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Sustainable Lawn & Landscape Practices for Communities

Lawn to Lake Guidebook for Illinois & Indiana

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Chicago Metropolitan Agency for Planning (CMAP)

CMAP is the official regional planning organization for the northeastern Illinois counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will. CMAP developed and now leads the implementation of GO TO 2040, metropolitan Chicago's first comprehensive regional plan in more than 100 years. To address anticipated population growth of more than 2 million new residents, GO TO 2040 establishes coordinated strategies that help the region's 284 communities address transportation, housing, economic development, open space, the environment, and other quality-of-life issues. See www.cmap.illinois.gov for more information.

Illinois-Indiana Sea Grant

Illinois-Indiana Sea Grant (IISG) is one of 32 college programs nationwide, and is dedicated to conducting research, education, and outreach to serve Lake Michigan's southern coast. With its mandate to bring the latest university-based science to those who need it, IISG brings together scientists, educators, policy makers, community decision makers, outreach specialists, business leaders, and the general public to work towards a sustainable environment and economy. Visit <http://www.iisgcp.org/>.

Lawn to Lake

Lawn to Lake is a collaborative program to protect water resources in the Great Lakes region by promoting healthy lawn and landscape practices. With funding from the U.S. EPA Great Lakes Restoration Initiative, partners are coordinating a pollution prevention campaign addressing the needs of those responsible for lawn and landscape care in the Southern Lake Michigan basin.

Visit www.lawntogreatlakes.org.

Northwestern Indiana Regional Planning Commission

NIRPC is a regional council of local governments serving the citizens of Lake, Porter, and LaPorte counties in Northwest Indiana. NIRPC provides a forum that enables the citizens of Northwest Indiana to address regional issues relating to transportation, the environment and community, and economic development. NIRPC has developed a 2040 regional comprehensive plan for the northwestern Indiana region providing vision and implementation actions.

Visit <http://www.nirpc.org/>.

Purdue University Calumet

Purdue University Calumet, a vital part of Purdue University and the leading post-secondary institution in the Calumet region, is a comprehensive, public university in the land grant tradition offering educational programs of excellence focused on the professional, general educational and lifelong learning needs of the people of the Calumet region. See <http://www.purduecal.edu/> for more information.

University of Illinois Extension

University of Illinois Extension is the flagship outreach effort of the University of Illinois at Urbana-Champaign, offering educational programs to residents of all of Illinois' 102 counties — and far beyond. Through learning partnerships that put knowledge to work, U of I Extension's programs are aimed at making life better, healthier, safer and more profitable for individuals and their communities. See <http://web.extension.illinois.edu/state/> for more information and <http://urbanext.illinois.edu/lawntalk/> for more information on lawn care.

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Introduction

Lawns are a significant feature in the urban environment. These often heavily managed landscapes have the potential to contribute to runoff pollution due to over-fertilization, over-application of pesticides, and overwatering.¹ Over the past few years a number of Great Lakes states including Illinois, Michigan, Minnesota, New York, and Wisconsin have restricted the use of fertilizers containing phosphorus for some applications.

Research has shown that concentrations of total nitrogen and phosphorus in urban runoff are certainly high enough to contribute to eutrophication (over-enrichment) of nutrient sensitive lakes and streams.² While many watershed management practitioners admit the difficulty in quantifying the contribution of lawn runoff to receiving waterbodies, a study conducted by the U.S. Geological Survey in Lauderdale Lakes, Wisconsin evaluating the effectiveness of a “lake-friendly” fertilizer program showed that median dissolved phosphorus concentrations in runoff were greater from regular-fertilizer sites than from non-phosphorus fertilizer and unfertilized lawn sites.³ The U.S. Geological Survey has also shown higher concentrations of pesticides in urban waterways than in agricultural streams.⁴ Conversely turf scientists have shown that turf grass does have water quality benefits such as erosion reduction.⁵ There is supporting literature for both sides.

One concern that watershed managers have is that land owners often do not necessarily see themselves as having an impact on water quality as individuals. However, we all live in a watershed and therefore we have to consider the cumulative impacts. Additionally some landowners may fail to realize that while they may not live right next to a lake or stream, runoff from their lawns may be readily conveyed to nearby waterbodies through a network of curbs, gutters, and storm drains in their neighborhood. When you

couple overuse of fertilizers, pesticides, overwatering and the often compacted soils of the urban environment there is an increased risk of polluted runoff.

The intent of this guidebook is to provide landowners with information that can help them reduce these risks with an emphasis on natural lawn care (also known as sustainable or organic lawn care). These terms are representative of a similar ideal, the replacement of synthetic pesticides and fertilizers with the lawn’s natural abilities to look good through natural methods. Organic lawn care depends on a single principle: that a healthy lawn will be able to resist most weeds, diseases, and insects. The goal of such lawn care, therefore, is to promote soil and turf health.

Sustainable lawn care doesn’t mean you have to give up your lawn, and it certainly doesn’t mean that you have to give up the rest of your life tending your lawn. It is an option for landowners to consider over traditional lawn care practices that rely on synthetic products. It means planting what will do well in your climate, conserving water, using organic sources of nutrients, minimizing the use of pesticides, building soil health, and minimizing the impacts of polluted runoff from your property. This manual should help, whether you’re obsessive about your lawn, want to contribute as a private individual in source reduction opportunities to protect local lakes and streams, or just want to take a test drive in sustainability.

1 U.S. Environmental Protection Agency - National Management Measures to Control Nonpoint Source Pollution from Urban Areas. www.epa.gov/owow/NPS/urbanmm/pdf/urban_ch09.pdf.

2 Barth, C.A. 1995. “Nutrient Movement from the Lawn to the Stream.” *Watershed Protection Techniques*. 2(1): 239-246.

3 Garn, H.S. 2002. “Effects of Lawn Fertilizer on Nutrient Concentration in Runoff from Lakeshore Lawns, Lauderdale Lakes, Wisconsin.” USGS Water-Resources Investigations Report 02-4130.

4 U.S. Environmental Protection Agency - National Management Measures to Control Nonpoint Source Pollution from Urban Areas. www.epa.gov/owow/NPS/urbanmm/pdf/urban_ch09.pdf.

5 Beard, J.B. & R.L. Green. 1994. “The Role of Turfgrasses in Environmental Protection and Their Benefits to Humans.” *Journal of Environmental Quality*. 23:452-460.

The Lawn to Lake Program

The Lawn to Lake (L2L) program is an education and training program targeted at reducing polluted runoff from entering Lake Michigan through the promotion of natural lawn care practices for both large property managers (ex. parks and businesses) and homeowners. Demonstration sites throughout the southern Lake Michigan watershed in Illinois and Indiana provide property owners with an opportunity to showcase how a natural lawn care program can be economical, beautiful, and good for local waterways.

Becoming a demonstration site partner with the L2L program means that you pledge to manage all or a portion of your property with natural lawn care practices. Visit lawntogreatlakes.org to take the L2L pledge.

The program's approach to sustainable landscaping emphasizes these principles:

1. **Right plant, right place.**
2. **Fertilize appropriately.**
3. **Manage lawn pests responsibly.**
4. **Water efficiently.**
5. **Compost.**
6. **Attract wildlife.**
7. **Reduce stormwater runoff.**

Figure 1. Lake Michigan watershed

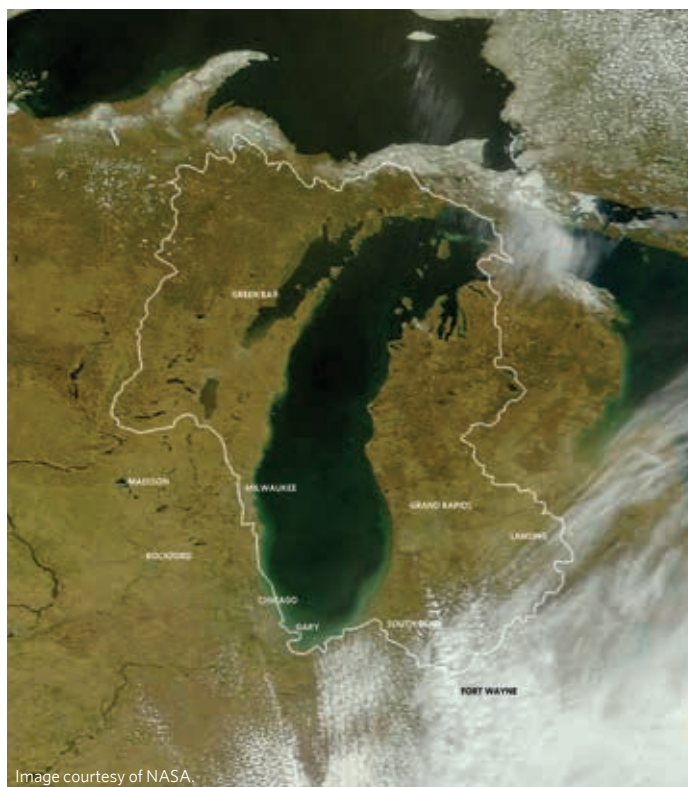


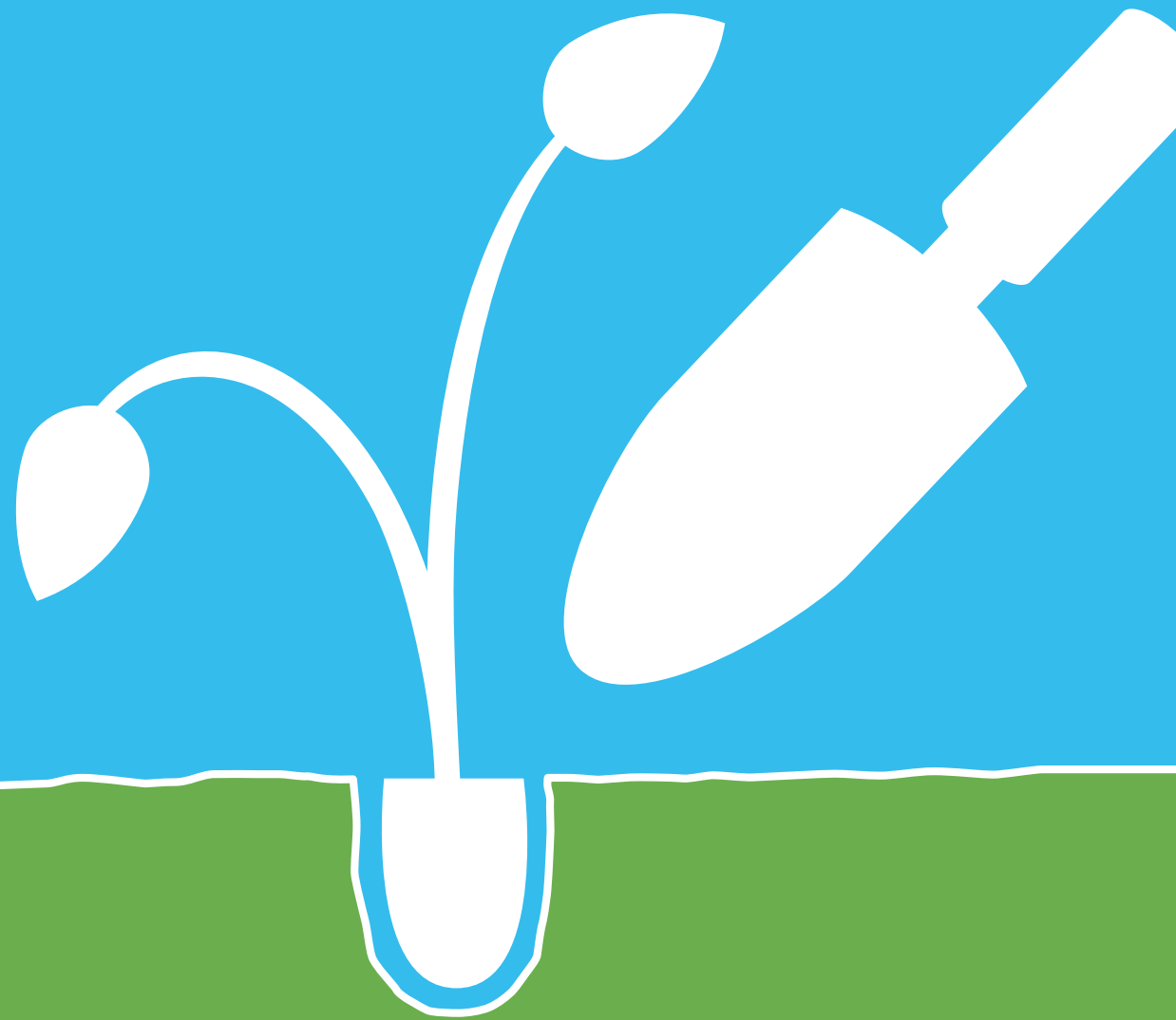
Image courtesy of NASA.

