

## CHAPTER FOUR

### Preparing and Installing Your Buffer Landscape

**Site preparation** is a critical step in establishing your buffer landscape.

Before you start work on your project, you will have to decide whether to add plant material with point plantings or to create beds. There are advantages and disadvantages to both methods.

Expanding your buffer with point plantings means that you will dig a hole (deeper and wider than the root ball), insert the plant and extra soil, and cover the exposed area with several inches of good mulch. The grass around the new plants can be mowed until the plants are large enough to shade out surrounding grasses, or the grasses can be left to grow up.

Developing a buffer strip by digging beds requires more up-front work and in some areas may require permitting. This method involves replacing the sod with plants and additional soil. Once all plants are in place, the whole bed should be mulched with at least four inches of well-rotted bark mulch or compost. The mulch will absorb moisture, discourage weeds, and eventually decompose. Either method is fine for the plants, but your choice is a matter of aesthetics and time-management. Choose a maintenance program that you can live with.

#### **Improving Soil Health**

If the soil in your area is lacking in organic matter, is clayey, or is heavily-compacted, you will want to add compost to your plantings for the first few years in order to build healthy soil. Keep in mind that healthy soil supports small organisms that help to break down nutrients and pollutants for uptake by plants. **Providing healthy soil for your buffer plants will help to keep pests to a minimum.**

Examine soil for compaction before planting. If soils are compacted, consider replacement with a good loam soil or incorporation of several inches of an organic material such as composted yard waste to a depth of at least eight inches over the entire planting area. Do not incorporate small quantities of sand since compaction will increase and drainage decrease.

If your plan includes removal of grass, there are two primary ways to remove the grass before installing a buffer landscape.

- You can cut the grass **very low**. Rake and save the clippings for your compost pile. Cover the area with several layers of newspaper you have soaked until it is wet all through then cover the paper with mulch. The newspaper will block out the light and prevent grass and weed growth. The mulch will help to retain

moisture, speed up the decay of the newspaper, and improve soil composition. Grass removal can be done at the time of planting, where you dig right through the mulch and paper to place your plants, or can be done months ahead so the soil in the area can be tilled to a depth of six to eight inches and you can work more compost into the soil.

- **Sod removal** – (This method is not recommended for steep slopes where the probability of erosion is high) Rent a sod removal machine or use a flat edge spade to lift the turf, severing the roots just below the soil line. Shake off any excess topsoil. These sod pieces can be planted elsewhere in your yard. If you are going to lift your turf, don't do so if the soil is excessively wet or dry. This job will turn into a muddy mess if the soil is wet or be a much more difficult task if the soil is bone-dry.

### **Plant and Site Selection**

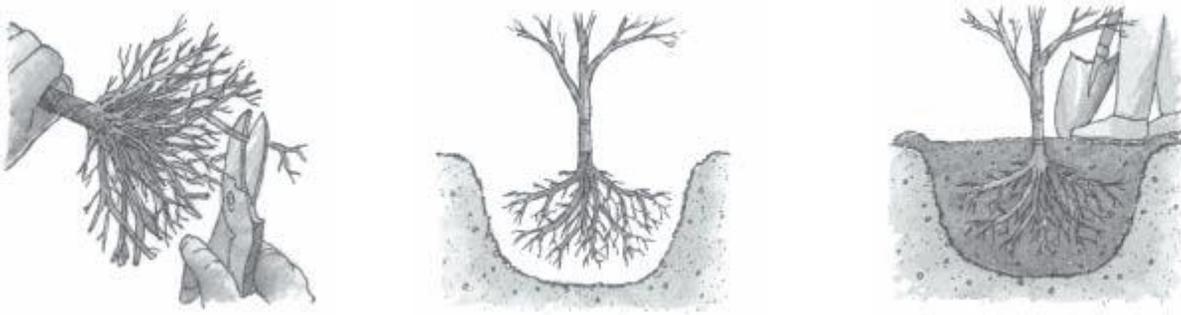
Select trees and shrubs well-adapted to conditions of individual planting sites. Poorly-sited plants are doomed from the start, no matter how carefully they're planted. Test soil drainage before planting. Dig a test hole as deep as your planting hole and fill it with water. If water drains at a rate of less than one inch per hour, consider installing drainage to carry water away from the planting hole base or think about moving or raising the planting site with berm construction. You could also consider using more water-tolerant species. For trees, try red maple, sycamore, bald cypress, willow oak, or river birch. For shrubs, try inkberry, redbud dogwood, and buttonbush. Avoid dogwoods, azaleas, boxwoods, Japanese hollies, and other plants that don't like "wet feet" where drainage is poor.

