

## Minimizing Transplant Shock

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Trees are usually planted either bare rooted, balled & burlaped, or with a tree spade. There are advantages and disadvantages with each method. It's not the method of planting that is important; it is whether the tree survives after planting. Transplant shock (TS), death caused by the tree's failure to establish, can occur up to six years after planting. If transplanting losses exceed 10%, something is wrong. Most transplant shock is due to improper site preparation or lack of follow-up maintenance.

### SITE PREPARATION

1. **Depth of Planting:** Trees that are planted too shallowly may die within the TS period. Trees that are planted too deeply usually survive the TS period but may fail after 10 or 20 years of apparently good growth.

The root flare, where the roots spread at the tree base, should always be at the ground line. When the soil added to the planting hole settles the root flare sinks below grade. To prevent settling do not dig the hole deeper than the roots or ball. Let the root system or ball sit on undisturbed subsoil. If the hole is dug deeper than the root system or ball, the fill soil must be packed firmly.

Sometimes nurseries mound soil around the tree base above the root flare. When balled with burlap, B&B, the basal flare is hidden. If the tree is planted with the tip of the ball at ground line, the tree will have been planted too deeply. Check B&B trees. Locate the basal flare and plant accordingly.

2. **Depth of the Fill Soil:** Most of the fine roots of a tree are located in the upper two feet of soil or within the black layer. The fine roots are absolutely essential to the growth and survival of the tree. The fill soil should provide nutrients, have a pH from 5.5-6.5, and permit oxygen movement (low in clay). The depth should not be less than 12 inches, ideally 20 inches or more.

3. **Diameter of the Planting Hole:** Most root regeneration occurs at the cut surfaces. Root growth therefore, starts at the outer edges of the transplanted tree root system. If the planting hole is one foot or less wider than the tree roots, then the roots have a very short distance to grow in the good fill soil before they reach the original soil. If the existing soil has a high clay content and is compacted, the roots won't grow into it and may begin spiraling as they do in a pot. Tree spades and augers can glaze the surface of the hole and produce a physical barrier to root regrowth.

The wider the planting hole, the better the root regeneration and the greater the prospects for survival. The hole should be at least three feet wider than the edge of the root system. For auger and tree spade planting, a rototiller should be used to break the tree soil-existing soil interface.

### FOLLOW-UP MAINTENANCE

1. **Mulch:** The research literature has overwhelming evidence that grass is harmful to trees. In a research study at College of DuPage, I have demonstrated that turf severely affects the growth of newly planted trees.

Grass is a highly competitive, energy demanding plant. Tree root systems in turf are hotter in the summer, colder in the winter, and drier than those growing in the natural forest or covered by organic mulch. Mulch also provides nutrients; the

lawn competes for nutrients.

The top of the planting hole (6-8 ft. dia.) should be covered with organic mulch: such as composted leaves, composted wood chips and fresh, composted hardwood bark, pine bark, mushroom compost, or other organic material. For golf courses, the organic mulch should not interfere with mowing. Mushroom compost or similar fine mulch should prove to be satisfactory. Weeds can be controlled with one or two sprays of Glyphosate (Roundup) each year. The mulch should not exceed five inches in depth and should be slightly thicker at the periphery of the planting hole.

The mulch will provide an excellent growing medium for roots, retain moisture during dry periods, protect tree roots from turf herbicides, and protect the tree base from lawnmower injury. (Lawnmower injury is the most serious problem affecting the future forest on golf courses)

2. **Staking and Wrapping:** Newly transplanted trees may require staking. Two 6' or 8' metal stakes, with heavy gauge wire and cut garden hose to protect the bark from the wire should be sufficient to hold newly planted trees in position. By keeping the two metal stakes inside the mulch, it will be easier to mow around than stakes or guy wires outside the mulch. It is also recommended to wrap newly planted trees.

3. **Watering:** All newly planted trees should be watered following planting. These trees should also be irrigated during periods of drought just like the fairways. Trees with mulch will need watering less frequently than trees planted in turf.

Every planted tree should outlive the person doing the planting. If a little time and effort is spent in preparation, planting losses will be minimized and the investment you are making in trees will pay off with a healthy and attractive landscape with specimen trees.

Anyone who is responsible for planting trees and shrubs should have **Tree and Shrub Transplanting Manual** by E. B. Himelick.

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## What Do We Plant

What do we plant when we plant the tree?

We plant the ship, which will cross the sea.

We plant the mast to carry the sails;

We plant the planks to withstand the gales —

The keel, the keelson, the beam, the knee;

We plant the ship when we plant the tree.

What do we plant when we plant the tree?

We plant the houses for you and me.

We plant the rafters, the shingles, the floors,

We plant the studding, the lath, the doors,

The beams, the siding, all parts that be;

We plant the house when we plant the tree.

What do we plant when we plant the tree?

A thousand things that we daily see;

We plant the spire that out-towers the crag.

We plant the staff for our country's flag.

We plant the shade, from the hot sun free;

We plant all these when we plant the tree.

by Henry Abbey