

Earth-Friendly Ideas for Your Lawn

Margaret Genkins

Americans love green lawns, spending untold hours planting, weeding, watering, fertilizing, treating and mowing an estimated 31,000,000 acres of lawn.¹ Our vision of a lush, evenly mowed, green lawn comes from the palaces and estates of the British and French aristocracy of the 18th century. Unfortunately, our contemporary dedication to realizing this vision now contributes to the environmental problems facing our planet and generates tremendous maintenance costs for homeowners. Nationally, lawn care accounts for 30-60% of all urban fresh water use; more than 50% of which is wasted because of inappropriate timing or application.² Expensive, environmentally toxic pesticides cost homeowners over \$700,000,000 annually; in fact, the U.S. Fish and Wildlife Service reported that “homeowners use up to 10 times more chemical pesticides per acre on their lawns than farmers use on crops.”³ An estimated \$5,250,000,000 per year is spent on over 3,000,000 tons of synthetic petrochemical-based fertilizer for lawns.⁴ Fertilizers and pesticides are often wasted because of improper timing, application, and/or dosage. These costly products wash off lawns into storm drains, and end up contaminating streams, rivers and aquifers. Lawnmowers are fueled by over 580,000,000 gallons of gasoline, contributing to regional air pollution and local noise pollution, as well as ground water pollution by spillage.

The question is: can the average American suburban homeowner have an iconic green lawn without damaging the environment and spending a fortune? The answer is yes, but the negative environmental impact and cost of lawn care can be significantly reduced by implementing some earth-friendly practices.

Know Your Lawn. To best care for your lawn you need to answer a few basic questions: what type of turf is your lawn? What are the growth patterns of your specific turf type? And what is the square footage of your lawn area? NC is in the transition zone for cool- and warm-season turf grasses. Cool-season grasses like fescue, Kentucky bluegrass, annual ryegrass, and perennial ryegrass have optimum growth between 60-75°F (spring and fall) and go dormant in summer. Warm-season grasses like Bermuda, Centipede, St. Augustine and Zoysia have optimum growth between 80-95°F (summer) and go dormant in winter. The most common residential lawn grass in our area is fescue. However, as drought conditions and water restrictions are more prevalent in our region, when starting a new lawn or renovating an old lawn, consider drought tolerance in turf selection: hybrid Bermuda is the most drought tolerant; Zoysia and hybrid Centipede are next; and Fescue is least drought tolerant.⁵

Reduce Lawn Size. Decrease the size of your lawn to achieve instant reductions in the amount of water, chemicals, labor and money used for landscape maintenance. Turf can be replaced with mulched natural areas or new or enlarged garden space, planted with hardy drought tolerant and native plants.⁶ Create or enlarge natural areas around your trees; a good landscaping rule of thumb is to incorporate at least half of the drip-line area on large trees and all of this space on smaller trees. (Not only does this reduce lawn size, but trees will benefit from better moisture retention and less feeder root competition.) On steep slopes or in shady or soggy areas, consider alternatives to grass such as ground covers⁷ like Dwarf Mondo Grass, *Ophiopogon japonicus* ‘Nana’; Allegheny Spurge, *Pachysandra procumbens*; Mazus *Mazus reptans*; or Green and Gold, *Chrysogonum virginianum*. As you eliminate grass, curve lawn edges to increase mowing efficiency.

Feed the Soil. The key to a successful lawn is healthy soil, alive with nature’s wide variety of beneficial microorganisms: bacteria, fungi and protozoa, as well as larger creatures like earthworms. These soil denizens feed turf and protect it from disease-causing microbes. Healthy soil also contains naturally occurring potassium, nitrogen and phosphorus, which are key nutrients for turf grass. The best way to get a complete dose of beneficial microbes is to add a thin 1/3-1/2-inch layer of finished compost (a maximum of 1 yard³ per 1,000 square feet of lawn) to your lawn in the fall, and then watering it in. Compost enriches soil with beneficial microbes, which provide a variety of benefits to grass including disease and nutrient-loss prevention, pH regulation, thatch decomposition, and breaking down organic material like grass clippings and protein-based fertilizers into nutrients.

