff contributes to unwanted plant growth in nearby streams or lakes. Especially in sandy soils, nitrogen and other chemicals can seep downward and enter groundwater used for drinking. Fall applications of fertilizer support strong healthy grass with good winter sur-

GREENING THE WHITE HOUSE

Take a cue from the White House, where the grounds-keepers have launched a gardening and landscaping practice designed to protect the environment. The staff now uses integrated pest management (IPM), an environmentally friendly approach that controls pests using a minimum of chemicals. (See page 73 for a more detailed description.) They fertilize according to local recommendations, limit watering to the early morning hours to save water, and leave grass clippings on the lawn where they decompose naturally.

vival and eliminates the need for spring fertilizing. In fact, fall fertilizing is adequate for the whole year.

If you hire a lawn-care service, make sure they test your soil before applying fertilizer. Insist that lawn fertilizers only be applied when the weather is favorable—when rain is not expected for at least twenty-four hours—or as specified on the label. Be sure to keep children and pets away from treated lawns for twenty-four hours. Sweep excess fertilizer off of walks and back onto the lawn before it is washed away by rain. Nonchemical fertilizers, such as compost, bloodmeal, fish meal, and other soil amendments also should be applied based on the needs of your lawn.

Are you taking proper care of your lawn?

It will be easier to keep your lawn healthy if the type of grass is suited to local growing conditions, which include rainfall amount, temperature, soil type, and available light. Contact your county Extension office for advice on recommended grasses for your region.

Cutting your grass to the right height is important; lawns cut too short invite weeds to invade. Grass clippings should be left on the lawn. In many cases, they supply enough natural fertilizer so that only moderate amounts of additional nitrogen fertilizer are needed to keep your lawn green and healthy. Clippings should be swept off of paved surfaces so they aren't carried away by storm water.

Are you applying pesticides wisely?

Although removing weeds, insects, and other pests by hand is safest for the environment and your health, pesticides, if properly used, may pose a minimal risk. The key is doing your homework *before* you start treatment. Correctly identifying the pest is the first step. Many plant problems are not caused by insects or disease but are related to temperature extremes, waterlogging or drought, damage caused by lawn mowers, or overuse of chemicals.

Learn when and where pesticides may be needed to control problems. Apply them only where pests occur. Select chemicals labeled specifically for

the pest you are trying to control. Check with your county Extension office or garden supply store for information. Remember to read the pesticide label carefully and follow directions for application rates and methods.

When mixing chemicals, be very sure that you NEVER let the end of the hose hang into the opening in the top of the sprayer. This practice is the only way to prevent chemicals from being siphoned back into your home's plumbing and your drinking water. If you connect a chemical applicator to the water system in any way, be aware that unless the proper protection is in place, the chemicals can back flow through the hose into your house. The hose end sprayer is the most common example of such an applicator. Where an air gap cannot be maintained, a backflow prevention device such as a check valve or vacuum breaker should be installed on the water supply line. For example, if you are using a pesticide sprayer that attaches directly to a hose, a hose bibb vacuum breaker should be installed on the faucet to which the hose is connected.

Pest prevention is often simpler (and cheaper) than pest removal. If you have disease-resistant grasses or other plants and keep them healthy, pests will be less of a problem. Be sure to ask yourself, for the sake of clean groundwater and an environment with fewer chemical pollutants, if you can tolerate a few more weeds and "bugs" around your home.

Integrated Pest Management (IPM)

It sounds fancy, but Integrated Pest Management, or IPM, is simply a systematic approach to controlling pests in your landscape. Although use of non-chemical controls is preferred, chemicals may be used selectively if nothing else works. Weeds can be controlled by hand pulling (Figure 7.1) or hoeing, and certain bugs can be removed by picking them off vegetables and garden plants. Cleaning up dead leaves and debris removes potential homes to pests. Using natural predators to control pests is another method; you can release into your garden beneficial insects and microorganisms that feed on pest insects.

