



# SMART Lawns



**A Residential Lawn Care Program to  
Protect Water Quality**

**Virginia Cooperative Extension  
Henrico County Office**

8600 Dixon Powers Drive; PO Box 90775

Henrico, VA 23273-0775

804-501-5160

<https://henrico.us/extension>

Revised March 2019

# Table of Contents

<b>Welcome to SMART Lawns!</b> .....	<b>3</b>
What is a SMART Lawn? .....	3
What to Expect From the SMART Lawns Program .....	4
What to Expect From Your Lawn (and Yourself) .....	5
<b>Chapter 1: Soil Test</b> .....	<b>6</b>
Reliable Soil Tests Depend Upon Good Soil Samples .....	6
Applying Lime .....	7
<b>Chapter 2: Measure the Lawn</b> .....	<b>8</b>
<b>Chapter 3: Aerate The Roots</b> .....	<b>9</b>
<b>Chapter 4: Right Fertilizer</b> .....	<b>10</b>
Right Ratio, Right Time, Right Rate.....	10
Timing is Everything.....	10
Getting the Rate Right .....	11
How Much Does One Pound of Nitrogen Cost? .....	12
<b>Chapter 5: Trouble-Free Maintenance</b> .....	<b>13</b>
Mowing to Enhance Health and Appearance .....	13
Irrigation is an All or Nothing Proposition .....	13
Managing Weeds.....	15
Grassy Weed Control .....	15
Broadleaf Weed Control .....	16
Managing Pests and Diseases .....	17
Insects .....	17
Diseases .....	19
Going Organic.....	20
Additional Lawn Care Resources.....	22
Are You SMART? A Checklist for Fescue Lawns.....	23

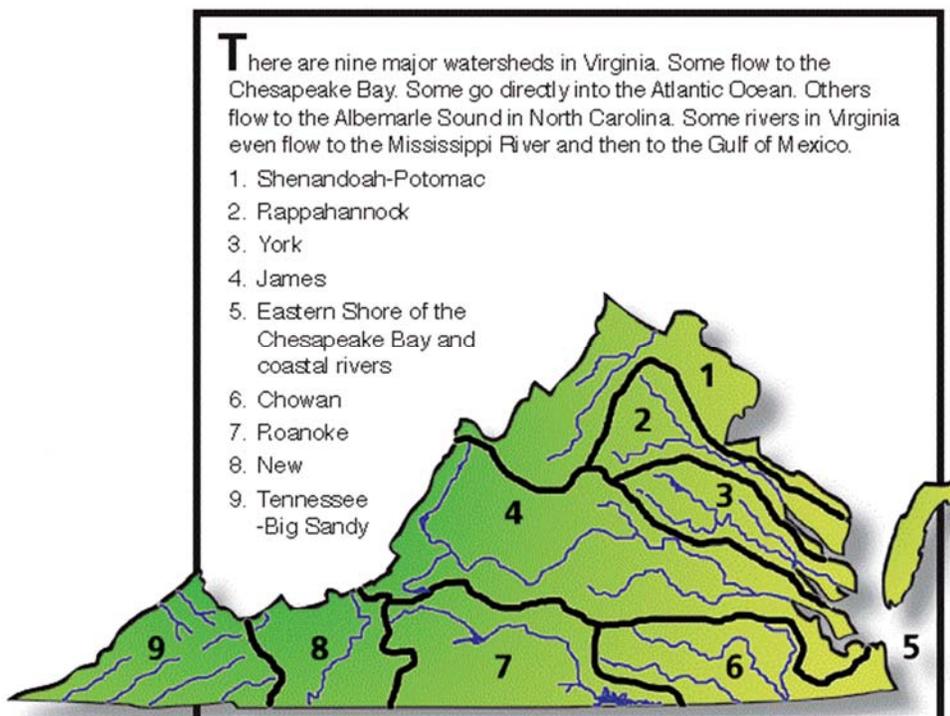
## Welcome to SMART Lawns!

Congratulations! You have decided to work smarter, not harder, on your lawn. The SMART Lawns program will help you learn about YOUR lawn and its needs, and teach you to do the right thing at the right time.



### What is a SMART Lawn?

- A lawn that is environmentally responsible.
- A lawn that is beautiful because it's healthy.
- A lawn that greens up more quickly in the spring.
- A lawn that makes the best use of two valuable resources—your time and your money.
- A lawn that protects your community's streams, lakes, and ponds from nutrient and sediment pollution.
- A lawn that does its part to reduce the amounts of nitrogen, phosphorus, and sediment entering the Chesapeake Bay; in other words, a lawn that helps the Commonwealth of Virginia meet its "pollution diet" requirements for the Bay.



## What to Expect from the SMART Lawns Program

As part of the SMART Lawns program, a Henrico Master Gardener Volunteer will come to your home to collect a lawn soil sample and measure your total lawn area. Once we receive the results of your soil sample, we will formulate a Nutrient Management Plan for your lawn which will provide lime and fertilizer recommendations.

This booklet, together with your Nutrient Management Plan, will give you information regarding how and when to aerate; how to choose the right fertilizer and when to apply it; and maintenance practices that prevent trouble. In summary, here are the SMART steps and who is responsible for each:

SMART Steps	
<b>S</b>	Soil Test - Master Gardener
<b>M</b>	Measure - Master Gardener
<b>A</b>	Aerate - Homeowner
<b>R</b>	Right Fertilizer - Homeowner
<b>T</b>	Trouble-free Maintenance - Homeowner

## The Challenges of the “Henrico Lawn”

Producing a quality lawn in the Richmond area can be challenging. Neither cool-season grasses, such as tall fescue, nor warm-season grasses like bermudagrass, look their best all year round. Tall fescue looks good in the spring, early summer, and fall, but can go dormant (unless watered) in the heat of summer. Bermudagrass looks great in summer, but goes dormant (and turns light tan in color) during the winter.