Fertilize Responsibly. Best practices dictate finding out exactly what nutrients are needed in your lawn by having your soil tested; this prevents adding unnecessary fertilizer. The EPA estimates that only 35% of lawn fertilizers ever reach the grass plant; the remainder is volatilized into the air or seeps into groundwater. But lawns do require some replacement of nutrients consumed during the growing season. Rather than using a synthetic chemical fertilizer, the organic option is to feed your soil microbes with a natural, protein-based fertilizer like corn-gluten meal, alfalfa meal, soy meal, cottonseed meal or sorghum meal. Over time, soil microorganisms decompose the protein-based fertilizers resulting in a slow, sustained release of required nutrients such as nitrogen to the turf. Although commercial brands like Espoma and Fertrell can be found at garden supply stores, bulk supplies are also available at some farm and feed stores;

call around to find best prices. Research at the University of Iowa has shown all-natural corn-gluten meal (CGM) contains 10% nitrogen by volume, making it an excellent, natural, slow-release fertilizer for lawns, but it is also an effective organic weed control when applied at the right time.⁸ CGM is marketed and distributed under several trade names, which can be found at <http://www.gluten.iastate.edu>. Whether you use CGM or another organic, slow-release fertilizer, the following application tips are helpful:

- Fertilize cool-season turf grass around Valentine's Day, Labor Day and Thanksgiving; fertilizing between mid-March and August forces growth and increases your lawn's need for water.
- Fertilize warm-season grasses late spring through early fall depending on the type of turf grass; a specific calendar for each turf type can be found at http://www.turffiles.ncsu.edu/Maintenance_Calendars.aspx#000019.
- Apply fertilizer when grass is dry, and then water lightly to help fertilizer move into root zone.
- Keep fertilizer on the soil, off the pavement and out of the street. Fertilizers that run off are a waste of money and contribute to pollution of streams and lakes.
- If needed, add lime to raise pH of soil. Turf grass likes a pH of 6.5-7, but healthy soil microbial action moves the pH toward 7.0. Winter is the best time to apply lime; gentle winter rains minimize runoff, and alternate freezing and thawing help incorporate lime into the soil.

Leave Grass Clippings on Lawn. When mowing leave the grass clippings, which contain about 4% nitrogen, 0.5% phosphorus, and 2% potassium, and provide turf with another natural source for these 3 key nutrients. The average homeowner throws away 40 pounds of nitrogen each summer, and then pays for nitrogen-based fertilizer products.⁴



Clippings decompose quickly thanks to beneficial soil microorganisms and earthworms, providing 25-50% of a lawn's nutrient needs, and reducing the need for water by protecting soil from moisture loss due to evaporation. Homeowners can reduce mowing time by 30-40% by not having to bag clippings, plus the gas and energy required to transport and process grass clippings are also saved. Yard waste can be reduced by 20-40% or more.⁹ Grass clippings do not contribute to thatch accumulation, which is caused by over-fertilization and soil compaction.

Mow Smart. Mow at appropriate height for your type grass: 3½ inches for fescue and bluegrass; 1 inch for hybrid Bermuda and centipede; ¾ inch for zoysia.⁵ According to research from the University of Maryland, mowing cool-season grass 3 inches or higher is an effective means to suppress crabgrass. Tall grass stems stimulate deep root growth (grass roots grow as deep as the blade grows high) and make for a more durable, drought tolerant lawn with fewer weeds. Mow as frequently as necessary to insure that no more than 1/3 of the blade needs to be removed; during rapid growth periods, you may need to mow every 5-6 days. Cut when grass is dry to allow better distribution of clippings and less chance of clogging the mower; early evening is best time, after the heat of the day, but before dew settles. Tune up your mower once a year; well-maintained engines are more fuel efficient and emit less air pollutants. Better yet, consider switching to a 4-stroke gas mower, an electric mower (new battery-powered mowers come in 24-volt models, giving them power comparable to a 4-hp engine), or even a manual reel mower and burn some calories while enjoying the outdoors.¹⁰ According to the EPA, gas-powered lawn care equipment contributes to 10% of nation's air pollution.

Water Less and Better. Lawns need a maximum of 1 inch of water per week, including rain during the growing season. Measure your sprinkler watering rate by scattering a few clean, empty shallow cans on your lawn; turn on sprinklers and check time; when most cans have 1 inch of water in them, turn off sprinkler and check time.¹¹ Watering is most effective in the very early morning (3-8 a.m.) to minimize evaporation; during warm weather, evening watering can contribute to development of mold and fungal diseases. You can also simply let your cool-season grass go dormant in summer; then you only need to water every 3 weeks. Make sure sprinklers are watering the yard, not the street, driveways or sidewalk; water your lawn separately from other plantings. Careful, efficient lawn watering protects our water supplies for more critical uses, lessens the effects of drought, minimizes run-off and leaching, and saves money.