When chemical controls become necessary, use ONLY products labeled for the target pest. Follow directions carefully and mix only the amount you need. For IPM to work, you will have to give more time and attention to your yard and garden.

Do your landscape practices help prevent soil erosion?

Like pesticides and fertilizers, soil washed away by rain can pollute streams, lakes, or ponds. Even if you do not live near water, soil will eventually be carried to surface water in runoff from storms. Gardens, lawns, and construction sites with areas of bare soil—especially on sloped land—are prone to soil erosion.



Figure 7.1 Pull weeds by hand instead of controlling with chemicals.

You can protect soil and reduce erosion by planting ground-cover vegetation or using wood-chip mulch or landscape fabric. On steep slopes, plant a grass which is attractive when left unmowed, such as fine fescue. Grasses hold the soil better than other types of plantings. Building terraces or retaining walls on slopes can also help prevent soil loss. As with lawns, choose plants that are suited to your area and resistant to insects and diseases.

Do you make compost?

Composting is a cost-effective, natural way to handle leaves, grass clippings, and other yard wastes—materials that might otherwise end up in a landfill. Composting creates an organic, slow-release

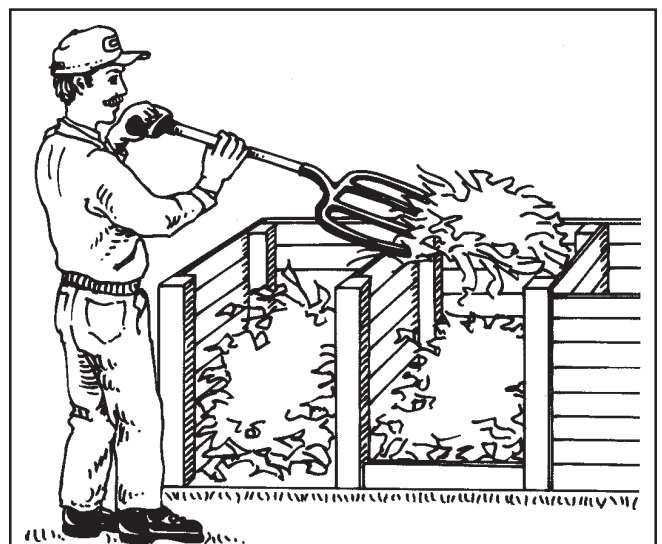


Figure 7.2 Compost piles will remain relatively odor-free if they are turned and aerated regularly.

fertilizer and soil-enhancing material. It takes advantage of nature's recycling system for breaking down plant and other organic materials. Proper composting also allows for neutralization of some pesticides which otherwise might make their way to the water resource. Another benefit is that the nutrients are released more slowly than other forms of fertilizer. Plants are benefited, while the chance that nutrients will reach ground and surface water is reduced. Some studies indicate that mature compost can bind heavy metals so that there is no movement in the water environment.

To compost, simply put yard wastes in a pile, or install homemade or store-bought bins to contain the material. In addition to yard waste, you can add vegetable trimmings and fruit peels from your kitchen. Your compost pile will remain relatively odor-free if it is turned and aerated regularly (Figure 7.2).

One word of caution: animal manures contain high levels of nitrogen and different types of manure have different levels. If manure is left in piles exposed to the weather, nitrogen-rich runoff may result. If you mix manure from horses, sheep, cows, or other plant-eating animals into your compost, be sure to add plenty of high-carbon materials such as leaves, straw, or sawdust to keep concentrations of nitrogen and other nutrients low. This will help prevent contamination of groundwater. Do not put pet wastes (from cats and dogs) in compost piles because of potential parasite and disease problems. Try to locate piles at least 50 feet from any wells,

lakes, or rivers. Finished compost can be mixed into garden soil or spread on lawns as a slow-release fertilizer. Check with your county Extension office, garden store, and the library for composting techniques and information.

Do your yard care practices save water?

