THE TENNESSEE YARDSTICK WORKBOOK

Does your yard measure up?

By adopting these simple actions, you can save time and money, make your yard the best it can be, and protect Tennessee's water resources.

TENNESSEE SMART YARDS

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Acknowledgments

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Tennessee Water Resources Research Center

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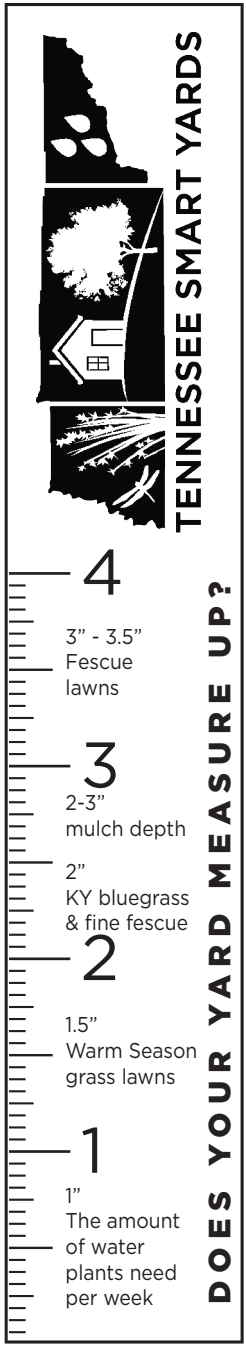


Every inch makes a difference. Whether it's mulching, mowing your lawn or calibrating your irrigation system, a simple ruler can help you do it right.

INTRODUCTION

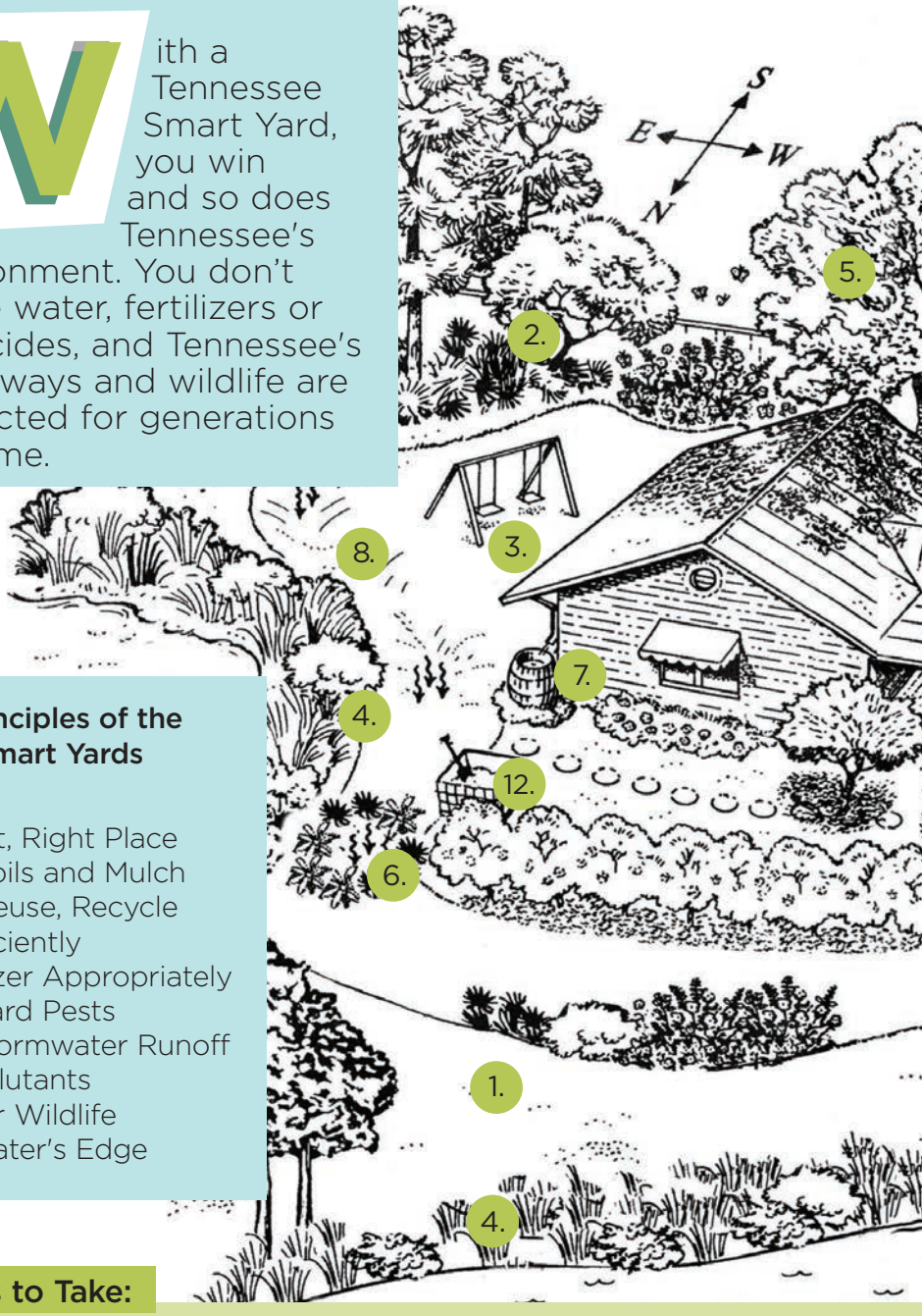
There's no doubt about it. Successful garden and lawn care in Tennessee requires special knowledge and skills. The Tennessee Yardstick Workbook shows you how to create attractive and healthy yards by working with Tennessee's environment rather than against it.

