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# FactSheet

Extension

## Ohio State University Extension Fact Sheet

### Department of Horticulture and Crop Science

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## Preparation and Planting of Landscape Plants

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The values of landscape plants are many, including their influence on climate, air purification, erosion control, noise reduction, privacy screening, and increasing property value.

Plants are important to the microclimate because they absorb heat from the air during the transpiration process (release of water in the form of vapor), provide shade that reduces solar radiation and reflection, lower wind speed, disperse fog, and influence snow deposition.

Businesses have noted that attractively landscaped buildings result in above average labor productivity, lower absenteeism and easier worker recruitment. Studies have indicated people have a basic desire for contact with plants. Satisfying this need can have a strong positive influence on human behavior. Hospital rehabilitation therapists are aware of this fact and increasingly include gardening in their programs.

Landscape plantings are important features of private and public properties and must be selected, planted, and maintained with skill. The emphasis of this article will be on the planting process with only a brief review of selection and maintenance.

### Plant Selection

The first step in selecting plants is based on specific needs identified in the landscape plan. A plan is important to maximize the landscape investment and meet the needs of climate control, noise reduction, privacy screening, or to satisfy other objectives. The plan should address the total property, but may only include the front of the home one year and another area later. The selection process should consider factors such as ultimate size, adaptability to local soil conditions, exposure to sun, shade, or wind, hardiness (ability to withstand cold, drought, etc.) and maintenance requirements. Consider as well,

branching habit, plant texture, foliage color, flowers, and fruit during various times of the year. All this information and more is available from trained landscape architects, extension service publications, and books. The more one learns about plants, the greater will be the satisfaction gained from the landscape.

Landscape plants are available in several common forms: (1) balled and burlapped (B & B), (2) bare-root, (3) packaged, (4) container grown, (5) field potted, and (6) flats or market-paks.

### ***Balled and Burlapped***

Many trees and shrubs are commonly transplanted with a ball of soil wrapped in burlap. Field grown evergreens and most trees with trunks more than two inches in diameter are available B & B.

### ***Bare-root***

Dormant plants were historically harvested bare-root (without soil) and offered to the public in this form. Nurseries harvested shrubs and smaller trees in this way and overwintered the bare-root plants in refrigerated storage. Many garden centers, however, do not have facilities to properly control the storage environment during the spring sales season, and therefore, this method of offering plants is being replaced by other practices. Many mail-order suppliers still provide plants in this form.

### ***Packaged***

Woody plants, particularly roses and some perennials such as peonies, are sold bare-root with either the root system or entire plant packaged in a cardboard or plastic wrap. Prior to packaging, the root system is wrapped with a moisture-holding medium or packing material. For the highest degree of success, plant bare-root material when they are in the dormant state or in the very early stages of growth.

### ***Container Grown***

This has become the primary form in which plants are available in the garden center. They are easy to maintain in the retail store and after purchase, and can be planted anytime of year unless the ground is frozen. Trees are now available in large sized containers from 10 to 25 gallons or more. Many garden centers will accept the return of plastic containers and reuse or recycle them.

### ***Field Potted***

This technique refers to plants that have been grown in the field and when harvested, placed in a container (often a fiber pot) rather than wrapped in burlap. Typically, narrowleaf evergreens are produced in this fashion. The plants are dug and containerized in autumn, stored under a polyethylene covering in winter and delivered to retail outlets in spring.

### ***Flats or Market-paks***

Ground covers, perennials, and annuals are sold in these containers. There are many different styles and forms available and nearly all are made of plastic which can be reused many times.

## **Planting Season**

If the soil is moist and kept sufficiently watered, planting can be done anytime the soil is not frozen. B & B or container-grown plants can be planted anytime during the growing season. Dormant, bare-root

stock is best planted in early spring or late autumn, if available.

Some plant species actually survive and grow better if planted in spring. Examples include beech, sassafras, sweetgum, sourwood, walnut, white oak, or others that have few, but large roots. Most plants that have many small fibrous roots can be transplanted with a high degree of success throughout the year.

## Site Preparation

Planting depth and a knowledge of soil texture (size of soil particles), soil structure (arrangement of soil particles), and the capacity of the soil to drain are critical.

The depth of planting is dependent on soil type or texture (size of soil particles, e.g., sand [largest], silt [next largest] and clay [smallest]). In sandy loam soils that drain well, plants should be positioned in the planting hole at the level they were originally grown in the nursery (Figure 1). The original depth can be identified by a soil line on the stem or trunk of plants or by the top of the soil of B & B or container-grown plants. Most Ohio soils, however, are not well drained. They usually consist of silt and clay particles, and drainage is often less than desirable. In soils that drain poorly, plants should be planted somewhat higher than they were in the nursery (Figure 2). More air needs to reach the root system when soils drain poorly. In these soil conditions, plants can be placed from 2 to 4 inches higher than they were during their growth in the nursery.