### **Planting your buffer**

Here are some general guidelines for planting your buffer landscape and keeping it healthy for years to come. These guidelines work for most plants; however, some have specific planting and care instructions which should be followed. Instructions are included here for bare root plants, container grown, or balled and burlaped plants and native grasses and wildflowers grown from seeds. Also included are instructions for the care of trees after they have been planted.

### **Bare Root Plants**

1. Keep roots damp and covered until planted.
2. Carefully separate plants.
3. Prune any dead or damaged roots.
4. Dig a hole deep enough for roots to remain straight.
5. Set seedling in hole so that previous growth depth is maintained.
6. Make sure trunk is straight.
7. Tamp soil to eliminate air pockets.
8. Water and mulch, **keeping mulch 2 to 3 inches away from trunk**



## Bare Root Planting steps

### Container-Grown or Balled & Burlaped Plants

1. Keep plants out of the wind during transport to the planting site.
2. Prune any dead or broken branches.
3. Dig a hole two to three times the size of the container; break up any large clods of soil.
4. Support roots so they are not damaged and remove plant from container. If roots wind around, pull them loose and/or prune roots lightly as needed.
5. If you have a balled and burlaped plant, detach burlap from trunk, loosen potting medium around roots, and set plant in hole at height it grew in the field. Alternately, you can plant with the burlap as long as it is an untreated natural fiber.
  - a. Closely inspect the wrapping around the root. Growers use many synthetic materials, as well as treated burlap to retard degradation, to wrap root balls. Many of these materials will not degrade. To insure root growth into surrounding soil, remove pinning nails or rope lacing, then cut away or drop the wrapping material to the bottom of the planting hole, backfilling over it.
  - b. Wire baskets used to protect root balls degrade very slowly underground. Remove the top eight to twelve inches of wire to keep equipment from getting caught in wire loops and to prevent surface roots from girdling.
  - c. Remove all rope, whether jute or nylon, from trunks. Again, degradation is slow or nonexistent, and ropes can girdle trunks and roots.
  - d. Remove plastic containers from container-grown trees and shrubs. For plants in fiber pots, break away the top or remove the pot entirely. Many fiber pots are coated to extend their shelf life, but the coating slows degradation below ground and retards root extension.
  - e. If roots are circling around the exterior of the root ball, cut through the roots in a few places. Cutting helps prevent circling roots from eventually girdling the trunk. Select trees grown in containers with vertical ribs or a copper treatment on the interior container wall. These container modifications and treatments minimize circling root formation.
6. Backfill with soil, **making sure trunk is straight**.
7. Tamp soil to eliminate air pockets.
8. Stake large trees in windy areas. Remove staking after one year.

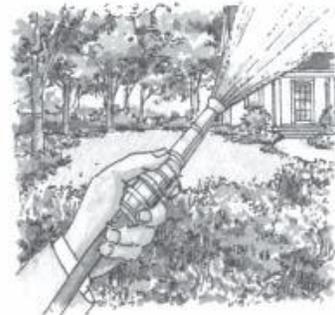
9. Water and mulch, keeping mulch away from trunk.