This Workbook guides you through an evaluation of your yard and yard care practices. Each action you take (or have already taken) earns you "inches" on the Tennessee Yardstick. A yard that measures up to at least 36 inches is a Tennessee Smart Yard! What is the payoff? It is a yard that meets your needs, enhances your community and helps protect Tennessee's beauty and natural resources.

The Tennessee Extension professionals and Master Gardeners at your county's Extension office along with your municipal stormwater professionals can provide you with more information and answer questions. They can also tell you about additional services they may provide such as diagnostic tests, workshops and on-site resources.

Remember, Rome wasn't built in a day and neither is a Tennessee Smart Yard. Take this adventure a step at a time and have fun!

With a Tennessee Smart Yard, you win and so does Tennessee's environment. You don't waste water, fertilizers or pesticides, and Tennessee's waterways and wildlife are protected for generations to come.



The Nine Principles of the Tennessee Smart Yards Program:

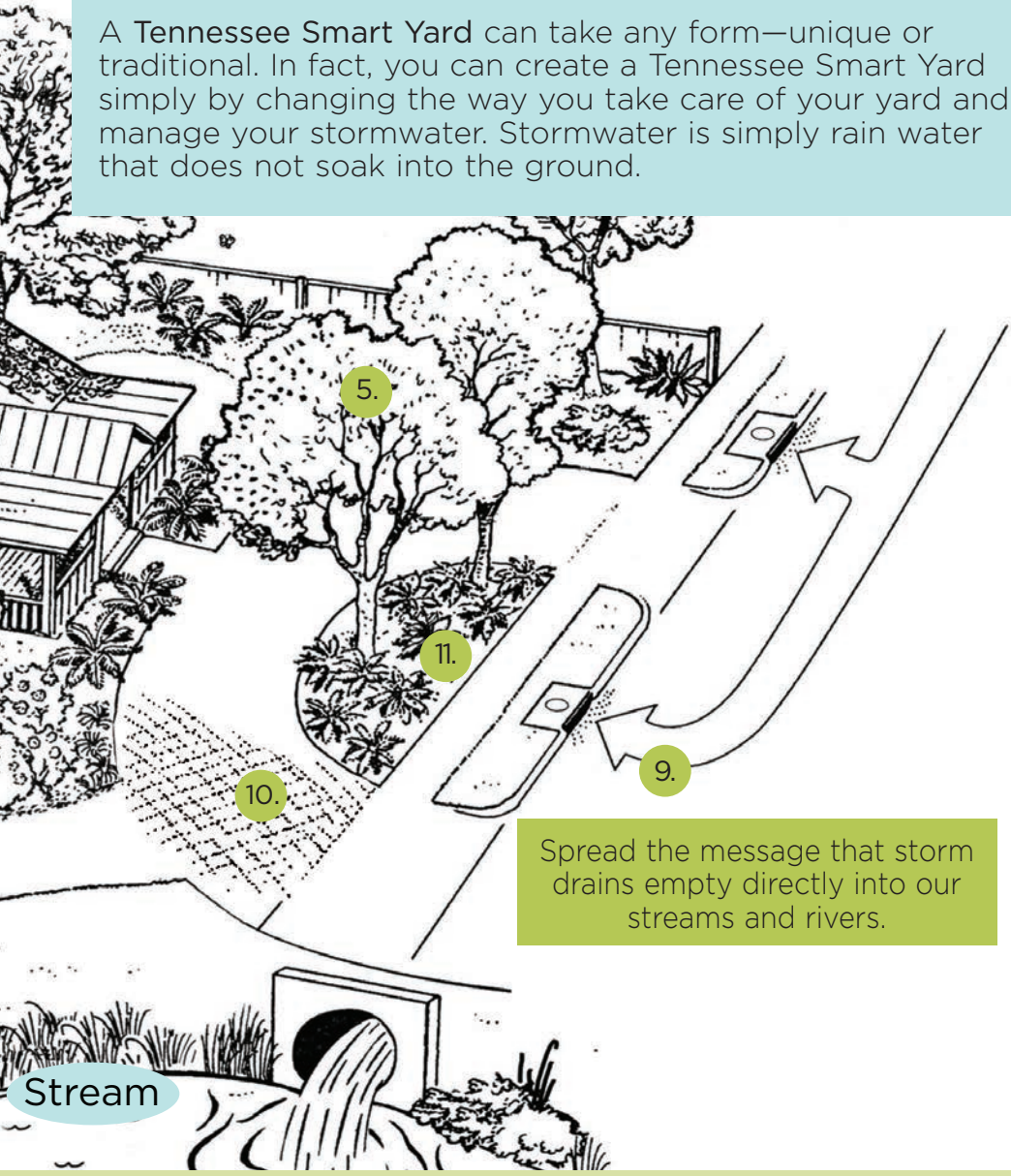
- Right Plant, Right Place
- Manage Soils and Mulch
- Reduce, Reuse, Recycle
- Water Efficiently
- Use Fertilizer Appropriately
- Manage Yard Pests
- Reduce Stormwater Runoff and its Pollutants
- Provide for Wildlife
- Protect Water's Edge

Actions to Take:

1. Test your soil and plant properly
2. Create wildlife habitat
3. Make lawn area practical
4. Install, enhance and protect vegetated buffers along the water's edge
5. Plant deciduous trees to shade southern and western sides of home
6. Divert stormwater runoff to a rain garden
7. Catch rainwater using rain barrels and use for watering plants or washing

WHAT DOES A TENNESSEE SMART YARD LOOK LIKE?