The major reason plants do not survive transplanting is improper moisture, e.g., too little, too often, too much, or a combination.

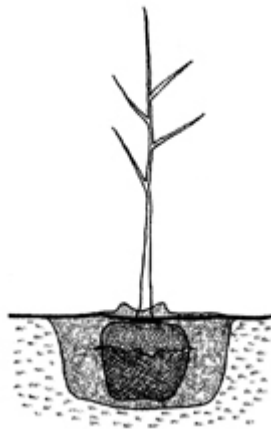


Figure 1. Balled and burlaped plant planted at original depth with watering depression.

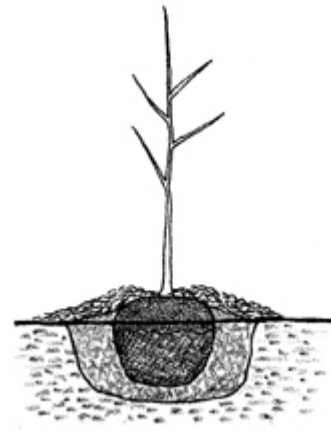


Figure 2. Balled and burlaped plant slightly raised above grade.

Soils that remain wet for long periods of time after a rain or irrigation can be managed to prevent problems. One option is to create planting beds on top of the existing soil. This could involve using landscape timbers to build up an area and filling it in with new topsoil or packaged planting medium. Another option is to install drain tile in the planting hole. The drain tile works more effectively if it is situated on a slight slope so water can drain away from the planting or bed area.

The width of the planting hole should be at least 2 or 3 times the diameter of the root ball. Recent research results have indicated feeder roots of trees and shrubs remain close to the soil surface, usually in the top 6 to 9 inches. This suggests that the major area of soil preparation should be the upper 12

inches, and the wider the area prepared for planting, the better.

If the sides of the planting hole have become compacted or glazed in the digging process, which is quite common in machine digging, use a shovel or spade to scarify or roughen the smooth surface. This provides for better air and moisture movement as well as root penetration.

## **Planting**

Remove any dead, diseased, broken, or twisted roots before planting by pruning to healthy tissue. Roots matted at the bottom or circling around the root ball of container-grown plants should be cut and removed or straightened. Some landscapers cut the root mass of container plants vertically on opposite sides at least half the distance to the main stem to decrease the chance that hidden circling roots will girdle ("strangle") at some time later. In contrast, disturb the root ball of B & B plants as little as possible.

Slowly lower the root ball into the planting hole to prevent breaking or cracking of the soil around the roots of B & B plants. After placing in the hole, the burlap of B & B plants should be loosened and rolled down the sides of the soil ball. No burlap should be exposed above the soil surface in order to prevent wicking and drying which interferes with proper moisture flow between the soil ball and the backfill. Cut and remove all twine, cords, wire, or strapping material, especially around the trunk or stems. Also, remove all labels attached with wire or nylon twine that can eventually girdle stem tissue.

Position the soil ball in the hole with the lowest branches of the plant facing areas of least people and pet activity, and higher branches facing areas requiring greater clearance. This reduces subsequent pruning. Orient the side of the plant with the most branches in such a way they are away from the afternoon sun. In so doing, the less developed side of the plant will be favored with more light.

## **The Backfill**

If the soil removed from the planting hole is a well-drained humousy loam, there should be little need for amendments. However, most soils in the urban landscape are silt to clay base, have often been disturbed by construction of the home, and, therefore, are less than ideal for plant growth. With these soils, organic amendments are beneficial.

Most organic matter amendments will open poorly drained, compacted soil and improve aeration, water infiltration, and percolation. In sandy loam soils, these same materials will increase water-holding capacity.

Certain organic products influence soil pH. Sphagnum peat moss and pine bark chips lower the pH of most soils, while most composts, including leaf mold, will increase soil pH. Having the soil tested prior to planting will help determine the need to adjust pH or mineral element levels.

New root growth can be enhanced by adding some form of organic matter (approximately one-third, by volume) to the soil being used to fill the planting hole. All subsoil from digging a planting hole should be discarded, especially if blue, gray, or yellow in color. Mix the soil amendments thoroughly with the top soil. Work the mixture gently around the root system and firm lightly. Heavy packing is not necessary and may be harmful. Water thoroughly, at least 2 to 3 times in a 60-minute period to make certain the entire growing mix is well moistened.

Leave a saucer-shaped depression around the plant inside the edge of the soil ball to facilitate

subsequent watering. Water all container and B & B plants to thoroughly wet the root ball area prior to planting.