Watersheds

A watershed is the land area that drains to a specific waterbody whether it is a lake, stream, or river. Watersheds come in all different shapes and sizes. They can be as small as the drainage area for a pond in the neighborhood or as large as Lake Michigan's. Understanding what a watershed is can help us begin to realize how the various land uses and practices within a given drainage area might impact the health of its lakes and streams. As rain falls and moves across the landscape (runoff) it can pick up harmful pollutants and deliver them to our lakes and streams. The type of pollution the runoff carries depends on the land uses present within the watershed. For example, fertilizers and pesticides can be found in the runoff of watersheds with urban land uses. That brings us back to the L2L program. We all live in a watershed, so we all have a potential impact. What are *you* willing to do as Lake Michigan watershed community member?



Image courtesy of Rich Sustich.



Right Plant, Right Place

Choosing practices that will assist you in choosing the right plant for the right place is the best place to start the guidebook because many issues that veer us off course in having a sustainable landscape can be avoided with a little pre-planning. Additionally, choosing the right plant for the right place in your landscape can save you time and money in the long run.

We've all probably gone through the following scenario at some point. You buy a truly stunning plant at the nursery or garden center only to have it die soon after planting it. Or maybe it just never looks as nice as it did when you first brought it home no matter what you try — even moving it half dozen times. What went wrong? Chances are it wasn't the right plant in the right place. For example, you wouldn't expect a cactus to thrive in a swamp.

The following information outlines some things you should consider when choosing plants for your property. You'll be a step closer to having a sustainable landscape.

Get To Know Your Property

One of the first steps in choosing the right plant for the right place is getting to know your property.

- Where is it sunny or shady during different times of the seasons or day?
- What are your soils like (ex. clay, sand, both)?
- Are there spots that never seem to dry out or are dry all the time?
- Look around — are there plants with problems?
- Where do you want play areas, vegetables, color, views, or privacy?
- How much lawn do you need or want to maintain?
- What kind of plantings would fit your property?

Determine the Exposure

Light can vary greatly depending on the time of day, the season, and whether it is filtered or completely blocked.

- Sunny areas get six or more hours of full sun, resulting in warm, dry soil. If plants are also exposed to wind, they will lose even more moisture.
- Shady areas are under trees or eaves or against north-facing walls. Moreover, these areas can be especially dry if tree roots are competing for moisture or when eaves block rainfall year round.

Test Your Drainage

Understanding how your soil drains is critical to choosing the right plants and knowing how to water them. If your soil drains too quickly, plants may not have a chance to absorb enough moisture, so you will need to water more often. If the soil drains too slowly, the plant's roots can suffocate from being submerged in water resulting in the roots rotting or even plant death. Test your soil drainage by digging a hole six inches wide and one foot deep (see image above). If you have one, a posthole digger works well for this job. Then fill to the top with water and let it drain. When the water has drained completely, fill the hole again. This time keep track of how long it takes for the water to drain completely from the hole.

- If the water drains in less than three hours, you probably have sandy soil.
- If water is still standing in the hole after eight hours, you probably have clay soil. It will be important to choose plants that don't need good drainage.
- If the water drains within four to six hours, you have good drainage and can choose a variety of plants.

You can amend your soil to help improve drainage, but this will take a little more time and money.



Image courtesy of Joe Mazza.

Know Your Soil

Pick up a handful of moist soil and squeeze. You may have to moisten it with a bit of water. Rub it between your fingers. How does it feel?

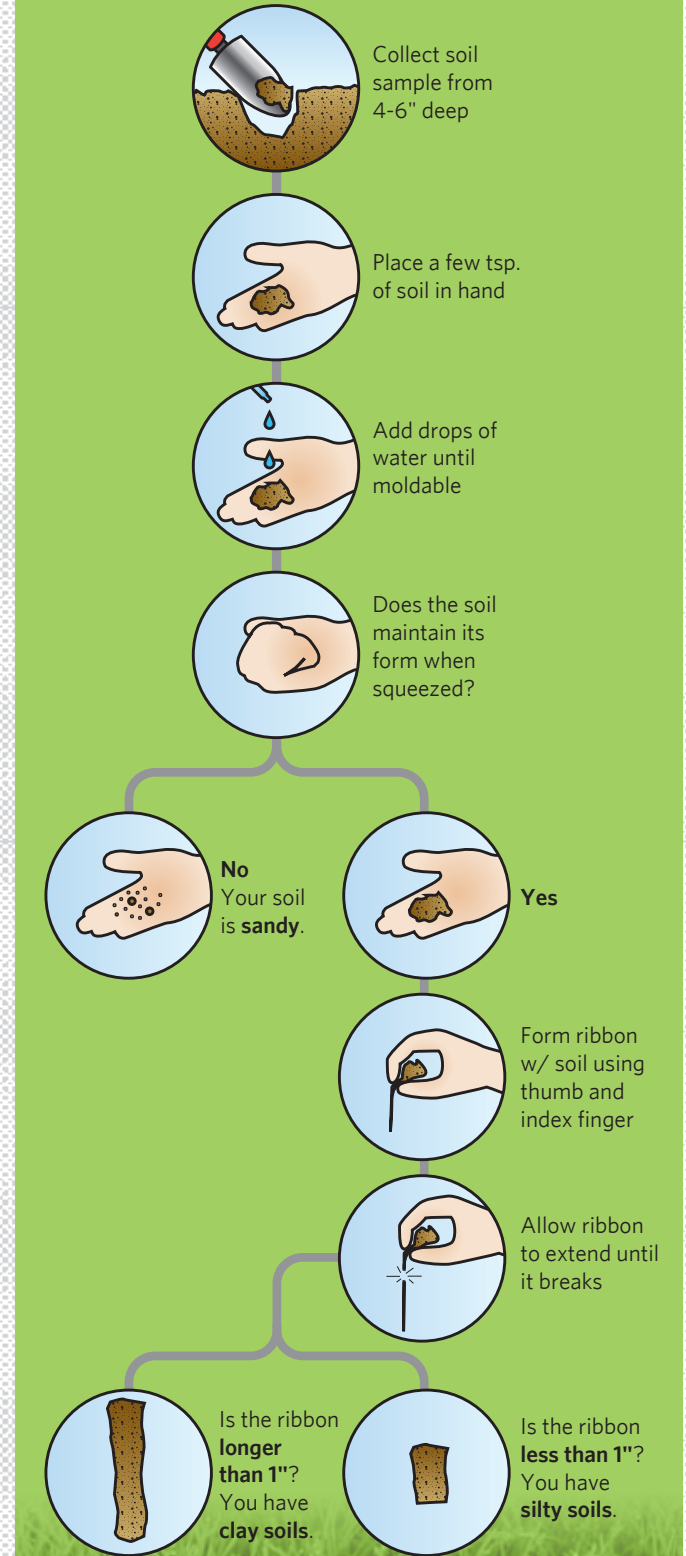
- Sandy soil has the largest particles and feels gritty. This soil is loose, drains easily and dries out fast.
- Clay soil has the smallest particles. It feels smooth like flour and holds together like Silly Putty. When wet, this soil is heavy, sticky, and often soggy. In winter, it can get waterlogged, causing some plants to rot. In summer, it can be hard to dig into. Clay soil holds onto nutrients and water better than sandy soil.
- Loamy soil is a mix of sand, silt, clay, and organic matter (decomposed plants, compost or manure). This soil is usually loose, drains well and holds onto moisture and nutrients.

Alternatively, you can use the simple flow chart on the following page to determine what type of soils you have.



Image courtesy of Joe Mazza.

Figure 2 Soil Type Determination Flow Chart



Group Plants by Their Needs

Once you know the sun, shade, soil, and drainage conditions of your property, you can choose the right plants. Check with your local nursery for what is available and for plant combination ideas. Be sure to group these new plants with plants that need the same conditions. This will greatly simplify your watering routine. That way you don't have to water the whole property to reach one thirsty plant!



Native Plants

Native plants have evolved to the conditions of our region. Not only do they generally require less maintenance (water, fertilizer, and pesticide use), they also provide food and habitat for resident and migrating wildlife such as birds, butterflies, and bees. Many of which are important pollinators. Native plants can also help reduce runoff by promoting rain to soak into the ground with their deep root structure.

Go For Diversity

Monocultures, large expanses of the same plant, can be prone to disease and insect infestation. Additionally, if you are planting for wildlife a diverse selection of plants is very important. As an example, when planting to attract pollinators (ex. butterflies and bees) and hummingbirds, choose flowering plants that bloom at different times of the season. The overlapping bloom periods will help assure that there is a continued food source that draws them to your property.

Avoid Invaders

A number of our region's invasive species were introduced because they looked attractive. Invasive plants have the ability to thrive and spread aggressively outside their natural range. An example is purple loosestrife. While the purple flowers are pleasing to the eye, purple loosestrife has overrun fragile wetland habitats creating a dense monoculture with little if any wildlife value. Get to know what plants are or may be invasive to your area.

Pick Plants That Resist Pests and Use Less Water

Many pest and disease resistant varieties are available now — ask at nurseries or Master Gardener clinics. Choose plants that are “low water use” or “drought tolerant.” After they're established (2-5 years) many will thrive just on our limited summer rainfall most years, saving you time and money on watering. Native plants are usually the best option.

Made In the Shade

Consider strategically planting trees and shrubs around your home to help offset heating and cooling costs. Deciduous shade trees planted on the south, west, and east sides of your home will cast shade over your home during the hot summer months while also allowing warm sunlight to come in through the windows in the cold winter months. Be sure to account for how big the tree will be once it is mature especially around power and phone lines. Never plant trees near a septic system if you have one. The tree roots can damage the system leading to significant repair or replacement costs.

Cope With a Slope

Use groundcover plants or deep rooted native plants and shrubs on steep slopes where turf grass may not thrive or be easy to maintain.

Lawn Grass Species

What is the best lawn grass species? The answer depends on local environmental characteristics, such as amount of shade, type of soil, and climate, and how these interact with the innate characteristics of the plant. Since grasses vary in their characteristics, select grasses that are best suited to the specific characteristics of the lawn or landscape to which they are added.

The variation in turfgrass stems in part from the distinction between warm-season grasses and cool season grasses plants. Most lawns in the upper Midwest region are made up of cool-season grasses that are better adjusted to the relatively cooler climate. Most lawns tend to use grass cultivars of species like Kentucky bluegrass, fine fescues, and perennial ryegrass, or a mix of such various cool-season grasses. However, cultivars of native grasses, including buffalograss, prairie junegrass, and blue grama, and native-non-native hybrids, such as Texas x Kentucky bluegrass, are being developed for use as turf in the Midwestern region.⁶ When planning a new lawn or redoing an old one, it is important to take into consideration which turfgrass or ornamental species are best adapted to regional water availability and the local environment.