A Tennessee Smart Yard can take any form—unique or traditional. In fact, you can create a Tennessee Smart Yard simply by changing the way you take care of your yard and manage your stormwater. Stormwater is simply rain water that does not soak into the ground.



8. Chose grassy swales over concrete, rock, and other impervious materials to direct stormwater
9. Keep street gutters and stormdrains clear of lose dirt, leaves, grass clippings and other debris
10. Use porous surfaces, such as gravel driveways and mulched paths, to allow stormwater to soak into the ground
11. Mulch plant beds
12. Compost yard waste

Right Plant, Right Place

Good landscape design hinges on one basic concept—the right plant planted in the right place. Careful planning and site evaluation are the first steps in applying this concept. The following checklists will guide you through some important considerations and decisions you should make when designing a landscaped area.

Resist (for now) the temptation to rush out and purchase plants. That will come later! First, you will need to evaluate your landscape. If you have an in-ground sprinkler system or are planning to put one in, make sure the designs for your landscape and sprinkler system match each other. Better yet, select plants based on their ability to survive and thrive on rainfall alone.

Tennessee is a diverse state which includes different ecoregions. Geology, soil types, temperature and rainfall patterns are dramatically different from the Appalachians to the Mississippi delta and the places between. A plant that thrives in a friend's yard in the mountains may struggle in your yard in the valley. Different conditions often exist in the same yard, creating microclimates. The front yard may be high and dry, while the backyard may be poorly drained and soggy. The way your soil was managed during home construction also plays a large part in your landscape conditions.

Once you know your landscape conditions and have decided how you will use your yard, you are ready to begin the design process. Consider your time, skills and resources--you may need to hire a landscape design professional at this point. Prioritize your landscape projects and then work on them one at a time in order to make the best possible use of resources.

1. **Determine your needs for a particular area. Here are a few suggestions:**

- Recreation (barbecue, outdoor sports, etc.)
- Garden (fruit, vegetable, flower)
- Screening
- Wildlife habitat (butterfly garden, brush piles, pond, etc.)
- Rain gardens; rain barrels
- Space for pets; storage buildings
- Pool, spa, hot tub

2. **Determine how much maintenance you want to put into your yard (Time needed for mowing, pruning and weeding; requirements for water, fertilizer and pesticides)**

____ high
____ medium
____ low

3. **Determine the site conditions in your yard**

____ full shade
____ partly shaded
____ sunny

____ sandy soil
____ loam soil
____ clay soil

____ well-drained soil
____ poorly drained soil
____ compacted soil

____ alkaline soil
____ acidic soil
____ neutral soil

Your county's Extension office can give you information on how to collect a soil sample for pH, nutrient levels, organic matter and fertilizer recommendations.

TENNESSEE SMART YARD ACTIONS:

☐ Determine your family's landscape objectives (e.g., entertainment areas, play areas) and level of maintenance desired. (e.g., extent of mowing) Value: 2 inches

☐ Assess yard site conditions (e.g., light availability, soil characteristics, topography, drainage patterns) and incorporate into sketch. Value: 2 inches

☐ Sketch your yard including long-term goals. (e.g., space use, aesthetics, level of maintenance) Value: 2 inches

☐ Group plants according to site conditions and their maintenance needs. Value: 2 inches

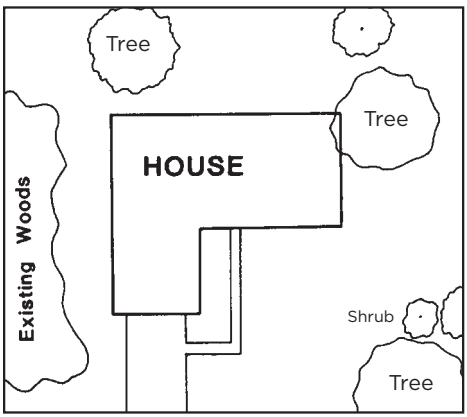
☐ Remove or avoid using invasive/exotic plants and incorporate native plants. Value: 2 inches

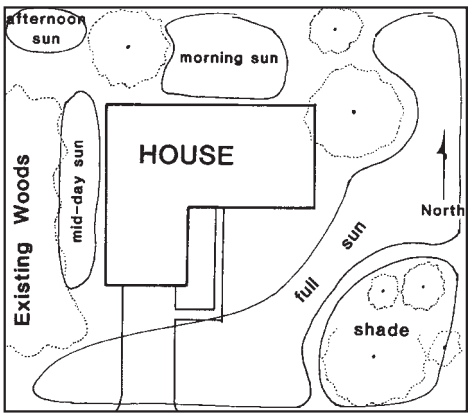
☐ Preserve existing vegetation, especially trees, during land disturbance activities. Value: 2 inches

____ Total Inches

4. Create your landscape design plan

Draw your landscape design to scale. Use graph paper to help with spacing. Be sure to indicate where activities will take place, future plans for additions to your home and space for outdoor activities and pets. Don't forget to add irrigation zones if you have an in-ground system.





Indicate existing plants you want to keep, then note landscape conditions including number of hours of sun in each area, wet or dry areas, steep slopes and drainage patterns. Add overhead and underground utilities and pipes, views you would like to screen and sounds you would like to soften.

5. Choose plants with characteristics that meet your yard's needs, considering:

moisture tolerance
native or not
light exposure
hardiness
plant type
mature height and width

6. Choose plants to meet your family's needs, considering:

bloom time
growth rate
edible fruit
leaf color
wildlife food source
maintenance
evergreen/deciduous
flower color
bark characteristics
fragrance

The Top Five Common Mistakes in Landscape Plantings

Mistake #1: Over-planting.