All things considered, most of us who have lawns in the Richmond area go the cool-season route. Of the cool-season turfgrass choices available, turf-type tall fescue performs best. Therefore, this booklet focuses on managing a cool-season lawn. However, we can assist with warm-season grasses if necessary.

SMART Lawns is based on the work of turf specialists at Virginia Tech who conduct research on the different types of turfgrass grown across the state. Their extensive research allows us to formulate guidelines specifically for Richmond area conditions. However, growing a SMART Lawn is a process. It may take two to three years to realize the full benefits of the program.

## What to Expect from Your Lawn (and Yourself)

The overall quality and appearance of your lawn is very much dependent upon the level of maintenance you intend to provide. The following chart can help you determine your expectations for the quality and maintenance of your lawn.

### SMART Lawns Expectations for Cool-Season Grasses

Quality Expectations	Maintenance Levels
<input type="checkbox"/> <b>High Quality Turf</b> Deep green color Manicured appearance Thick, dense turf Few to no weeds	<b>High Maintenance</b> Sunny to mostly sunny exposure. Regular irrigation to maintain active growth. Optimum fall fertilization (3-3.5 pounds N/1,000 ft <sup>2</sup> /year). Frequent mowing (2x per week) to meet max of 1/3 blade removal rule. Clippings returned to lawn. Multiple grassy and broadleaf weed control applications. Preventative or early curative treatments for insect & disease pressure. Fall aerate every year. Over-seed as needed to maintain dense coverage.
<input type="checkbox"/> <b>Moderate to Good Turf Quality</b> Good green color Mostly dense, some areas thinner Some weeds present (<15%)	<b>Regular Maintenance</b> Sunny to mostly sunny exposure. Rarely irrigated once established. Good fertilization program (2-2.5 pounds N/1,000 ft <sup>2</sup> /year). Weekly mowing to meet max of 1/3 blade removal rule. Clippings returned to lawn. Grassy weed control in spring; spot applications for broadleaf weeds. Insect and disease pests addressed only if pressure is extreme. Fall aerate every two to three years. Over-seed as needed.
<input type="checkbox"/> <b>Acceptable Turf Quality</b> Moderate green color Moderate density Noticeable weeds (20-30%)	<b>Reduced Maintenance</b> Sun to partial shade exposure. No irrigation. Moderate fall fertilization (1-1.5 pounds N/1,000 ft <sup>2</sup> /year). Mowing every 10-14 days to meet max of 1/3 blade removal rule. No weed control anticipated. Insect and disease pests addressed only if catastrophic.

Next, compare the current quality of your lawn with what you hope to achieve through the SMART Lawns program to determine your **Management Objective**.

### SMART Lawns Management Objectives for Cool-Season Grasses

Management Objectives
<input type="checkbox"/> <b>Maintain High Turf Quality</b> <input type="checkbox"/> <b>Improve Turf Quality</b> (denser turf, fewer weeds) <input type="checkbox"/> <b>Decrease Turf Maintenance</b> (may result in lower turf quality) <input type="checkbox"/> <b>Convert Some Areas to Turf Alternatives</b>

## Soil Test (*Master Gardener*)

Soil testing gives you an accurate reading of your lawn's pH (acidity) and nutrient levels. This is essential to determine if and how much lime you need to apply, and what type of fertilizer to use.

A soil test provides information on the proper amount of lime and fertilizer to apply to your lawn. When you apply only as much lime and fertilizer as the soil needs at the appropriate times, you are preventing nutrient runoff into surface and ground water, saving money and time, and optimizing the health of your lawn.

### Reliable Soil Tests Depend Upon Good Soil Samples

The results of any soil test are no better than the sample submitted. For reliable results, it is vitally important that the soil sample is taken correctly to accurately represent the soil in your lawn, garden, or landscape.

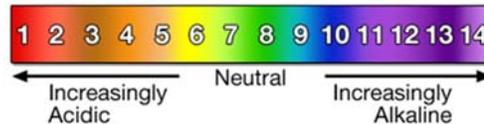
That's why a Master Gardener volunteer collected several random samples from your lawn, mixed them together in a clean bucket, and used a portion of that soil to send a representative sample to a soil testing laboratory. It's also why we asked you to specify which areas you wanted sampled. Experience shows that there are often significant differences between the front and back lawns. Therefore, it is recommended that these areas be sampled separately.

You can collect additional soil samples from other areas of your lawn, garden, or landscape and send them directly to a soil testing laboratory. For example, soil test boxes and forms are available at Henrico County Libraries for testing at the Virginia Tech Soil Testing Laboratory. After a representative soil sample is collected, you mail it to VA Tech with the sample form and a check. For more information about the Virginia Tech lab, [VCE Publication 452-129](#), *Soil Sampling for the Home Gardener* can be found on-line at <https://ext.vt.edu>.

## Applying Lime

Based on the Nutrient Management Plan you receive, apply the required amount of lime as soon as possible. Below are some helpful guidelines:

- A pH of 6.2 to 6.5 is considered ideal for turfgrass.



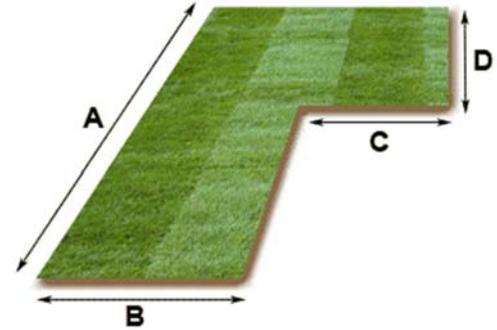
- Depending upon soil type, a relatively large amount of lime may be required to achieve the desired pH. For example:
  - In certain situations, it may be necessary to apply 100 pounds of lime to every 1,000 square feet of lawn area to change the pH by even one point, such as from 5.2 to 6.2.
  - However, the maximum amount per application is 50 pounds per 1,000 square feet regardless of the total recommended amount. Subsequent applications should be about four weeks apart.
- Lime can be applied at any time of year, and usually the sooner the better.
- Soil pH changes slowly. It may take six months or more to achieve a measurable change.
- Do not lime again until the soil has been retested. Virginia Tech soil test boxes and instruction forms are available at Henrico County Libraries and the Henrico Extension Office.
- It is recommended that the soil be tested every two to three years.