The average American uses approximately 200 gallons of water each day. About half of that water may be used for landscaping and gardening, depending on climate, time of year, and plant species in the landscape. This is an immense amount of clean water—and only a small portion is actually used by your plants. If you convert your landscape plants to ones adapted to your region and climate, you will take the biggest step in conserving water. This concept has become known as "Xeriscaping," and has been found to be not only water-saving, but low maintenance. Many native plants are insect tolerant or resistant, decreasing the need for pesticide use. Such plantings are adapted to the climatic extremes found in Kansas and once established will recover nicely, meaning the gardener does not have to replant as often.

Western Kansas receives far less rain than the eastern half of the state. In those counties with dry climates, there are many native plants that are drought-tolerant. Consider using drought-resistant turfgrass species like tall fescues and buffalo grass. Reduce the amount of high-maintenance lawn. Perennial flowers conserve water because their roots grow deeper than annual plants and require

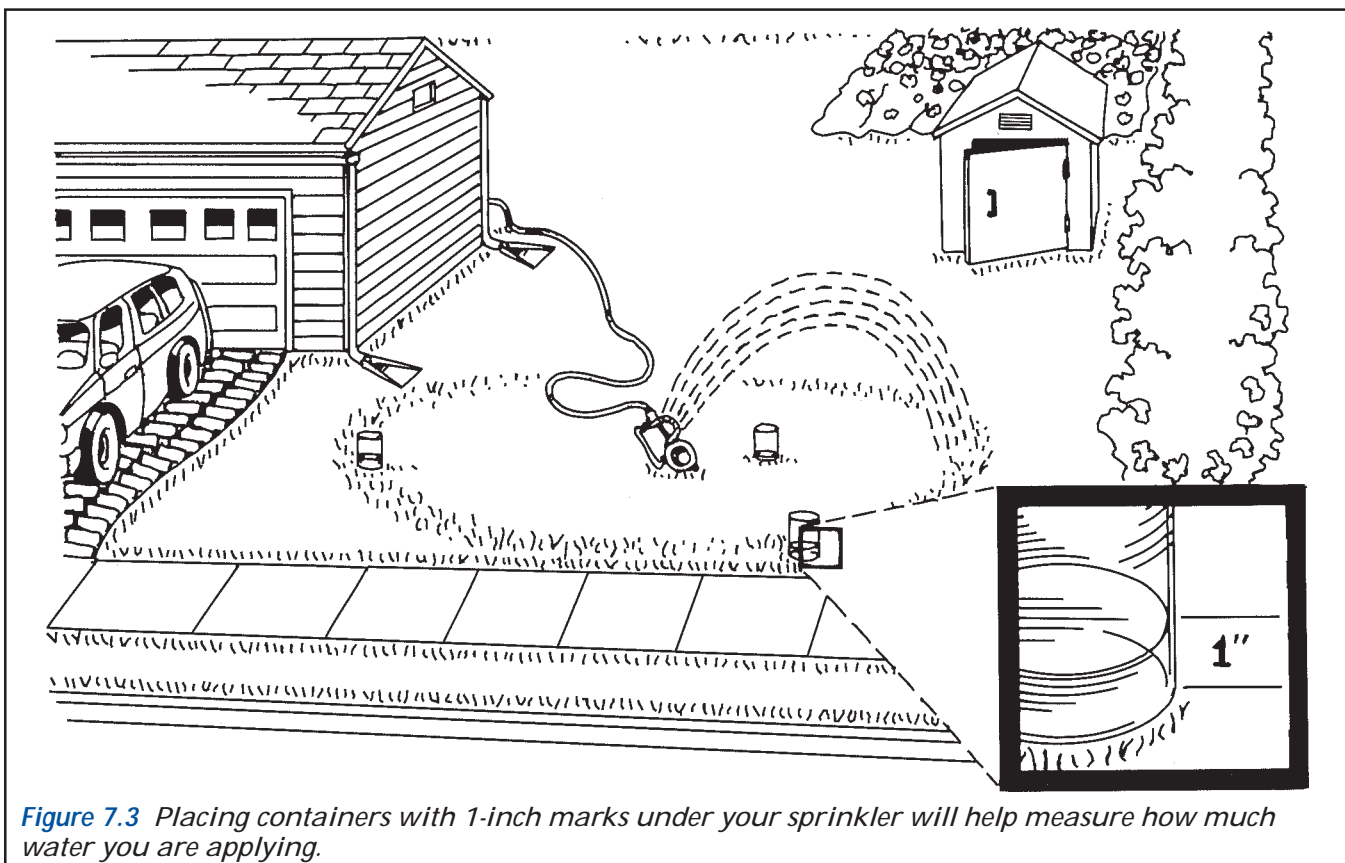


Figure 7.3 *Placing containers with 1-inch marks under your sprinkler will help measure how much water you are applying.*

little or no watering once established. A shallow mulch (about 2 inches deep) of wood or bark chips over bare soil will reduce storm water runoff and keep water from evaporating. Your county Extension office is an excellent resource for suggestions of plants adapted to your area. Plant nurseries which sell plants grown locally are usually able to help you select those plants which fit your gardening desires as well as the conditions in your landscape.

Watering wisely

Because most plants can tolerate at least short dry periods, watering should be timed to meet the biological needs of plants. Watering slowly and deeply helps develop deep roots; in the long run, your plants will need less frequent watering. Plants that seem to benefit most from shallow watering are the ones you do not want—weeds.

Plants can absorb only so much water.

Overwatering wastes water and can injure certain plants. Placing several containers with 1-inch marks under your sprinkler will help you gauge how much water your lawn or garden is getting (Figure 7.3).