Trees and shrubs are often planted too close together to get a "full" look. The result several years later is a crowded landscape that stresses plants. Plants must be removed or drastically pruned to reduce competition and increase air circulation.

Solution #1: Resist the temptation to have an "instant landscape." Know the mature size of plants and give them room, and time, to grow into their proper mature size.

Mistake #2: Plants around the home are too tall.

When plants grow too tall, they cover windows and no longer enhance the home's appearance. We usually try to compensate for this "mis-planting" by shearing to control the plant size. This constant shearing weakens and disfigures plants. It also creates extra work and yard waste.

Solution #2: Select plants with a mature size that fits their location. To keep the plant neat and healthy, follow proper pruning recommendations.

Mistake #3: Drought tolerant and water-loving plants are planted in the same bed.

Water-loving plants can die if kept too dry and drought tolerant plants can die if kept too wet.

Solution #3: Group plants according to the amount of water they need. Over-watered plants wilt and die just like under-watered plants. Over-watering can lead to root rot diseases that are not easily cured.

First year planting (top) vs. fourth year (bottom)

Mistake #4: Plants are planted too close to the house.

Plants too close to the house have more pest and disease problems because of wet foliage and lack of air circulation. They also create a maintenance nightmare when it's time to repair or paint the house.

Solution #4: Foundation plants should be planted half their mature width plus one foot away from the house. Therefore, a shrub that will grow to be 5 feet wide should be planted 3 1/2 feet away from the house.

Mistake #5: Soil is not properly prepared before planting and proper planting techniques are not followed.

Plants can not be expected to thrive when planted in poor soil or incorrectly.

Solution #5: Not many plants grow in soils with a high clay content and low amounts of organic matter. Soil amendments should be incorporated into the existing soil. Follow UT Extension guidelines when planting.

Manage Soils and Mulches

Soil is not simply idle dirt!

Soil has many important functions. It acts like:

Sponges, soaking up rainwater and slowly releasing it–replenishing ground and surface water sources.

Supermarkets, providing valuable nutrients, air and water to plants and animals.

Our body's liver, trapping, filtering and degrading contaminants from stormwater runoff and from direct land applications of pesticides and other toxic compounds.

Soil paved over loses many of its functions.

These critical functions include those that can reduce flooding in our backyards, protect the health of our creeks and create a community rich in trees that shade us and cleanse our air.

Consider what you can do in your own backyard to compensate for soils that have been paved over or built upon. This may include replacing hard surfaces with ones that allow for rainwater to permeate (e.g., walkway built with pavers instead of concrete) or retaining stormwater to allow for infiltration (e.g., building a rain garden). Also consider becoming involved in the local land planning process to promote Smart Growth concepts.

Soils are naturally made up of air, water, organic matter and minerals. Unfortunately, our urban soils often have very few of the characteristics of the native soil before development. Newly constructed home sites typically have had most of their top soil removed while older homes have often developed biological and nutrient imbalances from years of misguided fertilizer and pesticide applications. Both new and old homesteads often have highly compacted soils, resulting in the loss of a critical structure needed to maintain plant growth. Planting without addressing these soil issues is a sure recipe for failure!

The goal of good soil management is to create a better environment for plant roots. Soil amendments and mulches are often needed to meet this challenge.

Soil amendments are any materials that are added to a soil to improve its physical, biological and chemical properties. Lime or sulphur, for example, may be needed to adjust the soil pH to maximize nutrient availability for plants. Compost may be needed to increase organic matter that feeds fungi, bacteria and other living creatures that are required to maintain a biologically active soil community.

Mulches are materials that are typically applied over the surface of the soil to reduce moisture loss, moderate soil temperatures, reduce erosion and suppress weeds. Not all mulches are created equal. Some are organic while others are not. Inorganic mulches include materials like gravel, stone, brick chips, and textile products. Organic ones can include bark materials, pine needles, compost, and paper. The added benefit of using organic mulch is that as it breaks down it can enrich the soil with organic matter.

Steps to Making a Healthy Soil

Creating healthy soils so that your plants and lawn may flourish requires planning one step at a time. Here are three to start you on your way.

Step One: Test It

Before fertilizing or making any other amendments to your soil, first check its current condition. Soil can be tested by the University of Tennessee Soil, Plant and Pest Center. From your end, you will be asked to collect a composite sample. Here is how it is done.

Collect small portions of soil at a depth of six inches from approximately 10 random locations that represent the average soil conditions for your planting areas (typically one for your yard and one for your gardens if soil is fairly uniform).

Mix the portions together in a clean plastic bucket to create the composite sample. If the soil is wet, allow it to dry before mixing. From this mixture, remove one cup of soil for your sample analysis. You can obtain a soil box to send your sample from the local extension office or you can use a padded envelope.

The Basic Test

Consider having a basic test conducted that includes your soil's pH.

Did you know? Healthy lawns typically require a pH of 6.0 to 6.5.

Step Two: Plan for It
A soil management plan can be kept simple. Writing it on a home family calendar will also serve as an important reminder of tasks to be done. Here are a few tips:

- Call your local Extension office for assistance in helping you interpret your soil analysis results and how the results translate into a scheduled list of specific tasks to be done over the course of a year.
- Keep reminders of ways you can continually enrich your soil by creating and adding homemade compost.

Step Three: Mulch It
Don't forget to protect and enrich it. The benefits of organic mulches and composts are well worth the effort of spreading them. Just how much mulch do you need to have the recommended depth of three inches?