Overseed & Top Dress

Reseeding (a.k.a. over seeding) and top dressing your lawn at least once a year with compost can help maintain a dense turf to out compete weeds. Water your lawn daily for approximately two weeks so the new turf grass from seed can become established.⁷ In general spot seeding of bare soil patches can be done in mid-April. Whole lawn reseeding can be done in early summer or early fall.⁸ Once it has become established, you can follow the recommendations outlined later in this guidebook on water conservation.

New Sod Establishment

Establishing a new lawn is usually done by seed in our region. However, sod can provide both quick and reliable results in many instances. For the sod installation process to be successful, the site and soil must be properly prepared. You may want to consider doing a soil test before installing the sod to determine the condition of the soil and to see whether it needs any amendments. For instance, compost may be added to a soil lacking adequate organic content. There should be at least six inches of aerated soil for a healthy lawn to grow.⁹ It is also important to ensure that perennial weeds are under control and the site has been graded properly.

Once the sod has been put in, the lawn should be watered every day in the morning for about 10-14 days. Use your soil test results to help determine how much fertilizer or other amendments may be needed. It's important to make sure there is enough phosphorus available to support the critical initial development of roots in the soil. Potassium is important for improving stress tolerance in high traffic areas and during drought conditions. Nitrogen is best applied after the sod has become establishing in about a month's time followed up with another application in 30 to 60 days.¹⁰ The general target rate for nitrogen fertilizer use is still one pound per 1,000 square feet, even for newly planted sod; however, using less than that amount is recommended for plantings that take place in the summer. Once the lawn is established, you can switch to infrequent watering and twice-yearly fertilizer applications, or less, based on your soil testing results.

Why It Matters

Ultimately, when you match the right plants to the right environment, your plants grow stronger roots and are healthier, which in turn requires less watering, reduces or eliminates the need for pesticides, and makes plants more resilient to disease and harsh weather.

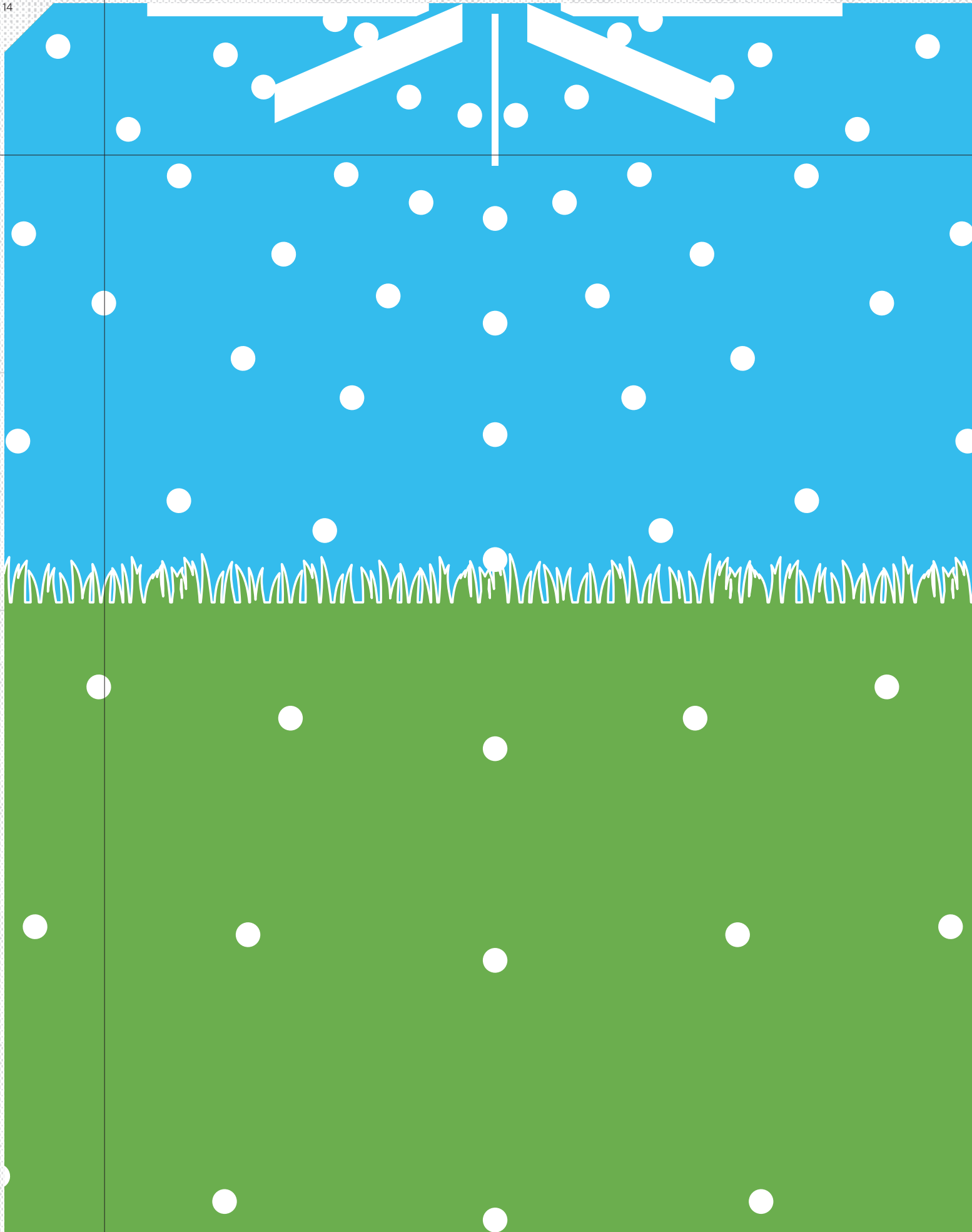
6 Mintenko, A., S. Smith, and D. Cattani (2002). Turfgrass evaluation of native grasses for the northern Great Plains region. *Crop Science* 42(6), 2018-2024; Su, K. et al (2008). Rooting characteristics and canopy responses to turfgrasses including hybrid bluegrass. *Agronomy* 100, 949-956.

7 Safer Pest Control Project: Natural Lawn Care for Homeowners. <http://www.spcpweb.org/factsheets/NaturalLawnCareforHomeowners.pdf>.

8 Safer Pest Control Project: Municipal Toolkit. <http://www.spcpweb.org/factsheets/SPCPMunicipalToolkitFinal.pdf>.

9 Missouri Extension. Sodding a home lawn. Retrieved from: <http://extension.missouri.edu/extensioninfolnet/article.asp?id=1051>.

10 Purdue Extension. Establishing a lawn from sod. Retrieved from: <http://www.extension.purdue.edu/extmedia/AY/AY-28-W.pdf>.



Fertilize Appropriately

All plants need nutrients to grow and thrive. However, it's not always necessary to fertilize them. Your lawn obtains the nutrients it needs from soil minerals, organic matter, fertilizer, and even the atmosphere to a lesser extent. A plant's nutrient needs depend on a number of factors including species, age, and location in the landscape. Too much fertilizer can weaken a plant, promote disease, and invite pests, in addition to wasting money and harming the environment. It also means more pruning and mowing. So consider your plants' needs carefully before applying any fertilizer.

In 2011, Illinois instituted a law (the Agriculture Fertilizer Act) prohibiting commercial landscape care industry applicators from applying fertilizer containing phosphorus unless a soil test shows the soil is phosphorus-deficient. Establishment of seed and sod is exempted from the law. While the law does not apply to property owners, it does make property owners more attentive to the products they choose and the opportunity to be more careful with their phosphorus applications.

The following tips can help you make the right choices for a sustainable landscape.

Soil Testing

While it may seem trivial, soil testing is perhaps one of the most valuable tips provided in this guidebook in maintaining a sustainable landscape, while also protecting the health of our lakes and streams. Fertilizing lawns for many of us is on autopilot — twice a year, an application in spring and another in fall. However, many soils in Indiana and Illinois already contain enough phosphorus to support a healthy lawn. One way to find out for sure is to do a soil test. Soil tests can help you understand what nutrients (ex. phosphorus) are present in the soil and if additional nutrients need to be applied for the particular area in your landscape. Check with your University County Extension Office to see where testing services are available.



Image courtesy of Irene Miles.

Read the Label

If your soil test comes back saying that your lawn has a nutrient deficiency make sure that you purchase the correct fertilizer to address that deficiency. All bags of fertilizers will have a label showing the nutrient analysis. It will have three numbers such as 22-0-15 which correspond to Nitrogen-Phosphorus-Potassium or N-P-K. Nitrogen (N) is important in overall plant health. Phosphorus (P) is integral in root formation. Potassium (K) regulates water movement. Remember, most established lawns in our region do not require phosphorus. You can make sure by doing a soil test. If this is the case, look for a fertilizer with a zero value in the middle of the nutrient analysis (N-P-K) which means it is phosphorus free.

Another important consideration is release rate. Quality nitrogen fertilizers should contain controlled-release nitrogen. You can find out by checking the guaranteed analysis section on the back of the bag. Key terms to look for include controlled-release, slow-release, slowly-available, or water-insoluble nitrogen. Slow release fertilizers reduce the likelihood of nutrients running off into nearby lakes and streams. However controlled release fertilizers won't give that immediate "greening up" effect.

Follow the Label

Make sure to follow the directions on the label. The label will provide information on calculating how much fertilizer will need to be applied based upon the square footage of your lawn and your soil test results. The label will also provide you with information about the release rate. Over-applying fertilizer can burn your lawn or runoff when it rains. The label will also contain some general safety and disposal information. If you need to dispose of any of your lawn chemicals check with the county solid waste district to see if they have a Hazardous House Hold Waste Disposal Day coming up in your area. There's no charge to dispose of these materials at these events.

Organic Fertilizers

A general "rule of thumb" for assessing organic fertilizer from synthetic is if any of the three nutrient analysis numbers (N-P-K) is higher than 8, or if all three numbers add up to more than 15, there is a good chance you are dealing with a synthetic source of fertilizer. There are some organic sources that have about 10-12 percent nitrogen.¹¹ One of the advantages of organic sources of nitrogen (N) is the low chance of burning grass. Some synthetic fast-release sources have high salt levels that increase the chances of burning.¹² Many organic fertilizers come from animal sources but can also include plant and mineral sources. If you can't find it at your local nursery or homecare center ask them to stock it. Otherwise there are many options available via mail order or online.

Table 1.
Nutrient composition of some organic materials used as fertilizer

| MATERIAL | N | P | K | RELATIVE AVAILABILITY |
|-----------------|-------|-------------------|-----|-----------------------|
| Alfalfa pellets | 3 | 0.5 | 3 | Slow |
| Blood meal | 13 | 2 | 0.5 | Medium/rapid |
| Bone meal | 0.5-6 | 15-34 | 0 | Slow |
| Compost | 1-3 | 0.5-1 | 1-2 | Slow |
| Fish emulsion | 3-5 | 1-2 | 1-2 | Rapid |
| Soybean meal | 6-7 | 1-2 | 2 | Slow/medium |
| Rock phosphate | 0 | 20-32 (2% avail.) | 0 | Slow |

Source: Adapted from Purdue University Extension Service: Organic Vegetable Production www.ces.purdue.edu/extmedia/ID/ID_316.pdf.

¹¹ University of Illinois Extension: Ask Extension. <http://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=17605&catID=154&AskSiteID=34>.

¹² University of Illinois Extension: Lawn FAQs. <http://urbanext.illinois.edu/lawnfaqs/fertilize.html>.

