

GUIDELINES TO TRANSPLANTING

AGE, TIMING, SPECIES AND SITE MAKE TRANSPLANTING A SCIENCE

By DOUGLAS CHAPMAN



Transplanting a tree is an art and a science. Many factors must be weighed, including timing, age, species, pre-treatment, antitranspirants, and site.

Timing is the paramount consideration of transplanting. In general, the earlier in the spring the tree is moved after the frost is out of the soil, the greater the degree of success will be. The only exception to this rule is northern native pine and spruce, e.g. *Pinus strobus*, *parviflora*, *sylvestris* or *Picea glauca*, which are best moved in late August.

Deciduous trees become more difficult to transplant after dormancy breaks and growth commences.

Bare root trees should be transplanted any time after the frost is out of the soil prior to bud swell. The root system should never be allowed to totally dry out. Protection is afforded by covering the root sys-

tem with chips or straw, or simply healing in.

Balled and burlapped trees can be transplanted from the time the frost goes out of the soil into early stages of growth or elongation when the temperatures are still cool. Since the root system remains

Pine and spruce are best moved in late August or early September.

in the same soil, success is higher, and shock to the tree is considerably less than with bare root.

Potted trees, those trees dug from the field and planted in containers and held for current year's sales, should be treated as balled and burlapped for transplanting considerations.

Container grown trees are easiest to transplant and have the highest degree of success. They not

only have been in the same media, but are simply popped out of the container. The plant is subject to little or no transplant shock. Therefore, container trees can be moved throughout the entire season. One thing to keep in mind when transplanting container grown plants, and this applies for several of the ericaceous plants, is to slice into the root system with a knife to stimulate root growth.

It must be stressed, transplanting before dormancy breaks is most desirable. Transplanting during early stages of growth is acceptable for balled and burlapped and potted trees. Transplanting after leaves fall from deciduous trees in the autumn is acceptable, but also less de-

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sirable than during dormancy. Our experience suggests spring transplanting is still number one but fall is second best. This disagrees with Himelick's discussion, but each area of the country has its best time for transplanting. Our concern with fall transplanting is frost heaving or desiccation during the winter.

Pine and spruce are best moved during mid-August through early September. This is probably due to photoperiod and warm soil condi-

Container grown trees suffer the least shock during transplanting.

tions favoring rapid root development. These allow the plant to establish a hold prior to dormancy. Planting beyond early September can result in problems with these two plants. Fall planting results in poor root growth and, therefore, a major decrease in transplanting success.

Age also affects transplanting success. The smaller or younger the plant, the easier to transplant. Generally, one should have a high degree of transplanting success (above 90%) with trees up to 1 to 1½-inches in trunk diameter.

In larger trees, attention should be paid to the ball size to make sure it is no smaller than the minimum developed by either the American Association of Nurserymen or the International Society of Arboriculture.

With the advent of large tree moving equipment, it has become more common to attempt moving these 4 inch trunk diameter trees. Ease of transplanting is certainly a prime consideration but good rules of transplanting must still be considered. Further, all trees should be mulched heavily with composted wood chips, pine needles, or peat moss.

Species of trees & shrubs certainly has significant impact on transplanting success. Some trees, e.g. willow, alder (*Alnus*), catalpa, and honey locust (*Gleditsia*), transplant with a high degree of success while other plants, e.g. birch (*Betula*), hickory (*Carya*), and sassafras, are very difficult to transplant. For

tree species that have shown historically to be difficult to transplant, one should carefully move the plants only during early spring or winter dormancy. For a more complete list of plant species and their relative ease or difficulty in moving, I suggest you obtain a copy of E.B. Himelick's "Tree and Shrub Transplanting Manual."

Shrub transplanting can be unique. Generally speaking, the discussion above for deciduous trees would be similar when considering timing and method of planting, e.g. bare root, balled and burlapped, or container grown. One main variant in transplanting time is for shrubs in the ericaceous family, e.g. rhododendron, azalea, mountain laurel. These shrubs can be moved almost any time from early spring through early fall (mid-September); avoid the period of rapid growth or elongation. The root system is compact—fibrous, being rarely over 18 inches in depth. Thus the plant can be dug and transplanted with minimum root loss.

