

Our Garden

Alternatives to Pesticides In Our Gardens

Like others, you want a healthy lawn, a productive garden and attractive landscaping that adds to the beauty of your home. Can it be achieved without using synthetic fertilizers, pesticides and other garden chemicals? Organic gardening practices coupled with good planning can build great looking productive lawns and gardens.

Some of the most significantly poisonous products we buy are targeted at lawn and garden care. Pesticides are not safe. They are designed to kill rodents, insects, plants, even microorganisms. They can injure and potentially kill people, too, through inhalation, ingestion, and absorption through the skin. Their toxicity and flammability characteristics make them high priority wastes to reduce. This Fact Sheet introduces three methods by which to reduce our chemical needs in our gardens, through Xeriscaping, Integrated Pest Management and Backyard Composting. Let's Begin!

Living with Pesticides

Pesticides are generally broad-spectrum, which means they kill beneficial insects, animals, and plants as well as the targeted pest. The environmental danger present when a pesticide is used depends upon the length of time the pesticide takes to break down, the substances it break down into, its ability to be stored in tissues, and its toxicity to different organisms in the environment.

Poisoning from pesticides may be immediate (acute) or long-term from repeated exposure (chronic). Symptoms of acute and chronic poisoning include skin, eye, and lung irritations, headache, dizziness, nausea, muscle cramps, and coma. The Environmental Protection Agency requires that pesticide manufacturers place "Signal Words" on the label of consumer products to warn consumers of the relative dangers of pesticides.

Danger = extremely flammable, extremely corrosive or extremely toxic
Poison = highly toxic
Warning or Caution = less toxic

This labeling system, however, does not provide information on the chronic health effects and various environmental effects of the product. Signal words provide information about the products' degree of toxicity.

Xeriscaping: Designing Out Your Chemical Needs

Xeriscaping is a type of landscaping that imitates nature. Plant materials are picked for the natural ability to grow in the climate zone in which you live. Once established, this landscape requires little maintenance because it is designed to work in harmony with nature. Typically, the design would include native plant species, those that grow naturally in Kansas, but certainly is not restricted to them and is not boring. In fact, xeriscaping can result in a greater diversity of plant materials from one yard to the next. See the box on the next page for some recommended varieties.

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Recommended Plants for Kansas Xeriscaping

Deciduous Trees

Black Walnut
Chinkapin Oak
Green Ash
Aristocrat Pear
Goldenrain Tree
Flowering Crabapple
Green Hawthorn
Redbud
Russian Olive

Shrubs

Common Buckthorn
Elderberry
Lilac
Flowering Quince
Forsythia
Serviceberry
Spirea
False Indigo
Golden Current
Russian Sage

Evergreen Trees

Austrian Pine
Red Cedar

Evergreen Shrubs

Junipers
Manhattan Euonymus
Yucca

Groundcovers

Honeysuckle
Sweet Woodruff
Creeping Junipers
Daylily
Phlox
Thyme
Hen and Chicks

Ornamental Grass

Big Bluestem
Blue Fescue
Blue Oat Grass
Feather Reed Grass

Perennials

Artemesia
Balloon Flower
Basket of Gold
Kansas Gayfeather
Lambs Ears
Lavender
Oriental Poppy
Hardy Mums

Annuals

Dusty Millers
Vinca
Four O'Clock
Zinnia

Xeriscaping can design out resource and chemically intensive areas. Planned landscaped areas require fewer, if any, chemicals to maintain proper plant nutrition and health. Lawns, on the other hand, need lots of watering, maintenance, and fertilizing to be healthy. Replacing lawns with perennial gardens or rock gardens will reduce your maintenance over time, reduce water usage and decrease your dependency and chemical needs. For areas where lawn is desired, choose recommended turfgrass species suited to the area, fertilize sparingly and grasscycle.

Grasscycling saves time and money by eliminating the need to bag and drag grass clippings to the curb. Grass clippings contain valuable nutrients that can return up to 25% of your lawn's fertilizer's needs. They do not contribute to thatch. Grass clippings are about 85 to 90% water and decompose rapidly. Thatch, on the other hand, is a layer of leaves, stems and root material that forms between the grass and soil. Thatch decomposes slowly, robbing lawns of moisture, and contributing to pest problems.

Integrated Pest Management (IPM)

Many homeowners believe that by spraying broad-spectrum pesticides they are forming a protective shield against all pests. This is not the case. Turning to chemicals will not always solve the problem. Solving the problem begins with prevention. Integrated Pest Management (IPM) uses prevention in its approach to controlling pests by focusing on the ecosystem as a whole. IPM accepts the presence of insects as a natural part of the plant/animal ecosystem and does not seek to eliminate them.

IPM is an approach to pest control that utilizes regular monitoring to determine if and when treatments are needed. IPM employs physical, mechanical, cultural, biological and educational tactics to keep numbers low enough to prevent intolerable damage or annoyance.

The **physical** tactic employed in IPM is garden design. A good design looks to preserve the balance of nature — the coexistence of plants, bird, insects and other organisms. Designing a garden that preserves balance is the only way to control unwanted pests without chemicals. IPM encourages two rules of good garden design:

1. Select plants suited to the climate and soils of your area, require no more maintenance, time and skill than you can give them, and are resistant to common diseases and pests in your area.
2. Place plants in the site and arrange them so that they have proper growing space, light, drainage and wind protection

The **mechanical** tactics of IPM emphasize the practice of proper maintenance. These practices consist of monitoring for pests, finding out why there is a problem, adjusting the environment to control the problem, using less toxic chemical controls as a last resort to control the problem and keeping records of the problems and solutions.

