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## G98-1349 Woody Landscape Plants: Selection and Planting

Justin R. Evertson

*University of Nebraska - Lincoln*, [jevertson1@unl.edu](mailto:jevertson1@unl.edu)

David P. Mooter

*University of Nebraska - Lincoln*

Mark O. Harrell

*University of Nebraska - Lincoln*

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## Woody Landscape Plants: Selection and Planting

This NebGuide discusses how to select the right tree or shrub for any location and how to properly plant and care for it.

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*David P. Mooter, Community Forester*  
*Mark O. Harrell, Forest Pest Specialist*  
*Justin Evertson, Planning Specialist*

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Properly planted and cared for trees and shrubs add beauty, protection, diversity and value to almost any property, whether they are planted in a park, in front of your house, or along a street or highway.

Planting is only the first step in the process of maintaining a well kept, desirable landscape. Proper maintenance practices (see *Tree Injuries* □ *Prevention and Care*, NebGuide G91-1035, and *Care of Newly Planted Trees*, NebGuide G94-1195 ) need to be considered and performed on an annual basis to ensure the plant's long term health and vigor. Landscape trees and shrubs are not difficult to plant, but proper species selection and planting techniques are necessary to ensure success. Successful planting also requires a knowledge of growth characteristics, site requirements and intended landscape function.

### Planting Locations

Selecting planting locations is one of the most critical decisions made during the planting process. If the plant must eventually be removed because the site is unsuitable, then the planting was a failure. To avoid failure, consider overhead and underground utilities, future construction sites and the mature size of the plant. Trees often have to be removed because they have grown too large for the site. Large landscape-sized trees should be planted a minimum of 15 to 20 feet away from buildings or other obstructions. Overhead and underground utilities must be considered in order to avoid potential conflicts. Large trees should be planted a minimum of 20 to 25 feet from overhead power lines. Shrubs should be planted a minimum of 5 feet away from any potential conflict. These distances are minimums and greater distances would be preferable in most cases. When selecting your planting location, consider the plant's requirements for growth and survival, such as exposure to sunlight and soil drainage needs.

### Selecting Trees and Shrubs

The basic criteria for plant selection in Nebraska are hardiness and function. Hardiness means the ability to

There are many different ways to select the species you want in your landscape. A walk or drive through your neighborhood will show species that historically have performed well. Species characteristics such as mature size, color (remember seasonal differences such as spring versus fall color), form and leaf types (important when it's time to rake leaves) can be identified readily when you are looking at actual plants. Other characteristics such as growth rate and longevity, soil drainage needs, shade tolerance and maintenance needs are equally important but more difficult to determine. Local foresters, arborists or nursery professionals are a good source of information concerning the species characteristics mentioned above.

To help insure survival, select plants from a hardy seed source and grown within a similar climatic zone. Plants from seed sources in the southern United States will find it difficult or even impossible to adjust to Nebraska's climate. If possible, purchase your plants from nurseries whose suppliers are located within the shaded portion of the map in *Figure 1*.



Trees and shrubs are typically purchased in one of four basic forms: 1) container-grown, 2) bare-root, 3) balled-and-burlapped (B&B), or 4) spade-dug. Nearly all herbaceous plants are now purchased as container-grown although some can be shipped bare-root. Generally, spade-dug and B&B trees allow for the

planting of larger specimens since more root mass can be moved with the tree. Container-grown plants, however, are quickly becoming the nursery norm since they have more shipping flexibility and usually have a longer planting season. Bare-root plants often have the lowest cost but are limited to a short planting period in early spring.

## Season for Planting

Bare-root plants should be planted in the spring when there is no frost in the soil (usually between March 1 and May 15). The air temperature should be above freezing whenever bare-root plants are planted, and the soil must be in workable condition. Planting operations should be suspended during exceptionally wet, dry or windy periods. During a "late" spring, the planting period may be extended a few days if the bare-root stock is still dormant.