# M

## Measure the Lawn (*Master Gardener*)

Instructions for the use of lawn care products such as fertilizers and herbicides specify an application rate “per thousand square feet,” so it is important that you know the size of your lawn. One method of measuring and calculating the total square footage of your lawn is to break it up into geometric shapes such as squares, rectangles, triangles and circles. The square footage of each individual area can be calculated and then all areas combined for a total square footage.



A Master Gardener measured your lawn in this manner and then calculated your square footage in thousands. Unless you change your turfgrass areas, this number is what you will use as you apply various lawn care products.

### Another Way to Measure Your Yard

If your lot is 126 feet deep and 105 feet wide\*, simply multiply  $126 \times 105 =$  a total of 13,230 square feet. Then subtract from this total the square footage of the house footprint, driveway, and any other areas that are not to be amended. The remainder will be the square footage of the area to be improved.

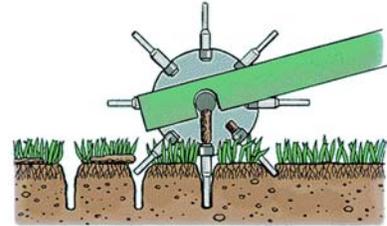
Total lot:	Lot 126' X 105'	= 13,230 ft <sup>2</sup>
Subtract:	House 40' x 26'	= 1,040 ft <sup>2</sup>
	Deck 12' x 12'	= 144 ft <sup>2</sup>
	Drive 40' x 12'	= 480 ft <sup>2</sup>
Remainder:	Yard	= 11,566 ft <sup>2</sup>

*\*An easy way to measure long distances is with your garden hose, provided you know its length. For instance, if your hose is 60' long and the area being measured is 2½ hose lengths long and 2 hose lengths wide, the area is  $2.5 \times 60' = 150'$  long by  $2 \times 60' = 120'$  wide. To get the square footage,  $150' \times 120' = 19,200 \text{ ft}^2$ .*



## Aerate the Roots (*Homeowner*)

Why aerate your lawn? Under certain conditions, such as high clay content or heavy traffic, soil can become compacted, making it very difficult for turfgrass roots to survive. Under compacted conditions, the mineral particles that make up the soil are pressed tightly together, preventing oxygen, water, and nutrients from reaching the roots.

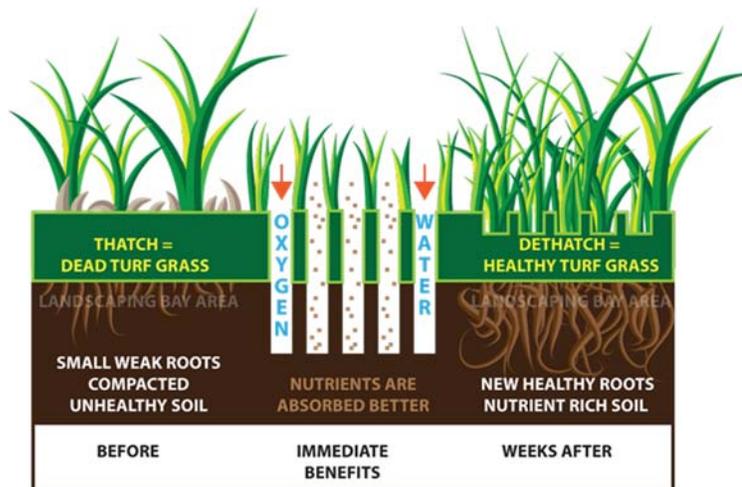


The effects of compaction can be reduced greatly by core-aerating the lawn. A core-aerating machine pulls plugs of soil out of the ground and deposits them on top of the lawn. The holes created provide a means for oxygen and water to penetrate to the root zone of the turf, greatly stimulating the growth of new roots.

Fall is the best time to aerate your lawn. The soil should be moist, but not wet. If rainfall has not been adequate, irrigate the lawn (applying one inch of water) a couple of days before aerating. Allow the removed plugs to dry in the sun. Then rake or break them up if necessary.

After aerating, you may elect to top-dress your lawn with a thin layer of leaf compost (about a quarter of an inch deep over the entire lawn). Compost works to improve soil texture and structure, and provides an improved habitat for roots.

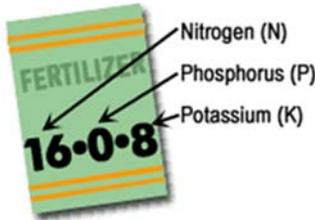
If you plan to over-seed, core-aeration is a must to prepare the soil surface and ensure good seed to soil contact.



# R

## Right Fertilizer (*Homeowner*)

### Right Ratio, Right Time, Right Rate



Your Nutrient Management Plan will recommend a fertilizer for you to apply and tell you when to apply it. Fertilizers are labeled with three numbers, called the “analysis”, which refer to the percentages by weight of nitrogen (N), phosphate ( $P_2O_5$ ), and potash ( $K_2O$ ), respectively. Often called N, P, and K, these “big three” elements are required in fairly large quantities for maximum plant growth.

Research shows that a cool-season grass like tall fescue needs about 2.7 pounds of nitrogen (N) per 1,000 square feet per year to maintain a strong, healthy lawn. Nitrogen promotes good green color and steady growth. However, too much nitrogen applied at the wrong time of the year contributes to pollution in the Chesapeake Bay, so careful timing and application is critical.