Before Reaching for a Pesticide, Ask Yourself This:

Is the problem really unacceptable to me?

Can I live with the pest in question?

Have I looked into nontoxic and less-toxic alternatives?

Am I sure the problem is caused by the pest I want to kill?

**Will I also kill beneficial plants or insects,
making my problem worse in the long run?**

Two Safer Pesticide Options

Non-Toxic Pest Control

(Do-it-yourself liquid soap):

- 1 gallon water
- 1 cup black tea
- 1 cup coffee
- 1 cup diatomaceous earth
- 5 drops essential oil (e.g. peppermint)
- 1 cup soap flakes

Heat to a boil, then cool. Pour into a sprayer. This mixture can be used whenever you need to spray soap on insects. Remember, too much soap will damage the plants and soil, so determine the correct amount that you will need for the job.

Less Toxic Pesticides

(Available in retail stores)

- Insecticidal Soaps
- Rotenone Products
- Pyrethrum Products
- Diatomaceous Earth
- Boric Acid
- Fine Horticultural Oils
- Beneficial Nematodes
- Bacillus thuringiensis (BT)

The **cultural** tactics of IPM involve learning to break the habit of chemical needs. IPM is preventative by monitoring and designing appropriately for a natural ecosystem. Conventional pest control means spraying on a predetermined schedule without taking into account the overall damage that continuous spraying may do.

The **biological** tactics employed by IPM are learning to identify the beneficial insects from the pests and learning how to change their environment to control the pests. The first step involves monitoring, observing and recording what the insects are doing. Once you have determined that you have a pest, it's not time to spray. It is time to figure out why. It usually is a simple process of a stressed plant that needs to be taken care of or not enough plants to attract the beneficials. Change a little bit of the environment to see if that will control the unwanted pests and give the advantage to the beneficials.

Plant These Plants to Attract

- Candytuft
- Coriander
- Evening Primrose
- Fennel
- Morning Glory
- Yarrow

Certain Beneficial Insects

- Syrphid Flies
- Zachinid Flies
- Ground Beetles
- Braconid and Sand Wasps, Syrphid and Tachinid Flies
- Syrphid Flies, Ladybugs
- Ladybugs, Parasitic Wasps of Aphids, Scales and Whiteflies

Composting

Composting is throwing organic material into a pile and letting nature do the work. The end product of composting is humus. Humus is rich in nutrients and organic matter and helps to build good soil structure. Both clay soils and sandy soils can be improved with compost. Good soil structure is like a slice of cake. It's moist but easily crumbles. Compost enables the soil to retain nutrients, moisture and air for the support of healthy plants.

Chemical fertilizers are no substitute for compost. Chemicals supply major nutrients in quick-release forms that stimulate plant growth but not long-term root growth that will maintain the plants during stressful conditions. Plants need nutrients far more complex than chemical fertilizers provide. They need nitrogen, phosphorous, and potassium, but they also need the trace elements.

Constructing a Compost Pile

- **Space:** A minimum of 3' x 3' x 3' of space is needed to maintain the proper volume for an active compost pile.
- **Bin:** Bins are not necessary but do provide shelter for the compost pile so that it will maintain an even temperature.
- **Oxygen:** Turn the pile to provide oxygen to the bacteria and other microorganisms doing the work.
- **Water:** The pile should be kept moist like a damp sponge. With rain, the pile may stay moist without help. During dry spells, use a hose to keep the pile damp. Covering your compost pile with a piece of plastic can help retain moisture and encourage decomposition.
- **Material or Food:** The microorganisms working to break down the pile need two types of food, carbon and nitrogen, to quickly decompose the organic matter and turn it into compost.

Carbon Materials

Leaves, sawdust and straw

Nitrogen materials

Grass clippings, fruit and vegetable waste, coffee grounds, and livestock manure. Do not use dog or cat feces as they may contain harmful pathogens.

Compost Benefits

- Provides Drought Protection
- Controls Erosion; Builds Soil Structure
- Improves Aeration; Neutralizes Toxins in the Soil
- Recycles Organic Matter into a Valuable Resource
- Provides Plants with the Nutrients They Need

References Cited

1. Cooperative Extension Service, "Residential Landscape Design." Kansas State University, Manhattan, Kansas.
2. Hamilton County Environmental Services, "Yardwaste at Home Handbook." 1632 Central Parkway Cincinnati, OH 45210
3. Lopez, A. Natural Pest Control: Alternatives to Chemicals for the Home and Garden. 1996. Harmonious Technologies, Sebastopol, CA.
4. Olkowski, W. Daar, S. and Olkowski, H. Common Sense Pest Control. The Taunton Press, Newtown, CT.
5. The Rodale Book Of Composting. Easy Methods for Every Gardener. 1992. Rodale Press, Emmaus, PA.

Additional Resources

Rodale's Chemical Free Yard & Garden. 1991. Rodale Press, Emmaus, PA.
Rodale's Encyclopedia of Organic Gardening. 1992. Rodale Press, Emmaus, PA.

This fact sheet was produced by the Waste Reduction and Recycling (WR/R) Division of the City of Lawrence. The City of Lawrence and Douglas County operate a Household Hazardous (HHW) Waste Collection Program. Please call 832-3030 for more information regarding drop-off times, materials accepted and information about our Product Reuse Program. For further resources regarding this publication, please call us.