Balled-and-burlapped stock may be planted in the spring between March 1 and June 15 if weather and soil conditions permit. These dates may be extended if daytime temperatures remain below 80°F. Fall planting should be done between August 15 and October 30 if possible, or at least before the soil freezes. Evergreen trees can transplant very well in the fall as long as follow-up moisture is adequate. Planting deciduous trees in the fall should be delayed until daytime temperatures drop to 80°F or below.

Container-grown stock may be planted during most of the year except when soils are frozen and during the extreme heat of summer. The best time for planting container-grown stock corresponds with the planting dates for balled-and-burlapped stock.

## Preplanting Care

All plant material should be planted as soon as possible after receipt. No advantage comes from storing landscape plants. Bare-root plants must be protected from drying and overheating until planting and may be stored for up to seven days, depending on the weather, by placing them in a cool, shaded location, out of the wind and with the roots covered with a moist mulch material. Do not submerge roots in water.

Balled-and-burlapped and container-grown plants must be properly watered and protected from damaging winds, mechanical damage, and drying. The plants should be kept in a shaded area during storage to provide them with the same protection mentioned above. Plants must be handled only by the container or soil ball. Lifting by the stem or trunk can cause shearing of the smaller roots which often leads to mortality. Prior to planting remove all labels, wires, etc. except from around the root ball.

## Landscape Planting Practices

For bigger projects, a landscape plan should be prepared before planting to insure that the right plant is planted in the right place. Consider aesthetic needs, site limitations, intended function of the landscape and maintenance capabilities. Consider also these two common landscape design goals: 1) arrange plants in natural and complementary groupings, and 2) reduce the potential negative impacts often associated with turf maintenance (damage from mowing equipment, over watering and over fertilizing). This can greatly improve plant survivability in Nebraska.

Time and effort should be spent on site preparation prior to planting. Major soil deficiencies should be identified and corrected before planting or a better planting site should be selected. It is especially important to locate all underground utilities before digging. In Nebraska, state law requires that you contact the "digger's hotline." Check the area for subsurface drainage and be certain plant placement will allow for proper growth and development (do not plant large trees under power lines).



Figure 2. Types of planting stock.

The planting site should be dug two to three times wider than the root system of the tree or shrub to be planted (Figure 3). The finished hole should be narrower at the bottom than at the top and be at least two feet wider than the root mass. Hole dimensions should be increased when planting in heavy or hard soils. With heavy or hard soils, the sides of the planting hole should be scarified (loosened) to facilitate root penetration into the adjacent soil.

The plant should be set slightly higher (2-3 inches maximum) than the nursery level. Mound the soil up to the top of the root ball when filling. Make sure the root ball is placed on solid soil.

The soil used for backfill should be neither too wet nor too dry, and all large stones or clods should be removed. If the soil which was removed from the planting hole is unsuitable for backfill, mix it with a good soil. Do not use soil amendments.

Balled-and-burlapped or container-grown stock must be lifted and carried only by the ball or container. After the plant is set at the proper level in the hole and sufficient backfill is placed in the hole to prevent any movement of the ball, cut the twine holding the burlap and remove the burlap from around the root collar. If the plant is in a wire basket, the wire should be cut and removed where possible, as long as damage to the root ball can be prevented. The burlap should be laid back around the sides of the ball and removed. Containers (even peat pots) should be completely removed before planting. If girdling roots are present, they should be loosened by hand and spread out as much as possible. Backfill soil should be added in alternating layers with water used to help settle the soil. Care must be taken not to tamp or otherwise work or compact the soil after the plant has been watered or the soil structure will be damaged.