Another option in some regions is to allow established cool-season lawn grasses such as blue grass or fescue, to go dormant during the hot, dry summer rather than to continue irrigating. Drip irrigation systems deliver water to the intended plants efficiently and easily. Some onsite wastewater treatment systems utilize underground drip irrigation, resulting in reuse of the water. Perennial flowerbeds are good candidates for drip irrigation since the lines can be left in place year around. The time of day you irrigate matters, too—early morning is best.

Assessing your yard and garden care

The assessment table on page 76 will help you identify potential environmental risks related to your yard and garden maintenance practices. For each question, indicate your risk level in the right-hand column. Although some choices may not correspond exactly to your situation, choose the response that best fits. Refer to the previous pages if you need more information to complete the table.

Responding to risks

Your goal is to lower your risks. Complete the action checklist page 77 to help make plans to reduce your risks.

ACTION CHECKLIST

In the checklist on page 77, write down all medium- and high-risk practices you identified in the assessment table. For each risk, write down improvements you plan to make. Use recommendations from this chapter and other resources to decide on actions you are likely to complete. A

target date will keep you on schedule. You do not have to do everything at once, but try to eliminate the most serious risks as soon as you can. Often it helps to tackle inexpensive actions first.

For More Information

Web sites:

www.oznet.ksu.edu/pubs/library—look under “horticulture” and “miscellaneous—solid waste management”

www.csu.org/xeri—maintained by the City of Colorado Springs; explains xeriscaping and contains an exhaustive list of plants with pictures and their characteristics for garden use

www.waterwiser.org/wwwlinks.html—maintained by the American Water Works Association, contains links to many web sites dealing with water conservation

Publications

Bulletins available from your county or K-State Research and Extension Office:

- *Bermuda grass Lawns*. MF-1112.
- *Planting a Home Lawn*. MF-1126.
- *Mowing Your Lawn*. MF-1155.
- *Watering Your Lawn*. MF-2059.
- *Overseeding Your Lawn*. MF-2116.
- *Shade-Tolerant Grasses*. MF-2128.
- *Aerating Your Lawn*. MF-2130.
- *Kentucky Bluegrass Lawns*. MF-2262.
- *Buffalo grass Lawns*. MF-658.
- *Tall Fescue Lawns*. MF-736.
- *Fertilizing Kansas Lawns*. MF-2324.
- *Fall Lawn Fertilizing Program*. MF-628.
- *Weed Control in Home Lawns*. (in progress)
- *Making & Using Compost at Home*. MF-1053.
- *Recycling Grass Clippings*. MF-2110.

