

## Virginia Cooperative Extension

---

*A partnership of Virginia Tech and Virginia State University*

# A Landscaping Guide for Homeowners Associations

# AN INTRODUCTION TO BEST MANAGEMENT PRACTICES

*Research-Based Information for Enhancing the Overall Health of Your Landscape, local water supplies and the Chesapeake Bay*

**W**ater quality is a critical issue for the entire Chesapeake Bay watershed. Home owners, home owners associations (HOAs), businesses and public agencies will be asked to do more and more to help reduce pollutants going into the Bay. Properly maintained landscapes play a key role in this effort. Doing the right thing for your landscape and doing the right thing for the Bay go hand in hand when you follow some basic guidelines.

- Avoid planting monocultures of any one type of tree, shrub or turfgrass. Diversity of plant species will benefit the soil and beneficial insect populations. A less complex plant population favors insect and disease outbreaks. When attacks occur, treatment and replacement costs will be much higher in a monoculture than in a diverse planting.
- Use compost or plant cover crops to improve soil structure and fertility in lawns or gardens
- Prevent erosion by maintaining vegetative cover, correcting drainage problems
- Group plants with similar needs (water, fertilizer, sun...) for easier maintenance
- Use plants or mulch to conserve water, suppress weeds and prevent soil erosion
- Don't apply fertilizers or pesticides near water
- Avoid planting invasive plant species
- Achieve a low maintenance garden by planting natives
- Plant "All-America Selections" (AAS) ornamentals for less disease and pest problems and better performance. Lists of the AAS are available at [www.all-america-selections.org](http://www.all-america-selections.org)
- Always identify pests before using pesticides. Apply the right pesticide at the right time.

Many HOA landscape committees don't always have the expertise to negotiate the technical aspects of what maintenance is needed and when it is needed. Virginia Cooperative Extension (VCE) is charged with providing research-based knowledge to the public. This guide presents proven best management practices (BMPs) based on university research. They will help you make environmentally-friendly decisions to improve your landscape. For more information on any the BMPs presented here, please contact us.

**Virginia Cooperative Extension – Prince William Unit**

8033 Ashton Avenue • Suite 105

Manassas, VA 20109

Phone 703.792.4671 • Fax 703.792.4630

---

# Table of Contents

AN INTRODUCTION TO BEST MANGEMENT PRACTICES .....	i
Thomas Bolles, Environmental Educator, Virginia Cooperative Extension - Prince William Unit, 2015	
MAINTAINING TURF.....	3
Types of Turf.....	3
Soil Tests.....	3
Mowing .....	3
Irrigation.....	4
Fertilization .....	4
Lime and pH .....	5
Other Ways to Improve Your Soil .....	5
Aeration.....	5
Compost.....	5
Overseeding .....	6
Pest Management.....	6
Weeds.....	6
Disease .....	7
Insects.....	7
MAINTAINING TREES AND SHRUBS.....	8
General Guidelines .....	8
New Plants.....	8
Plant Selection .....	8
Planting .....	8
Mulching .....	9
Pruning .....	9
When to Prune .....	9
Why Prune .....	9
Pruning Faux Pas .....	10
Shearing Shrubs .....	10
Topping Trees.....	10
Fertilizing Trees and Shrubs.....	11
In General .....	11
Fertilizer Placement .....	11
Factors Affecting Nutrient Uptake .....	11
Fertilizer Rates.....	12
Timing .....	12
Irrigating Trees and Shrubs .....	12

---

OTHER LANDSCAPE PLANTS.....	13
Improving Soil.....	13
Annuals, Perennials and Bulbs.....	13
Irrigation.....	14
Compost.....	14
Fertilizer and Lime.....	14
Insects.....	14
Diseases.....	14
Weeds.....	14
OTHER CONCERNS.....	15
Wildlife.....	15
Wildlife Control.....	15
Wildlife Conservation.....	15
Stormwater Management.....	16
Resident Education.....	18
Turf Care.....	18
Invasive Plants.....	18
Stormwater Issues.....	19
Pesticide Use.....	19

# MAINTAINING TURF

## *Understanding Your Turf Will Save You Time and Money*

**G**rass is the part of the landscape that often requires the most attention. Like its cousins, corn and wheat, turf grass requires a good deal of maintenance for peak performance. Understanding your turf will better enable you to make sound management decisions. The VCE has turf maintenance calendars for both warm and cool season turf available to give an overview of when key maintenance tasks need to be done.

## Types of Turf

There are basically two types of turf grass. Since we live in a transition zone, species from both groups can grow in our area. Warm season grasses thrive in the summer. Only two species, Bermuda grass and Zoysia are somewhat suitable for Northern Virginia. They stay green through all but the toughest droughts, but spend most of the year in a dormant state. Cool season grasses thrive in the spring and fall. They also stay green in the winter. With proper irrigation, they can stay green throughout the year. Tall fescue and Kentucky bluegrass are the main cool season turf grasses used in most home lawns, but perennial ryegrass and fine fescues can also be used. Warm and cool season grasses are managed differently because of their growing cycles. This guide will focus on cool season turf management as cool season grasses are the best choice for our region. Communities with warm season grasses in common areas should contact the VCE office for assistance in managing their turf. The VCE office can also help you identify your grass if you are unsure of its type.

## Soil Tests

Healthy turf and soil are your best defense against weeds, insects, disease and extremes in weather. The standard development model is to scrape off the top soil before construction begins. This top soil is usually sold for off-site uses. Subsoil is certainly not ideal for growing plants, but before you set about trying to improve it, soil testing is necessary. A soil test will reveal the type and quantity of fertilizer to use for the crop (cool season turf) you are growing. It will also tell you if you need lime and how much. Separate soil tests should be done for areas with different management strategies and different crops. Ideally, subsequent soil tests should be done every 3-4 years at the same time of year. Virginia Cooperative Extension provides home owners and communities with assistance in getting soil tested and interpreting the results.