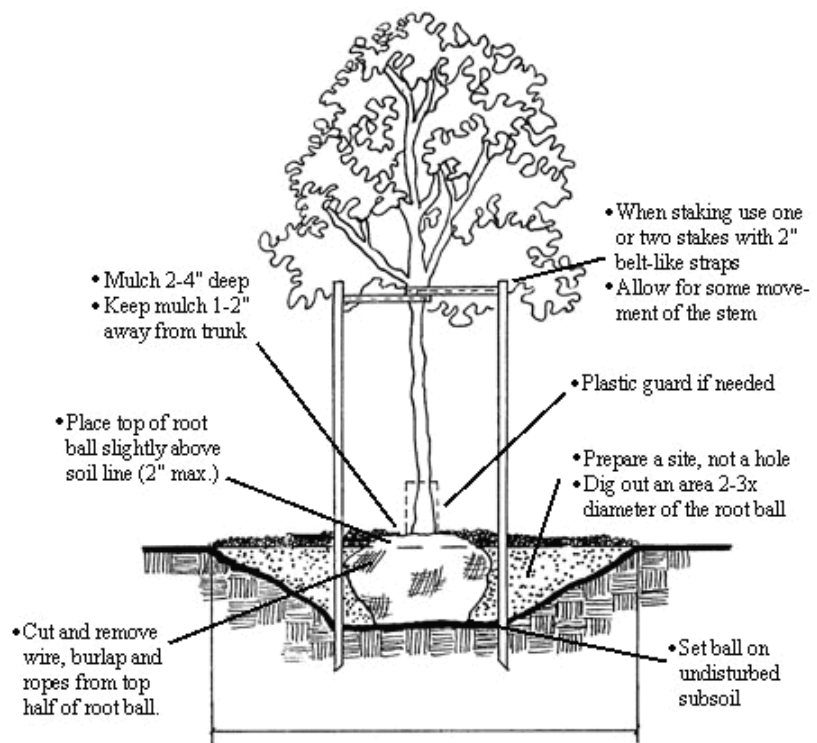


Figure 3. Typical planting detail.

The burlap should be laid back around the sides of the ball and removed. Containers (even peat pots) should be completely removed before planting. If girdling roots are present, they should be loosened by hand and spread out as much as possible. Backfill soil should be added in alternating layers with water used to help settle the soil. Care must be taken not to tamp or otherwise work or compact the soil after the plant has been watered or the soil structure will be damaged.

Bare-root plants require special care in backfilling. The roots should be placed in their natural position directly above a mound of soil built in the bottom of the hole. This allows the roots to spread over the sides of the mound and form close contact with the soil. Backfill soil should be worked gradually around the roots and settled by watering. The plant may be gently raised and lowered during the backfilling process to help filter the soil in between the roots.

## Post-Planting Cultural Practices

Please refer to *Care of Newly Planted Trees*, NebGuide G94-1195, for a more detailed description of cultural practices for after planting and during the first years on site.

### Pruning

At planting time trees and shrubs should be pruned only to remove branches damaged during handling and transplanting. The main leader on single-stemmed trees should not be pruned unless it has been damaged. Lower branches should not be removed completely because they manufacture critically needed food and help protect and shade the lower trunk.

### Staking and Guying

The purpose of most staking and guying is to prevent a newly planted tree from tipping over in the wind. If at all possible, staking and guying systems should not be used, but in Nebraska this practice is sometimes valid. Excessive movement can dislodge the small, fibrous roots from their new footing in the soil before they are firmly established. *(However, many trees are lost because guying materials are not removed or are improperly installed.)* If plants are staked and guyed, the material used should have a broad surface at the point of contact with the tree to prevent damage from rubbing, and supports should allow for some free movement of the plant. Do not use wire and hose.

To prevent girdling, remove all guying material at the end of the first growing season.

### ***Wrapping***

Tree wrap should not be used on newly planted trees. Tree wraps may not always protect trunks from damage and, in fact, can cause, hide and increase problems. In addition, tree wrap covers the photosynthetic tissues of the trunk, preventing the production of food that is needed by the young tree. Tree wraps should be used only if a nursery guarantee requires it or during the time that the tree is being transported and needs protection from mechanical damage. If used, wrap should be on the tree only during the first winter and should be removed completely the following spring. Wrap left on the tree during the growing season may girdle the tree as the trunk grows in diameter.