By the bag:
1 bag containing 2 cu. ft. covers 8 sq. ft. (2 ft. x 4 ft.)

By the bale:
1 pine straw bale covers 18 to 20 sq. ft.
(5 ft. x 4 ft. or 10 ft. x 2 ft.)

By the yard:
1 cu. yd. covers 108 sq. ft. (9 ft. x 12 ft.)

By the truck load:
1 mini pickup holds 1.5 yds. & covers 162 sq. ft. (9 ft. x 18 ft.)
1 full-sized pickup holds 2.5 yds. & covers 270 sq. ft. (9 ft. x 30 ft.)

TENNESSEE SMART YARD ACTIONS

- ☐ Assess and address soil compaction. Value: 2 inches
- ☐ Maintain a 2-3 inch layer of mulch in plant beds and over tree and shrub roots, leaving at least 2 inches of space at the base of trunks. Value: 2 inches
- ☐ Use organic pine straw, pine bark, leaves, or hardwood mulch. Value: 2 inches
- ☐ Protect all soil surfaces with vegetation to minimize erosion by rainfall and runoff. Value: 2 inches

Reduce, Reuse, Recycle

Think about ways to reduce, reuse, and recycle materials in your landscape. Composting is one of the most effective ways to reuse yard waste and kitchen scraps in our landscapes. There are also creative and whimsical ideas that you can use to keep landscape materials in your yard and out of the landfill.

Composting Basics

Organics go in - like plants and kitchen scraps– along with water and oxygen. These support the living and breathing organisms who consume these organics and just like humans respire, releasing heat, carbon dioxide and more water.

When all these organisms are being well fed, they can really heat up – in fact, a well functioning compost system should have temperatures ranging from 90 to 140 degrees F. In addition, the pH of your compost will change over time. Early in the decomposition stages, organic acids are produced which are favorable for the growth of fungi that break down the tougher plant materials made of lignin and cellulose. As the composting process continues, the organic acids are neutralized with mature compost generally having a pH between 6 and 8.

The length of time it takes for stable compost to be formed depends on the microbes having prime living conditions. This includes having an infusion of oxygen and adding the right mix of organics.

Compost organics can be broken down into two groups, the greens and browns. The greens have needed nitrogen and break down easier while the browns are rich in carbon and give structural strength to the compost.

Greens	Browns
Egg shells	Wood chips
Coffee grounds	Paper
Vegetable waste	Leaves
Grass clippings	Pine needles
Cattle/Poultry manure	Straw

Things that should not be put into the compost pile:

- Dairy products
- Fats, grease, lard, oils
- Meats, seafood scraps
- Pet wastes
- Yard trimmings with chemical pesticides
- Perennial weed roots
- Charcoal ash
- Black walnut tree leaves or twigs
- Invasive plants like privet

How to create your compost pile:

- Locate in part to full sun
- Aim for a 3 ft. x 3 ft. pile, with a mix of greens and browns
- Add layers as collected (raking leaves, big week of vegetable consumption…)
- Aim to maintain a mix of greens and browns (Rule of thumb : 50-75% brown to 25-50% green)
- Turn periodically (1x/wk.)
- Water as needed, keeping lightly moistened

Leave grass clippings on your yard after mowing

Grass clippings are high in nitrogen. By leaving grass clippings on your lawn, you can fertilize one less time per year! (See "Use Fertilizer Appropriately" for more guidance on fertilizing practices.)

Using Salvage Materials in Your Landscape

Consider "waste" from inside to outside your home and how it might be used in your landscape.

Functional:

- newspaper or cardboard as bedding in your gardens to prevent weeds

Unique and useful:

- reusing branch debris or recycled bottles to make a fence or border to a garden
- old shoes or buckets as planters

TENNESSEE SMART YARD ACTIONS

- ☐ Leave grass clippings on lawn. Value: 2 inches
- ☐ Use composted grass clippings, leaves, pruned plant parts, kitchen scraps to improve soils. Value: 2 inches
- ☐ Locate plants to increase home energy efficiency. (e.g., deciduous trees on southwest of house to provide shade) Value: 2 inches
- ☐ Use landscape waste (tree trimmings, fallen leaves, pine needs, etc.) on site. Value: 2 inches
- ☐ Incorporate salvaged materials into landscaping. (e.g., newspaper in garden to suppress weed growth, repurposed wood for trellis) Value: 2 inches

___Total Inches

Water Efficiently

A truly efficient way to use water in a yard is to design the yard so that it thrives predominantly on rainfall. Even if your yard has lawn and specialty gardens, it is possible to design it as a Tennessee Smart Yard which requires minimal supplemental watering.

When planning your landscape, classify low, moderate and high water-use zones and select plants accordingly. Incorporate as many of the original undisturbed native plants in the landscape. They do not require the additional water that new plants need for establishment. Shade is also another great way to make the landscape more water efficient. When it comes to irrigation, it is extremely important that water be applied to meet the needs of plants in each of your zones.

For example, a lawn in full sun will demand more frequent irrigation than an established plant bed of shrubs and groundcover. One exception to the water-use zone rule is new plantings. These plants require regular water during the establishment period, regardless of their intended water-use zones. Plan to water landscapes during the morning, as less evaporation and wind drift occurs at this time and the plants can make more efficient use of the water.

Give your lawn a break during the summer! Avoid the temptation to keep your lawn green and growing year-round. Cool season lawns go semi-dormant in Tennessee from June through August. During this time, the lawn will only need watering during drought periods. Be aware of any watering restrictions in your area.