## Mowing

Most of the time spent on lawn maintenance is spent mowing. Mowing correctly is one of the easiest things that can be done to help keep turf happy. Because mowing causes physical injury to grass, it is important that no more than 1/3<sup>rd</sup> of the total leaf height is cut at anyone time. This allows the grass sufficient leaf area to photosynthesize the energy it needs to heal. When grass is very high due to wet weather, it needs to be cut in stages, taking 1/3<sup>rd</sup> off at a time and waiting until the clippings left on the ground disappear between cuttings.

The proper height to cut turf varies by species. Tall fescue should be mowed to a height of 3-4 inches. Perennial ryegrass, (creeping) red fescue and Kentucky bluegrass should be mowed 2.5 to 3.5 inches.

Mowing high from spring to fall provides a number of benefits. The lower you mow, the more frequently you will have to mow. High grass helps shade out many weeds before they get started. It also helps cool the soil in the heat of the summer, which helps non-irrigated turf survive summer droughts. As winter approaches, the grass can be cut a little shorter to help ward off fungal diseases that thrive in grass matted down by snow and ice. Cutting too short in the winter will expose to the crown and may lead to cold damage.

## Irrigation

Most plants need about one inch of water on a weekly basis. Normally, cool season grasses go dormant in the summer and only need water in cases of extreme drought. When cool season grasses go into their summer dormancy they tend to turn yellowish brown. In more cosmetic areas, such as around entrance ways or clubhouse, irrigation is often used to keep turf green through the summer. It is important that not to stop and start irrigation over the summer as this will overstress the grass - be consistent.

When irrigation is used, watering should be done deeply and infrequently in order to promote deeper, more drought tolerant roots. Ideally, this should be a once a week watering, but many soils in the area lack the drainage to handle an inch at one time. In this case, watering a half inch twice a week is necessary. Early morning (5 am – 8 am) is the best time to water to avoid fungal issues and minimize water loss to evaporation.

Irrigation systems should be checked to ensure they are applying the right amount of water. To do this, you can put empty tuna cans around the irrigated area and check to see how long it takes to fill them and adjust the timing accordingly. A tuna can is one inch deep. You may find not every can fills at the same rate so you might need to adjust sprinkler heads. Automatic rain sensors are important to avoid wasting water and money when adequate water is being provided by rain.

## Fertilization

The application of fertilizer and lime should always be based on the results of a soil test. The amount of fertilizer required by the turf grasses varies by species. Generally speaking, the more fertilizer used the more care and maintenance required. It is extremely important to not to over fertilize and not to fertilize at the wrong time of year. Fertilizers with less than 15% of the total nitrogen in slow release form may not be applied at a rate greater than 0.7 lbs. of nitrogen (N) per 1,000 square feet per application per 30 days. Fertilizers with 15% or more of the total nitrogen in slow release form can be applied at a rate up to 0.9 lbs. of N per 1,000 square feet per application per 30 days on cool season turf. Virginia Tech recommends using fertilizers with at least 50% of the total nitrogen be in slow release forms. Over fertilization is the main cause of disease problems in turf.

Because of their annual growth patterns cool season grasses respond best to being fertilized in the fall. Cool season grasses' fall growth is focused on root development. Good root growth is important for quick green up in the spring and surviving the heat of the summer. The window for fall fertilization is

September through November. Applications should be at least four weeks apart. For most turf, two applications in the fall are sufficient. Pure stands of Kentucky bluegrass tend to require a third application.

In some cases, a late spring fertilization of 0.5 lb of nitrogen (N) per 1,000 square feet can be applied. In the spring, grass is focused on leaf growth. Fertilizing in the spring means more mowing. It also can produce tissues that are not sufficiently hardened off before the summer, which in turn are more susceptible to fungal diseases – most commonly Brown Patch – in the summer. By returning your grass clippings to your turf instead of bagging them, you will also recycle the equivalent of about 0.5 lb N per 1,000 square feet per year.

Cool season grasses should **NEVER** be fertilized when the ground is frozen or when the turf is under stress, like during the summer.

## Lime and pH

The acidity or alkalinity of soil has an effect of the availability of nutrients in the soil. It is important to keep your soil at a pH suitable for the crop being grown. Turf prefers a slightly acidic soil. Soils in our region can be much more acidic than ideal for turf. Lime is used to raise the pH of the soil.

**The application of fertilizer and lime should always be based on the results of a soil test.** Lime should only be applied if the soil test says it should be added. It is much easier to raise pH than lower it, so care should be taken to follow the soil test recommendations. Because soil can only absorb 50 lb of lime per 1,000 square feet at a time you may – depending on your soil – need to make multiple applications. These applications should be 1-6 months apart depending on the soil and weather conditions. Lime can be applied anytime the ground is not frozen, but is best done in the spring and/or fall.

**It is also important to note that lime is not an annual maintenance item.** You should apply the recommended amount and wait until your next scheduled soil test to see if you need more. When your landscape contractor wants to apply lime annually, ask to see the soil test.

## Other Ways to Improve Your Soil

### Aeration

Aeration reduces compaction, increases gas exchange in the root zone and improves drainage in clay soils. Core aeration should be done annually, but only if the turf is compacted. Turf should be mown prior to aerating and the soil watered (if necessary) to a moist but not wet consistency. Aeration can be early fall (late-August through September) or early spring (late-March through late-April). Fall aeration is preferred as it allows more recovery time for roots damaged by aeration.