Damage from rodents, mowers and weed trimmers can be prevented by using plastic guards. A simple, yet effective guard can be made using perforated drain tile cut in twelve-inch sections and split down the side so that it can be placed around the tree trunk. Plastic guards should be monitored regularly and removed before rubbing or girdling problems occur.

### ***Watering***

All landscape plants should be thoroughly watered to the point of soil saturation at the time of planting. Watering at planting time provides essential moisture for the plant and also settles the soil in the planting hole for better contact between root and soil.

Care should be exercised when planting in poorly drained soils. To test for poor drainage, dig a hole and fill it with water. Allow the water to stand for 24 hours. If the water has not drained completely from the hole in that period, then special planting and watering procedures may be necessary.

Each year, irrigation kills many landscape plants by drowning their roots. Ideally, plants should be grouped according to their water requirements and the irrigation system designed and zoned accordingly. Planting slightly higher than the surrounding grade and watering less often will help when planting in poorly drained soils and within existing lawn irrigation systems. Less frequent and deeper watering is more beneficial than light watering for most landscapes. Generally, 1 inch of water distributed in one or two applications per week, through either natural rain or watering, provides adequate moisture for proper development of most landscape vegetation.

### ***Mulching***

Mulching is the most important post-planting practice that you can do to improve the health and vigor of your landscape plant. Studies have shown that wood chip mulch can nearly double plant growth in the first few years after planting. Mulching conserves moisture, reduces weed competition, and insulates roots from temperature extremes.

Mulch with a two to four-inch layer of organic material. The minimum diameter of the mulched area should be two feet. Do not place mulch directly against the stem of the plant. Clear an area in a dish-shaped pattern around the root collar.

Proper mulching provides a well-groomed appearance and designates an area where grass or weeds are eliminated, which results in lower damage rates from mowers and weed trimmers. Mechanical damage is one of the leading causes of injury and death of landscape plants. Desirable mulching materials include wood chips, wood shavings, bark, or equivalent materials. Organic mulch is preferred because it helps aerate the soil and replenish soil nutrients as it decomposes.

Caution must be used when applying mulch since a layer too thick (more than four inches) may provide an excellent habitat for small rodents and lead to considerable tree damage, primarily during the winter months. Heavy mulching can also be a problem in poorly drained or wet sites where moisture can remain at high levels for extended periods and cause root dieback. In addition, heavy mulch layers encourage tree roots to grow up into the mulch material which may dry and cause the roots to die during long dry periods.

Use of landscape fabric in combination with other mulches is not recommended. Studies suggest that landscape fabric used in this manner often does not control weeds well and may even cause harm to trees and shrubs. Landscape fabrics in high rodent areas may increase the damage to tree roots by field mice. Also, some tree roots grow up into porous fabrics. If these fabrics are lifted or adjusted as changes are made in the landscape, tree roots growing through the fabric will be damaged.

### ***Fertilizing***

Most base soils contain sufficient levels of available nutrients to supply the requirements of newly planted landscape plants except where construction has either altered the soil or changed its composition. Fertilizer should not be applied during the first several growing seasons while the new roots are establishing themselves. After this period, determination of additional nutrient needs should be based upon the condition and vitality of the plants and analysis of soil samples.

### ***Follow up***

After you have properly prepared the soil for planting, installed the plant, backfilled the soil around the plant, and initially watered and mulched the plant, you have completed only a part of the work needed to ensure a healthy, vigorous, productive landscape plant. Typically, landscape trees in Nebraska have a much shorter life-span compared to the same species in a native woodland. Proper post-planting care and follow up is necessary to protect your investment for the future. There are a number of sources of information available on proper landscape plant care and maintenance that should be consulted for further information. Your Cooperative Extension Office, arborist, nursery professional, or State Forest Service office can be contacted for more information.

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