Soil testing

Contact your county K-State Research and Extension Office or private testing laboratories. In your yellow pages, look under the heading “laboratories” or “soil testing.”

Poison control centers

Kansas Poison Control Center toll-free phone number: 1-800-332-6633. Keep it by your phone.

In case of spills:

- ✓ Call your Sheriff’s Office
- ✓ Call your nearest Fire Department
- ✓ Call your Kansas Department of Health and Environment District Office—see inside back cover
- ✓ Call the Kansas Department of Health and Environment in Topeka (785) 296-1679

ASSESSMENT 3—Yard and Garden Care

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Fertilizers	Soil is tested for nutrients and fertilizer is used as recommended.	Soil is tested but fertilizer use is not measured.	Soil is not tested and fertilizer is used in large amounts.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Pesticides	Nonchemical or low-toxicity methods (such as integrated pest management) are used to control pests.	Chemicals are used according to label instructions, whether pests are present or not.	Chemicals are used without regard to label instructions or conditions.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Lawn (turf) type and maintenance	Turfgrass is suited to soil type, available sunlight, and climate. Grass is pest-resistant and mowed to the proper height. Fertilizer is applied only in the fall.	Turfgrass is suited to the site but is overfertilized and mowed short.	Grass type is not suited to available light, soil type, or climate. Grass is pest-prone and mowed too short.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Ground cover and other plantings	Grasses, ground covers, flowers, trees, and shrubs are planted to reduce soil erosion. Plantings resist insects and disease.	A slow-spreading ground cover is used.	A hilly landscape or lack of ground cover causes soil erosion. Plants require insect- and disease-fighting chemicals to survive.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Composting	The compost pile is well maintained: It is aerated regularly and contains yard waste, vegetable food scraps, and a nitrogen source such as manure.	The compost pile is poorly maintained: It is not aerated or lacks the proper mix of materials. Dog, cat, and other pet wastes are added to the pile.	The compost pile is poorly maintained: It contains excessive high-nitrogen material and is not turned regularly. The pile is less than 50 feet from a shallow well or surface water.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Water requirements of plants	Grass, flowers, trees, and shrubs are able to survive with normal rainfall and occasional watering during dry periods. Xeriscaping is practiced.	Landscape plants require frequent waterings during the summer.	Heavy watering is required to keep the lawn and other plants alive.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Water methods	Watering is done in the morning or evening, only as needed. Low water-use devices (like drip irrigation) are used. The sprinkler system is on manual control.	Watering is excessive. (For example: The sprinkler is left unattended, much water lands on the pavement, or automatic watering occurs during rain events.)	Watering is done during the heat of the day. The sprinkler system is used daily without regard to weather conditions. There is excessive water runoff.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

Action Checklist

Yard and Garden Care

Write all high and medium risks below	What can you do to reduce the risk?	Set a target date for action
Sample: Fertilizers applied but soil has never been tested.	Find laboratory that does soil testing. Take samples and send them to lab.	One week from today: March 15

Kansas Home*A*Syst Helps Ensure Your Safety

This *Kansas Home*A*Syst* handbook covers a variety of topics to help homeowners examine and address their most important environmental concerns. See the complete list of chapters in the table of contents at the beginning of this handbook. The end of each chapter lists resources and other useful information. For more information about topics covered in *Kansas Home*A*Syst*, or for information about laws and regulations specific to your area, contact your county K-State Research and Extension Office.

Contact the Kansas Farm*A*Syst/Home*A*Syst Office at Biological and Agricultural Engineering, Seaton Hall, Manhattan, KS 66506–2917; phone: (785) 532-5418. Web page: www.engg.ksu.edu/enggext/ppi/homeasyst; or the National Farm*A*Syst/Home*A*Syst Office : B142 Steenbock Library, 550 Babcock Drive, Madison, WI 53706–1293; phone: (608) 262-0024; e-mail: <HOMEASYST@MACC.WISC.EDU>.

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