Time to Apply

If you need to apply fertilizer based on soil testing results, September and November are the two best times to fertilize your lawn. An application of nitrogen fertilizer in the fall promotes good root development, enhances your lawn's energy reserves, and extends color retention. The benefits will be seen in the spring with earlier green-up, better turf density, and improved tolerance to turf diseases.

For the September application, pick a product that contains some quick and slow-release nitrogen. The timing of the September application is anytime of the month after the daytime high temperatures are no longer in the 90s °F. The target application rate for this fertilization should be 1.0 lb. N/1000 square feet.

The November application timing should be near or after the last mowing of the year, but while lawn is still green. Typically, there may be a month or more between your last mowing and the time the grass turns brown or goes under snow cover. Generally the first few weeks of November are when to apply. Research suggests that the nitrogen must be taken-up by the plant before winter to be most effective. Therefore, a quick-release (or soluble nitrogen source) such as urea, ammonium nitrate, calcium nitrate, or ammonium sulfate is most effective. The target application rate should be 0.5 to 1.0 lbs. N/1000 square feet.¹³

General Considerations

Never apply fertilizer if moderate or heavy rain is forecast for your area within the next 24-48 hours. Heavy rains can quickly carry fertilizers in runoff to nearby storm drains or waterbodies. If you live next to a lake or stream, do not fertilize within 25 feet of the water's edge. Make sure to sweep up any fertilizer that gets spread onto the sidewalk or street curb.

Calculating Pounds of Fertilizer to Apply

Desired rate (lbs. N/1000 ft²) / % nutrient = Total fertilizer need (lbs. /1000 ft²)

Total fertilizer needed (lbs. /1000 ft²) × Area to be treated (ft²) = lbs. fertilizer needed

For example, how much fertilizer do you need to apply a 22-0-15 fertilizer at 1 lbs. N/1000 ft² to a 5000 ft² lawn?

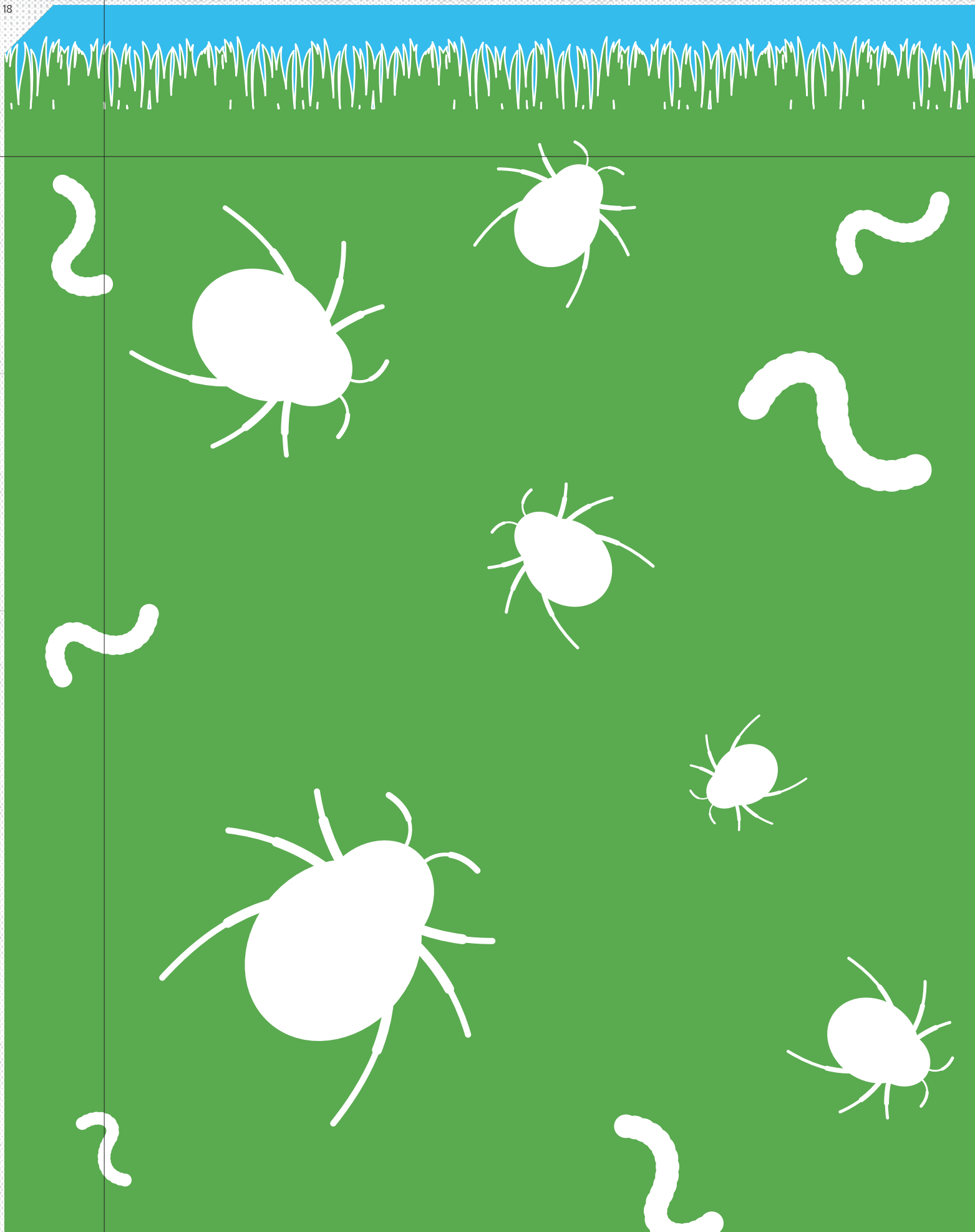
1 lbs. N/1000 ft² / .22 = 4.5 lbs. /1000 ft² of 22-0-15 fertilizer

4.5 lbs. /1000 ft² × 5000 ft² = 22.5 lbs. of 22-0-15 fertilizer would be needed for a 5000 ft² lawn.



Image courtesy of Lake Champlain Sea Grant program.

¹³ Turf Tips: Fall Fertilization, Purdue University. <http://purdueurftips.blogspot.com/2011/09/fall-fertilization.html>.



Pesticides

Pesticides (the generic term for insecticides, herbicides, and fungicides) are among the most widely used chemicals in the world. Pesticides do pose some risk and their use cannot be made completely safe. However, there is a time and place when they may be necessary. The following tips will provide you with information on how to minimize the risks associated with pesticide use.

Integrated Pest Management

Home gardeners have many insect pest management options that don't rely on insecticide use. The systematic adoption of these options with attention to pest and beneficial insect life cycles and behavior is a key component of Integrated Pest Management (IPM). IPM is a strategy that helps gardeners prevent and manage pest problems with as few chemicals as possible. Some of its basic principles include: early and accurate identification of pests; regular inspections to gather information used in the management decision process; and having an "action threshold" which describes the level of pest presence that requires control.

After the garden has been planted, harmful insects can be managed in a variety of ways. If the garden is relatively small and the insect pests few, hand picking remains one of the most effective means of insect control. Traps or barriers can be useful for some pests, and biological control agents that are commercially available can be very effective against specific insect pests. Finally, when all other measures have failed, very selective and well-timed spot treatments of individual plant parts with a low-impact insecticide (such as insecticidal soaps or horticultural oils which are relatively safe compounds) may be considered. Even though insects may cause some damage, you may not need to control them if you learn to tolerate a modest level of insect feeding on your garden vegetables.

An Attractive Lawn with Minimal Herbicidal Use

The following steps from the Purdue and University of Illinois Extensions can reduce the need or amount of herbicides used to control dandelions and crabgrass while still maintaining an attractive and healthy lawn. Spot treating or mechanical removal of the occasional dandelion may be all that is needed.

1. Mow at 3 inches or more.
2. Mow frequently, never removing more than 1/3 of the grass leaf blade.
3. Return the lawn clippings.
4. Fertilize in the Fall (nitrogen).
5. Irrigate only as needed.

The best defense against weeds is healthy, dense turf. Overseeding can be used to improve turf density in many existing lawns. The best time to seed cool season turf grasses in northern Indiana and Illinois is generally mid-August to late August.

1. Mow the area to approximately 1.5 inches.
2. Aerate if needed.
3. Fertilize (organic alternative: 1/4 to 1/2 inch compost).
4. Apply seed at recommended rate.
5. Lightly tamp or press to insure seed/soil contact.
6. Water newly seeded area lightly and frequently over the first few weeks.

Source: www.agry.purdue.edu/turf/pubs/ay-13.pdf, www.agry.purdue.edu/turf/pubs/ay-32.pdf



Management Strategies

IPM uses a combination of compatible control techniques. These include cultural, biological, mechanical, plant selection, and chemical techniques. In many cases a combination of these strategies may be necessary.

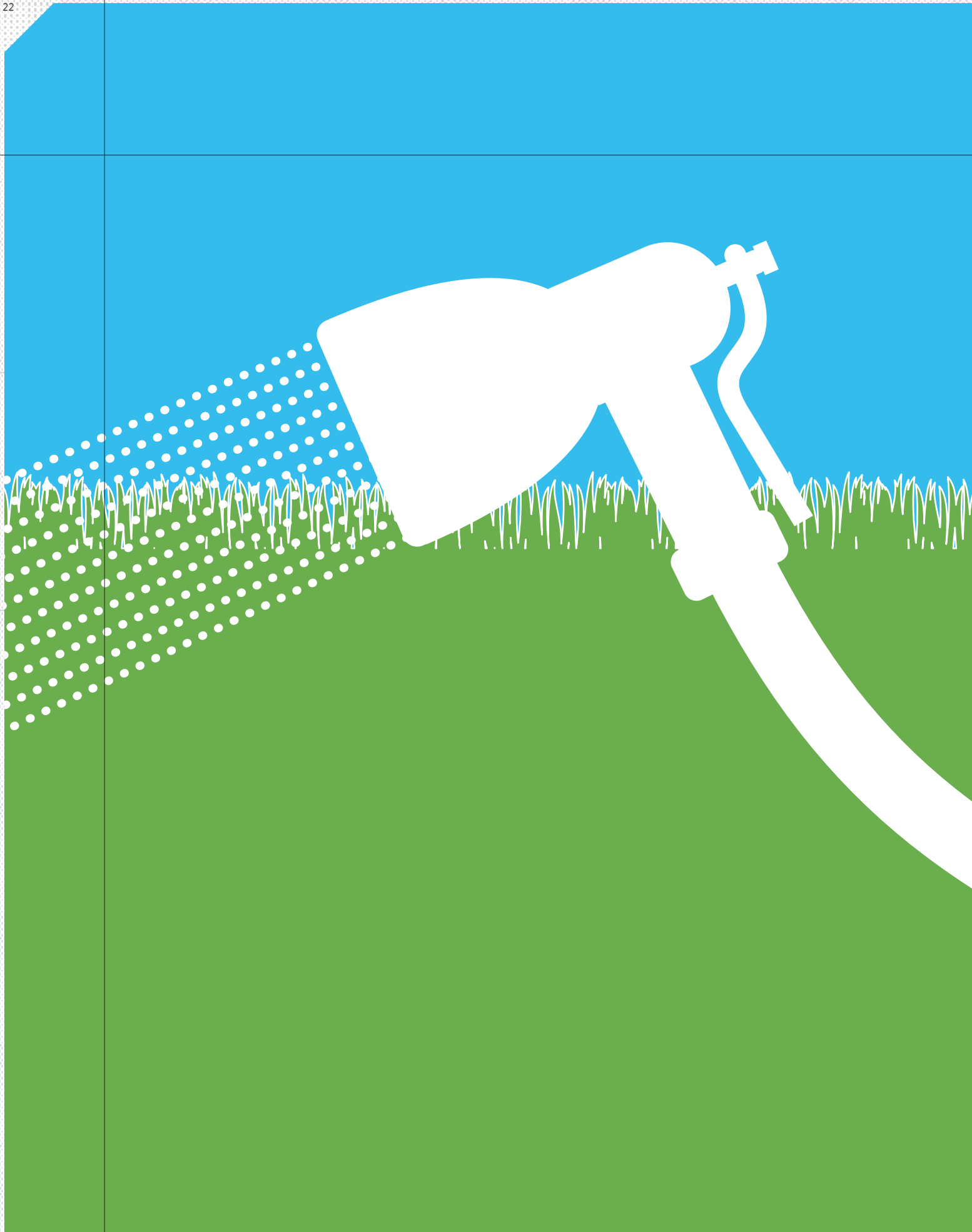
- Cultural controls are modifications of practices to disrupt or reduce pest populations (ex. maintaining healthy soils, proper watering and fertilization, sanitation).
- Biological control refers to the use of natural enemies to control pests.
- Mechanical control refers to the use of barriers or traps to exclude or catch pests.
- Plant selection involves the selection and use of plant varieties that are disease and/or insect resistant and compatible with the existing conditions.
- Chemical control, as a last resort, includes the use of pesticides. The least toxic pesticide should be used initially.