Small amounts of fertilizer may be added to the backfill when planting. Since phosphorus moves slowly in the soil, it is important to incorporate it, if called for by a soil test, at the time of planting. This can be done by adding 5-10-5, 4-12-4, 0-20-0, 0-45-0, or similar high phosphorus ratio fertilizers to the backfill. Use half a pint of 5-10-5, 4-12-4, or one-fourth pint of 0-20-0 or 0-45-0 per bushel of soil.

## **Staking**

Staking trees after planting may be necessary until new root development is sufficient for the plant to stand alone. Staking may also be needed to protect young trees from vehicles, equipment, animals, and vandalism.

Trees with trunks up to two inches in diameter can be supported with a single stake 2 x 2 inches x 8 feet driven firmly into the ground close to the trunk. Attach the tree to the stake with plastic ties designed for the purpose, or with a wire run through a piece of garden hose. The garden hose will protect the trunk from injury by the wire as the tree grows in diameter. Do not fasten a stake to a tree with wire alone.

Trees with trunks larger than two inches in diameter may require 2 or 3 stakes or guy wires anchored into the soil.

## **Maintenance Following Planting**

### ***Watering***

Natural rainfall is usually not adequate to provide the moisture needs of newly planted landscape plants. The limited root system of bare root, container grown, or B & B plants makes them highly susceptible to dry weather conditions. Pay particularly close attention to plantings of container plants. The potting media used for container plants dries out much more rapidly than soil.

Determine the amount of soil moisture by sampling the soil with a narrow trowel or soil probe at a depth of 6 to 8 inches. Squeeze the soil. If it holds together and is not sticky, soil moisture is adequate. If the soil does not stick together, it is too dry and water is necessary. At each watering, wet the soil thoroughly to the base of the root system. Apply a minimum of one inch of water per square foot per week between rainfall and irrigation. If the temperature is high or the soil is very dry, apply more than one inch per week.

Be cautious not to overwater or the amount of oxygen in the soil will be lowered to a level that will damage roots. Make certain the timing patterns of lawn watering systems are not overlapping into plant beds and too much water is being applied to landscape plants. Monitoring the soil for moisture with a soil probe or trowel, as mentioned above, is recommended.

### ***Mulching***

Apply a mulch around newly planted landscape plants to conserve moisture in summer, reduce weed growth, stabilize soil temperature, and improve the overall appearance of the site. Apply two inches of one of the bark products, sphagnum peat moss, compost, or any number of other products readily available for the purpose. Avoid applying too much mulch, as it could significantly reduce drying and lead to excess wetness in clay loam or poorly drained soils. Reapply or replace mulch annually in the

autumn, late spring, or both, depending on rate of decomposition. Never allow the mulch to exceed 3 inches in depth.

### ***Fertilizing***

The key to plant survival and growth is proper moisture management; however, most plants require an annual application of nitrogen, if not a complete fertilizer. Each autumn after the first hard freeze, apply a fertilizer with a 3-1-2, 4-1-2, 3-1-1, or 4-1-1 ratio of nitrogen, phosphorus, and potassium (N-P-K). Apply at a rate of 3 pounds of actual nitrogen per 1,000 square feet annually to maintain healthy plants. For example, if using an 18% nitrogen fertilizer such as an 18-6-12, applying 3 pounds nitrogen to 1,000 square feet would require the use of approximately 17 pounds of product. One half the above amount should be applied to broadleaf evergreens, dwarf conifers and rock garden plants. Apply the fertilizer when the soil is moist and water the nutrients into the soil. Slow-release fertilizers will yield a longer period of release and are safer to use than quick-release farm grade fertilizers.

### ***Pest Control***

If pest-resistant plants were selected initially, the need for pest control should be minimal. However, weather conditions dictate the degree of many pest infestations and treatment with pesticides may be required from time to time.

When insects or diseases are first observed, take a sample of the insect or affected plant part to a local garden center and ask for a diagnosis. Failure to control pests in the early stages can lead to greater problems later in the season.

### ***Pruning***

The selection of the proper plants for the site will reduce the need for much pruning over time. However, branches will occasionally outgrow the intended space or plants may be damaged (storms may break up plants, etc.).

Pruning of most plants is best done in late winter or early spring, although light pruning can be done anytime. Annual pruning is done to maintain plant shape, or to remove dead, broken, weak, crossing, or low-lying limbs. Removing branches while still less than an inch in diameter promotes rapid healing of wounds.

For an excellent landscape program, select high quality plants and have a knowledge of their growing requirements. Plant at the proper depth based on soil conditions, prepare a large enough planting hole, use a prepared backfill, and water thoroughly. Remove all twine and wires and maintain plants with water, mulch, fertilizer, pruning, and pest control.

<sup>1</sup>This fact sheet was originally produced by Elton M. Smith, Professor Emeritus, The Ohio State University for the Ohio Florists' Association who has granted permission for its use and distribution. Dr. Rose is the person currently responsible for the contents of this factsheet.

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