Just Say No to Lawn Chemical Abuse. A healthy, lush lawn is not a favorable environment for weeds and diseases; most insects are beneficial and nature often rids itself of the bad ones before you need to take action. Over time, fertilizers and pesticides kill or minimize the activity of beneficial microbial and bug life in the soil. The safest alternative to chemical herbicides, pesticides and fungicides is to use nothing, recognizing that past use of toxic chemicals has destroyed or diminished your soil's beneficial microorganisms and that it may take at least a season for the soil to begin to recover. In general, be willing to accept a few weeds or a little damage in your lawn and give nature a chance to work. If you encounter a potential problem, verify and identify the weed, pest or disease to determine the best treatment, if any. Chronic problems are often a sign that a lawn is not getting what it needs to stay healthy and the underlying problem needs to be corrected. For example, St. Augustine turf is susceptible to brown patch, which thrives in warm

moist, high nitrogen environments, so preventative measures would include watering only in early morning and using minimal or no fertilizer in the heat of summer. When it comes to weeds Paul Tukey asserts that weeds are messengers that tell you what's wrong with your soil.¹² A dandelion invasion is an indicator that soil is too low in calcium, too high in potassium and too acidic—not problems that can be solved with an herbicide. Before you eradicate clover as a weed, consider that this little drought-tolerant plant converts nitrogen into a form, which can feed turf. A lawn with about 5% clover can create enough nitrogen to significantly reduce the need for fertilizer. When weed control is necessary mechanical removal is the least expensive, safest method; simply grab your favorite weeding tool, remove weeds before they bloom and get some exercise. Organic, minimum risk herbicides are another option and include CGM applied at 20 pounds per 1,000 square foot of lawn in mid-February to early March to inhibit seed germination for 5-6 weeks (with the added benefit of being an organic fertilizer); vinegar (acetic acid) solutions applied to weeds as a foliar spray not a soil drench¹³; or other commercially available organic herbicides for spot treatment of weeds. When it comes to turf diseases remember healthy soil is the key to prevention. However, there are organic solutions to pest and disease control, including beneficial bacteria like milky spore, *Bacillus popilliae* for white grub control, beneficial fungi like Trichoderma (which grow well on corn meal) to fight pathogenic fungi that cause some lawn diseases, and beneficial nematodes which are lethal parasites to a variety of destructive insects. Before using any herbicide or pesticide—whether organic or synthetic—be certain you understand the full environmental and human health impacts of the substance. Read the label for application instructions and safety information. Try to limit any use to spot treatments.

By reducing lawn size, enriching the soil, using protein-based fertilizers, leaving clippings on the lawn, following good watering and mowing practices, and eliminating the use of harsh chemical herbicides and pesticides, not only will you be creating a healthy, green lawn that your family and friends can safely enjoy, but you will be saving money and improving the environment. *MG*

Sources

¹ Bormann, F. Herbert, et al. *Redesigning the American Lawn*. 2nd edition. Yale University Press, June 2001.

² Purdue University site on both conventional and organic lawn care: <http://www.purdue.edu/envirosoft/lawn/src/main2.htm>.

³ Health and environmental risks of pesticides: <http://www.ehhi.org/reports/lcpesticides/>.

⁴ Garden Club of America pamphlet on the New American Lawn: <http://www.gcamerica.org/pamphlets/lawnbrochure.html>.

⁵ NCSU Extension TurfFiles detailed information on turf grass types and maintenance: <http://www.turffiles.ncsu.edu/>.

⁶ Going Native: Urban Landscaping for Wildlife with Native Plants: <http://www.ncsu.edu/goingnative/>.

⁷ EPA site on “greenscaping” your yard: <http://www.epa.gov/epawaste/conserve/rrr/greenscapes/owners.htm#natural>.

⁸ Naeve, Linda, Urban Agriculture Specialist. *Corn Gluten Meal—A Natural Weed and Feed for Lawns and Gardens*. Iowa State University, 3/28/2005: <http://www.extension.iastate.edu/news/2005/mar/mar0522.htm>.

⁹ “Grasscycling”: <http://www.charmeck.org/Departments/LUESA/Solid+Waste/PLANT+Program/grassbro.htm> Mecklenburg County P.L.A.N.T.

¹⁰ Mowers: http://safelawns.org/tips/Grass_off_Gas.pdf.

¹¹ Florida State University on how to calibrate a sprinkler system: <http://edis.ifas.ufl.edu/LH026>.

¹² Tukey, Paul. *The Organic Lawn Care Manual*. Storey, 2007.

¹³ NCAP article on vinegar as an herbicide: <http://www.pesticide.org/pubs/alts/weeds/vinegarinherbicides.html>.



As an Army-brat, Margaret Genkins was raised all over the world from Japan to Germany to Oklahoma, but despite the frequent moves to faraway places her parents who had grown up on working farms in northern Mississippi and Oklahoma always tried to have something growing. Since 1988, Margaret and her husband have made their home in Charlotte on two acres of land where Margaret enjoys gardening. Recently, Margaret has focused her efforts on organic gardening, including lawn care. Margaret is an Extension Master Gardener volunteer with Mecklenburg County, NC.