Root pruning can often be the difference between success or failure in transplanting. One must realize that the main difference between nursery grown and native trees is the fact that nursery grown trees are root pruned at least every other year. This results in a more compact, well branched, fibrous root system. Therefore, transplanting success is significantly increased.

With the advent of large ball and burlap equipment, some have felt that trees can be transplanted simply from the wild and not cared for in the nurseryman's time-proven manner, e.g. frequent root pruning. This has resulted in trees that are often slow in becoming established with borer damage and frequently other declining symptoms. If the tree does become established, it takes 3 to 4 years before growth again is significant. Root pruning remains a key factor in nursery production and transplanting success.

Antitranspirants offer another opportunity to prolonging the transplanting season while increasing success. Early research by Smith and Chadwick showed clearly that the antitranspirant was

not effective over long periods of time but would afford protection during short periods just after application. As new antitranspirants have been developed, similar early studies should again be repeated to see if current products have improved over original compounds. Even though antitranspirants are not effective totally, they are one tool which can improve transplanting success for late spring plantings.

Site can be the difference between success and failure. Generally speaking, most trees and shrubs should be transplanted into well-drained soils. As Herbert Dow once said, "Clay on sand, trees in hand; sand or clay often resulted in tree death."

Sub-surface drainage is critical in moving most trees and shrubs. Therefore, one should condition the soil or, even in extremely heavy conditions, bore down through the clay to provide some form of drainage. Midland, Michigan and Chicago, Illinois are essentially lake bottoms, that is heavy clay soils and sub-surface drainage in these areas is frequently the difference between success and failure. There has been, in the past several years, a considerable amount of research discussing the "bath tub effect" in planting trees. Sub-surface drainage remains an important fact in transplanting success.

The **mechanics of transplanting** are similar for trees or shrubs. The hole the tree is to be placed in should be dug 6 to 12 inches deeper and wider than the size of the root

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system. Top soil or organic matter should be mixed with the ambient soil. The plant is then placed in the hole. Then the hole is filled ⅔ with soil; watered thoroughly. This first watering is an important step in that it eliminates air pockets, and affords intimate contact between soil and roots.

The planting depth should be essentially the same as it was when

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the plant was growing in the nursery. One exception would be with transplanting large trees. Here the weight of the ball would often cause the soil to compact under the tree. This settling often results in the tree being planted 4 to 5-in. too low. For large trees transplanting slightly higher than the depth at which it was growing is paramount. After backfilling completely, a saucer of earth should be developed around the base of the tree. This saucer of earth is extremely helpful in that it collects moisture and, therefore, on sites where watering is difficult, provides maximum chance to collect and supply water.

When moving large trees, our greatest success results when the plant is mulched heavily. Mulching not only reduces evaporation and frost heaving but also limits weed growth and, therefore, competition.

When considering fertilization at the time of planting, the experts remain at odds. One recommends working fertilizer into the soil; another, no fertilizer for the first year. Generally speaking, our experience has shown that working dehydrated manure, e.g. sheep or cow, into the soil not only provides some soil conditioning but also a small amount of nutrients. Organic matter certainly has been one factor in assisting us with plant success.

Watering has been and remains paramount in transplanting. At the time of transplanting, one should water thoroughly, soaking the root ball as well as the soil surrounding the ball. This eliminates air pockets. Watering the plant provides sufficient moisture for 5 to 7 days. A thorough watering every 7 to 10 days dramatically increases the success ratio. More frequent watering not only encourages root rot but dramatically decreases transplanting success. More trees rail from overwatering than from underwatering.

Staking of trees—to stake or not! Most agree that evergreens, e.g. pines, spruce, should be either staked or wired in place. This reduces the opportunity for the tree to blow over or becoming loose in the ball. Our experience has shown some desirability to stake 2 to 3-in. trees. Whether this truly helps the tree or simply provides another barrier to keep lawn mowers from the tree trunk is a moot point and certainly not one that has been heavily researched. But in moving large trees, we still feel staking has a place.

The degree of transplanting success certainly includes a science, e.g. time, species selection, mulching, and hole preparation; an art—lacing a ball so that the soil does not become loose around the root system; and luck. If weather conditions are favorable, again, the degree of success is increased, although transplanting can be done almost any time of the year with some success. One must still follow good practices for consistent results, e.g. timing, species selection, site preparation, and watering.

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