Phosphorus is essential to good root development. However, as many of our soils already contain adequate amounts of phosphorus, applying more in the form of fertilizer can have a negative impact on water quality in the Chesapeake Bay watershed. Phosphorus should be applied only if the results of a soil test indicate that it is needed to maintain a healthy turf.

Potassium, the third nutrient provided by lawn fertilizers, is not implicated in water quality concerns, but should be applied according to the results of a soil test.

If your soil test indicates that you have adequate amounts of phosphate and potash in the soil, you will purchase a basic lawn maintenance fertilizer that is typically high in nitrogen and low in phosphorus and potassium. If your soil analysis indicates a deficiency in P or K, you will need to apply a fertilizer that has larger amounts of these nutrients. “Starter” fertilizers will provide more phosphorus while fall or “winterizer” blends will provide more potassium. Your Nutrient Management Plan will give you a specific recommendation based on your soil test.

## Timing is Everything

Research indicates that fall, not spring, is the best time to fertilize cool-season grasses like tall fescue. Why? Fertilizing in the fall builds a strong, vigorous root system that allows the lawn to stay greener in the winter, and green-up sooner in the spring without stimulating excessive growth (less mowing!) that is susceptible to disease. Strong roots also produce a denser, thicker turf that helps crowd out weeds.

Virginia Cooperative Extension has summarized its recommendations for fall fertilization of cool-season grasses with the acronym “SON.” Make three fertilizer applications, applying no more than 0.9 lb. of N/1,000 ft<sup>2</sup> of turfgrass, during **S**eptember, **O**ctober, and **N**ovember for most lawn fertilizer products. Applications should be made approximately four weeks apart.

	Nitrogen Applications by Month	
	Month	lbs. Nitrogen per 1000 ft <sup>2</sup>
	September	0.9
	October	0.9
	November	0.9

## Getting the Rate Right

Research shows that a cool-season grass like tall fescue needs about 2.7 pounds of nitrogen (N) per 1,000 ft<sup>2</sup> per year. Thus, each of the three fall applications should supply 0.9 pound of N per 1,000 ft<sup>2</sup>. Computing the amount of fertilizer of a specific analysis needed to deliver 0.9 pound of N per 1,000 ft<sup>2</sup> can seem tricky at first, but actually is quite simple. Here are a couple of options:



1. You can use our [SMART Lawns Fertilizer Calculator](#) to determine the amount of a particular fertilizer to apply for your specific square footage.
2. The following formula can be used to calculate the exact amount of any fertilizer to apply per 1,000 square feet of lawn area:

$\frac{\text{Desired pounds of Nitrogen per 1000 square feet}}{\% \text{ Nitrogen in Fertilizer}} \times 100 = \text{Pounds of fertilizer needed per 1,000 ft}^2$
---

Example: To apply 0.9 pound of nitrogen per 1,000 ft<sup>2</sup> using a 32-0-4 fertilizer:

$\frac{0.9}{32} \times 100 = 2.8 \text{ pounds of 32-0-4 per 1,000 ft}^2$
---

If the lawn covers a total of 8,000 square feet, multiply 2.8 by 8 for a total of 22 pounds of 32-0-4 fertilizer.

Thus, 22 pounds of 32-0-4 fertilizer would be applied to your lawn three times during the year—once in September, once in October, and once in November—resulting in a grand total of 66 pounds of 32-0-4 fertilizer per year.

## How Much Does 0.9 Pound of Nitrogen Cost?

The price for a bag of fertilizer will vary from analysis to analysis. It is difficult to determine the “best buy” based on bag weight alone. Consider how many pounds of a particular fertilizer are required to deliver 0.9 pound of nitrogen when comparing its cost to another brand or analysis.

Other factors that determine the value of a fertilizer is how much phosphorus and/or potassium is included and what percentage of the total nitrogen is being supplied in a slowly-available form. The amount of slowly available nitrogen (SAN) in a fertilizer is determined by how much of the nitrogen is water insoluble (WIN) and how much is water soluble, but slowly available. This information is provided on every fertilizer label, although usually in very small print! **A lawn fertilizer should have at least 15% SAN to be applied at the 0.9 pound N rate.** Lawn fertilizers with less than 15% SAN are applied at lower rates, but they are not as common. Fertilizers with greater than 50% SAN usually cost more, but slowly-available nitrogen helps protect water quality as it is not as susceptible to runoff or leaching.

Use the chart below to make your own comparisons:

Product	Price/ bag	Pounds/ bag	Price/ pound	SAN as % Total N	Lbs. Fertilizer to deliver 0.9 lb N	Cost/0.9 lb N
Conventional Product 1 32-0-4	\$15.99	14 lbs	\$1.14	28%	2.8	\$3.19
Conventional Product 2 10-20-15	\$21.90	40 lbs	\$0.55	15%	9	\$4.95
Organic Product 1 5-2-0	\$12.99	36 lbs	\$0.36	70%	18	\$6.48
Organic Product 2 10-2-8	\$38.70	50 lbs	\$0.77	90%	9	\$6.93
Organic Product 3 18-0-3	\$42.99	20 lbs	\$2.15	80%	5	\$10.75
Organic Product 4 5-3-2	\$21.99	40 lbs	\$0.55	60%	18	\$9.90
Product A						
Product B						
Product C						



## Trouble-Free Maintenance (*Homeowner*)

### Mowing to Enhance Health and Appearance



Be sure your mower blade is sharp to avoid tearing and damaging leaf blades, which can lead to disease or insect attack. Set the mower blade height at 3 - 4 inches for fescue lawns. Remove no more than 1/3 of the leaf blade at each mowing. Recycle grass clippings.

Lawn clippings are 80 to 85% water and can contain 4% N, ½% P, and 2% K. Clippings are free fertilizer; they decompose quickly, and return nutrients to your lawn. Clippings do not contribute to thatch buildup. Tall fescue grasses do not develop thatch layers.

### Irrigation is an All or Nothing Proposition

To keep your lawn green during a hot, dry summer you need to water deeply and consistently as conditions require.