Using IPM is the best way to safe, long-term pest management with minimal adverse effects to your family and the surrounding environment.

10 Stewardship Principles for Safe Pesticide Use

1. Read the label before buying the pesticide.
2. Buy only the amount of pesticide needed for one season.
3. As a general rule of thumb, the temperature inside the storage area should not get below 40 degrees F or over 100 degrees F.
4. Calibrate equipment carefully to assure that the pesticide is applied at labeled rates.
5. Be aware of the current and probable future weather conditions in order to make the best application decisions to prevent drift.
6. Locate the mixing/loading site away from wells, streams, and lakes.
7. Never leave a tank while it is being filled and pay constant attention during filling to prevent overfilling and spilling of the pesticide on the ground.
8. When you empty a container, allow it to drain into the spray tank for 10 seconds after it begins to drip.
9. Remember that exceeding the label rate of application is a violation of the law.
10. Follow the label each time you mix and use the pesticide, and follow the label when storing or disposing of the pesticide. Do not trust your memory.





Landscape Water Conservation

Talking about water conservation in our area can be a hard sell sometimes, especially with Lake Michigan nearby. While water is relatively cheap here, getting it to you does have costs (ex. infrastructure, maintenance, and processing) and it is, in fact, a nonrenewable resource. In addition to these monetary costs, overwatering your landscape can have negative consequences to your lawn and potentially harm adjacent waterbodies with polluted runoff. The following information outlines some steps you can take to conserve water while maintaining your landscape and protecting local streams and lakes.



Reduce Need for Watering

By choosing drought tolerant plants for you landscape you will have to water less frequently. One option to consider is going native. Once established a number of native plant species require little if any watering. A good example is purple coneflower. You can also reduce watering frequency and the amount of water you would otherwise use by grouping plants in your landscape based on watering needs. By using this approach you can reduce watering needs to only a few flower beds if you so choose.

Going Dormant

Most people think that a lack of water will damage the lawn, when actually over watering may cause more damage. Letting your lawn go dormant in summer or other dry periods is another strategy to consider as long as it is established. Turf grass will naturally go dormant as part of a survival mechanism during prolonged dry conditions. Your lawn can survive in this state for about four weeks without substantial thinning once it recovers. However you will want to consider a thorough watering about once every four to five weeks. Try and avoid foot or lawnmower traffic when your lawn is dormant. Your lawn will green up again after a soaking rain.¹⁴

Watering Frequency & Amount

If you chose to water your lawn, using a regular schedule probably isn't the way to go. This can lead to overwatering, which can leach vital nutrients away from the root zone and promote disease. Additionally, daily and brief watering discourages deep root growth that is essential for healthy turf grass. Instead, water your lawn based upon its appearance. Lawns that appear bluish-green or where footprints remain after walking across them could use watering. Watering more frequently has no benefit. If you have an automatic sprinkler system you should set it for a single cycle then turn it off until the lawn needs watering again. When the lawn does require water it's best to do a deep soaking (1 – 1 1/2 inches) in the morning to encourage deep root growth for a more drought tolerant lawn.¹⁵ You can easily measure the amount of water applied with a rain gauge.

Irrigation Systems

A variety of high efficiency irrigation systems are readily available to the public. Even a do-it-yourselfer can find many options at a home center ranging from drip irrigation to misters. These systems allow the property owner to have greater control over the volume of water applied and the timing.

Lawns and Drought

With the shifting weather patterns in the Midwest, we can expect to see more frequent episodes of drought.¹⁶ These hot, dry conditions are uncomfortable for us, but they seem even more uncomfortable for our lawns. What can you do for your lawn to get it through a drought? The most common answer is to just keep pouring on more water — but this “quick fix” is at odds with the increasingly common goal of water conservation. Luckily, there are other ways to equip your lawn for a dry spell.

In general, lawns made up of drought-tolerant grass species tend to fare better in drought conditions. Since these species are adapted to use water more efficiently, they don't usually need extra irrigation to get through periods of low rainfall. However, the climate in the upper Midwest has historically been relatively cool and humid. Accordingly, most lawn grasses used in this region are “cool-season” grasses, like Kentucky bluegrass, that are not very drought-tolerant. This doesn't mean you have to watch your lawn die whenever there is a drought, though. Even if your lawn isn't drought-tolerant to begin with, here are some things you can do throughout the year to help it survive a potential drought:

- Mow the grass higher.**

Raise the height setting on your mower and mow the lawn less frequently so that your grass is taller. If you make this a common practice, even when there isn't drought, your grass will develop deeper roots. This enables the grass to reach and store more water, which is a helpful characteristic when the weather turns hot and dry. Using a sharp mower blade is also recommended; it produces a cleaner cut that heals more quickly, losing less water to the atmosphere.
- Don't over-fertilize.**

Using too much nitrogen fertilizer can promote a lot of blade growth above ground, without enough root development below ground to be able to support the grass. Too much fertilizer can also make grass more susceptible to disease — overall, it will be less able to make it through tough conditions.
- Improve soil structure.**

Applying compost or organic soil amendments improves soil structure so that the soil can hold more water, which helps keep the lawn going during a drought. Properly treating thatch can also improve soil structure. On a related note, try to limit traffic on the lawn during dry spells, as that compacts the soil and reduces the space where it can hold water.
- Go dormant.**

If your lawn goes brown under its normal watering routine, consider allowing it to go dormant. Adding water to green the lawn up again can actually drain its reserves, making it more susceptible to pests and disease; if conditions stay dry, the grass will not be able to build those reserves up again. A dormant lawn is not a dead lawn — far from it. A minimal input of water, about 1/4 to 1/2 inches every month or so, is enough to keep a dormant lawn ready to resume growth when the weather improves.

For more information on managing your lawn during drought conditions check out the University of Illinois Extension Lawn Talk at <http://tinyurl.com/d93c6pt>.

¹⁴ Irrigation Practices for Home Lawns, Purdue University Extension Service. <http://www.agry.purdue.edu/turf/pubs/ay-7.pdf>.

¹⁵ Irrigation Practices for Home Lawns, Purdue University Extension Service. <http://www.agry.purdue.edu/turf/pubs/ay-7.pdf>.

¹⁶ Mishra, V., K. Cherkauer, and S. Shukla (2010). Assessment of drought due to historic climatic variability and projected future climate change in the Midwestern United States. *Journal of Hydrometeorology* 11, 46-68.



Compost



Compost — you hear people talk about it and can sometimes find a bag of something with that word in it at the local lawn and garden store but what is it really? In the most basic of terms compost is a mixture of decayed plants and other organic matter used by gardeners for enriching soil. Those in the know call it black gold. For avid recyclers it is often a forgotten element of the recycling triangle.

Take some greens, browns, yellows even some purples and reds (explained in detail later), mix it together and overtime you will get a deep rich black soil full of all of the nutrients left by the decaying matter that was mixed into the pile ready to be spread onto your flowers, vegetables, around trees and even over your lawn. Is it that simple? Can I do it on MY property? Yes and Yes!

The simplicity or complexity (as well as the amount of effort required) of composting depends on the desired outcome — to reduce the amount of waste sent to the landfill or to create a super high quality product for your property; either way, compost happens. The tips and information below will help guide you in choosing and starting a composting program for your home.

Mowing Height & Thatch Control



Mowing height depends on your lawns grass species. Mowing below the optimum height can restrict root growth, encourage weed growth and increase susceptibility to drought, disease, insects and foot traffic. If your lawn is shaded mow it 1/2-1 inch higher than the recommendations below.

| SPECIES | HEIGHT (IN) |
|--------------------|-------------|
| Kentucky bluegrass | 2 to 3.5 |
| Perennial ryegrass | 2 to 3.5 |
| Fine fescue | 2 to 3.5 |
| Tall fescue | 2.5 to 4 |

Excessive thatch buildup is a symptom of over fertilization, over watering, and /or soil compaction. To control buildup long-term you will need to address one or more of these causes. In the meantime a dethatching machine can be used.

For more information please see *"Mowing, Dethatching, Aerifying and Rolling Turf."*

www.agry.purdue.edu/turf/pubs/AY-8.pdf

Leave-it-Lay

Rather than bagging your lawn clipping just leave them there. Not only will you save mowing time and disposal/compost costs, you will save on fertilizer costs. The decomposing grass clippings will release nitrogen, phosphorus and potassium as well as other elements that will help feed your lawn. The clippings will also lead to an increase in earthworm activity which will help improve soil aeration.

To recycle your grass clippings you only need the most basic of lawn care on a regular basis.

- Mow your grass to a height of 3-4 inches high. Try to never cut more than **one-third** of the grass blade's height during any single mowing. This will allow the grass to develop a deeper root system, help block out weeds, defend against drought and disease, and create finer clippings which will decompose more readily.
- Keep your lawn mower blades sharp. If you do not already have one, next time you purchase a lawn mower purchase a mulching mower. Mulching mowers chop up the blades in to finer clippings that will decompose faster. You may be able to retrofit your current non-mulching mower with a mulching kit.
- Remove any existing thatch using a dethatching machine or core aeration machine. You should only need to do this when the thatch is over 1/2 to 1 inch thick. Returning grass clippings to the lawn does **not** increase thatch. Excessive thatch buildup can be a symptom of other turf management issues such as deficient microbial life in the soil to help breakdown organic matter.
- Avoid over-fertilizing or over-watering your lawn. Fertilize your lawn according to the recommendations in the Fertilize Appropriately section of this guidebook.

Sometimes your lawn just gets away from you and grows too tall to mulch. In those situations consider doing a few passes spread out over a couple of days, lowering the mower deck each time. This will reduce stress on the turf grass and provide a cleaner looking cut. Alternatively use the grass clippings around flowers, garden plants, and shrubs (as long as the grass was not recently treated with herbicides or pesticides). There may be cases when you should bag your clippings such as if your grass is heavily infected with a fungus, bag your clippings. Do not use them as mulch or in your compost pile.



Image courtesy of Sea Grant.

What Exactly is Happening in a Compost Pile

There are three important factors that are necessary in making good compost: air, water, and heat. Each is important because they help create a good working environment for the real composters. A good compost pile will have a variety of workers, each doing their part to help breakdown the organic material into usable compost. These include a variety of insects, fungi, and bacteria. Each has specific environmental conditions that need to be met within the pile for them to do their part in the breakdown process. Where one group ends in breaking the materials down, another one gets started.