### **Planting Container-grown or Balled and Burlaped plantings**

#### **Native Grasses and Wildflowers Grown from Seed**

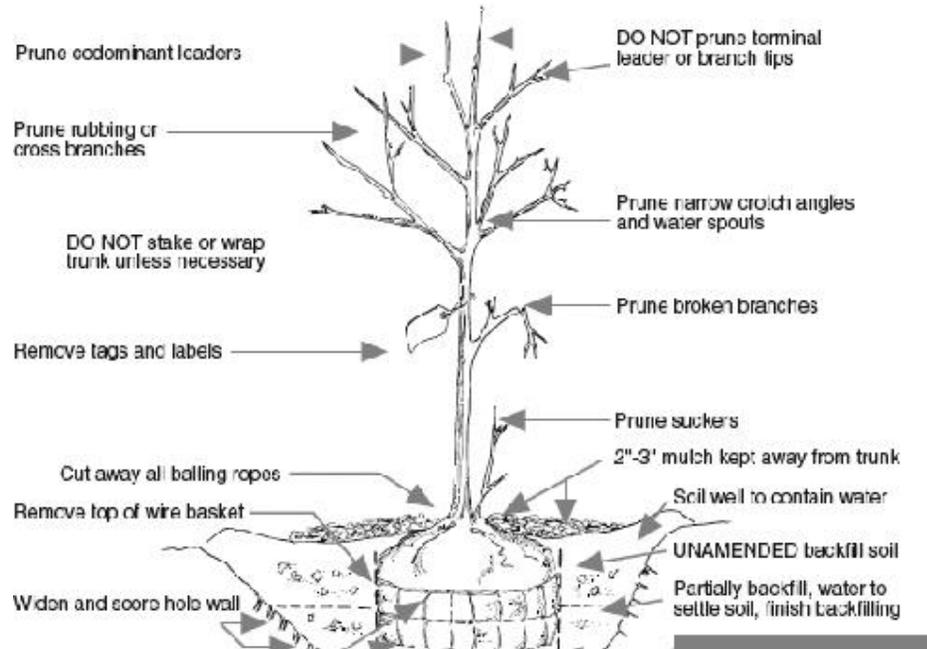
1. After selecting a site, till only when there is little chance of erosion due to flooding or runoff. Do not till on steep slopes or locations adjacent to water.
2. Distribute the seeds according to the package or nursery instructions.
3. Apply an adequate cover of straw over seedbed to prevent erosion and to hold moisture.
4. Seedlings should appear in ten to fourteen days. Keep seedlings moist for thirty days or until well established.
5. Reduce annual weeds without harming perennial wildflowers by mowing two to three times the first year. Never mow native grasses less than eight inches high.
6. Have patience; plants can take up to three years to flower or become fully established. Be prepared to weed your new meadow frequently.



## Tree Care After

### Planting

1. Remove tags and labels from trees and shrubs to prevent girdling branches and trunks.
2. Water to promote root growth. Drip irrigation systems and water reservoir devices can facilitate watering.
3. Mulch, but don't



- over mulch, newly-planted trees and shrubs. Two to three inches of mulch is best. Use either organic mulches (shredded or chunk pine bark, pine straw, composts) or inorganic mulches (volcanic and river rocks).
4. Keep mulch from touching tree trunks and shrub stems to prevent disease and rodent problems if using organic mulches and bark abrasion if using inorganic mulches. The mulch should be at least two to three inches away from the trunk.
5. Avoid using black plastic beneath mulch around trees and shrubs because the plastic blocks air and water exchange. For added weed control, use landscape fabrics that resist weed root penetration. Apply only one to two inches of mulch atop fabrics to prevent weeds from growing in the mulch.
6. Stake trees with large crowns, those situated on windy sites, or those located where people may push them over. Stake for a maximum of one year. Stake to allow trees a slight amount of flex rather than holding them rigidly in place. Use guying or attaching material that won't damage the bark. To prevent trunk girdling, remove all guying material after one year.
7. Avoid wrapping the trunks of most trees. Wrapping often increases insect, disease, and water damage to trunks. If thin-barked trees are planted in spring or summer into hot or paved areas, they may benefit from wrapping if a white wrap is used. To avoid trunk girdling, do not attach wraps with wire, nylon rope, plastic ties, or electrical tape. If wraps must be used, remove within one year.
8. For protection against animal or equipment damage, install guards to protect the trunk. Be sure the guards are loose-fitting and permit air circulation.