The other option is to not water at all and let the grass go dormant. It will recover and turn green again in the fall (or with cooler temperatures and adequate rainfall).

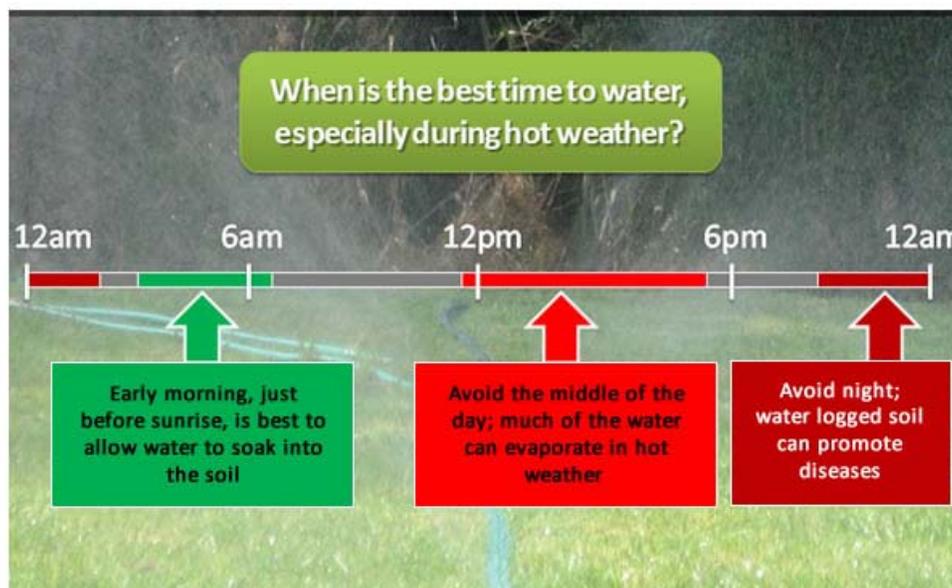


#### If you decide to water:

- ✓ **Water deeply each time.** Lawns require an inch or more of water per week to stay green and growing. Light, frequent watering results in a shallow root system that is vulnerable to heat and drought.
- ✓ **Calibrate your irrigation system** by placing shallow pans in the sprinkler pattern and determine how long it takes to collect one inch of water on average. Do not allow runoff. You may have to cycle the sprinklers on and off to give the water a chance to soak in.

### Know When to Water:

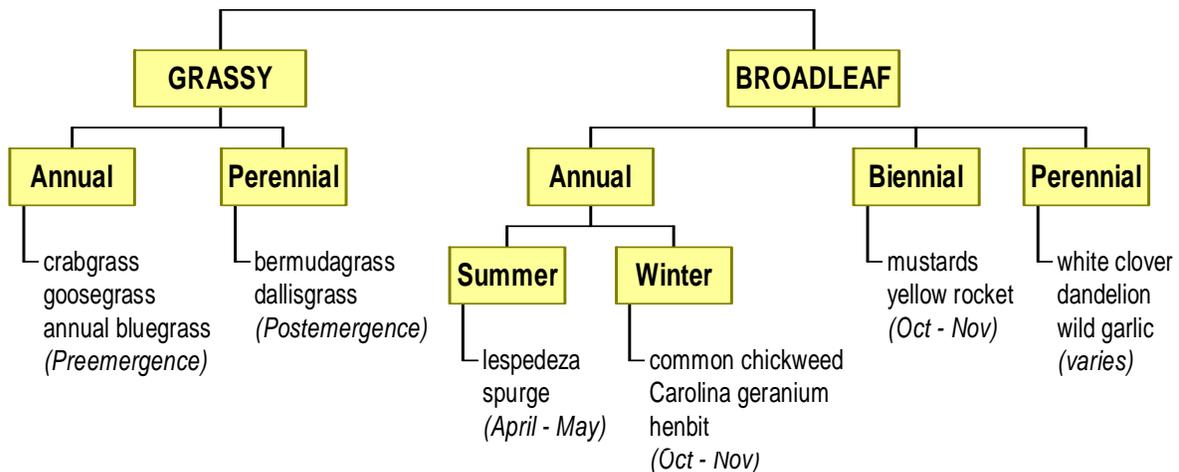
- ✓ Irrigate when the soil is dry, but just before the grass actually wilts. Just before wilting, the grass will develop a bluish-gray tint. If you walk across the lawn at this time, your footprints will be clearly visible.
- ✓ The easiest method to determine exactly when to water is the "screwdriver test." Insert a six-inch screwdriver blade into the lawn at several points. If it cannot be easily inserted at least two inches deep, it's time to water.
- ✓ If time slips away from you and your grass has reached the wilting stage, water as soon as you can, but wait until the appropriate time of day (early morning, before sunrise) if at all possible.
- ✓ Observing dew patterns on the grass in the early morning is another way to determine if water is needed. Lack of dew in certain sections of the lawn is a good indication of "dry spots," areas that dry out more quickly than others.



Source: National Weather Service – Goodland, KS

## Managing Weeds

Good cultural practices will prevent many problems, but there are still times when specific weed control measures are needed. Successful control depends upon accurate identification of the weed type and best treatment time. The chart below summarizes the types of weeds commonly found in home lawns.



## Grassy Weed Control

**Crabgrass** is the most common summer annual grassy weed. It is best **controlled by a pre-emergent herbicide**, also called **crabgrass preventer**, which is applied before the weed seed germinates. The first application should be made after the forsythias are in bloom but before the dogwoods are, about March 15. Many products require a second application. Read and follow label directions exactly for season-long control. Note: All of these products, with the exception of Tupersan®, will also prevent turf grass seed from germinating, and should not be applied when over-seeding.

**Another annual grassy weed, annual bluegrass (*Poa annua*), can be controlled by a pre-emergent herbicide**, but this application is made **in late August**. Note: This pre-emergent herbicide will also prevent grass seed from germinating.

