TREES AND SHRUBS

ESTABLISHING AND MAINTAINING CONTAINERIZED AND BALLED-AND-BURLAPPED PLANTS

Conservation Practice Job Sheet

Natural Resources Conservation Service (NRCS) July 2003

INTRODUCTION

Trees and shrubs may be planted to reduce soil erosion and sedimentation, improve water quality, produce commercial timber, provide wildlife habitat, beautify an area, and provide shade.

This job sheet provides instructions for planting and maintaining trees and shrubs in good condition so that they can serve their intended purpose. Using proper planting and management techniques, especially during the establishment years, will significantly improve plant health and survival.

USING CONTAINERIZED VS. BALLED-AND-BURLAPPED PLANTS

Containerized and balled-and-burlapped (B&B) plants are available in a wide range of sizes and wrapping materials. Containerized plants are usually sold in plastic or fiber pots, or in paper wrappers. The plants are generally younger and smaller than B&B plants, are less expensive to purchase, and are easier to handle.

B&B stock is usually sold with the root ball wrapped in natural burlap or synthetic fabric material. A wire basket may also cover the root ball to help hold the soil in place during shipment. B&B plants are generally older and larger than most containerized plants, and are usually more expensive. They are most often used when it is not feasible to wait for smaller plants to reach a desired size, such as for landscaping, visual screens, or windbreaks.

The root balls of B&B plants can be very heavy. If you decide to use large B&B trees and shrubs, consider hiring professional landscapers who have proper planting equipment and are experienced with planting large stock.

SITE PREPARATION

Before planting, it is essential to reduce competition from other vegetation that may be present on the planting site, such as grasses or weeds. The type and density of existing vegetation will determine how much site preparation you will need to do before planting.

It's important to allow adequate time to complete this process. If significant amounts of noxious or aggressive weeds or invasive plants are present, be aware that you may need a year or two to control them before you can plant, especially if you will be planting a large area. By state law, noxious weeds in Maryland are Johnsongrass, shattercane, Canada thistle, bull thistle, plumeless thistle, and musk thistle.

For more information about controlling specific weeds in tree and shrub plantings, contact your local office of Maryland Cooperative Extension; the Maryland Department of Agriculture, Weed Control Section; or the Maryland Department of Natural Resources, Forest Service.

Sites without Existing Vegetation

If the trees and shrubs will be planted into a clean, relatively weed-free area, then competition from existing vegetation should not be a concern. However, a companion planting (see page 3) may be needed or desirable for erosion control and/or to reduce future weed competition.

Land owners and managers please note: *If you received cost-sharing for your tree or shrub planting, be sure to check with your funding agency/organization for specific management requirements.*

Take into account any noxious or aggressive weeds on the site that might have been suppressed (but not killed) with previous herbicide applications. If live rootstocks are present, these weeds may be very difficult to kill in a new planting without destroying the desirable plants. If you think you may have a weed problem, or if you don't know the site's weed history, it may be prudent to wait one full growing season to see what comes up. Use an appropriate herbicide to treat weeds if they occur, then plant the trees and shrubs.

Sites with Existing Vegetation

If grasses or weeds are tall, you should mow or brush hog the planting strips. It is recommended that the planting strips either be cultivated or treated with a non-selective herbicide such as glyphosate (for example, Roundup, KleenUp). A selective herbicide such as 2,4-D may be used instead, depending on the species of weeds you are trying to control. Follow all label directions when using herbicides. Then plant the trees and shrubs.

PLANTING

Trees and shrubs that are planted correctly will grow faster, and will be more likely to survive, than ones that are planted incorrectly.

Always check for utility lines (water, gas, electric, cable) before planting. Avoid planting on top of buried utility lines, or below overhead lines.

Plant Availability and Planting Dates

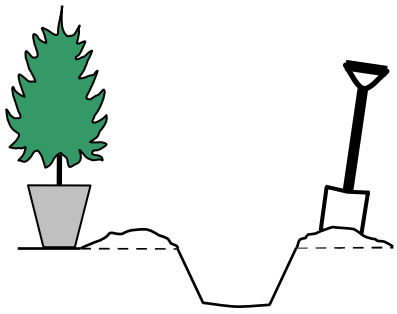
Containerized and balled-and-burlapped plants are usually available throughout the year. The preferred planting times are in the fall or early spring. Do not plant during the summer months when high temperatures and lack of rainfall will make survival very difficult, or in the winter if the ground is frozen.

To obtain recommended planting dates for the different types of woody plant materials, contact your local NRCS Field Service Center.

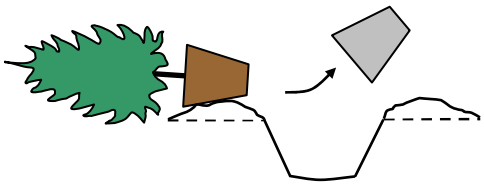
Storing and Planting Techniques

Containerized and balled-and-burlapped (B&B) plants can be stored for extended periods before planting if they are protected. Store the plants in partial to full shade and water as needed to keep moist. Lift and carry the plant by the container or rootball, never by the branches or trunk.