Bare root	Winter
Container grown	Any time
Balled and burlaped	Late fall, early winter
Native grasses and wild flowers from seed	Spring, early summer, fall

### **Planting Chart**

Remember to keep new plants watered throughout their *first and second* seasons. Once the root systems are well-established, the plants can survive with little attention, except in times of extreme drought. Give them a little "TLC" to get them started.

### **Cautions for steep slope preparation**

Many of the waterfront lots at Smith Mountain Lake have steep slopes leading down to the shoreline. Steep slopes can lead to serious erosion and sedimentation problems.

Long term studies have shown a well designed hillside buffer landscape planted in native plants can stop nearly all erosion and hillside movement. Almost. The only way to stabilize a slope better than using plants is to install a reinforced retaining wall which can be very expensive. Your buffer landscape needs to be a mix of groundcovers, shrubs, trees, and perennials with the areas between plants covered with appropriate mulch and/or boulders. **A varied planting is FAR more effective than a single variety on a slope.** When you have a mixture of plants, you have layers of vegetation that will lessen the impact of rainfall hitting the ground and reduce the amount and severity of runoff.

When planting a hillside buffer landscape, keep in mind that generally the bigger the plant grows, the deeper the roots. However, there are exceptions - most pines have shallow roots and can be used within the landscape but not as the total solution. Some pines can grow in only one foot of soil. If you only have a foot of soil on the slope shallow rooted pines are VERY useful. If the soil is deeper, a mix of plants with deeper roots is needed to hold this soil in place. Also, the type of mulch you use is important. Do not use compost, rice straw, hay straw, or large chunks of bark. Hardwood mulch or pine needles are the best solutions. The goal is to control the runoff in a way that does not cause further problems.

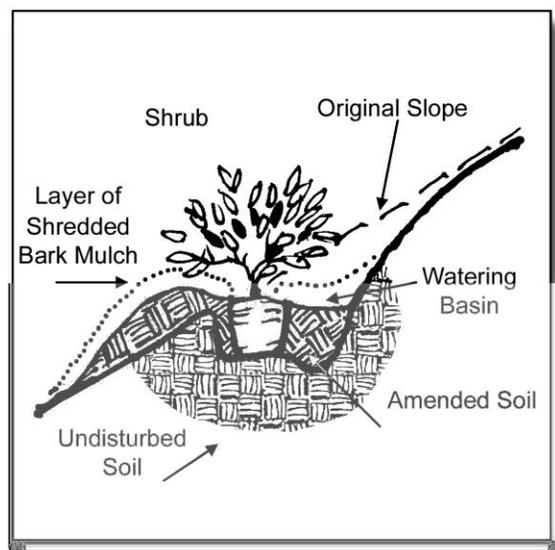
Several observations should be made before you start a buffer landscape on a slope or hillside.

1. *Water Flow.* Determine if there is water moving across the slope or down the hillside. Also determine if erosion has been common on this slope. Look to see if there are small or large channels on the slope. Finally you need to

determine where the water is going in the landscape.