### Compost

Adding ¼” of fine compost will help improve soil texture and drainage. It will also provide organic matter which will nourish and attract beneficial organisms in the soil. Ideally, this is done right after aeration to help incorporate it into the soil.

## Overseeding

Regular overseeding will help keep turf thick and push out weeds. This should be done in the fall (late-August to October 15<sup>th</sup>), after the ground has been aerated and compost has been applied. Light, frequent irrigation will be needed until the grass germinates. Deeper, less frequent irrigation will be needed throughout establishment.

Tall Fescue is the best all-around option for turf in our area. It works well in sun to partial shade and maintenance requirements are fairly low. A blend of Tall Fescue with Kentucky Bluegrass is a typical mix that can be used in our area for sunny spots, but perennial ryegrass could be substituted for bluegrass. Alternatively, you could choose 100% Tall Fescue but use a blend of cultivars. For high shade areas, tall fescue mixed with 10% fine fescues (red and/or hard fescue) should work. In very high shade areas, grass will not grow and alternate plants and/or mulch are a better option. You can get the latest recommended cultivars for turfgrass in Virginia at [pubs.ext.vt.edu/CSES/CSES-17/CSES-17.pdf.pdf](http://pubs.ext.vt.edu/CSES/CSES-17/CSES-17.pdf.pdf). These are updated annually and are based on research plots throughout the Mid-Atlantic.

## Pest Management

While you may need to use pesticides early on to correct areas with serious problems, as you improve the quality of your soil and turf you should need pesticides less and less frequently. For better water quality and to save money, it is important that you only treat for pests you know you have and use the correct controls at the correct time. Never treat for a pest unless it has been correctly identified.

The [Home and Grounds Pest Management Guide](#) is published annually by Virginia Tech and contains listings of specific chemicals approved for use on specific pests (weeds, insects & fungus) and on specific plants. It also lists the optimal time to treat the pest. This guide is for homeowner use. The current version can be found at <http://pubs.ext.vt.edu/456/456-018/456-018.html>. Lawn care professionals who are certified pesticide applicators will have access to chemicals which are potentially more dangerous and not permitted for homeowners to use. The professional version can also be found on the pubs.vt.edu website. HOAs should be aware of any pesticides that are being applied and why they are being applied. HOAs should also encourage residents to **READ AND FOLLOW THE LABEL** of any pesticide they use.

## Weeds

Weed control can be minimized by good mowing and fertilization management, which help grass compete with weeds. Broadleaf or grassy weeds can be perennial, annual, or biennial. Control methods and timing vary depending on the weed species. Proper identification of the weed is critical in selecting appropriate control strategies.

Instead of blanket herbicide applications, if an area has few weeds present, consider alternative methods such as hand pulling first, then spot treatment with a chemical for control.

Broadleaf Weed Control: Most broadleaf weeds are controlled well with weed control products with a combination of active ingredients (e.g. 2,4-D, Dicamba, MCPP, etc.) Use a liquid formulation and



treat the entire lawn. Timing is crucial! Control winter broadleaf weeds in October and November; summer broadleaf weeds in April and May.

Crabgrass Control: A thick turf, mowed high is the best crabgrass preventative. Choose pre-emergence crabgrass herbicides that do not contain fertilizer. Treat in March-April. Two or more applications are usually necessary for season long control. If needed, apply a post-emergence control in June.

It is necessary for all pre-emergent herbicides to be watered in soon after application. Most products must receive at least one-quarter inch of water within 48 hours of application or the herbicide will begin to decompose due to the effects of the sun.

### **Disease**

Proper management will greatly reduce a lawn's susceptibility to disease. Disease damage may be difficult to identify since many of the same symptoms are also caused by bad management or by natural factors, such as competition from tree roots. Most lawn diseases are caused by fungi; fungicides can be applied to control their spread.

Fungal spores are very common in the environment and only manifest into disease when conditions are right. In cases where the disease does little permanent damage to the turf, it may be advisable to wait a few weeks for a change in weather to see if that takes care of the problem without having to apply fungicides. Often fungicides will cause more harm by killing beneficial fungi in the soil than good. This should be considered before deciding to apply fungicides to turf.

### **Insects**

Many types of insects occur naturally in a lawn; most of them are not harmful and do not require control unless the pest population builds up enough to cause visible damage. Close examination of the turfgrass is the most effective way to identify insects.

The most common above-ground insect pests in Virginia lawns are chinch bugs and sod webworms; both feed on grass leaves and stems. Below ground, the most common pests are white grub larvae and weevil or billbug grubs; these feed on plant stems and roots.

It is important to scout insect populations to see if their numbers warrant treatment. Many insects have a window of vulnerability when insecticides are most effective. Insecticides should not be applied outside of these. When turf contains clover and flowering weeds, it is important to time insecticide treatments so that applications are made when bees are less active.

# MAINTAINING TREES AND SHRUBS

## *Protecting Your Investment*

**T**rees and shrubs add a great deal to a landscape. Improper care can lead to the premature decline and death of woody plants. The cost of replacement is often high. Taking steps to properly maintain your trees and shrubs will pay off with lasting beauty.

## General Guidelines

When replacing plants or adding new ones to the landscape, select plants that will grow in the conditions present. (i.e. soil, pH, sun or shade, etc). Picking the right plant for the right place will make maintenance easier. If you meet their cultural requirements, trees and shrubs will be healthy and less prone to damage from insects, disease and the weather. Planting plants native to our area (commonly referred to as “natives”) will lower maintenance as well.

## New Plants

### Plant Selection

Diversity in planting is also important. A line of cedars, for example, can make an impressive boarder. If a disease outbreak or pest infestation should occur, however, all of the trees could be easily lost. Planting a boarder of alternating tree species, on the other hand, might stop the spread of the problem. Or it might only affect one of species, leaving some trees if the affected trees had to be removed. As new plants are selected it's important to understand their needs and growth habits. Make sure selected plants are suitable for our area and are not invasive. Pay close attention to the plant's mature size and space plants accordingly.

### Planting

As new trees and shrubs are added to the landscape, how they are planted can make a big difference in their long term survival. Many trees do best if planted when they are dormant. Ensure that trees and shrubs are planted so that the flare of the trunk, also called butt swell, is not buried. Fertilizer should **NOT** be applied at planting. New plants will almost certainly need irrigation during their first year. Irrigate 1” of water per week when not provided by rain. Mulch as described below.

Staking of trees is a practice that many tree experts discourage. Trees need some movement when they are young in order to develop strong resilient trunks. Stakes tend to be left on too long which can strangle a tree as it grows. When high winds are an issue, new trees can be staked. However it is important to follow these guidelines:

- Set 5'-8' stakes firmly into the ground in such a way so they don't go into the root ball
- Use padded supports that are just tight enough to prevent trees from tipping, and are low enough to allow the tree to sway
- Remove all supports no later than one year after planting

Choose the site for your trees carefully. Take into account the mature size of plants. Often, trees are planted in places where there really isn't enough soil to support trees as they mature. Large tree species planted in narrow median strips are a common example of this. Root systems naturally extend beyond the canopy. If you have a small space, a small tree species or shrub is a better choice.

Tree health can be compromised by planting other plants under the canopy. Competition for water and nutrients can cause problems for both the tree and the plants beneath. Pesticides use under the canopy can negatively impact trees.

## Mulching

Mulching around trees and shrubs should be only 2 – 3 inches high. Any higher and you create conditions that may lead to a variety of problems for your tree. Keep mulch away from the trunk of the tree. This is especially important both to prevent damage to the trunk and avoid having roots grow spirally in the mulch. Roots growing in the mulch can strangle plants. Ideally, mulch should be extended to at least the plant's drip line. This will help reduce competition between trees and grass under the tree. Grouping trees and shrubs in large mulched beds instead of planting them individually will reduce the overall turf area and make it easier to mow around them.

## Pruning

Select plants whose mature sizes will fit the scale and size of your landscape. Having the right plant in the right place will save on maintenance in the future. Ensure that your trees and shrubs are pruned by a trained tree care professional.

### When to Prune

Pruning at different seasons triggers different responses. Late winter or early spring, before bud break, is a good time to prune many species because callus tissue forms rapidly. When pruning flowering trees, take care not to cut off flower buds. Some trees, such as cherry, plum, and crabapple, form buds on old wood from the previous year. Others, such as crape myrtle, bloom on new wood growing in the current year.

Summer pruning tends to suppress growth of both suckers and foliage. Late summer or early fall pruning causes vigorous re-growth, which in some species may not harden off by winter, leading to possible cold damage. Whenever unexpected damage from vandalism or bad weather occurs, prune immediately.

Not all trees and shrubs should be pruned at the same time. It's important to have an understanding of when plants need to be pruned in order to ensure the overall health of your trees. A certified arborist can help you with this. You can also access information on pruning timing at <http://pubs.ext.vt.edu/category/trees-shrubs-groundcovers.html>. There you will find pruning calendars for deciduous trees, evergreen trees and shrubs.

### Why Prune

Pruning done without one of the following objectives in mind or at the optimal time for the type of plant decreases plant vigor and causes unnecessary stress on the plant, which in turn invites disease and insect problems.

1. To improve the appearance or health of a plant. Prompt removal of diseased, damaged, or dead plant parts speeds the formation of callus tissue, and sometimes limits the spread of insects and disease. For trees, pruning a dense canopy permits better air circulation and sunlight penetration. To avoid future problems, remove crossing branches that rub or interfere with each other and those that form narrow crotches.
2. To control the size of a plant. Pruning reduces the size of a plant so that it remains in better proportion with your landscape. Pruning can also decrease shade, prevent interference with utility lines, and allow better access for pest control.
3. To prevent personal injury or property damage. Remove dead or hazardously low limbs to make underlying areas safer. Corrective pruning also reduces wind resistance in trees. Prune shrubs with thorny branches back from walkways and other well-traveled areas. Have trained or certified arborists handle any pruning work in the crowns of large trees.
4. To train young plants. Train main scaffold branches (those that form the structure of the canopy) to produce stronger and more vigorous trees. You'll find it easier to shape branches with hand pruners when a plant is young than to prune larger branches later. Pruning often begins with young plants for bonsai, topiary, espalier, or other types of special plant training.
5. To influence fruiting and flowering. Proper pruning of flower buds encourages early vegetative growth. You can also use selective pruning to stimulate flowering in some species, and to help produce larger (though fewer) fruits in others.
6. To rejuvenate old trees and shrubs. As trees and shrubs mature, their forms may become unattractive. Pruning can restore vigor, and enhance the appearance of these plants.

### **Pruning Faux Pas**

There are two common pruning techniques that should be avoided. Make sure your landscaping contractor does not use these on your landscape.

### **Shearing Shrubs**

Shearing is a common pruning technique for shrubs in the landscape border. Shearing shrubs to a round ball or other desired shape is quick and easy. However, sheared shrubs lose their natural shape and the rounded “balls” may detract from a more natural informal landscape design. Shaping spring flowering shrubs after midsummer removes the new wood with next year’s blossoms. Frequent shearing does not encourage new growth from the base, which is needed to promote flowering.

With frequent shearing, the plant becomes bushier on the exterior. The thick outer foliage may shade out the interior and lower foliage and the plant becomes a thin shell of foliage with a woody interior and base. The thin shell of foliage is prone to browning and burning from wind and cold weather. Over time, shrubs become woody with lots of dead branches and few flowers. When shrubs become overly woody from routine shearing, replacement is the best option to refresh the landscape design.

### **Topping Trees**

Topping is like giving a tree a ‘flat top’ haircut. It involves cutting the vertical stem (leader) and upper primary limbs (scaffold branches) on mature trees a uniform height. Topping is also called heading, stubbing, or dehorning.

Topping removes a large part of the tree’s food making capacity and depletes stored reserves. It stimulates ‘water sprout’ growth – unattractive upright branches – just below the pruning cuts. This growth is

vigorous and will rapidly return the tree to its original height, but not its original shape. The resulting shape with broom like branches distorts the natural beauty of the tree and decreases its value. Topping tends to leave large wounds which are slow to close, inviting damage from insects and disease. This creates weakened stubs that are more prone to wind and storm breakage because they generally begin to die back or decay. Topping increases sun exposure on trunk and branches and can lead to severe bark damage.

When a tree's height must be reduced, the drop-crotching technique should be used. This involves thinning cuts that reduce the tree's overall size but keeps its natural shape. Growth is stimulated throughout the tree from this technique, discouraging water sprouts and preserving the natural beauty of the tree.

## **Fertilizing Trees and Shrubs**

### **In General**

How and when to fertilize landscape trees and shrubs depend on three factors. One consideration is the maintenance objective. Is the goal to stimulate new growth or maintain the existing growth? The age of the plant is another factor. Older plants usually require less fertilizer than newer plants. Finally, plant stress needs to be considered.

A visual inspection of trees and shrubs is usually a good overall factor to use in making fertilization decisions. Fertilizer might be needed if any of the following conditions exist:

1. Poor or chlorotic leaf color (pale green to yellow)
2. Reduced leaf size and retention
3. Premature fall coloration and leaf drop
4. Reduced twig and branch growth and retention
5. Overall reduced plant growth and vigor
6. Soil and foliar analysis can also be used to help determine or confirm if fertilization is needed.

### **Fertilizer Placement**

Fertilizer should not be concentrated around the stem or trunk of a tree or shrub, but should be applied over as much of the plant's root zone as possible. For trees and shrubs, fertilizer should be applied over an area twice as large as the crown spread or dripline. Since most landscape plant roots grow in the top foot of soil, surface or shallow, but not deep application, is recommended.

### **Factors Affecting Nutrient Uptake**

Numerous factors affect how easily and well trees and shrubs absorb fertilizers. The most important uptake factors are:

1. Fertilizer form (inorganic, fast release, or liquid forms are absorbed faster than organic, slow-release, or dry forms)
2. Soil type (clay particles and organic matter adsorb or bind more nutrients than sand, so fertilizer application needs to be more frequent in sandy soils, but with lower rates each time due to leaching potential)
3. Soil moisture content and soil temperature (nutrient uptake is faster in moist warm soils)

4. Plant vigor (plants under stress are less able to take up available nutrients due to damaged or reduced root systems)

### Fertilizer Rates

Fertilizer use rates should be based on plant type (with younger trees and shrubs generally receiving higher rates (of N) than mature plants), landscaping goals and the current state of the soil. Soil and/or foliar analysis should be used to provide information on the state of soil fertility. Fertilizer rates for trees are based on root system spread, calculated by determining the area of crown coverage ( $3.14 \times \text{radius}^2$ ). This is the area of (fertilizer) application and contains the greatest concentration of a tree's roots.

Without the benefit of the a nutrient analysis, there are some general guidelines for deciduous trees. Slow-release fertilizer should be applied at a rate of 2-4 lb of N per 1,000 square feet of the area of application, not to exceed 6 lb per year. Lower rates are preferred, especially when the root zone area contains turf. When turf is present applications of not more than 1 lb per 1,000 square feet are recommended. Quick release fertilizers are generally not recommended. Healthy, mature trees may not require fertilization. Established, but not fully mature trees may benefit from the growth benefits of 2-3 lb per 1,000 square feet. Young trees, where rapid grow is desired, may benefit from high rates of fertilizer (not to exceed 6 lb per year). Fertilization at time of tree installment is not recommended.

It is important to exercise CAUTION when fertilizing trees. Some important things to remember are:

- The higher the rate of fertilizer the higher the likelihood of insect or disease problems
- When the root zone area includes turf, excess fertilizer will burn the turf
- Conifers have adapted to survive without much soil nutrition and tend to need much, much lower fertilization rates than deciduous trees

### Timing

Fertilizer should be applied when plants need it, when it will be most effective, and when plants can readily take it up. Ideally fertilizer should be applied before bud break and after the leaves have fallen in deciduous trees. The use of slow release fertilizer makes the timing a little more flexible however. If the ground is frozen or water is unavailable, do not fertilize at all.

### Irrigating Trees and Shrubs

The best advice for a healthy, drought- and stress-tolerant lawn and landscape is to use less water. Plants can tolerate being dry better than being over-watered. Watering for long periods of time with several days spanning in between each watering allows moisture to penetrate the soil more deeply. This encourages healthier roots that branch to seek water. Watering frequently encourages shallow roots with skinny growth and poor structure. These roots don't tolerate heat or drought as well.

Water loss is greatest under conditions of high light intensity, high temperature, low atmospheric water vapor content, and windy conditions. Night watering minimizes water evaporation, but may increase

fungal diseases. Early morning (5 to 8 am) irrigation is a good compromise in this regard. Make certain water is not being wasted by landing on driveways, sidewalks, or roads.

Application of 1 inch of irrigation water per week is the standard recommendation for watering when there is insufficient rainfall. One acre-inch of water is equal to 27,154 gallons of water. Using this amount of water requires sensitivity as to how to effectively use every drop that comes out of the sprinkler. See the section on turf irrigation for more information on figuring out how much water your system is putting out.

## OTHER LANDSCAPE PLANTS

### *How to Take Care of the Rest of Your Landscape*

**I**n addition to turf, trees and shrubs, many communities maintain annual and/or perennial plant beds. Care of these plants involves similar concepts to the ones presented above: the wise use of water, choosing the right plant for the right place, fertilizing based on need and reducing pesticide usage.

### Improving Soil

Always test the soil to learn the pH and nutrients already present before trying to amend it. Only fertilize and lime based on soil test results. Adding compost will improve soil structure and fertility over time. Prevent erosion by maintaining vegetative cover, using mulch and correcting drainage problems. You will have the best results by using plants that will grow in the existing soil.

### Annuals, Perennials and Bulbs

It is best to avoid planting invasive species. Just because a local nursery carries a certain plant, does not mean it is not invasive. It's important to remember that many residents in our region are transplants. What is invasive here may not be invasive in other parts of the country. Before deciding on adding plants, decision makers should do some research. Invasive plants are quick to establish and extremely difficult to control. The Virginia Department of Conservation and Recreation (DCR) maintains a list of the more common invasive plants on their website: [www.dcr.virginia.gov/natural\\_heritage/invspinfo.shtml](http://www.dcr.virginia.gov/natural_heritage/invspinfo.shtml).

Choosing native plants is a better option. (The DCR also has lists of native plants on their website.) Native plants typically require less maintenance and provide habitat for native insects, birds and other animals.

Plants with similar water, sun, pH and fertilizer needs should be grouped together for easy maintenance. This will make it easier to meet all their cultural needs and keep them healthy. Healthy plants have fewer pest problems.

## Irrigation

When nature does not provide it, irrigate landscape plants deeply and infrequently, at a rate of 1" per week. Check soil drainage to ensure the water applied enters the soil and is not running off. Irrigate early in the morning. Periodically inspect your irrigation system to ensure it is in good working order and using water efficiently.

## Compost

Applications of compost annually will improve drainage over time. Apply 2" of compost existing plant beds in the fall to improve the soil structure of clay soils and work it in to the top 6-8" of soil. Where this is not possible, top-dress with ¼ - ½" of compost one to two times per year to improve the soil structure of clay soils. A simple formula to calculate how much compost is needed is:

Area to cover (square feet) X depth of compost (inches) X 0.0031= compost needed (cubic yards)

## Fertilizer and Lime

Fertilizer and lime should only be applied based on a soil test. As plants differ in their nutrient and pH requirements, it's important to know what the needs are of the individual plants in the landscape. As stated above, install plants with similar needs together for ease of maintenance.

## Insects

Not all insects are pests. Identify the pest and susceptible life stages before you treat with a pesticide. Contact the Extension office for identification and control recommendations. Learn which insects are common to the plants growing in your landscape. Monitor plants in the landscape regularly to recognize when pests are present. Establish thresholds for acceptable levels of pest infestation; consider how beneficial, non-target insects might be affected by a chemical treatment. Keep all insecticides off hardscapes (e.g. roads, driveways, sidewalks, etc.).

## Diseases

Learn the diseases common to the plants growing in your landscape. Maintain good plant health to reduce disease instances. Monitor plants in the landscape regularly to recognize when signs of disease are present. Keep all fungicides off hardscapes.

## Weeds

In plant beds, mulching will go a long way in suppressing weeds. Identify weeds before using a chemical control. Hand-pull weeds or use spot herbicide treatments where possible as many herbicides will also harm ornamental plants.



## OTHER CONCERNS

### *Looking at Beyond Just Plants*

**N**eighborhood communities are both an ecosystem unto themselves and a part of the environment. What activities and practices people choose to do – both individually and collectively – has an effect on the environment. This section discusses issues that can affect a community's impact on the environment.

### **Wildlife**

Dealing with wildlife requires flexibility and informed decision making. Public perception of HOA action or inaction can often lead to knee-jerk reactions based on emotion rather than fact. HOA leadership should keep it's residents informed about actions taken for and against wildlife to minimize potential backlash.

Wildlife ranges across many parts of the animal kingdom. Typically, however, most people equate the term with macro vertebrates, usually birds, mammals and reptiles. Some are considered valuable by residents, some are considered pests and some have both supporters and detractors. As a community, it is important to determine what species are of concern – both for conservation and control.

### **Wildlife Control**

When wildlife damage becomes a problem, it is critical to identify the species causing the damage before attempting to correct the problem. Effective control involves understanding the pest and it's habits. Food, water, and shelter sources that attract and harbor pests should be removed. Combine tactics for the best control strategy. Some otherwise tolerated (or even desired) species can become a nuisance when their populations get too high. Encourage success of natural predators where possible. The USDA's Animal and Plant Inspection Service (APHIS) can provide assistance in control measures for problem species.

The Virginia Department of Game and Inland Fisheries (VDGIF) operates the Virginia Wildlife Conflict Helpline, a resource for resolving human-wildlife conflicts. The helpline is a collaborative effort between the VDGIF and the U.S. Department of Agriculture - Wildlife Services (WS) to address human-wildlife interactions by sharing science-based wildlife information. The helpline is available toll-free at (855) 571-9003, 8:00AM-4:30PM, Monday through Friday.

### **Wildlife Conservation**

Where there are wildlife species that a community finds desirable, it is important to provide an appropriate habitat. All species require a certain amount of space, cover, water and food. When there is not enough dedicated habitat, species will seek out more of whatever resource(s) it is lacking. Most commonly this manifests itself as animals eating community and home owner landscaping. By ensuring appropriate habitat, wildlife damage can be minimized. The more the community and especially it's decision makers understand targeted species, their needs and their behaviors, the better they will be able to minimize negative animal-human interactions.