The Better the Ingredients, the Better Compost

Before starting your compost project you should first think about the types of organic wastes you generate, how much time you want to spend composting, how big your property is, and how much of it you are willing to give up to your composting operation. Composting can be as simple as tossing vegetative waste in a pile or as complex as carefully managing your compost pile with hydrometers, thermometers and various other meters. Be realistic in your expectations of time, energy, and effort.

Simple Compost Recipe

A simple compost recipe calls for blending roughly equal parts green materials with brown materials. Chop or shred when necessary to ensure no piece is over 12 inches' in length. Add water to the pile to maintain a moist environment but make sure it does not get too wet from rain by placing a cover or roof over it. Occasionally the pile will need to be turned with a pitch fork or rake to add air. In about 3-8 months your compost should be ready. The usable compost will be located toward the bottom of the pile. It should look like loose dirt or soil however you may still see some remnants of the larger and woodier waste depending on how well you shredded or broke up the materials when you started.

This type of composting has its pros and cons. It is an easy way to compost requiring little time, effort or skill. It is a good method for folks who generate little yard waste and can manage yard debris and grass clippings. This is an "add as you go" pile and does not require preplanning or stockpiling of yard waste. This type of compost pile, however, decomposes slowly and is prone to odor problems that can attract pests. It does not offer the rich nutrients that more managed compost piles offer and may not kill nuisance weeds and disease.

Advanced Compost Recipe

This approach will deliver rich, nutrient packed materials but it requires time, planning and effort. You will need a minimum of one compost bin, and the more bins the better. You will also need space to stockpile the ingredients so that are available when needed.

To start, consider where you are going to place your bin(s) and stockpiles. You will want them in a convenient location but where there is access to a water spigot. They should not be in full sun or under larger trees. Air circulation is important so try not to stick them in the corner blocked by fences or other structures. Insects, worms, bacteria, and yes, even mice may, make their home in the bins so make sure they are placed away from the home or garage.

Next consider the ingredients. You will need the right mix of “browns” and “greens,” Browns are materials with high carbon (C) content, such as twigs, branches, and dried leaves that are needed to help feed the bacteria that are breaking down the materials. Greens are materials such as grass clipping that are full of nitrogen (N). The correct ratio of C:N is important to maintain a good compost pile. Too much carbon may cause the pile to heat too fast not allowing the bacteria to do its job. An improper ratio can also affect the quality of nutrients in the compost. A rule of thumb is to use approximately 25-30 parts “brown” materials to one part green materials.¹⁷

To make sure that you have the ingredients on hand you will need to have holding bins or a suitable place to stockpile the materials. Store the browns, greens, and food waste separately. These bins or stockpiles should be covered and protected from moisture. Do not seal up grass clippings. Make sure that they are placed in an aerated hold bin or pile.

You can make the batch as big as you want, but remember, once you start the batch you cannot add anymore ingredients. Any new materials will have to be held until you are ready to make a new batch. A basic compost recipe is as follows:

- 1 Place the coarsest material such as stalks, twigs, hay and large weeds at the bottom. This layer should be about 3 inches thick.
- 2 Add 2-3 inches of “greens” topped with 2-3 inches of dry “browns.”
- 3 Moisten by using a spray nozzle.
- 4 Repeat with alternating layers of “greens” and browns” remembering to sprinkle with water after each “brown” layer until the bin is full. Do not overwater. You just want to dampen the pile.
- 5 Cover the pile to retain moisture and heat. The cover should also be able to keep out pests while still allowing air flow.

Check the compost pile weekly. Use a pitchfork to turn the materials



Image courtesy of Susan Ask.

to add air and better incorporate materials. Another option to this would be to purchase a rotating compost bin from a garden center or on-line. Add water as necessary to keep the pile damp. In about two to three months the volume in the bin should have been reduced by about a half. It should also start to look like dirt or soil. When it is ready, generally after three months, you should be able to start drawing good compost from the bottom of the pile.

Overwintering Your Compost Pile

Before the ground freezes, you should empty as much material as you can from your compost pile. If you have unfinished compost you can place it in garden beds under a layer of soil. Store finished compost in a dry place so it is ready to use in the spring. Keep a small layer of finished compost on the bottom of the pile to ready it for spring activities.



Putting Worms to Work

Vermicomposting or worm composting is an easy way to turn food wastes into a nutrient rich soil amendment. This method of composting is especially useful for families with little or no yard space. Worms like to feed on slowly decomposing organic materials like fruit and vegetable scraps. The worms produce castings that are full of beneficial microbes and nutrients, which make a great plant fertilizer. Worms are very efficient at breaking down food scraps and can eat over half their body weight in organic matter every day.

The equipment needed to vermicompost is minimal. You can purchase a premade vermicomposter or you can make one at home using a plastic tote storage box. Material lists and “how-to” instructions are readily available online and can be found with a simple internet search. Alternatively contact your county Soil and Water Conservation District or University County Extension office to see what information they might have available. Some may even offer workshops on creating your own vermicomposter.

Using the Compost

Compost is finished when it looks like a rich dark soil that crumbles easily and has a good loamy smell. Compost, unlike other soil amendments can be worked into the soil anytime of the year without risk of burning the plants. You can either mix in one to three inches of compost into the soil or simply spread the compost in a thick layer around new plants. To use the compost as a lawn top dressing, simply rake in a loose layer over the lawn in the spring and fall. Compost can be used with indoor plants as well. Use caution in where you place your compost based on the sources of material that you composted (ex. grass clipping with herbicide and seedy weed material).

Composting, mulching, vermicomposting, and leave-it-lay are all great methods to increase the health of your lawn and garden, and reduce your dependence on chemicals, as well as your costs. Taking a “greener” approach to gardening does not need to be all or nothing. Start with small simple steps. Purchase a premade composter and work with your yard wastes a little bit at a time. Play around with some worms. Vermicomposting is a great experiment for children. And work smarter, not harder. Let the earth do its thing and recycle your grass clippings on site.

¹⁷ Household Composting: Methods and Uses for Compost (HENV-103-W), Purdue Extension. <http://www.ces.purdue.edu/extmedia/HENV/HENV-103-W.pdf>.



Landscaping for Wildlife Habitat

Have you noticed a decrease in the number of butterflies, dragonflies, or other wildlife in your neighborhood? Across the globe wildlife populations are on a decline due to increasingly fragmented habitat resulting from human development. Generally, habitat includes all the plants, trees, bushes, logs and other amenities that provide food and cover for wildlife. When we develop land we convert once connected habitat into small isolated pockets, making it difficult for wildlife to travel.

Fortunately, property owners can provide wildlife habitat by landscaping with native plants and trees which, in addition to providing habitat, also enhance water quality. Native plants are plants that grow naturally in a region such as northern Illinois and Indiana. These plants have had thousands of years to adapt to their surroundings and can therefore survive extreme weather conditions and disease better than your average ornamental plant. They also have longer roots that can soak up and filter water. But of more importance here, wildlife has also adapted to their surroundings and they depend on these native plants for their survival. For example, native plants provide butterflies with the nectar and foliage they need as caterpillars and adults. Adult butterflies may accidentally mistake non-native, ornamental plants for a good egg-laying site when in fact they do not always provide adequate amenities to support the species.

In order to survive, wildlife requires access to water, food, cover, and places to bare young. With a few simple steps, property owners can help provide these essential habitat components. This section uses a framework created by the National Wildlife Federation to briefly describe the amenities necessary to develop wildlife habitat. However, it is not comprehensive. Once you have a general understanding of the basic habitat components listed here, a simple internet search can shed light on the needs required by your favorite wildlife. With that information you can recreate habitat using human-made and natural materials. Recreating wildlife habitat is about creating a place for the entire life-cycle of a species. While this requires a bit of effort on your part, you'll be rewarded with an abundance of wildlife to enjoy.

Plants for Pollinators

The following list of perennial flowers, shrubs, and trees are just a few of the many options available to landowners to incorporate into their landscape to provide shelter and food for a variety of pollinators.

| PERENNIAL FLOWERS: | TREES & SHRUBS: |
|------------------------|------------------|
| • Sunflowers | • Maples |
| • Joe-Pye-Weed | • Service Berry |
| • Beebalm | • Dogwood |
| • Goldenrods | • Eastern Redbud |
| • Tickseed (Coreopsis) | • Sumacs |
| • Black-Eyed Susans | • Viburnum |
| • Spiderwort | |

For more information please see *“Selecting Plants for Pollinators: A Regional Guide for Farmers, Land Managers, and Gardeners”* available at <http://pollinator.org/>.



Image courtesy of Amy Roth.

Supply Water for Wildlife

Wildlife requires sources of clean water for many purposes including drinking, bathing, and reproduction. Water sources may include natural features such as ponds, lakes, rivers, and wetlands. In the absence of natural features, human-made features such as bird baths, installed ponds, or rain gardens work well as substitutes.

Provide Food for Wildlife

Native forbs (an herbaceous flowering plant other than grasses, sedges, and rushes), shrubs and trees provide the foliage, nectar, pollen, berries, seeds, and nuts that many species of wildlife require to survive. While non-native plants may have many of these features, the timing of their pollination and seed dispersal may not coincide with local wildlife feeding and breeding patterns. Taking this into account, many landscapers utilize native plants and plant for continuous bloom (the selection of a variety of plants so that a garden is in bloom throughout the growing season). Such a practice will ensure both adequate food resources for wildlife throughout the season and a longer period in which to enjoy a vibrant garden. Ask your landscaper or local nursery for more information on selecting plants for continuous bloom.

Provide Cover and other Essentials

Wildlife needs cover to hide from predators and inclement weather. Native vegetation acts as a perfect cover for terrestrial wildlife. Shrubs, thickets, and brush piles provide great hiding places as do fallen trees and branches. If natural options are not available, consider creating a simple structure to meet the habitat needs of your favorite wildlife. For example, butterflies need flat areas to bask in the sun. Therefore, by incorporating stone pavers into your landscaping you are helping to meet the needs of this species. Also, human-made structures, such as ponds, provide cover for aquatic life and amphibians. These are just two examples of how property owners can create cover and other essentials for wildlife habitat.



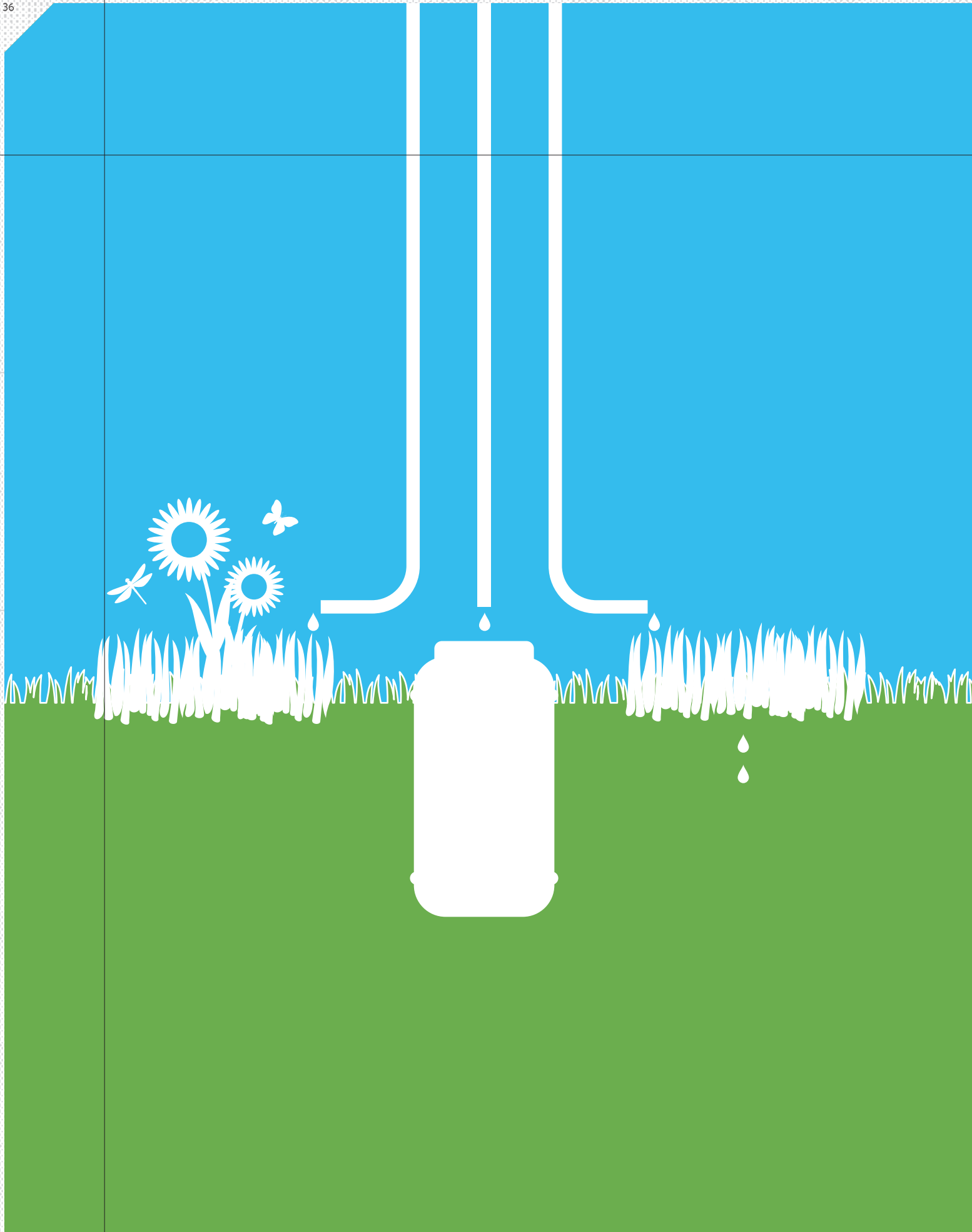
Image courtesy of Victoria Kinder.

Give Wildlife a Place to Raise their Young

It's great to have butterflies, dragonflies, and other wildlife pass through your property, but how can you keep them there longer for your viewing pleasure? For one, you can provide places for wildlife to raise their young. By incorporating the right habitat features into your property you can contribute to the reproductive success of your favorite wildlife year after year.

For instance, female butterflies lay eggs on plant species that their offspring will eat, so including favored host plants in your habitat helps ensure reproductive success. Also, avoid pesticides and herbicides, which kill not only target species but also beneficial insects and the foods they rely on in order to reproduce.





Rain Friendly Landscaping

Under natural conditions, most rainfall soaks in where it falls and is naturally filtered by plants and soil. Urbanization has led to an increase in impervious surfaces (hard, paved surfaces that water can't soak through). Precipitation runs quickly across these impervious surface and into nearby streams or stormdrains. Along the way the precipitation, now considered runoff, picks up and carries whatever pollutants it encounters, such as lawn chemicals. There are many simple steps you can take to reduce the amount of water that runs off your property, as well as the amount of pollution it carries. Even if you don't think you live near water, a stormdrain might channel your runoff quickly to a stream. Many of the practices listed below use soil and native plants to naturally absorb and filter runoff. Refer to the Right Plant, Right Place section of this guidebook for more information about native plants.

Buffer Strips

Do you have water on your property — a pond, a stream, wetland, even a channel that only flows after a rain? If so, consider buffer strips to protect these waterways from runoff and erosion. Buffer strips are best planted densely with native plants and can either be herbaceous (grasses and wildflowers) or woody (trees and shrubs). Plants in the buffer soak up water and filter pollutants before the runoff enters the waterway. The deep roots of the plants hold soil in place, stabilizing banks from erosion. The wider the buffer the better, but even a narrow buffer will help protect the waterway. In addition to water quality benefits, the buffer strip will save you from mowing along the waterway and provide habitat for aquatic wildlife. Can't afford new plants right now? Simply stop mowing the area along the waterway and see what starts to grow.



Image courtesy of Lake Champlain Sea Grant.

Rain Gardens

A rain garden is simply a shallow depression planted with deep-rooted native plants. Water from your property is directed toward the garden where it temporarily collects after a rain. Pollutants are filtered naturally as the water soaks into the soil or is absorbed by the plant. Creating a rain garden is not complicated. Place the garden in an area where it can accept runoff from your rooftop, driveway, or lawn. Consider diverting your downspouts or sump pump outlet to the rain garden. Dig a shallow depression with a level base so water can spread out and soak in evenly. Maintaining a perimeter of turf grass around the rain garden can be maintained as a pre-filter to treat runoff and to help prevent soil erosion. If your soil doesn't drain quickly, consider amending the soils by mixing in sand, gravel and compost to improve drainage. Select and plant beautiful native plants that are adapted to your soil, moisture, and sun conditions. Spread mulch around the plants to prevent weeds and retain moisture. The rain garden should drain within two days.

Swales

A swale is similar to a rain garden in that it is a shallow depression planted with native plants. However, a swale conveys water from one point to another. Do you have an area of your property where water flows after a storm? Planting this area as a swale can slow the runoff and reduce erosion.

Critical Area Plantings

Do you have areas on your property where turf grass just won't grow? Maybe the area is too wet, too dry, too shady, or too steep? Whatever your problem, there are probably native plants adapted to the conditions. For example, if a patch of your property is too low and wet to grow turf grass, consider planting wetland plants. These plants will help to take up the water and may thrive where turf grass did not. Woodland wildflowers might love that shady area under your Oak Tree. Deep-rooted native plants can stabilize a steep slope, preventing erosion.

Minimize Impervious Surfaces

Minimize the amount of impervious surfaces (hard paved surfaces that water can't soak through) in your property. Thinking of adding a new patio? Consider using brick pavers. Cracks between the bricks allow water to soak into the ground. Time to replace your driveway? There are materials on the market that look just like regular asphalt or concrete, but allow water to soak through. Or consider gravel instead. For areas that you can't make pervious, such as your rooftop, direct the runoff into a rain garden or area where it can soak in, rather than to the road or a storm drain.

Don't Over Water

Remember, water that doesn't soak into the ground or get soaked up by plants can run off of your property carrying pollutants. Refer to the Landscape Water Conservation section of this guidebook for tips on watering efficiently to avoid overwatering and generating runoff.

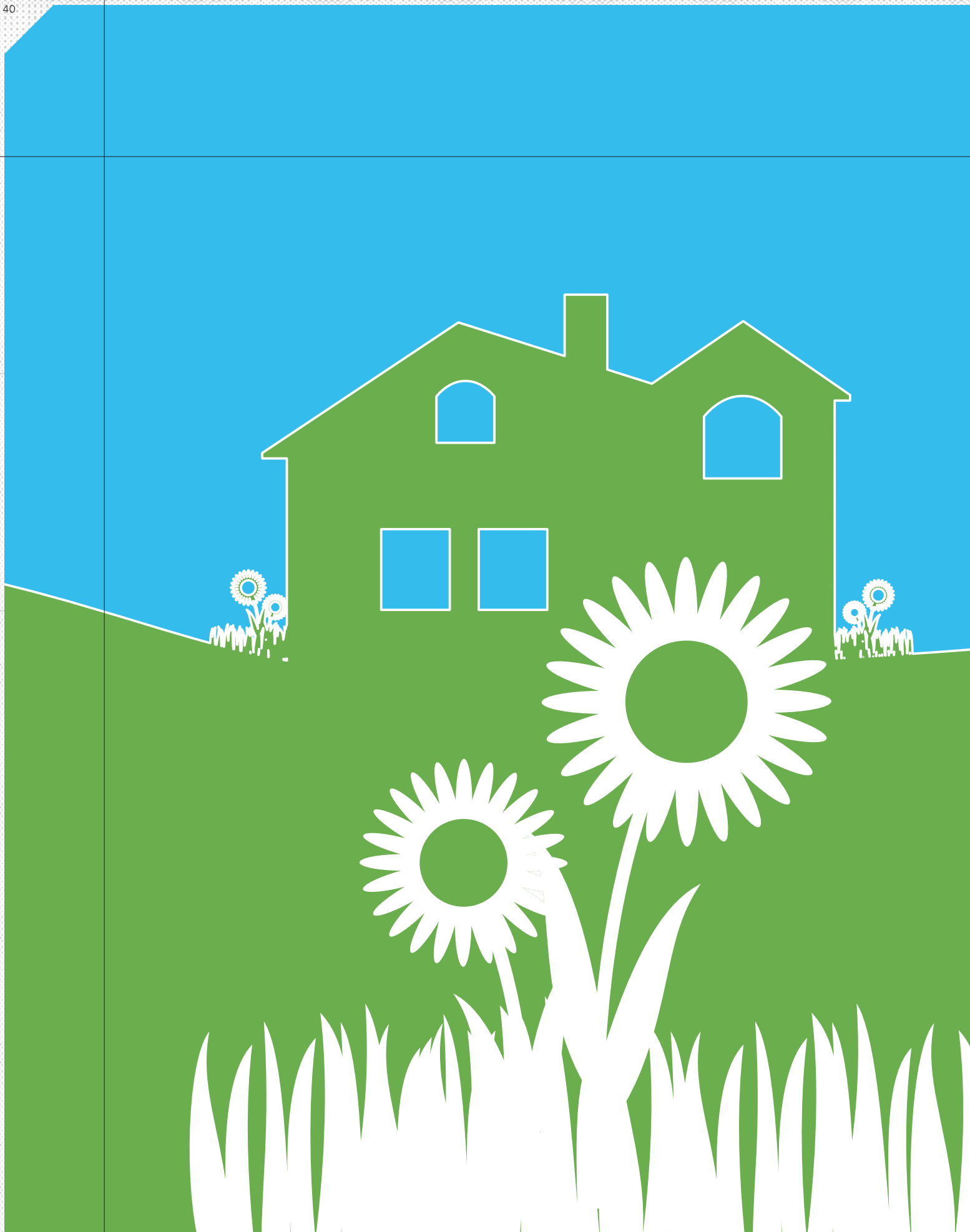
Reduce Pollutants

Remember that whatever is on your lawn — fertilizer, pesticide, pet waste, yard clippings — can leave your lawn with runoff. The overall goal of the L2L Program is to reduce the amount of pollutants from reaching our waterways. Refer to The Pesticides section of this guidebook for tips on appropriate use of lawn chemicals.



Rain Barrels

A rain barrel is a container used to capture water that runs off your roof so that you can reuse it later. The barrels vary in shape, size, and style, but all contain similar features: a hole at the top to allow water in from your downspout, a screen to keep bugs and debris out of the opening, a spigot to release water from the bottom, and an overflow mechanism to divert extra water away from your foundation. The barrels work best when elevated a few feet to allow pressure for releasing the water. Consider threading a soaker hose through your landscaping to automatically irrigate your plants when the spigot is opened. You can purchase a barrel for about \$100 or make your own from a recycled barrel. Be sure to use the water around your property — water your plants or wash the car — so that the barrel is empty to collect the next storm.



Landscaping and Property Values

If you're a property owner, chances are you've undertaken a landscaping project to enhance your property's esthetic appeal. But in addition to beautifying property, landscaping has the potential to increase property values and accelerate a home's sale. Research demonstrates that landscaped properties consistently have a positive effect on selling price. Therefore, potential buyers place a premium on completed landscapes.