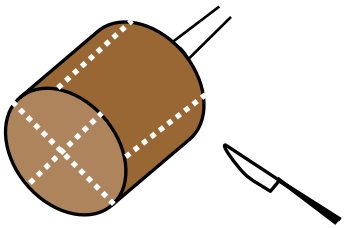
Small containerized seedlings can be planted by machine or by hand. Larger containerized or balled-and-burlapped stock is usually hand planted. A



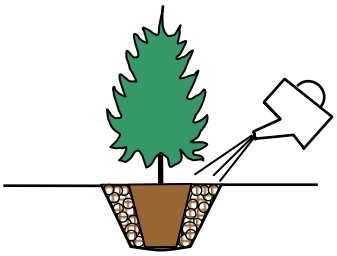
1. Dig a hole that is the same depth and at least 2 times wider than the root ball. Digging a deeper hole is not necessary, and may result in death of the plant.



2. Remove the container from the plant, even if the container is paper or peat. Lay the plant on its side, and tap the container sharply to loosen it from the root ball. If necessary, use snips to cut away the container.



3. Roots of containerized plants often completely circle the root ball. Use a sharp knife to make 3 or 4 vertical cuts on the sides of the ball, just deep enough to cut the net of roots. Also, make a criss-cross cut across the bottom of the ball. Gently pull roots away from the ball and spread them out.



4. Set the plant in the hole. Backfill the hole with soil up to the original ground surface. Do not add sand, peat, compost, or other materials to the backfill. Tamp the soil gently with your feet, but don't pack the soil or break the plant's roots. Thoroughly water the root ball and soil, then add more soil if settling occurs.

AML

Figure 1. Hand planting containerized trees and shrubs.

mechanized tree spade may be used to plant large B&B stock. See Figure 1 for instructions on hand planting smaller containerized stock.

Instructions for hand planting balled-and-burlapped plants are essentially the same as for planting containerized stock. Prepare a planting hole, and gently set the plant in the hole. Cut away any wire or twine from around the trunk.

If the root ball is contained in a wire basket, some nurseries and arborists recommend leaving it on, while others say it should be removed. Most experts recommend cutting and removing as much of the wire basket as possible, *provided you can do so without breaking up the root ball*. Avoid buying plants that have a plastic liner inside the basket, because the liner must be removed and you will probably have to remove the basket to reach it.

For very large trees, it is best to leave the wire basket in place if there is no liner. Just remove any wire from around the trunk. Improper removal of a wire basket can result in serious damage to the root system that may outweigh any benefits derived from removal of the basket.

For burlap-wrapped plants, remove natural burlap and fasteners from at least the top half of the root ball, again being careful not to damage the roots. Avoid purchasing plants wrapped in plastic or synthetic fabrics. These must be completely removed because they can severely restrict the roots if left in place.

Do not try to "improve" the soil by adding sand, peat, compost, or other materials when backfilling a planting hole. Backfill soil should not be amended unless it contains large amounts of rock, construction debris, or other materials that will adversely affect plant growth. Trees and shrubs planted in natural soil without soil amendments are more likely to develop root systems that extend well beyond the planting hole. If planted in improved soil, roots will tend to remain confined in the original hole for a longer period of time.

Staking

Trees may need to be staked if they have dense crowns, are more than 10 feet tall, or will be planted in windy locations. Use guy lines that won't damage the bark. Leave some slack in the lines so that trees will have slight amount of flex. Remove all stakes and guying materials after one year.

Lime and Fertilizer

Newly planted trees and shrubs should not be limed and fertilized, unless soil tests show that pH and nutrients are extremely low. For most sites, it's best to allow the root systems of new plantings to become established before applying lime and fertilizer.

Ground Cover

Ground cover may be needed around newly planted tress and shrubs to retain moisture, stabilize soil temperature, control erosion, and suppress weeds. Mulch or companion plantings can be used to provide ground cover and sustain seedlings.

Mulch. Spread a layer of well-aged bark mulch (shredded, chipped, or nuggets) 2 to 3 inches thick around new plantings, but not within 3 inches of the trunk. A minimum 3-foot diameter circle of mulch is recommended around each plant. On steep slopes, use shredded bark mulch, rather than chips, because it is less subject to movement by water.

Do not over-mulch. Mulch that is too thick may absorb most of the moisture from light rain, inhibiting water from reaching the roots. Thick mulch can also attract moles and voles. Furthermore, tree and shrub roots may try to grow upward into deep mulch.

Companion planting. A companion planting mix of herbaceous species may be needed or desirable for erosion control and/or to reduce future weed competition, especially on large cultivated areas where mulching is not feasible. Be aware that if you don't provide ground cover, then nature will. Nature's choice is likely to be weeds that you will need to control.

A mix of the following three fine fescue grasses, plus clover, is recommended.