Communities can use parts of their common space for wildlife. Given enough space and care, these areas can be a host to a diverse group of plants and animals with minimal to no maintenance once established.

Devoting common space to naturalized habitat areas will reduce the overall amount of turf in the community, saving money by reducing overall mowing and fertilization costs, and improve the water quality of stormwater runoff.

There are a variety of agencies who may be of help to a community wanting to establish or improve a wildlife habitat. These include the Natural Resources Conservation Service and the Virginia Department of Game and Inland Fisheries.

There are a number of resources available on plantings to encourage/support wildlife. Among these are:

Backyard Wildlife Habitats, Virginia Cooperative Extension ([pubs.ext.vt.edu/426/426-070/426-070.html](https://pubs.ext.vt.edu/426/426-070/426-070.html))

Backyard Conservation: Wildlife Habitat, USDA Natural Resources Conservation Service  
([www.dgif.virginia.gov/habitat/habitat-at-home/backyardconservation.pdf](http://www.dgif.virginia.gov/habitat/habitat-at-home/backyardconservation.pdf))

BayScapes for Wildlife Habitat: a Homeowner's Guide, Alliance for the Chesapeake Bay,  
([www.dgif.virginia.gov/habitat/habitat-at-home/bayscapes.pdf](http://www.dgif.virginia.gov/habitat/habitat-at-home/bayscapes.pdf))

## Stormwater Management

As stated in the beginning of this guide, water quality is an issue of increasing local and regional importance. The bulk of this guide has been devoted to practices that will improve the quality of water running off green areas. There are a number of other BMPs relating to impervious surfaces (roads, sidewalks, etc.) that can also make a positive contribution to improving the quality of stormwater running into the Bay.

Stormwater runoff is all the water that washes over the land and through drainage systems into waterways. It is generally recognized as the single largest threat to water quality in the United States, whether in a rural or urban setting. Rain is not the problem. But the pollution that rainwater picks up as it runs over manmade surfaces pollutes our swimming holes and poisons our drinking water. Surges in rainwater that are channeled directly into our waterways through storm drains increase the magnitude of floods. Stormwater runoff alters the amount, quality and temperature of water in our rivers and creeks. Stormwater runoff fundamentally changes the natural circulation of water.

When land is left in its natural state, the majority of rainfall soaks into forests and meadows, flows slowly underground, is filtered by natural processes, and eventually feeds streams, lakes, underground aquifers, and the Bay. As land is developed by humans, the natural filtering process gets interrupted by the application of impervious surfaces on the land. Roads, sidewalks and buildings all block the ground underneath them from absorbing stormwater.

This drastically changes the amount of water that runs off the land. In a one inch rainstorm, one acre of woodland will allow 1,361 gallons to flow off that acre. One acre of parking lot, however, allows 25,800 gallons to flow off of it. An increase in the volume of runoff can also cause an increase in the velocity of runoff. This, in turn, increases erosion and increases the water's ability to pick up and move contaminants. Since stormwater systems are not part of local sewer systems, pollution carried by stormwater goes directly into our waterways without treatment of any kind.

A variety of pollutants contribute to poor water quality. Sediments, pet waste, salts, pesticides, fertilizers, yard waste, vehicles, litter and even heat can all negatively effect water quality.

Sediment can clog storm drains causing flooding. It also clogs fish gills and smothers fish eggs. It destroys habitat by covering bottom-dwelling animals and submerged aquatic vegetation. Over time, sedimentation requires dredging in lakes, ponds and channels. Ensuring that soil is held in place by vegetation will help prevent erosion. Vegetative buffer strips also filter pollutants, and provide habitat.

Pet waste typically contains high concentrations of pathogens which pose a human health hazard for recreational and drinking water. Nutrients contained in pet waste can cause algal blooms which reduce the amount of oxygen in water available to plants and fish. Ensuring pet owners dispose of waste properly is essential, especially for communities with pathways near waterways.

Salts are commonly over used in the winter. Salt is toxic to freshwater organisms and plants. It is corrosive to water pumps and pipes. It stunts plant growth. The use of alternatives such as ice melt, sand, kitty litter and cinders ashes can help avoid this seasonal problem. Fertilizer should never be used as an alternative to salt for melting ice. You can reduce the need for melting materials by clearing snow to the lower end of paved areas and clearing snow from drains to allow for better drainage.

Insecticides, herbicides and fungicides are washed into our waterways pose a threat to humans, animals, birds, plants and beneficial insects. Seeking non-chemical solutions to plant pest problems and using pesticides as a last resort go a long way to help reduce this threat. Native, hardy plants suited for our climate will resist drought better and require less pesticides.

Fertilizer is a major cause of algae blooms and aquatic weed growth in our waterways. Using the right amount of fertilizer at the right time of year helps to eliminate the potential for leaching and runoff. Regularly testing soil will enable applicators determine the correct amount and type of fertilizer. NEVER apply fertilizers or pesticides near bodies of water, or before a rain. Sweep up any residue from hard surfaces and dispose of properly.

Oil, antifreeze, gas, brake dust, tire bits and car wash soap from vehicles are washed into the drain system during storm events. Soaps can threaten aquatic habitats by destroying the protective coating on fish, making them more susceptible to bacteria and parasites. Soap can also kill certain species fish and fish eggs as well as disrupt reproduction. Certain soaps can also cause algae blooms. The used oil from one oil change carelessly dumped into a storm drain can contaminate 1 million gallons of fresh water. Even as little as a teaspoon of oil from a leaky engine can contaminate almost three and a half gallons of water.

Keeping vehicles well maintained will prevent leaks. Disposing of automotive liquids properly will save millions of gallons of water from contamination. Saw dust and kitty litter can be used to absorb spills and dispose of properly. Cars should be washed at commercial car washes that have their waste water treated. Alternatively, cars should be washed with phosphate-less soap on turf which will help filter the waste water.

Litter and trash are unsightly. It clogs storm drains which leads to localized flooding. In addition, litter is a threat to wildlife who can become entangled in litter or mistake it for food. Communities with outdoor trash facilities, such as a dumpster for the clubhouse, should make sure trash containers have secure lids. Dumpsters and other container should be regularly checked for leaks. Dirt, trash, cigarette butts and anything that can be washed away in a storm should be swept from paved surfaces and put into the trash.

Yard debris is another potential threat to water quality. When left on impermeable surfaces, it is easily carried off into waterways. As it decomposes it will deplete oxygen in streams. Nutrients from decomposed yard debris cause algae blooms and excess aquatic weed growth. Leaves, branches and grass can also clog drains. Keep sidewalks and pavement clear of yard waste. Grasscycling turf clippings back onto lawns helps recycle nutrients and keeps them out of the waterways. This is easily done with mulching mowers or regular mowers mowing less than 1/3<sup>rd</sup> of the grass height.

Stormwater will pick up heat as it travels over hot pavement and sidewalks. This lowers the dissolved oxygen of the water and increases the solubility of salts, herbicides and pesticides. Hot water can decrease species diversity in streams and upset the ecological balance.

## Resident Education

Thomas Jefferson said “an informed constituency will always make the right decision”. HOAs need to inform and educate their residents so residents better understand the decisions being made about the community’s landscape. Additionally, this allows residents the opportunity to incorporate best management practices in their own yards. Virginia Cooperative Extension (VCE) can help HOAs educate residents.

Virginia Cooperative Extension can help residents with plant care in several ways. The Horticultural Help Desk is staffed by Master Gardener volunteers who can help diagnose problems and recommend solutions. This service can be accessed by email ([master\\_gardener@pwcgov.org](mailto:master_gardener@pwcgov.org)), by phone (703-792-7747) or in person at the VCE office located at 8033 Ashton Avenue, Suite 105, in Manassas. VCE also offers a variety of classes on plant care topics at county libraries and at its teaching garden in Bristow. Information on the current schedule of classes can be found brochures at the county libraries, on the Prince William County website ([www.pwcgov.org](http://www.pwcgov.org)) or by signing up for the county’s eNotifications program ([eservice.pwcgov.org/eServices/eNotifications/subscribe.aspx](http://eservice.pwcgov.org/eServices/eNotifications/subscribe.aspx)).

## Turf Care

Residents may not understand how to properly care for their lawns. Uninformed residents can easily apply the wrong management strategy for their lawns without realizing it. Additionally, many homeowners are unaware of the laws governing using pesticides. The Virginia Cooperative Extension’s BEST Lawns program can help. Residents who sign up for the program can have their soil tested, their turf measured and receive a nutrient management plan for their turf. This will include information on what type of fertilizer to apply, how much and when. Virginia Cooperative Extension can also do education talks on the basics of lawn care. Consider scheduling a Master Gardener volunteer to give such a talk in the spring and fall and the community club house. Turf maintenance calendars are available from VCE to help homeowners better maintain their turf by doing the right maintenance at the right time of the year. Calendars are available for both cool season and warm season turf ([www.pwcgov.org/government/dept/vce/Pages/BEST-Lawns.aspx](http://www.pwcgov.org/government/dept/vce/Pages/BEST-Lawns.aspx)).

## Invasive Plants

Just as it is important for HOAs to be aware of and avoid the planting of invasive species, residents also need to be informed about the possible consequences of planting the wrong plant. Lists for this area of plants to avoid as well as recommend plants can be found at on the Virginia Department of Conservation

and Recreation website ([http://www.dcr.virginia.gov/natural\\_heritage/invspinfo.shtml](http://www.dcr.virginia.gov/natural_heritage/invspinfo.shtml)) and the Environmental Protection Agency website (<http://www.epa.gov/reg3esd1/garden/invasives.htm>).

### **Stormwater Issues**

Many water quality pollutants come from private and common area landscapes. To have the greatest positive impact on stormwater quality, both the HOA and its residents need to be onboard with limiting the potential for pollution. Residents can help by keeping things like ice melt, fertilizer and pesticide stored inside under cover, and limiting their use. Residents may not know about the proper storage, handling and disposal of potentially hazardous wastes. When a community educates its residents about how their actions can influence the quality of our waterways, there will be a greater benefit to reducing pollutants community-wide. Use of HOA newsletters and webpages for frequent, timely, and short messages on preventing and reducing pollution can be very effective. Your local VCE office can provide many of these messages as well as links to popular, research-based fact sheets for residents to download.

### **Pesticide Use**

The law requires that **ANYONE USING A PESTICIDE MUST READ AND FOLLOW THE DIRECTIONS ON THE LABEL**. Misusing pesticides can pose health risks for humans, pets and wildlife. It can also damage plants and potentially pollute waterways. Using the wrong chemical or using the right chemical at the wrong time is a waste of time and money. The VCE office can provide guidance on what pesticides should be used when. This information can also be found in the Virginia Tech publication Home and Grounds Pest Management Guide (<http://pubs.ext.vt.edu/456/456-018/456-018.html>).

**WWW.EXT.VT.EDU**

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Extension is a joint program of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and state and local governments.

Virginia Cooperative Extension programs and employment are open to all, regardless of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, genetic information, marital, family, or veteran status, or any other basis protected by law. An equal opportunity/affirmative action employer