Let your plants tell you when they <u>need</u> water:

- Grass has a bluish-gray tint and rolled leaf blades.
- Annuals droop and don't recover by the next morning.
- Most plants thrive on 1 inch of water per week, including rainfall.
- Most established trees and shrubs need watering only during times of drought.

Plants can die from too much water just as easily as from too little water; and in both cases, symptoms include wilting.

It takes 1 inch of water to wet the typical Tennessee soil 6 inches deep.

Rain Barrels

Consider installing rain barrels to collect roof-top runoff. They are a great way to recycle water for use on your lawns and gardens. The water will also be free of chemicals and reduce your utility bill.

Most manufactured rain barrels for homes:

- range in cost from around $100 to $300
- range in size from 50 to 100 gallons
- are designed to keep mosquitoes out
- connect to gutter downspouts

TENNESSEE SMART YARD ACTIONS

- ☐ Use rain gauge to help monitor plant water needs; apply about one inch of water per week, taking into account rainfall. Value: 2 inches
- ☐ Use rain barrels to catch rooftop runoff. Value: 2 inches
- ☐ Adjust sprinkler heads to avoid hitting paved surfaces and calibrate the output as directed by plant needs. Value: 2 inches
- ☐ Mow grass high, creating deeper root systems and reducing water needs. Value: 2 inches

___ Total Inches

Rain barrels should be placed on a leveled base. A full 50 gallon rain barrel weighs about 460 pounds, making it a safety hazard if it topples over.

Effective Irrigation

Ineffective Irrigation

Use Fertilizer Appropriately

Most trees and landscape plants need little or no fertilizer once they are established. In fact, excess fertilizers can weaken plants and make them more vulnerable to insects and disease problems. Rainfall can also carry fertilizers from yards and paved areas, causing pollution in our waterways.

How much fertilizer should you apply?

Fertilizer labels always display three numbers in the same order (e.g. 10-6-4). They represent the percent by weight of three important nutrients:

- Nitrogen (N)—for green, leafy growth
- Phosphorus (P)—for root and bud growth
- Potassium (K)—promotes disease tolerance and drought tolerance

Example: A 40 lb. bag of 10-6-4 fertilizer has: 10% nitrogen (4 lbs.), 6% phosphate (2.4 lbs.) and 4% potassium, also called potash (1.6 lbs.).

Remember when selecting fertilizers to follow soil test recommendations.

Calculating the Amount of Fertilizer You Need

A typical lawn needs 1 lb. of nitrogen per 1,000 sq. ft. Here are some common lawn fertilizer formulations and the amount of each needed for 1 lb. of nitrogen:

For other formulations, follow this example using a fertilizer labeled 24-6-6:

- The first number is the % of nitrogen—24%.
- To find out how much total product it takes to apply 1 lb. of nitrogen, divide the 1 lb. by 0.24.
- 1 ÷ 0.24 = 4.17. This is equal to a little more than 4 lbs. of product.

If your lawn is 5,000 sq. ft., multiply 4 lbs. by 5, since fertilizer rates are always calculated as 1,000 sq. ft. the result is 20. You would need a 20 lb. bag of 24-6-6 to cover your lawn.

Fertilizer Bag Reads	Amount needed for 1 lb. of nitrogen
6-2-0	17 lbs.
10-10-10	10 lbs.
14-3-6	7 lbs.
20-5-5	5 lbs.
26-3-4	4 lbs.
35-3-5	3 lbs.
24-6-6	4 lbs.

How many nutrients should you apply?

- First step, test your soil. Soil test information is available from your local extension office or online at the University of TN Soil, Plant and Pest Center website.
- Use your soil test results to determine how much phosphorus and potassium you need to apply.
- Nitrogen amounts should be based on grass type. Many lawns in Tennessee are tall fescue. Fescue needs no more than about 2 1/2 lbs. of nitrogen per year. Apply 1/2 lb. in February, 1 lb. in September, and the final 1 lb. in October. Better yet, leave your grass clippings on your lawn to reduce the amount of fertilizer to 1/2 lb. in September and 1/2 lb. in October.
- Try to match fertilizer to the nutrients needed. Consider using a slow release lawn fertilizer, appropriate for the season or stage of growth.
- If using organic fertilizers, the nutrient content should be matched to the lawn's need. Organic nutrients are released more slowly and cause as much pollution as synthetic fertilizers. Do not overapply!

TENNESSEE SMART YARD ACTIONS

☐ Maintain soil pH in the recommended range. Value: 2 inches

☐ Fertilize as recommended by soil test and not in wet weather; use low maintenance plans when available. Value: 2 inches

___ Total Inches

Manage Yard Pests

It is unrealistic, and even unwise, to strive for an insect-, disease-and weed-free yard. Many insects are beneficial, helping to keep pests under natural control. Many other insects simply coexist with humans causing us no harm. In fact, only about 1% of all insects are harmful.

Meet some of the "Good Guys." Help protect these beneficial insects so they can naturally keep pests under control.

Lady Bug (larva)

Lady Bug

Assassin Bug

Green Lacewing (larva)

Green Lacewing

Big-eyed Bug

Praying Mantis

Syrphid Fly (larva)

Syrphid Fly

Integrated Pest Management (IPM)

Homeowners are successfully managing pests by protecting beneficial insects and reducing the use of pesticides. By definition, pests include insects, diseases and weeds. With a little bit of knowledge and the right tools, it is easy to practice IPM in your yard.