Table 1. Recommended companion seeding mix for tree and shrub plantings.

Fine Fescue & Clover Mixture	Seeding Rate (lbs/ac)
Creeping Red Fescue or Chewings Fescue	3 - 6
Hard Fescue	3 - 6
Sheep Fescue	3 - 6
White Clover	1 - 2

Alternatively, planting only the fine fescues (no clover), or only one fine fescue species plus clover, is also acceptable. The total seeding rate for the grasses should be at least 9 pounds per acre, up to 18 pounds per acre. Use the higher rate for erosion control, and the lower rate if only weed suppression is needed. The companion mix can be planted before or at the same time as the tree and shrub planting, either in the spring or the fall.

PROTECTING PLANTS

Plants should be protected from damage by wildlife, human activities, or livestock by using rodent guards, repellents, tree shelters, fences, and/or other exclusion measures.

Rabbit and Rodent Damage

Rabbits and rodents can use tall grasses and weeds for protection while gnawing on tree and shrub plantings. Mow, mulch, or use herbicides as needed to control vegetation around plantings and reduce animal damage. Follow recommendations from Maryland Cooperative Extension when using repellents or poisons to protect plantings from mice and voles.

Commercially available wire or plastic guards are also available that you can wrap around the lower part of tree trunks to discourage rabbits and rodents from gnawing bark. These guards need to be securely placed in the ground to deter voles and mice.

Fences and Use Exclusion

Many types of fences and exclusion devices are available. Contact your local NRCS Field Service Center for recommendations for your site.

ESTABLISHING AND MAINTAINING THE PLANTING

Establishing the Planting

Planting year. After planting, keep plants watered during dry periods. It can take at least 2 years before a tree or shrub develops a root system extensive enough to sustain itself. The feasibility of watering will depend on the size and location of the planting, availability of a water source, watering equipment, etc.

On well-drained loamy soils, new plantings usually need about 1 inch of water per week in summer and fall, and also during the spring if there is little rainfall. On sandy soils, plants may need up to 2 inches of water per week, preferably in two separate 1-inch waterings. On heavier soils or wet sites, plants may need less water. Watering should be sufficient to moisten the soil to the depth of the root ball—usually 1 to 2 feet deep. For extensive plantings, installation of a trickle irrigation system (instead of hand-watering) is recommended. Contact your local NRCS Field Service Center for a list of suppliers or irrigation companies.

Control weeds by mowing, hand pulling, or treating with an appropriate herbicide. Mowing should be done with extreme caution to avoid damaging the stems or bark of plantings. Vegetation not immediately adjacent to the plantings can be left unmowed (except for noxious weeds, which must be controlled as required by Maryland state law).

Herbicides may be spot-sprayed around plantings or applied to the planting strip. . Follow specific label instructions to reduce or eliminate damage to trees and shrubs. Do not apply herbicides on windy days when spray drift can damage nearby plantings.

Second year after planting. Continue to water plants, as needed. Control weeds by mowing, hand pulling, or treating with an herbicide. Always avoid damaging the plantings during mowing and herbicide application. If using mulch around plants, do not exceed a total thickness of 3 inches (new mulch, plus any remaining old mulch).

Maintaining the Planting

The trees and shrubs should be well established by this time. For optimum wildlife habitat, all management practices should be conducted outside of the primary nesting season for birds and ground-nesting wildlife (April 15 - August 15).

If it becomes necessary to control weeds during the nesting season (for example, noxious weeds), contact your local weed control specialist concerning recommendations for spot-treating the weed problem.

Please note: Brand names are mentioned in this jobsheet for informational purposes only. NRCS does not intend any endorsement of brands mentioned, nor criticism of similar products not mentioned.

Contents of this jobsheet may be reproduced for non-commercial purposes, provided that USDA-NRCS, Maryland, is credited. Text, graphics, and photo by Anne Lynn, State Biologist, NRCS, Maryland. (Portions adapted from a jobsheet prepared by Livy Marques, formerly with NRCS, Maryland.)

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

PLANTING PLAN for TREES & SHRUBS		
Name:	**Farm No.:**	**Tax Map:**
	Tract No.:	**Parcel:**
Address:	**Primary Purpose(s):** ☐ **Erosion Control** ☐ **Water Quality** ☐ **Wildlife Habitat for:**	**Recommended Planting Date(s):**
Assisted By: **Date:**		

Planting Area (identify by field no., stand, etc.)	Acres	Tree or Shrub Species (list cultivar, if needed)	Spacing (LF) Between Plants	Number of Plants Needed per Acre	Total Quantities Needed

COMPANION PLANTING

Planting Area	Acres	Mix	Cultivar (if any)	Seeding Rate (lbs/ac)	Total Quantities Needed (lbs)
		Creeping Red Fescue or Chewings Fescue		3 - 6	
		Hard Fescue		3 - 6	
		Sheep Fescue		3 - 6	
		White Clover		1 - 2	

Additional Recommendations/Notes: