A Virginian's Year-Round Guide to Yard Care

Tips and techniques for healthy lawns and gardens

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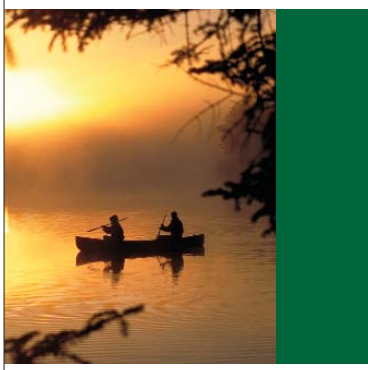
The Health of Virginia's Waterways Begins in Your Backyard



Green lawns, tall trees, bright flowers—Virginians love the outdoors, even when it's just the backyard. The way you maintain your yard, however, can have surprising impacts on the natural world.

You probably know that pesticides and herbicides are powerful chemicals that can injure wildlife if overused. But, did you know that overfertilization and erosion are major threats to Virginia waterways and wildlife?

Carried with rainwater into lakes, rivers or the Chesapeake Bay, nitrogen from fertilizer feeds toxic algae to create dead zones where nothing else can survive. Sediment from erosion clouds waterways, preventing the growth of aquatic grasses—the base of the food chain for many fish and waterfowl.

The good news is that you can help protect Virginia's waterways and wildlife and still enjoy a vibrant, healthy yard. This guide will help.

Arranged in a convenient seasonal format, it will help you decide what to plant and when to fertilize; it will help you restore ailing plants and enrich your soil. Many of the steps outlined in the guide will save you both time and money, making it even easier to enjoy your lawn or garden.

Understanding Plant Nutrition

Winter

Fertilizers are not plant food! This is a misnomer. Plants produce their own food using water, carbon dioxide and energy from the sun.

The Six Macronutrients

Plants need 17 nutrients for health but these six are the most important.

Nitrogen (N): Building block for proteins, enzymes, chlorophyll and growth regulators; excess produces excess leaf growth with little fruit

Phosphorus (P): Used in metabolism, respiration and photosynthesis; often lacking in acid and alkaline soils

Potassium (K): Aids in starch formation, water regulation, disease resistance, chlorophyll development and tuber formation; found in potash

Magnesium (Mg): Building block for chlorophyll, an enzyme activator; excess interferes with calcium

Calcium (Ca): Needed for cell wall structure and cell division, an enzyme activator; excess blocks micronutrient absorption

Sulfur (S): Component of proteins and amino acids, important in respiration; generally present in Virginia soil

Fertilizer Analysis

All fertilizers are labeled with three numbers. These three numbers give the percentage by weight of nitrogen (N), phosphate ($P_2 0_5$) and potash ($K_2 0$). Examples of commonly used fertilizers are 23-3-7 and 20-10-5. An "incomplete" fertilizer lacks one of the three nutrients.

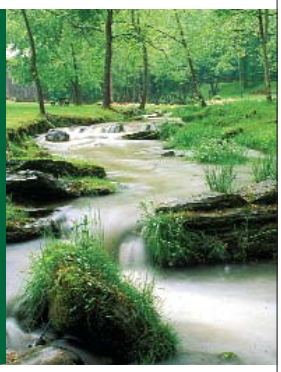
Cottonseed meal, blood meal, bone meal, hoof and horn meal, fish emulsion and manures are examples of organic fertilizers. Organic fertilizers may contain lower concentrations of nutrients, but they perform important functions that synthetic formulas do not, improving the physical structure of your soil and promoting beneficial bacterial and fungal activity.

Effects of Over-Fertilizing

Not only is over-fertilizing a waste of time and money, it can do serious harm to the plants you intend to help. Fertilizers are salts, much like table salt. If tender plant roots are close to fertilizer granules, water is drawn away from these roots and they dehydrate. Over-fertilizing trees or shrubs, particularly with slow-release fertilizer, can also cause them to keep growing into the fall when they should be hardening off for winter.

TIP:

Organic fertilizers are a source of slowly available, water-insoluble nitrogen (WIN). These slow-release fertilizers require fewer applications.



Excess fertilizer poses a serious threat to water quality. Rainwater runoff carries it into streams and lakes, where it promotes the growth of harmful algae. Excess fertilizer can also leach into the groundwater supply.

Avoid getting fertilizer on sidewalks and driveways so it is not washed into storm drains that flow into streams. To minimize leaching and runoff, provide your soil with holding power by planting groundcovers in bare spots.

Nutrient Troubleshooting for the Garden

Here are some common symptoms of nutrient deficiency. It is recommended that you test your soil and consult a professional before beginning fertilizer treatments.

Problem	Missing Nutrient
Yellowing, especially of older leaves	N
Yellowing of new growth	S
Yellowing between veins	K
Yellow leaf edges	Mg
Leaves turn lighter green	N
Leaves turn brown or purple	P
Brown leaf tips	P
Brown leaf edges	K
Tendency to wilt	K
Cupping of mature leaves	Ca
New leaves irregularly shaped	Ca
Reduced flowering	P
Reduced seed production	Mg
Inhibited bud growth	Ca

Testing Your Soil

Winter

It is important to apply the optimum amounts of fertilizer, lime and other soil amendments and to do so at the proper time of year. A soil test supplies valuable guidance for improving your soil. Perform a soil test every 3 to 4 years. If possible, test in the fall so that lime and other soil amendments can alter pH over the winter.

Types of tests

Soil test kits are available from your local Virginia Cooperative Extension office (find your office at www.ext.vt.edu). Follow the instructions when collecting a sample, complete the enclosed form, then mail the kit to Virginia Tech according to the instructions provided. Your results will arrive by mail, along with recommendations on what fertilizer or other soil amendments to use for specific plants. Results show pH and availability of phosphorus, potassium, calcium and magnesium.

Some nurseries also sell soil test kits for at-home use. Private testing companies can provide detailed reports but may be expensive.

The accuracy of any soil test is a reflection of the soil sample. Be sure your sample is representative of the area to be treated. Using a stainless steel or chrome-plated shovel or spade, sample the soil from 10 random areas, avoiding border areas such as those near roads, compost or brush piles, or under eaves. Place the samples in a clean pail or container and mix them thoroughly, then submit the combined soil for testing.

TIP:

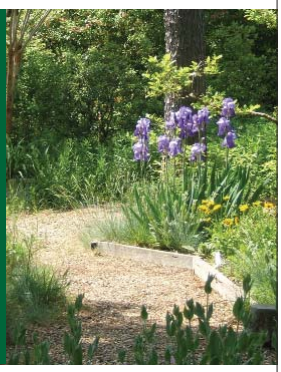
Do not use brass, bronze or galvanized tools to collect soil samples because they will contaminate samples with copper and/or zinc.

How deep should I dig for a soil sample?

Established lawns	2–4 inches
Vegetable and flower gardens	6–8 inches or tillage depth
Trees and shrubs	6 inches

Common Soil Types in Virginia

- Sandy soil is coarse and grainy. Sandy soil drains well but dries out rapidly.
- Clay soil is very thick, like putty. It holds water like a sponge, but when it does dry out becomes hard and very solid.
- Silty soil is between sandy and clay soil. It holds water but does not dry into a hard, solid mass.
- Loam is the ideal mixture of sand, clay and silt. Through the addition of organic amendments, loam can become the perfect soil for your vegetable garden.



Erosion Control

Soil erosion begins when rainfall detaches soil particles. Runoff then carries the particles away.

Erosion robs your lawn or garden of the nutrients and organic material your plants need. It also contributes to water pollution. Soil is the largest volume pollutant in Virginia waterways, and most of the phosphate and pesticides in our waters arrive attached to soil particles.

Signs of Erosion

- Exposed tree roots or stones
- Small rills or gullies
- Silt accumulation in low areas
- Soil splashed on windows and outside walls
- Widening or deepening of stream channels

TIP:

Cover pathways and high-traffic areas in your yard with a permeable surface such as pea gravel or wood chips. More attractive than exposed dirt, these surfaces allow your soil to absorb water and keep mud out of your house.

The destructive process of erosion can be controlled. Reducing the quantity and velocity of runoff will abate erosion. This may require regrading steep slopes, building terraces or installing drainage pipes. Groundcovers are a more cost-effective way to slow erosion. These plants cover the ground surface so that rain does not directly strike the soil. Their roots hold the soil in place and absorb water and nutrients.

Turfgrass is one important type of groundcover, but newly cut banks and slopes greater than 12 percent are best treated with groundcovers other than sod. Around buildings, groundcovers are superior to paving or structural controls for reducing heat, glare, noise and dust.

Groundcovers can:

- Conserve soil moisture and lower soil temperatures during periods of extreme heat.
- Reduce lawn maintenance and fill narrow, odd-shaped areas where mowing and edging might be difficult.
- Obstruct foot traffic without impeding view.
- Produce interesting patterns with variation in height, texture and color.

Significant maintenance is necessary for the first one to three years after planting until groundcovers become established. Use organic mulch, such as wood chips or pine straw, to control weeds in your groundcover plantings.

Non-turf Groundcovers

Allegheny spurge, *Pachysandra procumbens*
Wild ginger, *Asarum canadense*
Green and Gold, *Chrysogonum virginianum*
Eastern foam flower, *Tiarella cordifolia*
Eastern alumroots, *Heuchera spp.*
Woodland phlox, *Phlox divaricata*
Creeping phlox, *Phlox stolonifera*

Rain Gardens

Puddles in your back yard? Rain gardens are an attractive solution to drainage and erosion problems. Rain gardens are slight depressions planted with hardy perennials that soak up more stormwater than a typical lawn. Besides absorbing pesticides and fertilizers that would otherwise enter waterways, rain gardens create habitat for songbirds and butterflies. Once established, they require minimal maintenance. In Virginia, most rain gardens consist of flood- and drought-tolerant trees and shrubs (red maples, river birch, winterberry) surrounded by a strip of grasses, ferns and flowers (cardinal flower, Virginia bluebells, sensitive fern). Some include a shallow, pebble-bottomed ponding area near the center. Hardwood mulch will keep your rain garden weed-free and improve water absorption and filtration.

Tilling the Soil

Tilling or plowing your garden correctly preserves the soil and its fertility, enhancing the absorption of rainfall and protecting local streams from sediment runoff.

When to Till

Gardeners often wonder whether to till in the spring or in the fall. Spring plowing is better for sandy soils. In most of Virginia, however, working the soil in the fall is far more beneficial:

- Turning under organic matter in the fall results in better decomposition because there are more warm days for the process to take place.
- Incorporating limestone or rock fertilizers in the fall gives them time to interact chemically with the soil.
- Insects and perennial weeds are reduced by exposing soil and roots to harsh winter weather.
- Finally, tilled soil retains more moisture by trapping snow between its furrows.

Steep Slopes

Fall plowing alone is not recommended for hillside garden plots. Sloped soil left exposed all winter is subject to erosion. Till sloped areas, then plant a winter cover crop of rye and hairy vetch. Turn the green cover crop under in the spring.

Minimum-till Gardening

Vegetable gardeners: consider a move to minimum-till gardening, also known as conservation tillage. This method is ideal for transplants, and you can start on a test plot within your garden.

1. In the fall, till under summer crop wastes. Remove tomato vines and corn stalks to make tilling easier.
2. Plant a combination cover crop such as rye and hairy vetch. Use 2 pounds of winter rye grain and 0.75 pounds of hairy vetch seed (coated with a Rhizobium innouculant) per 1000 square feet.
3. In the spring, cut the cover crop to a manageable level with a scythe or string-line trimmer. Rake the clippings aside and save them. Use a lawn mower to completely trim the cover crop to the ground.
4. A week later, mow the area again. Now your area is ready for planting. Dig a hole for each plant, pulling out the surrounding vegetation. Mulch the area between plants with the clippings reserved from the week before.
5. As the plants grow, add mulch or weed as needed.

Fertilizing Your Vegetables

Fertilizers are designed to supplement the nutrients already present in your soil. Too much fertilizer can damage roots, and the excess can pollute groundwater or local waterways.

Different Plants, Different Needs

Proper use of nutrients, particularly nitrogen, can control the rate and character of a plant's growth, but certain crops require more of some nutrients than others. If tomatoes are fertilized heavily with nitrogen into the summer, the plants may be all vine and no fruit. This is also the case with potatoes, which will produce vines instead of tubers. Corn, however, may require nitrogen fertilization every month.

Remember that a nitrogen application will have its greatest effect three to four weeks after application. Slow-release fertilizers or heavy amounts of manure will keep plants producing leaves or vines, with fruit or vegetables developing very late in the season.

Application Methods

Broadcasting. Fertilizer is spread over the growing area then left to filter into the soil or incorporated into the soil with a tiller or spade.

Banding. Narrow bands of fertilizer are applied in furrows 2 to 3 inches from the seeds or plants and 1 to 2 inches deeper. If the fertilizer band is placed too close to the seeds, it will burn the roots of the seedlings. For plants widely spaced, such as tomatoes, fertilizers can be placed in a circle 4 inches from the plant base. Banding is a good way to satisfy the needs of plants like tomatoes for phosphorus as the first roots develop.

Side Dressing. Dry fertilizer is applied as a side dressing after plants are up and growing. Scatter fertilizer on both sides of the row, 6 to 8 inches from the plants. Rake it into the soil and water thoroughly.

Foliar Feeding. Nutrients applied to foliage are absorbed and used by the plant quite rapidly. Absorption begins within minutes and is complete within two days. Foliar feeding is best when your soil is too cold for plants to extract dry fertilizer. Foliar nutrition can be a supplement at a critical time, but cannot replace soil fertilization.

TIP:

Plant crops with similar fertilizer needs close together to avoid improper application rates as nitrogen enters the soil.

Irrigation

Adequate soil moisture is essential for good crop growth. A healthy plant is 75 to 90 percent water; water is necessary for photosynthesis, provides rigidity to plant tissues and transports nutrients and sugars to various parts of the plant.

There are several options for watering plants: a watering can, a garden hose with a spray attachment or portable lawn sprinkler, a perforated soaker hose, or an irrigation system.

Careful irrigation helps local streams and reservoirs by reducing fertilizer and pesticide runoff and conserving water.

When to Water your Lawn

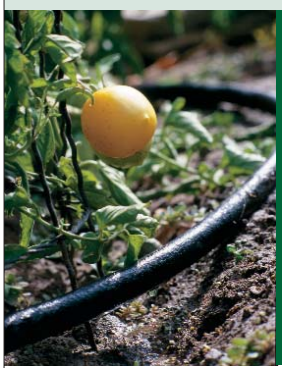
Your lawn can use an inch or more of water per week in hot, dry weather. Water the lawn when the soil begins to dry out but before the grass wilts. Here's a tip: Look at your footprints. On a thirsty lawn, footprints will make a lasting imprint instead of bouncing back.

Basic Principles for Watering Lawns and Gardens

- Morning watering is preferred. Do not sprinkle foliage in the evening. Wet foliage overnight may encourage disease. Avoid watering during the heat of the day, as water will be lost to irrigation.
- Apply water at a rate of half an inch per hour. Faster application will cause runoff, wasting water and money. Test the application rate for a sprinkler by placing small cans at within the sprinkler's reach, and checking the level of water in them at 15-minute intervals.

TIP:

Trickle or drip irrigation systems and soaker hoses are the most efficient ways to water your plants; a timer even allows your system to water in the morning, while you're getting ready for work.



- When using an oscillating lawn sprinkler, place the sprinkler on a platform higher than your garden plants to prevent water from being diverted by their leaves. Water evenly by moving the sprinkler often and overlapping about half of each spray pattern.
- Perforated soaker hoses should be placed with holes down along one side of the row of plants. Semi-permanent soaker hoses can be placed underneath mulch.
- Frequent, light waterings encourage shallow rooting, which causes plants to suffer more during drought. On the other hand, too much water can be as damaging to plants as too little.

When to Water Vegetables

Be sure to water the following vegetables at these critical phases of development.

Asparagus	Spear production, fern development
Broccoli, cabbage, cauliflower	Head development
Beans, peas	Pod filling
Carrots	Seed emergence, root development
Corn	Silking, tasseling, ear development
Eggplant, tomatoes cucumber, melons	Flowering, fruiting
Lettuce	Throughout head development

Selecting Turfgrass

The first step toward a beautiful, healthy lawn is to select the right turfgrass variety—one that is adapted to your climate and maintenance preferences. Cool season grasses provide winter lawn color in most areas of Virginia, whereas warm season grasses go dormant after the first hard frost, requiring less maintenance and water.

In order to flourish, turfgrass requires a soil depth of six to eight inches for good root growth, a soil pH of approximately 6.2, about an inch of water weekly and adequate sunshine. If your yard doesn't meet these criteria, consider an alternative groundcover (see page 7).

Turfgrass Varieties for Virginia

In the Northern Piedmont and the Blue Ridge Mountains, the cool-season species Kentucky bluegrass and tall fescue generally produce the best year-round lawns. In the Southern Piedmont and Eastern Virginia, tall fescue is preferable. For a shade-tolerant cool-season grass, use fine leaf fescue (creeping red fescue, hard fescue, chewings fescue or sheep fescue).

Warm-season bermudagrass and zoysiagrass produce a dense sod like Kentucky bluegrass. Select a winter-hardy cultivar of bermudagrass if you live in northern Virginia. Also be aware that bermudagrass spreads rapidly, often invading shrub or garden beds.

Mow Regularly

Proper mowing is important for a well-kept lawn. Although recommended cutting heights vary by type of grass, you should cut no more than one-third of the plant at any mowing. For cool-season grasses, increase mowing height during the summer to reduce stress on the turf.

Bagging grass clippings robs your lawn of valuable nutrients. Clippings left on a properly mowed lawn act as fertilizer. During peak growing periods, usually in April, it may be necessary to collect grass clippings. In this case, add them to your compost pile to produce mulch.

TIP:

To determine the pH of your soil, obtain a soil test kit from your local Virginia Cooperative Extension office. The soil report will also tell you what kind of fertilizer to use and how much.

Recommended Turfgrass Mowing Heights (inches)

Kentucky bluegrass	1.5–2.5
Tall fescue	2–3
Fine fescue	2–3
Perennial ryegrass	1.5–2.5
Bermudagrass	0.5–1
Zoysiagrass	0.5–1

Fertilize in the Fall

Fall fertilizer application is the most beneficial to cool-season grasses in Virginia. Applications of fertilizer containing nitrogen should be made from September through November. By leaving grass clippings on the lawn all summer, you can reduce the need for artificial nitrogen 20 to 30 percent after the first year and 35 to 45 percent after the second year.

Water if Needed

Except during the most severe drought, grasses common to Virginia will survive without watering. If you wish to maintain a green yard in dry weather, add about 1 inch of water a week, preferably in the early morning and only as much as will soak into the ground. Water that is allowed to run off carries with it nutrients that are valuable to the lawn but harmful to streams and reservoirs.

Save Time and Money

By leaving their grass clippings on the lawn rather than bagging them as trash, homeowners in Virginia save more than time. Annual homeowner savings for a typical quarter-acre lot amount to $25 to $50 in fertilizer costs and $25 to $45 for plastic bags. In addition, you will help your local government keep a lid on refuse disposal costs. A typical quarter-acre lot generates 3,500 to 4,000 pounds of grass clippings a year. Disposing of them costs the homeowner $50 to $90 a year in public service charges, private collector fees or taxes.

Saving your Soil

What happens to soil nutrients during a drought? Nothing. The good news about drought is that it does not rob your soil of nutrients.

But, heavy rainfall after a dry period can wash away clay, and with it valuable nutrients and topsoil. To hold on to your soil:

- Incorporate organic matter into clays and other soil types to improve soil structure.
- Mulch your plants to conserve moisture and control erosion.
- Use trickle irrigation near the base of plants to reduce runoff.

Watering during a Drought

There is no substitute for water during a dry spell. However, you should adhere to local water restrictions, if applicable. Your water conservation ensures safe drinking water for your community.

Avoid afternoon watering, which results in a 20 to 25 percent loss of water through heat and evaporation. And if foliage is watered, it can create a magnifying-glass effect that burns leaf tissue. The best time to water is early morning, when humidity is high and moisture loss is minimal.

Watering in the evening prevents evaporation, but it increases the risk of fungal disease and damage from nocturnal insects searching for water.

Dormancy or Death?

When rainfall is sparse, Mother Nature has provided your lawn with a built-in protection plan: dormancy. Grass turns brown as moisture reserves dry up, but it is far from dead. By going into a dormant state, grass halts the process of photosynthesis. This is why grass grows at a slower pace in hot, dry periods. When rains do come, your grass will green up, especially fescues, bluegrass, zoysiagrass and bermudagrass.

Never apply fertilizer to a dormant lawn, because it could kill your grass.

TIP:

Restrict the use of herbicides to reduce stress on your lawn. Grass uses water to detoxify these chemicals, so avoid them during drought.

Pest Control

TIP:

Enlist the aid of wild birds in your garden. They feed on pest insects. Consider planting shrubs and trees with fruits that attract them–and distract them from your fruits and vegetables. You can protect ripening fruits and vegetables with bird netting.

The best way to control insects and disease is to prevent them before they get a foothold in your yard. A few important things to remember:

- Use native plants when possible, as these are most resistant to indigenous pests.
- Buy plants from a reputable grower who can assure you that they are pest-free; use disease-free, certified seed.
- Water in the morning. This allows plants to dry before the cool evening, making them less susceptible to disease. It also discourages the presence of many insects that feed at night.
- Avoid overcrowding in your garden beds. This will slow the spread of diseases and insects, giving you more time to deal with them.
- Weed your garden beds. Weeds and grasses often harbor pests. Organic mulches and fabric covers are extremely effective for weed control and also reduce soil splash, which can bring soil-borne diseases into contact with lower leaves.
- Avoid injury to plants. Broken limbs, cuts, bruises, cracks and insect damage are often sites of infection. Remove and dispose of diseased or infested leaves from as soon as you observe them. Remove severely damaged plants before they contaminate others.
- Inspect plants for egg clusters, beetles, caterpillars and other insects as often as possible. Hand-pick as many pests as you can. Avoid sprays until the population has reached a critical level.
- If slugs are a problem, try to create drier conditions. Placing diatomaceous earth, crushed eggshells and hydrated lime near plants may deter slug activity.

Using Pesticide and Herbicide

Before applying a pesticide, be certain to identify the target pest accurately. Also, make sure it is causing harm to your plants. Poor growing conditions (moisture or nutrient levels, severe weather) cause most plant problems, not pests.

Always read the label before applying chemicals in your yard. Select products targeted to the pest or weeds in your yard to avoid damaging beneficial insects or even your own flowers and vegetables.

Never spray chemicals near water, polluted runoff is a threat to your local water supply and to wildlife. Also avoid spraying on windy days and near paved surfaces.

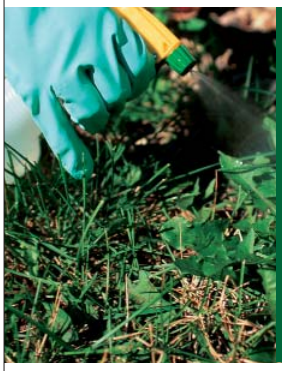
Beneficial Bugs

Many insects prey on pest insects. Here are a few bugs you want to see in the yard and the pests they feed on.

Assassin bug, *Reduviidaye*	Aphids, caterpillars, potato beetles, Japanese beetles, leafhoppers, Mexican bean beetles
Damsel bug, *Nabidae*	Aphids, leafhoppers, mites, caterpillars
Big-eyed bug, *Lygaeidae*	Aphids, caterpillar eggs and larvae, immature bugs, leafhoppers, spider mites
Predacious stink bug, *Pentatomidae*	Potato beetles, caterpillar larvae
Syrphid fly larvae, *Syrphidae*	Aphids, mealybugs
Lady beetle, *Hippodamia convergens*	Aphids, mealybugs, spider mites
Green lacewing larvae, *Chrysopa camea*	Insect eggs, aphids, spider mites, thrips, leafhopper nymphs, caterpillar larvae
Trichogramma wasp, *Trichogrammatidae*	200 pest insect eggs including cutworms, corn borers, corn earworms, armyworms, codling moths, cabbage moths
Encarsia wasp, *Encyrtidae*	Greenhouse whiteflies

TIP:

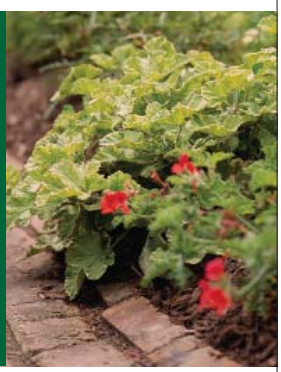
Purchase only the pesticide, herbicide and fertilizer you need for one season to avoid the storage and disposal problems associated with strong chemicals. Never pour pesticide down a sink, toilet or storm drain.



Pest-Control Plants

Many plants produce natural chemicals that repel insects. When planted among flowers and vegetables, these plants help keep pests away.

Pest	Plant Repellent
Ant	Mint, tansy, pennyroyal
Aphids	Mint, garlic, chives, coriander, anise
Bean leaf beetle	Potato, onion, turnip
Codling moth	Common oleander
Colorado potato bug	Green beans, coriander, nasturtium
Cucumber beetle	Radish, tansy
Flea beetle	Garlic, onion, mint
Imported cabbage worm	Mint, sage, rosemary, hyssop
Japanese beetle	Garlic, larkspur, tansy, rue, geranium
Leaf hopper	Geranium, petunia
Mexican bean beetle	Potato, onion, garlic, radish, petunia, marigolds
Slugs	Prostrate rosemary, wormwood
Spider mites	Onion, garlic, cloves, chives
Squash bug	Radish, marigolds, tansy, nasturtium
Stink bug	Radish
Thrips	Marigolds
Tomato hornworm	Marigolds, sage, borage
Whitefly	Marigolds, nasturtium



Fertilizing Your Lawn

When the weather warms and spring is on the horizon, many people make plans to fertilize their lawns. However, spring may not be the best time to apply fertilizer. Be sure you apply the right kind of fertilizer, in the right amount, at the right time.

Selecting a Fertilizer

Before beginning a fertilization program, use a soil test to determine the fertility of your soil. The results will indicate the amounts of nutrients already present and the acidity (pH) of your soil.

Based on the results, choose a fertilizer with the appropriate amounts of nitrogen, phosphate and potash for your lawn. Acidic soils may need lime in addition to fertilizer (apply it in the fall so it can break down during the winter). Mature lawns generally require more nitrogen than phosphorus and potassium.

TIP:

Choose a fertilizer with slowly available nitrogen; look for the percentage of water insoluble nitrogen (WIN) on the label.

Applying at the Proper Time

Proper timing of fertilizer applications is different for warm-season and cool-season turfgrasses because of their different growth cycles. Most yards in Virginia are made up of cool-season grasses, including Kentucky bluegrass, tall fescue, perennial ryegrass and fine fescues (creeping red fescue, hard fescue, sheep fescue and chewings fescue). The best time to fertilize cool-season grasses is from mid-August through November. Warm-season grasses, including bermudagrass, zoysiagrass and centipedegrass, perform best when fertilized between early April and late August in Virginia.

Monthly Fertilizer Needs of Cool-Season Grasses (Lbs per 1000 square feet)

	May 15 to June 15	Aug.	Sept.	Oct.
Less than 50% slowly available nitrogen	0–0.5	0	1	1
More than 50% slowly available nitrogen	0–1	0–0.5	1	1–1.5

Monthly Fertilizer Needs of Warm-Season Grasses (Lbs per 1000 square feet)

	April	May	June	July or Aug.
Less than 50% slowly available nitrogen	1	1	0	0
More than 50% slowly available nitrogen	0.5	1	1	0.5

TIP:

Excessive spring fertilizer application leads to leaf growth at the expense of food reserves and root growth, increasing injury to lawns from summer disease and drought.

Choosing Application Equipment

It is important to apply lawn fertilizers uniformly for even growth. Proper application by hand is very difficult. Drop-type or rotary fertilizer spreaders are most effective.

Rotary spreaders tend to cover a broader swath, but take care to avoid application of any fertilizer to driveways, roads or bare soil, as it could be washed into the water supply.

Use the following chart to determine the correct amount of fertilizer to apply for a desired amount of nitrogen

Fertilizer analysis	Lbs of fertilizer per 1000 square ft.	
6-2-0	8.3	16.6
10-10-10	5.0	10.0
12-4-8	4.1	8.3
16-8-8	3.1	6.2
20-0-16	2.5	5.0
23-3-7	2.1	4.3
28-0-12	1.8	3.6
31-0-0	1.6	3.2
33.5-0-0	1.5	3.0
38-0-0	1.3	2.6
46-0-0	1.1	2.2
	0.5	**1**
	Lbs of nitrogen per 1000 square ft.	

Applied correctly, soil amendments conserve moisture, improve infiltration of rainfall water and unlock existing nutrients in the soil. Common soil amendments include lime, sulfur, ash, compost and manure.

Changing the pH of your Soil

The correct soil pH is essential for optimum plant growth. Sulfur and lime are common amendments used to balance soil pH. Elemental sulfur makes soil more acidic. Dolomitic limestone adds calcium and magnesium as it increases pH to make soil more alkaline. Wood ashes also raise soil pH, but you must apply twice as much ash as limestone. Never use coal ashes or more than 20 pounds of wood ash per 1000 square feet, as toxicity may result.

Adding Nutrients to your Soil

Commercial fertilizers are the most common amendments for adding nutrients to soil. Other nutrient sources include cottonseed meal, kelp meal, leather meal and worm castings, each of which contains nitrogen, phosphorus and potassium in some amount. Common potassium sources also include granite meal, which releases potassium slowly, and greensand, which is more readily dissolved.

The regular addition of manure, compost and other organic matter can improve soil structure and nutrient content to the point that little or no synthetic fertilizer is needed. This rarely happens with a single addition but requires a long-term program.

Fresh manure is quite high in nitrogen and may burn plants in a growing garden. It is best applied in the fall and tilled under. Compost, typically made by gardeners from plant wastes such as yard clippings and fallen leaves, can be added to gardens when tilled in the spring or placed beneath mulch in plant beds. Composting produces a valuable source of nutrients, and the resulting dark earth, called humus, helps soil retain moisture.

Making Use Of Fallen Leaves

Deciduous trees provide cooling shade through the summer and let sunlight warm your home in the winter. But if you have large trees adorning your property, you may consider yourself cursed in the fall, when all those leaves need to be raked and carted away. This year, try a different strategy. Instead of turning leaves into garbage, turn them into beneficial compost for next year's flower and vegetable beds. A compost pile need not take up a large area. Nor does a properly maintained compost pile produce offensive odors.

TIP:

Organic fertilizers typically contain more calcium, magnesium and micronutrients than commercial fertilizers.

Build a compost pile

- Select a location for composting. Many people build wooden or wire enclosures for composting, and some purchase mounted rotating bins. However, the microbes that produce good compost are content with a simple pile of leaves and grass clippings.
- Rake clippings from tall grass to use in your compost pile. They provide an excellent nitrogen source, especially if you are without access to manure. If the grass is green, however, do not add too much at once.
- Add other lawn wastes such as leaves (dry and fresh), straw, sawdust and woodchips. These provide carbon and nitrogen to the compost. Consider using your lawn mower to shred leaves before composting them.
- You can compost kitchen waste such as orange peels and apple cores, but avoid adding scraps that will attract pets or wild animals.
- Add diseased or insect-infested plant parts and weeds only if you are certain your compost pile will heat up enough to kill the pest organisms and weed seeds.
- Add an occasional layer of soil and some ground limestone to aid the decomposition process. Turn the compost occasionally.

Winterize Your Yard

It is often necessary to give your plants a little extra attention in the fall to help them make it through winter and start spring in peak condition.

Landscape with Winter in Mind

Begin by selecting hardy plants, particularly if you live in a region where snow and ice are common, such as Virginia's Blue Ridge Mountains. Native plants are your best bet because they are uniquely adapted to a region's climate.

Also be sure to plant trees and shrubs in an appropriate site. Avoid poorly drained soil, low spots that create frost pockets and sites that experience rapid fluctuations in temperature. Consider the wintertime patterns of sun and shade in your yard.

TIP:

Many varieties of rhododendron, azalea, camellia, daphne and holly should be planted on the northern or eastern side of a building or wall to protect them from prevailing winds and intense winter sun.

Garden Cover Crops

Cover crops maintain and even improve the nutrients in your garden soil during the winter. The cover crop's roots hold the soil, decreasing erosion. When tilled under the in the spring, the crop adds valuable organic material to the soil.

Plant winter cover crops in September or October. Till under plant wastes from the summer, then broadcast the seed and rake it evenly into the soil. If you have fall crops growing, you can sow cover crop seed between rows within a month of harvest without hampering your vegetables.

Some cover crops are legumes such as crimson clover, fava beans or hairy vetch. Others include barley, winter rye and winter wheat. Mixtures of two cover crops are often very effective.

Prune at the Right Time

Proper pruning throughout the year reduces damage by ice and snow. Trim branches so that limbs are not weighted down by ice and snow. Avoid late summer pruning, however, as it stimulates new growth, exhausting the nutrients a plant needs to survive winter.

TIP:

Remove snow from branches with a broom. Always sweep upward with the broom to lift snow off. When branches are frozen and brittle, avoid disturbing them. Wait until a warmer day.

Water Properly

Be sure your plants have enough water. If autumn rains have been insufficient, give plants a deep soaking that will supply water to the entire root system before the ground freezes. This practice is especially important for evergreens. Watering on warm days in January, February and March is also important.

Apply Mulch

Mulch helps to control erosion, retain moisture and stabilize soil temperature. A two-inch layer of mulch material, such as fir bark, pine needles or wood chips, will reduce water loss and maintain uniform soil moisture around roots. Mulch also reduces repeat freezing and thawing of the soil, which causes significant damage to some shallow-rooted plants. Mulch can even be applied to garden beds in lieu of cover crops to prevent winter erosion.

Protect Newly Planted Trees

Bark splitting, especially dangerous to young trees, results from extreme fluctuations in temperature. Afternoon sun warms exposed trunks, and the sudden temperature drop at nightfall causes splits and cracks. Prevent bark splitting by wrapping trunks with burlap strips or a commercial tree wrap.

More Information

Virginia Department of Conservation and Recreation (DCR)
Native plants, backyard wildlife habitats, soil and water conservation

www.dcr.virginia.gov
(804) 786-1712

Virginia Cooperative Extension
Local Extension agents, Master Gardeners groups, soil tests

www.ext.vt.edu
More than 100 local offices across Virginia

Virginia Department of Forestry
Tree care, urban forestry, fire prevention, rain gardens

www.dof.virginia.gov
(434) 977-6555

Virginia Department of Game and Inland Fisheries
Backyard habitats, nuisance wildlife control

www.dgif.virginia.gov
(804) 367-1000

Virginia Department of Environmental Quality
Water monitoring, recycling, litter prevention

www.deq.virginia.gov
(804) 698-4447

Chesapeake Bay Program
BayScaping, native wildlife, water quality

www.chesapeakebay.net
(800) YOUR BAY

Alliance for the Chesapeake Bay
BayScaping, rain gardens, green roofs

www.acb-online.org
(804) 775-0951

U.S. Department of Agriculture, Natural Resources Conservation Service
Backyard conservation

www.nrcs.usda.gov
(804) 287-1691

U.S. Environmental Protection Agency,
Conservation, water quality

www.epa.gov
(202) 272-0167

U.S. Fish and Wildlife Service
Wildlife habitat

www.fws.gov
(800) 344-WILD

American Horticultural Society
SmartGarden program, seasonal yard-care tips
www.ahs.org

(800) 777-7931

Virginia Nursery and Landscape Association
Plant sources

www.vnla.org
(800) 476-0055

Virginia Native Plant Society
Native plants, invasive species removal, Wildflowers across Virginia program

www.vnps.org
(540) 837-1600

DCR
Virginia Department of Conservation & Recreation

Chesapeake Bay Program
A Watershed Partnership