In one study by the University of Michigan, researchers reported that people are willing to pay more for well-designed properties with mostly native plants than for properties dominated by lawn.¹⁸ For instance, a study conducted by the University of Vermont found that landscaping can add as much as 15 percent to your homes resale value. Additionally, by spending 5 percent of your home value on landscaping you may see a 150 percent or more return on your investment upon sale.¹⁹

Another study by Clemson University documented the impact of landscaping on resale value of single family residences. A house that obtained an "excellent" landscape rating from a local landscaping professional could expect a sale price 4 to 5 percent higher than equivalent houses with "good" landscaping. Homes with landscaping ranked as "poor" could expect a sale price 8 to 10 percent below equivalent homes with good landscape appeal.²⁰ Overall, studies consistently find that landscaping can add anywhere from 3 – 20 percent to your homes selling price depending on geographic region, neighborhood type and many other variables.

18 Heifand, Gloria E. et al. "The economics of native plants in residential landscape designs". *Landscape and Urban Planning* 78 (2006): 229 - 240. Print.

19 Perry, Dr. Leonard. "The Economic Value of Landscaping." *The Green Mountain Gardener: Anytime News Article*. University of Vermont Extension. Department of Plant and Soil Science. Web. 4 Oct. 2011. <http://perrysperennials.info/articles/econvalue.html>.

20 Henry, Mark S. "The contribution of Landscaping to the Price of Single Family Houses: A Study of Home Sales in Greenville, South Carolina." *Journal of Environmental Horticulture* 12(2)(1994): 65-70.

A second reason landscaping can have a positive effect on selling price is that a landscaped property may decrease the time it takes to sell your home. A study completed by the National Association of Realtors found that the longer a home sits on the market, the lower its selling price.²¹ Since we know property owners place a high value on landscaping, a landscaped property may sell quicker and at a premium compared to non-landscaped properties.

In addition to having a positive effect on selling price, properly selected and placed plants can lower costs for heating and cooling homes by up to 20 percent or more.²² Benefits vary based on the orientation and size of the plantings, as well as their distance from a building. For instance, large trees planted close to the west side of a building will generally provide greater cooling energy savings than other plants. The U.S. Department of Energy recommends four landscaping objectives based on our particular climate to help reduce your homes energy: 1) maximize warming effects of the sun in the winter, 2) maximize shade during the summer, 3) deflect winter winds, and 4) funnel summer breezes toward the home.²³

In addition to energy savings, landscaping can also reduce water usage costs. According to the U.S. Environmental Protection Agency, the average U.S. household uses about 30 percent of its water outdoors. Using native plants appropriate for a property can reduce outdoor water use by 20 to 50 percent, reports the agency.²⁴ In contrast, many grass lawns require a lot of water because they are usually non-native and have therefore not adapted to the conditions in our region. For example, grass lawns cannot survive drought or disease as well as native plants that have adapted to such conditions. Additionally, native plants do not require fertilizer and the costs associated with its use.

The financial benefits from landscaping depend on many variables such as those mentioned above. But one thing is certain; research has proven that no matter your situation, landscaping positively effects the value of your home and the potential for energy savings is very real. Consider these facts when considering the design of your next landscape project.



Image courtesy of Susan Ask.

21 Sirmans, Stacy et al. "The Value of Housing Characteristics." *National Center for Real Estate Research* (2003): 33. Print.

22 Perry, Dr. Leonard. "The Economic Value of Landscaping." *The Green Mountain Gardener: Anytime News Article*. University of Vermont Extension. Department of Plant and Soil Science. Web. 4 Oct. 2011. <http://perrysperennials.info/articles/econvalue.html>.

23 U.S. Department of Energy. *Your Home, Landscaping*. Feb. 2011. Web. 9 Oct. 2011.

24 U.S. Environmental Protection Agency. *Outdoor. Water Use in the United States*. Aug. 2008. Print.

How big should you make your rain garden?

Rain gardens can come in all shapes and sizes. As with a conventional garden, property owners can tailor the size of their rain garden to the space they have available and the amount of time they want to spend creating and maintaining it. However, rain gardens serve a somewhat different purpose from conventional gardens. Though both features can be aesthetically pleasing, rain gardens help prevent flooding and water contamination by absorbing and filtering rainwater. As rain gardens become increasingly popular, property owners often wish to take full advantage of this ability in order to avoid problems such as basement flooding and ponding — but how large should a rain garden be in order to absorb 100% of a property's drainage?

We don't have an exact answer, but there is a way to estimate the necessary rain garden size to accomplish this goal. We'll focus on drainage from the rooftop, since that often represents the main source of rainwater that would run off into a rain garden.

First, you should identify the portions of roof that will drain in the direction of the garden. Multiply the length of each section of roof by its width; then, add up the results to get the total square footage of roof that will drain into your garden.

Then, you should assess the land where you would like to install your rain garden. You'll need to determine your soil type. Conduct a soil ribbon test as shown in "Know Your Soil" (pg. XX) to find out whether you have sand, silt, or clay soil.

Make sure this area is suitable for a rain garden by testing how quickly water can infiltrate ("Test Your Drainage," pg. XX). If your water-filled hole drains within 24 hours, you can put a rain garden there. You'll have to figure out the slope of this land, as well. To do so, insert two stakes into the land — one downhill, and one uphill (see diagram below). Use the height of the downhill stake and the level width between the two stakes to complete the following calculation:

$$\frac{\text{height}}{\text{width}} \times 100 = \% \text{ slope}$$

Once you know the slope, you can determine the depth of the rain garden:

| SLOPE | DEPTH |
|-------|--------|
| < 4% | 3-5 in |
| 5-7% | 6-7in |
| 8-12% | 8 in+ |

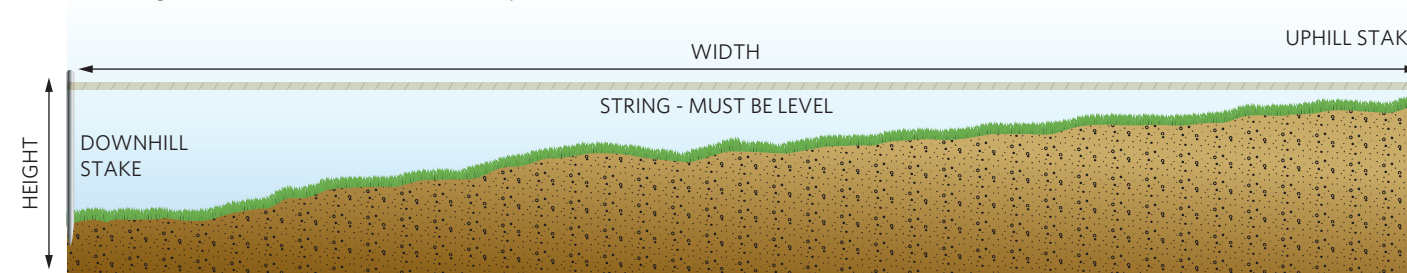
Then, use the depth and your soil type to find a size factor:

| DEPTH | 3-5 IN | 6-7 IN | 8 IN + |
|-------|--------|--------|--------|
| SAND | 0.19 | 0.15 | 0.08 |
| SILT | 0.34 | 0.25 | 0.16 |
| CLAY | 0.43 | 0.32 | 0.20 |

Finally, use the size factor for your required garden depth and soil type, as well as the drainage area from your roof that you found earlier, to estimate the necessary size of your rain garden:

$$\text{Size Factor} \times \text{Drainage Area (sq. ft.)} = \text{Size of Garden (sq. ft.)}$$

The string should be tied to the base of the uphill stake, then tied to the downhill stake at the same level.



| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--------|--------|---------|-----------|----------|--------|----------|
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |

Natural Lawn Care Calendar for Homeowners

The following table can be used by homeowners to help guide them through when some of the typical natural lawn care practices should be done over the course of a year.

Table 2 Natural Lawn Care Calendar for Homeowners

| | |
|-----------|---|
| March | Sharpen mower blades. Clean up winter debris (leaves, twigs, etc.). |
| April | Mowing – remove only 1/3 of the leaf blade or less at a time. First mowing – grass height of 2 inches. Regular mowing – grass height of 3 inches (or taller). Apply corn gluten in early April to prevent weed seeds from germinating. Hand pull or spot spray weeds with an organic herbicide. Fill in bare spots with a 50/50 mix of compost and soil, and seed with grass. Apply compost tea to entire lawn. |
| May | Test soil for pH and nutrients. First fertilization — top dress with a compost/soil mix OR fertilize with a natural organic fertilizer. Aerate lawn. Grub control — apply beneficial nematodes or milky spore (Japanese beetle grubs only). |
| June | Begin irrigation as needed applying 1 to 1 1/2 inches of water in the a.m. Recycle grass clippings on your lawn or in a compost bin. Hand pull or spot spray weeds. Apply compost tea to entire lawn. Insect problems — tolerate some; use natural controls, organic insecticide or appropriate least-toxic pesticide. |
| July | Fertilize (1st through the 15th) — slow release (natural organic) at half rate so as not to promote excessive growth and disease. Look for signs of weed, disease or pest problems — address underlying soil or turf health issues. |
| August | Look for signs of weed, disease or pest problems — address underlying soil or turf health issues. Continue irrigation or allow lawn to go dormant. Over seed entire lawn (after the 15th). |
| September | Limit irrigation. Aerate as needed (grass should be actively growing). Fertilize (1st through the 15th). |
| October | Late season fertilization — generally 1 week before final mowing of the year. |
| November | Mow until lawn goes dormant. Last mowing — grass height of 2 inches. Apply compost tea to entire lawn. |
| December | Reduce lawn traffic — let it rest through February. |

Source: Adapted from Safer Pest Control Project- Natural Lawn Care for Homeowners Calendar & Modified with Feedback from Dr. Aaron Patton- Purdue University, Turfgrass Extension Specialist

Additional Online Resources

The following are just a few of the many additional resources available to property owners and businesses wanting to dig a little deeper into sustainable lawn and property care practices.

Native Plants & Trees

Indiana Native Plant & Wildflower Society
www.inpaws.org/

Illinois Native Plant Society
<http://ill-inps.org/>

Plant Native
www.plantnative.org/index.htm

Indiana DNR- Division of Forestry
www.in.gov/dnr/forestry/3605.htm

Illinois DNR- Division of Forestry
<http://dnr.state.il.us/conservation/forestry/>

Univ. IL Extension- Forestry
http://web.extension.illinois.edu/forestry/useful_links.html

Lawn Care

Purdue University Turf Tips
<http://purdueturftips.blogspot.com/>

University of Illinois Extension- Lawn Talk
<http://urbanext.illinois.edu/lawntalk/>

Safer Pest Control Project
www.spcpweb.org

Pest Management

North Central IPM Center
www.ncipmc.org/index.cfm

Safer Pest Control Project
www.spcpweb.org

University Extension Service

University of Illinois Extension Service
<http://web.extension.illinois.edu/state/>

Purdue University Extension Service
www.ag.purdue.edu/extension/pages/default.aspx

Purdue County Extension Service Offices
www.ag.purdue.edu/extension/Pages/Counties.aspx

Illinois County Extension Service Offices
<http://web.extension.illinois.edu/state/findoffice.html>

Rain Gardens

Indiana Coastal Area Rain Garden Documents
www.in.gov/dnr/lakemich/6084.htm

Wisconsin DNR Rain Garden Website Links
www.dnr.state.wi.us/runoff/rg/links.htm

Soil & Water Conservation Districts

Indiana SWCD Offices
www.iaswcd.org/pdfs/IndianaSWCDoffices2011.pdf

Illinois SWCD Offices
www.agr.state.il.us/Environment/LandWater/swcddirectory.pdf



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Sea Grant

ILLINOIS - INDIANA

Illinois-Indiana Sea Grant Program

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www.lawntogreatlakes.org