FORESTRY EXTENSION NOTES

TRANSPLANTING TREES AND SHRUBS

Transplanting or moving trees or shrubs from one location to another site is a major operation from which most plants recover slowly. Transplanting, regard-less of how carefully performed, results in the destruction of a large portion of the absorbing root area. It is imperative that the digging, moving, and replanting operations are carried out with the least possible damage to the residual root system.

Timing

The recommended time for moving trees and shrubs is during the dormant season. Early spring is generally the best time to transplant; conditions should be ideal for rapid root growth. Digging should be done when the soil is moist and when the plant is not under moisture stress. If transplanting in the fall, conifers move best early (late August through September) and hardwoods move better after they are dormant.

Methods

Plants are either moved "bare-root" or "balled-and-burlapped" (with an intact soil ball). Bare-root transplanting is usually limited to deciduous shrubs and small deciduous trees (up to two inches in diameter); bare-root transplanting should always be done in early spring. Balling-and-burlapping is favored for: all evergreens; trees greater than two inches in diameter; deciduous shrubs and trees moved during the growing season; and deciduous trees and shrubs considered difficult to transplant. Even though many plants may be moved balled-and-burlapped during any time of year, the greatest success is achieved by transplanting during the dormant season.

Size of Soil Ball

The size of the soil ball dug depends primarily upon the size of the plant to be moved. A general guide for determining the *diameter of the soil ball* for different plant types and sizes is given in Table 1. Plant species, soil type, and post-planting care may slightly modify the recommended diameter of the soil ball. Species that are difficult to move should have a larger soil ball diameter than those that are more easily transplanted. Heavier soils (clays and clay loams) are preferred when moving trees and shrubs because the soil ball holds together much better than coarse textured soils. Loose, sandy soils may make transplanting with balled-and-burlapped techniques very difficult or even impossible. Trees and shrubs that are guaranteed to receive exceptionally good post-planting care may be moved with slightly smaller soil ball than the minimum recommended.

The *depth of soil ball* is also important and should be sufficient to hold the majority of fibrous roots and to provide mechanical support. In the *Principles and Practices of Planting Trees and Shrubs* by Gary W. Watson and E. B. Himelick, the following recommendations are given for depth of soil ball based on diameter of the soil ball.

Relationship between diameter and depth of the root ball

Ball Diameter	Ball Depth
less than 20 inches	75% of width
20-30 inches	67% of width
31-40 inches	60% of width

Procedures for balling-and-burlapping

Equipment needed to prepare soil balls include a spade, burlap, 6- or 8-penny nails, and heavy twine. Hand carts are useful for moving larger, heavier soil balls. Digging is generally made easier if the branches of the plant are tied in with twine.

First, remove sod or loose material from around the plant using care to avoid injuring or cutting surface roots. Second, mark a circle about six inches greater than the diameter of the desired finished ball to allow for final trimming and shaping. Working with the back of the spade toward the plant, cut straight down to a depth of 9 to 12 inches around the marked circle. Using the spade in this

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way prevents prying up uncut roots and loosening the soil ball. Sever large roots with a sharp pair of loppers; cutting such roots with a spade tends to jar the roots and loosen the soil ball. Third, dig a trench beyond the circle to a depth equal to about three-fourths of the ball depth. Fourth, shape the soil ball by rounding off the top edge of the ball making a unformly-tapered, nearly oval ball. Finally, after removing loose soil from the trench, undercut the ball at a 45° angle to sever all remaining roots.

Smaller soil balls can be lifted from the hole on a piece of burlap. Place burlap beneath the soil ball by tilting the ball and tucking rolled burlap under it; tilt the ball in the opposite direction and unroll the burlap under the ball. Two people grasping the corners of the burlap can then lift the soil ball and plant from the hole. A tree or shrub should never by lifted from the hole by pulling on the stem or top.

This manual procedure should work well for smaller soil balls. But moving plants that require soil balls greater than 24 inches in diameter will generally require use of mechanical equipment and may indicate the need for the services of a professional. Soil balls rapidly increase in weight as the diameter and depth increase. A 12-inch soil ball may weigh between 30 and 60 pounds, a 24-inch ball may weigh between 250 and 400 pounds, and a 36-inch ball could weigh more than 1,000 pounds.

With the ball centered on the burlap diagonal corners of the burlap are pulled tightly across the top of the ball, and each pair is pinned in place with six- or eight-penny nails. Loose folds of burlap are tightened by pleating and pinning them in place. Take care to bury nail points to avoid injury. Large soil balls or those with sandy soil should be tied with cord or rope for reinforce-ment.

Plants should not be exposed to excessive drying after digging. Place the balled-and-burlapped plants in a shaded area, and cover the soil ball with moistened wood chips or damp straw to keep the plants in good condition until replanting.

Table 1. Recommended minimum diameter of soil ball for trees and shrubs. (from: *Principles and Practice of Planting Trees and Shrubs* by Gary Watson and E.B. Himelick, International Society of Arboriculture.

Caliper (inches) [1]	Minimum Height (feet) [2]	Ball Diameter (inches)
	1	8
	2	10
1/2	3	12
3/4	4	14
1	5	16
11/2	6	20
2	7	24
21/2	9	28
3	10	32
31/2	13	38
4	17	42
5		54
6 [3]		

[1] Caliper of the trunk measured 6 in above the ground up to and including 4 in size, and 12 in above the ground for larger sizes

[2] For small trees up to 5 ft, deciduous shrubs up to 9 ft, and columnar evergreens over 3 ft. Root balls of conical evergreens and broadleaf evergreens are at least one size larger.

[3] Trees 6 in and greater caliper should have a root ball of 10 in diameter per inch of trunk caliper, that is, a 7 in tree should have a 70 in diameter root ball

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