2. *Type of soil.* Determine if the soil on the slope is stable or sandy or rocky. Go up on the slope and dig a hole where you'll plant a plant later. Fill the hole with water and time how long it takes for the water to drain. This will give you an idea of the type of soil that you're dealing with. The type of landscaping you'll need to put in to remediate your problem will vary depending on the type of soil found on the slope. Sandy slopes will need to be landscaped with a different mixture of perennials, groundcovers, bushes and trees, than those used on a loam or clay soil. If the slope is extremely rocky, it may not support much in the way of plantings. If you have a rock outcropping, enjoy it, stop trying to plant it.
3. *Steepness of the slope.* The steepness of the slope will have an impact on the amount and type of plantings you will be able to put on the slope. A slope that is too steep will have limited accessibility. You'll have to be able to put your plants in the ground, and you'll need to be able to do a few weeding and waterings to establish plants on the slope. If you can't get on the slope, you may have to let nature take its course in that area of your buffer landscape.
4. *Watering or irrigation.* You will need to determine how you are going to get water to the plants you put on your steep slope. If watering is difficult or impossible, you will need to put in plants that are more resistant to periods of drought. On the other hand, the more water you put on the slope, the more unstable the slope will be.
5. *Light Patterns.* As in plantings in other areas of your buffer landscape, you should note the amount of sunlight or shade you have on your slope and plant accordingly as outlined in Chapter 2.

**Planting on a slope** Planting begins by first leveling out a terrace or table on the hillside where you want to plant. Carve away the slope above the planting hole with a pick and shift the resulting soil to build up a table area level with the eventual planting hole. This table should be large enough to provide a stable place for you to stand while you finish the work. Carve out a table two or three feet wide depending on the size of your planting container (two or three times wider than the width of the root ball).



Smooth out the hill above the plant where you have cut into the soil so that the old slope and the new slope transition together smoothly.

The trick with planting on a hill is that the berm you build around the plant to hold water should be only on the downhill side of the plant. And the plant itself ends up being planted almost within the berm instead of beside it. A basin for holding water sits behind the plant on the hill rather than surrounding it.

### **Additional points for consideration when planting on a slope**

1. Be cautious when using sprinkler systems on slopes. Too much water, applied with too much force, can cause erosion, and over-saturation can cause slope failure (a slide). Use a drip system if possible.
2. Slopes should be designed so they do not dump water onto used areas or allow water to drain toward a building. Use a swale or shallow gutter to carry water away.
3. The maximum slope for a maintained landscape should be 30%. The slope for a lawn area is 20%
4. When feasible, circulation pathways on a slope should occur parallel to or at an angle to contours, not perpendicular (which can be too steep for easy movement)
5. Steps ideally should have six inch risers and twelve inch treads (a five foot distance for a three foot rise in height).
6. Ramps require substantially more horizontal distance, with a preferred gradient of 8.33% (a 36 foot distance for a three foot rise in height). Long ramps should be avoided. Provide a level landing area every 30 feet.
7. When planting on a slope, use a variety of plants with varying root depths and canopy heights. (shrubs, trees, and ground-covers). Avoid using only low, shallow, even-rooted plantings which can create a potential shear plane. A dense, deep-rooted slope will absorb water and be more stable.
8. Plants should be dug into the slope in a shallow well, allowing the water to infiltrate and not run-off. Make sure that taller plantings are positioned vertically and properly staked until their roots take hold.
9. Remember to allow access for equipment (ramps vs. steps) when terracing a slope.

### **Other approaches to aid in planting slopes**

**Retaining walls.** A series of small terrace walls are a much more pleasant and environmentally benign solution to the slope problem than a massive reinforced wall. Also, they usually do not require a permit. Small rock or interlocking walls allow rainfall to stay on the landscape slope, and you can garden on the resulting terraces.

**Boulders and logs.** Make sure they are secured to keep them from rolling down the hill. “Plant” the boulders by burying at least one third of the boulder which will aid in securing the slope.

**References:**

**Tree and Shrub Planting Guidelines** 430-295 *Bonnie Lee Appleton, Extension Specialist and Susan French, Extension Technician, Hampton Roads AREC; Virginia Tech*

**<http://www.aldenlane.com>**

**<http://web.extension.illinois.edu/gardendesign/maintenanceworkingsoil.html>**

**<http://www.gardenaesthetics.com/dilemmas.html>**

**<http://www.state.me.us/dep/blwq/docwatershed/bufk.htm>**

**<http://www.tva.gov/river/landandshore/stabilization/>**