**Perennial grassy weeds, such as wiregrass (common Bermudagrass), are not controlled by pre-emergent herbicides.** They require a **post-emergent application of a non-selective herbicide such as glyphosate** (Roundup®, Kleenup®, etc.). The wiregrass should be actively growing when the herbicide is applied. Results are usually not seen for several days and repeated applications may be necessary. Note: Glyphosate will kill any vegetation it touches, including desirable grasses.

## Broadleaf Weed Control

The **best time to control summer annual broadleaf weeds** is in the **spring** when they are small. Summer annuals like lespedeza and spurge should be treated in **April and May**.



The **best time to control winter annual broadleaf weeds** is in the **fall**. Winter annuals like henbit, bittercress, and chickweed make their appearance in the fall, so treat in **October and November**.

There are some broadleaf weeds that grow as **biennials and others as perennials**. The **best time to control either of these types of weeds will vary**, depending on the species in question. (Contact the Extension office or consult the VA Pest Management Guide ([VCE publication 456-018, https://ext.vt.edu](https://ext.vt.edu)) for specific recommendations.)

There are a **limited number of broadleaf weed herbicides available for purchase by homeowners: 2,4-D; MCPP; MCPA; dicamba; triclopyr; and carfentrazone** are the most common. They will kill broadleaf weeds without harming the turfgrass. They are readily available as liquid formulations (best for spot application) and sometimes in granular form.

Some weeds are harder to control than others, and some products work better on certain weeds. Therefore, proper identification of the weed is essential to making a good management decision. Be sure to read and follow all label instructions. For example, **dicamba is soil-mobile** and may move a short distance through the soil and be taken up by the roots of nearby trees and shrubs. Following label instructions closely will help you avoid this type of off-target damage.

<b>A Simple Weed Management Plan</b>	
	<p><b>Mid-March</b></p> <p>Apply crabgrass preventer (without fertilizer). Repeat for season-long control according to label directions.</p>
	<p><b>April and May</b></p> <p>Make spot applications with a broadleaf weed product for summer weed control as needed.</p>
	<p><b>October and November</b></p> <p>Make spot applications with a broadleaf weed product for winter weed control as needed. Consider using “weed and feed” formulations.</p>

## Managing Pests and Diseases

The good news is that there are very few insect and disease problems that significantly impact residential lawns in the Richmond area. Therefore, **there is absolutely no need for the routine application of lawn insecticides and fungicides.** This saves you time, money, and helps protect the environment.

That is not to say, however, that you will never experience the occasional insect or disease issue, particularly if the other recommended cultural practices are not in place. Here are some general considerations about pest management:

- ✓ **Always identify insects and diseases before attempting to control them.** Submit samples to the Extension office for identification and control strategies.
- ✓ **Physically remove pests when possible.**
- ✓ **When a pesticide is necessary, choose the least toxic one available.**



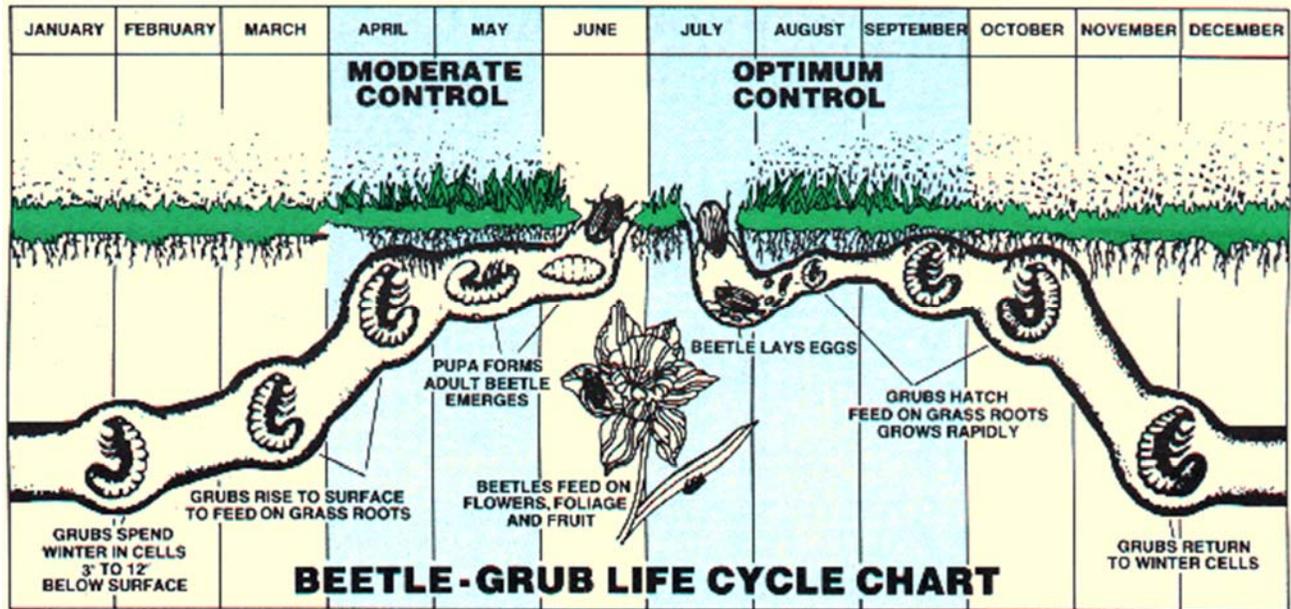
## Insects

The insects most likely to damage lawns in our area are white grubs. Grubs are beetle larvae, and the species most likely to cause problems for us is the Japanese beetle. However, finding two or three beetle grubs in the lawn does not warrant the immediate application of a soil insecticide. If you suspect your lawn is being damaged by grubs, first complete the simple “scouting” steps outlined below to determine if a soil insecticide is needed.

### Scouting for Grubs

1. In at least four locations across your lawn, cut three sides of a 1-foot square portion of sod with a spade to a depth of three inches.
2. Roll back the cut-out portion, loosen the soil around the exposed roots, and count the number of grubs.
3. If the average number of grubs is greater than six, you may want to treat the lawn with an insecticide labeled for grubs.
4. Milky Spore is a biological control product containing bacteria that suppresses the population of Japanese beetle grubs in the lawn.
5. Alternatively, you can apply an insecticide in mid-July when the grubs are small. Water in the product with about 1/2 inch of water to move the product through the soil to reach the grubs.
6. Always follow label directions carefully when applying any pesticide.

If the population of grubs is sufficient to warrant control, contact the Extension Office for current product recommendations. Any control product for grubs is best applied in late summer to early fall, when the grubs are still relative small and actively growing, as illustrated in the chart below:



Source: <http://www.PestControlSupplies.com>

## Diseases

**Brown patch is the most common lawn disease in our area.** This disease is caused by a fungus that thrives during our warm, humid summers. Leaf blades turn brown and die in patches, but the grass plant itself usually survives. The grass patches will recover when the weather turns cooler and less humid.

A six inch round sample of turf with roots intact can be brought to the Extension Office to confirm brown patch. The disease can be controlled with fungicides, but this is an expensive option. You may decide to live with the problem and wait for the grass to recover on its own.



However, the best way to deal with brown patch is to not get it in the first place! Here are a few key considerations:

### Avoiding Turf Disease

- **Plant disease resistant varieties.** Choose a variety of turfgrass that has performed well in the National Turfgrass Evaluation Program. Each year Virginia Cooperative Extension publishes *Virginia Turfgrass Variety Recommendations* ([VCE Publication SPES-66, https://ext.vt.edu](https://ext.vt.edu)) that is available on-line or from the Extension Office.
- **Fertilize at the correct time and rate.** Applying too much fertilizer or fertilizing at the wrong time, can result in soft, succulent turf that is particularly susceptible to attack by fungus diseases. The ideal time to fertilize is when conditions are optimal for root growth—in the fall for cool-season grasses.
- **Irrigation.** If you do decide to irrigate, the best time to do so in order to minimize disease is around sunrise. This decreases the leaf wetness period, foreshortening the time and conditions necessary for diseases to development.
- **Mowing height.** In most cases, turfgrass that is cut too short is more susceptible to disease. Keeping a tall fescue lawn between 3 - 4 inches in height helps it withstand stress and recover more quickly from disease pressure.
- **Air movement.** Areas with poor air circulation have more turf diseases. Strategic pruning of trees and shrubs is a good way to improve air movement and allow additional sunlight into disease-prone areas.
- **Sanitation.** Wash mowing equipment to remove infested leaf clippings following each use. Disease pathogens can live on plant debris and be transported to other locations.

## Going Organic

While SMART lawns is designed to be a “conventional” lawn care program, it also provides the very best basis for a partially, or even totally, organic lawn care regimen. The key to a successful organic lawn is a healthy soil that supports a healthy turf. Review all of the information covered in this publication; then focus on the following “organic keys.”

1. There is **no such thing as a perfect lawn**. Working with nature means that one will need to be tolerant when the lawn doesn’t look its best. In the long run, consistent use of natural organic methods will result in an acceptably green, uniform turf that is able to “bounce back” from environmental stresses.
2. Compared to conventional lawn care, organic methods may take longer to produce visible results. The organic approach focuses on **soil-building** and that takes time; there are no quick fixes.
3. The most important factor in soil-building is **organic matter**:
  - Don’t bag the clippings. Letting the grass clippings “recycle” back into the lawn improves the soil and provides about one-fourth of the lawn’s annual nitrogen needs.
  - If you rake tree leaves each fall, allow some to remain on the lawn after chopping them up with the mower. Doing this weekly can add lots of organic matter to the soil without weighing down the grass. However, if you have so many leaves that they don’t sift easily into the lawn, they should be removed and composted.
  - Aerate the lawn each fall to stimulate new root growth and top dress with leaf compost. Approximately 20 cubic feet (3/4 cubic yard) of compost is needed to cover 1,000 square feet of lawn. A 30-gallon garbage can holds about 4 cubic feet of compost.
4. Use **organic fertilizers** derived from animal manures and previously living plant and animal materials. The same rates and timing as outlined for conventional fertilizers also apply to organic ones. This chart shows some options:

Organic-Fertilizer	N (%)	P (%)	K (%)	Pounds-of-this-product-to-supply-1-lb.-actual-nitrogen
alfalfa-pellets	5	1	2	20
blood-meal	10	1	0	10
bone-meal,steamed	3	15	0	33
composted-chicken-manure	4	2	2	25
composted-cow-manure	0.5	0.3	0.5	200
cottonseed-meal	3	1	1	33
feather-meal	12	0	0	8
fish-pellets	7	7	2	14
kelp-meal	2	1	3	50
seabird-guano	12	8	2	8
shellfish-fertilizer	3	3	1	33
soybean-meal	7	1	3	14
Milorganite®	5	2	0	20

5. **Pests and diseases** will present challenges to the organic lawn, but synthetic insecticides and fungicides are easily eliminated. In fact, their routine use on home lawns is not recommended even with conventional programs. That just leaves **weed management**:

- Mow at a height of 3 to 4 inches for cool-season grasses to keep the lawn dense and discourage weeds.
- Re-seed bare patches and over-seed thinned areas of the lawn in the fall.
- Knowing the life cycle and growth habit of a particular weed is important to successfully managing it. In general, annual weeds are more easily controlled than perennial weeds. The best time to control any weed is when it is young and actively growing. Since annual weeds tend to germinate in the spring and fall, regularly inspect the lawn during these times and be prepared to hand-pull or “spot treat” with an organic-based herbicide.
- A list of **organic-based herbicides** labeled for home lawn use is available in the *Virginia Pest Management Guide for Home Grounds and Animals* ([VCE publication 456-018, https://ext.vt.edu](https://ext.vt.edu)). Almost all of these products are non-selective and have contact activity only. Non-selective means that they can also injure desirable plants, including the lawn grass. Contact activity means that they work by penetrating green plant tissue, disrupting its cellular structure, resulting in dehydration or “burn-down.” They do not affect the roots or other underground parts of a weed, so they work best on young weed seedlings that have limited roots.
- Research shows that **corn gluten** is an effective pre-emergent herbicide that can control crabgrass and some broadleaf weeds. The proteins in corn gluten act on germinating seeds to inhibit root growth. After a period of water stress, weed seedlings wilt and die. Corn gluten also contains 10% nitrogen by weight and has a slow-release fertilizing effect when applied to home lawns. Research shows that 50-60% weed control can be achieved in the first year when corn gluten is applied at 20 pounds per 1,000 square feet (this rate supplies 2 pounds of actual nitrogen); 80-85% in the second year; and over 90% control by the third year. This is due to the reduction in weed seeds, since weeds do not mature, and from the effect of nitrogen in the corn gluten increasing the lawn’s density. Much more information about corn gluten can be found at the Iowa State Corn Gluten Research site: <https://www.hort.iastate.edu/horticulture-research/corn-gluten-meal-research/>.

**For more information about organic lawn care:**

Frank Rossi, “Lawn Care without Pesticides,” Information Bulletin 248, Cornell University Cooperative Extension.

Jane Martin, Alyn Eickholt, and Joanne Dole, “Natural Organic Lawn Care for Ohio”, HYG-4031-04, Ohio State University Extension.

“Natural Lawn Care”, Horticultural MU Guide G6749, MU Extension, University of Missouri-Columbia.

A.H. Bruneau, Fred Yelverton, L.T. Lucas, Rick L. Brandenburg, “Organic Lawn Care: A Guide to Lawn Maintenance and Pest Management for North Carolina,” North Carolina Cooperative Extension Service, North Carolina State University.

## Additional Lawn Care Resources

The following additional information is available on the Virginia Cooperative Extension Website at <https://henrico.ext.vt.edu> or by calling our office at (804) 501-5160.

- Virginia Turfgrass Variety Recommendations
- A Good Turfgrass Maintenance Program for Henrico County
- Establishing Lawns
- Fall Lawn Care
- Home Landscape Practices to Protect Water Quality
- How to Buy Lawn Seed
- Lawn Establishment in Virginia
- Lawn Moss: Friend or Foe
- Maintenance Calendar for Warm-Season Turfgrasses in VA
- Maintenance Rates for Lawn Fertilizers
- Management of Wet Soils
- MU Guide – Home Lawn Weed Control
- Producing Quality Turfgrass in Shaded Areas
- Selection and Use of Mulches and Landscaping Fabrics
- Summer Lawn Management – Watering the Lawn

If you are interested in identifying the weeds in your lawn, a great resource is the book “**Weeds of Arkansas**,” a 148-page color booklet published by the University of Arkansas Cooperative Extension Service. You can download and print this publication from the University of Arkansas website at: <https://www.uaex.edu/publications/pdf/MP169.pdf> . (The weeds that grow in Arkansas also grow in Virginia!)

Have questions? Call the Henrico Master Gardener Helpline at (804) 501-5160 to talk to a Master Gardener Volunteer.

## Are You SMART? A Checklist for Fescue Lawns

### Lime and Fertilization Practices

- My total managed lawn area is \_\_\_\_\_ square feet.
- I apply lime only after receiving a soil test report that indicates a need for lime.
- I fertilize in September, October, and November (SON), using the recommended fertilizer type.

### Mowing Practices

- My mower blade is sharp to avoid tearing and damaging grass blades.
- My mower blade is set to a height of 3- 4 inches.
- I mow regularly and avoid removing more than 1/3 of the grass blade at each mowing.
- I recycle my grass clippings by leaving them on the lawn whenever possible.

### Irrigation

- I avoid light, frequent watering, instead watering deeply 1-2 times per week as needed.
- I have calibrated my irrigation system to deliver approximately 1 inch of water per week.
- I irrigate early in the morning (before sunrise, if possible).

### Aeration

- I core-aerate my lawn in spring and/or fall.
- I water my lawn before aerating to ensure good soil moisture.

### Over-seeding and Lawn Repair

- I over-seed my lawn between September 1 and October 15.
- I apply 2- to 3- lbs. of grass seed per 1,000 square feet when I over-seed.
- I over-seed with high quality turf-type tall fescue cultivars in sunny areas.
- I over-seed with fine fescue cultivars in shady areas.
- I rake or vacuum leaves in the fall to prevent packing down the grass over winter.

### Weed Management

- I know what types of weeds are in my lawn.
- I spot-treat or hand pull weeds when possible.
- I apply a pre-emergent crabgrass preventer (without fertilizer) in March and repeat according to label directions.
- I apply a broadleaf herbicide in April/May to control summer annual weeds such as lespedeza and spurge.
- I apply a broadleaf herbicide in October/November to control winter annual weeds such as henbit and chickweed.

### Pest Management

- I identify insects and diseases before attempting to control them.
- I physically remove pests when possible.
- When a pesticide is necessary, I choose the least toxic one to protect beneficial insects.
- I check for grubs before applying a chemical grub control product.



Virginia Cooperative Extension programs and employment are open to all, regardless of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, veteran status, or any other basis protected by law. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Edwin J. Jones, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; M. Ray McKinnie, Administrator, 1890 Extension Program, Virginia State University, Petersburg.

Disclaimer: Commercial products are named in this publication for informational purposes only. Virginia Cooperative Extension does not endorse these products and does not intend discrimination against other products which also may be suitable.



**Virginia Cooperative Extension**

Virginia Tech • Virginia State University

[www.ext.vt.edu](http://www.ext.vt.edu)