- Check your lawn and plant beds regularly for pest problems.
- Identify the problem. Know the good from the bad. It makes a difference. Good bugs eat bad bugs.
- When appropriate, first try non-chemical approaches (like cultural methods), then use the safest pesticides possible, such as insecticidal soaps, horticultural oils and biological products.
- Spot treat. If insects are a problem, treat only the affected areas. If one out of ten shrubs have scale, treat only the infested plant.
- Be tolerant! Low levels of pests will do minimal damage to plants and many are a source of food for beneficial insects.
- The label is the law! Read pesticide labels carefully for information on using pesticides and disposing of leftover chemicals and containers.

TENNESSEE SMART YARD ACTIONS

- ☐ Check for pests regularly to detect and determine problems that require intervention. Value: 2 inches
- ☐ Use mechanical approaches to pest control such as pruning and hand removal. Value: 2 inches
- ☐ Protect beneficial insects that control pests and support pollination. Value: 2 inches
- ☐ Spot treat only affected areas, avoiding routine applications of pesticides. Value: 2 inches
- ☐ Use environmentally-friendly pesticides such as horticultural oils and insecticidal soaps. Value: 2 inches

___ Total Inches

Friendly Fungus?
Beauveria bassiana is a beneficial fungus naturally found in the environment that infests and kills adults and larvae of many insect pests.

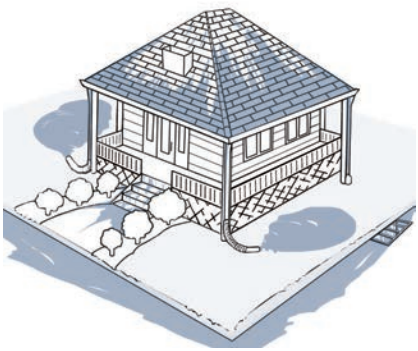
Reduce Stormwater

The next time you are home while it is raining, put on a rain jacket and go outside and watch where the water flows. Is the rain water:

- soaking into your lawn and gardens?
- pooling in some areas and not in others?
- flowing directly off your rooftop and driveway into your lawn or into a ditch leading off your property?

If it has rained only 1 inch and you live in a home that is 2000 square feet, almost 1250 gallons of stormwater will flow off your roof, alone. The rainwater not absorbed into your lawn and garden will flow off your property and into the stormwater management system; a lost opportunity to capture free irrigation water!

A stormwater management system is the collection of ditches, pipes, detention basins and other conveyances that carries excess stormwater runoff from developed areas (like neighborhoods and shopping centers) and empties into our local waterways. In almost all communities across the state this water does not go to a treatment plant before it is released into these bodies of water.



Keeping in mind the observations you made of the stormwater flow on your property and adjacent properties, now consider all of the pollutants that could potentially be picked up as it makes it way to the local creek. First, there is the rain water that flows from rooftops, driveways and walkways. These hard surfaces also referred to as "impervious" do not allow water to permeate, so any pollutants on them like oils can be picked up and carried through the stormwater system to a waterway.

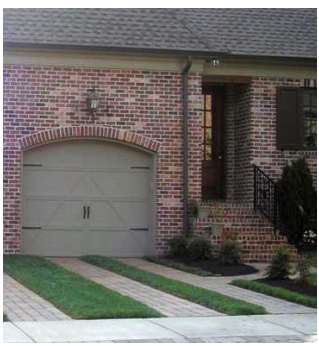
Secondly, consider the rain water you observed flowing over your yard's surface, particularly if it was a hard rain over compacted soils or steep slopes. In these situations, it does not have the opportunity to be absorbed into the soil. As it flows

over lawns, it can pick up fertilizers and pesticides and over bare spots or unmulched gardens, it can collect soil particles. In the end, pollutants from both paved surfaces and our lawns and gardens can pollute our waterways.

As the number of subdivisions expands across the state, so does the pollution flowing out of them. Did you know that sediment is one of the top water pollutants in Tennessee? It literally smothers the life of waterways, filling fish gills, reducing oxygen levels, and destroying habitat. It also build up in channels, causing flooding.

The good news is that we can all help protect our community's waterways through our landscaping and household maintenance practices and in the process reduce flooding in our yards and neighborhoods! Here are a few ways you can help.

Increase Porous/Pervious Surfaces



Consider replacing hard surfaces like driveways and walkways with permeable ones that allow rain water to soak into the ground. Soil is a natural pollutant filter and by allowing stormwater to percolate through the ground, most pollutants can be filtered out before reaching our waterways. Also, increased infiltration translates into less ponding and flooding.

- Install a "Hollywood Driveway" with a dividing strip of grass or one where the asphalt has been removed and replaced with decorative pea gravel. (see photo)

- Use porous pavers for your walkways and patios or a paver design with a spacing pattern that allows for water infiltration.

Pet waste should be collected and disposed of in a solid waste receptacle. Otherwise, it can become a source of pathogens (bacteria, worms, parasites, and viruses) in our waterways.

Rain Gardens

Build a rain garden! Rain gardens are simply gardens that are planted depressions built in a location to capture rainwater runoff from your rooftop, driveway and upland areas, allowing the water to slowly soak into the ground.

Among their many benefits, rain gardens:

- Filter pollutants and reduce the overall amount of runoff leaving your yard
- Can be designed to create an aesthetic amenity out of an under-utilized lawn area
- Can include a variety of plants to attract birds, butterflies and other wildlife

Rain gardens can be built by homeowners or professionally designed. They are located at least 10 ft. from your home's foundation in areas with soils that percolate. The garden size will depend on the area draining to it and soil conditions.

Grassy Swale

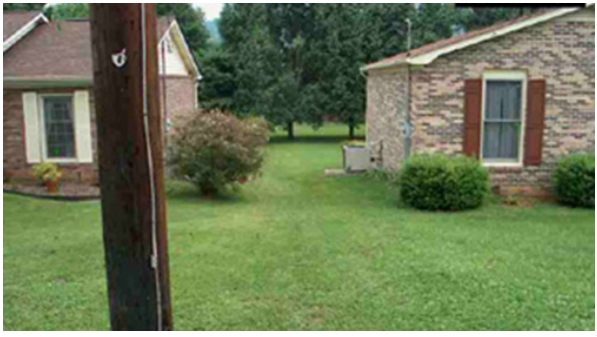
Ditches are often overlooked features in yards and neighborhoods, only being noticed during rain storms as they carry excess water out of areas. However, they do deserve attention, offering opportunities to reduce localized flooding, improve water quality of local creeks and enhance a landscape's attractiveness. Consider converting rock- or concrete-lined or eroding ditches in your yard into ones that are broad-bottomed and grass-lined. These are referred to as "swales."

Example of a concrete-lined ditch

A grassy swale allows stormwater flowing through it to be partially absorbed and helps filter out pollutants. Concrete-lined ditches do not.

With a broadened bottom and more gentle slopes, a swale is easier to mow and more visually appealing. Its potential for erosion is also decreased, first because its shape allows for a greater volume of stormwater to flow through it and second, because the grass and/or other vegetation in it holds the soil in place. An eroding ditch line is also unsightly and a source of sediment pollution into our waterways.

Before tackling the problem, consider contacting a stormwater engineer for assistance. Size, slope, soils and runoff volumes need to be calculated in the design or redesign.



Example of a grassy swale after removal of concrete-lined ditch

TENNESSEE SMART YARD ACTIONS

- ☐ Disconnect downspouts, directing them onto a lawn or garden rather than into drainage channels or onto impervious surfaces. Value: 2 inches
- ☐ Build a rain garden to catch and filter stormwater runoff. Value: 3 inches
- ☐ Use permeable surfaces for hardscapes such as driveways, walkways and patios. Value: 3 inches
- ☐ Practice good housekeeping. (e.g., sweep impervious surfaces, "scoop the poop," wash your car on the lawn instead of on your drive) Value: 2 inches

_____ Total inches

Provide for Wildlife

Tennessee is one of the most biologically diverse states in the country.

Providing adequate food, water and shelter can increase the diversity of wildlife that you can enjoy in your own back yard.

Butterflies add beauty to our yards and pollinate plants.

Adult dragonflies are beneficial because they prey upon mosquito larvae.

Frogs help keep mosquitoes and other unwanted insects under control. They also serenade us at night, especially after a good rain.

TENNESSEE SMART YARD ACTIONS

- ☐ Incorporate plants that supports habitat needs of desired wildlife. (e.g., provides food, cover, place to raise young) Value: 2 inches
- ☐ Provide a water source. (e.g., bird bath, pond) Value: 2 inches
- ☐ Install bat houses, bird houses, bird feeders, etc. Value: 2 inches

___ Total Inches

Attract pollinators like butterflies and bees to your landscape by planting these native plants:

- Common Chokecherry, *Prunus virginiana*
- Canadian Serviceberry, *Amelanchier canadensis*
- Beebalm, *Monarda didyma*
- Blanket Flower, *Gaillardia aristata*
- Purple Coneflower, *Echinacea purpurea*
- Butterfly Weed, *Asclepias tuberosa*
- Common Milkweed, *Asclepias syriaca*
- Showy Goldenrod, *Solidago speciosa*
- Dotted Blazing Star, *Liatris punctata*
- Maximilian Sunflower, *Helianthus maximiliani*
- Pale Beardtongue, *Penstemon pallidus*
- Common Yarrow, *Achillea millefolium*

Protect Water's Edge

Waterfront property owners realize the special contribution water makes to their quality of life. The biologically distinctive area that borders waterbodies is called a riparian zone. Planting this area with a mixture of trees and shrubs not only stabilizes the soil but creates wildlife corridors, improves water quality, reduces maintenance time, provides privacy and can even increase property values.

Many homeowners, upon acquiring property with a waterbody like a stream want to remove the vegetation along it and plant turfgrass. Turfgrass can help filter out pollutants in stormwater runoff, but with a limited root system, it does a poor job holding soil in place. As a result, streambanks erode, sediment enters waterways, and property is lost.

The wider and more diverse the stand of waterfront vegetation, the more beneficial it is to water quality, wildlife habitat and erosion control.

Healthy riparian zone (left) vs. eroding stream bank (right)

TENNESSEE SMART YARD ACTIONS

- ☐ Maintain a mix of native trees, shrubs, grasses and wildflowers along water's edge, creating a vegetated width that is as wide as practical. Value: 2 inches
- ☐ Create "no mow, no fertilizer, no pesticide" zones along waterways. Value: 2 inches

___ Total Inches

Does your yard measure up?

Everyone needs to be aware of the impacts they make to Tennessee's environment. The Tennessee Yardstick Workbook provides valuable information to help residents make wise decisions in their landscapes. By following the nine simple principles described in this workbook, you can keep your yard healthy and reduce surface and groundwater pollution. Track your total inches below.

Total Inches for Your Tennessee Smart Yard Actions:_____

TENNESSEE SMART YARDS

is a program of the University of Tennessee Extension and the Tennessee Water Resources Research Center.

For additional information on implementing TN Smart Yard actions, visit the following website: http://tnyards.utk.edu

Tennessee Water Resources Research Center

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