

It Might Be Worth Saving

Transplanting Trees and Shrubs-Part I: Preparing for the Move

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Tree to save.

Photo credit: Gary Johnson

"I don't know anything about planting trees, but my neighbor told me that you shouldn't plant in the autumn in Minnesota." "I was at the local nursery last weekend and they had signs advertising "Fall is for Planting"." Who should you believe?

Part of this contradiction involves mythical information vs. factual information. A bigger part of the contradiction relates to the differences between planting and transplanting. Most of the mythical information revolving around the blanket statement "you shouldn't plant in the autumn in Minnesota" is a misunderstanding. Planting is literally placing a plant in the ground at its (hopefully) permanent growing site. Transplanting involves digging a plant from one site and transferring the tree or shrub to a new site. When planting is done, theoretically, no roots are lost. When transplanting is done, the majority of the tree or shrub's original root system is cut off during the process.

It's SHOCKING! The loss of roots during the transplanting procedure normally induces a health condition called transplant shock. This condition is actually less ominous than the term implies, and the vast majority of transplanted trees and shrubs fully recover in a relatively short amount of time. During this shock period, however, the abbreviated root system must recover and reestablish a more characteristic "root:shoot" balance. During this recovery period the tree or shrub exhibits retarded growth above ground (contrary to what's going on below ground), maybe a little branch or twig die-back, and often fewer and smaller leaf production.

As the tree or shrub is growing through this recovery period, it's more vulnerable to stressful weather and landscape conditions that healthy plants would normally be able to tolerate. Short-term drought, hot and windy weather, and early, deep freezes can result in some abnormal damage to the plants. Whether the plant is a native one or an introduced one, they're all vulnerable to transplant shock.

When the leaves are falling, the roots are growing. Autumn, especially early through mid-autumn, is actually an excellent time to transplant many trees and shrubs in Minnesota because of the aggressive root growth going on below ground. Normally, the autumn soil temperatures and moisture content in most Minnesota landscapes are ideal for root growth. That's why most field nurseries "root-prune" trees and shrubs in the weeks during late summer to early autumn. Warm soil temperatures + uniform soil moisture = new roots.

Spring is also an excellent time period for transplanting, especially if it can be done between ground thaw and leaf emergence. Both spring and autumn seasons present the advantage of moving largely dormant plants, and the disadvantage of not knowing what the following months will be like (weather-wise). Droughty, hot and windy summers can be just as stressful on newly transplanted trees and shrubs as early, windy, bitterly-cold and long winters.

Why take the chance and potentially waste all the efforts of transplanting something when it's easier to just buy a new tree or shrub? Good question!



Not worth saving.
Photo credit: Gary Johnson

Maybe the plant has some **sentimental value**, such as a memorial tree or a shrub that you propagated from your grandparent's garden?...GOOD REASON!

Maybe the tree has some **historical significance**, and is worth preserving, such as the "Eagan Oak" that was transplanted in 2001?...GOOD REASON!

Maybe it's a **unique species**, or a species that isn't normally found growing in Minnesota, such as the Japanese maple in Grand Marais, or a topiary juniper that has taken you years to develop?...GOOD REASON!




Maybe it's just a **beautiful specimen**, the most perfect potentilla you've ever seen?...GOOD REASON!




Maybe the tree or shrub is in **pretty bad shape**, unhealthy, unshapely, and a new site could improve its appearance?...BAD REASON!

As a rule of thumb, if the plant is in poor health or poor condition, it probably would be best to transplant it to the chipper and then to the mulch pile. You can do this during any season.

Okay, you've convinced me. Can I move anything, spring or fall? Well, yes, you can move anything, but it may not survive! Literally, just about any tree or shrub can be moved, but there are definite limits to success (a.k.a., the plant actually lives).

Smaller trees and shrubs transplant more successfully. They're younger and recover from the transplant shock much sooner and easier. Plus, there's a better chance that you will be able to transplant a larger percentage of the roots if the plant is smaller. For instance:

<p>Root and Top Growth of a One-Inch Caliper Tree Following Transplanting (Reyes, 2002) A 1" caliper tree would have a root diameter of 4.5 feet. By nursery standards a root ball of about 1.5 feet would be moved. Less than 5% of the root system is transplanted.</p>	<p>Root and Top Growth of a Four-Inch Caliper Tree Following Transplanting A 4" caliper tree would have a root diameter of 18 feet. A root ball of 3.5 feet would be moved. Less than 5% of the root system is transplanted in the root ball.</p>
 <p>First Year. The tree is under severe water stress soon after transplanting. With good care the stress diminishes, and the root system diameter should increase to 4.5 feet (100% of the original) by the end of the first year. Roots and top are now balanced and the tree should grow normally.</p>	 <p>First Year. Root system diameter increases to 6 feet, 9% of original volume. With less than 10% of the absorbing roots to support a full crown (top), the tree is often under severe water stress, inhibiting top growth, including bud formation.</p>
	 <p>Second Year. Root system increases to 9 feet, 23% of original volume. The tree is frequently under water stress, inhibiting current season growth.</p>

	 <p>Third Year. Root system diameter increases to 12 feet, 41% of original volume. As root/top balance is gradually restored, the tree is exposed to less water stress and growth improves.</p>
	 <p>Fourth Year. Root system diameter increases to 15 feet, 60% of original volume. The effective rate of root generation accelerates as the overall diameter of the root system increases.</p>
	 <p>Fifth Year. Root system diameter increases to 18 feet, 100% of original volume. Roots and crown and the tree should grow normally.</p>

Healthy plants transplant more successfully. It takes a lot of the plant's stored energy to establish a new, more characteristic root system. If a plant is unhealthy, it probably has a very poor, energy reserve system. Not only will it be more difficult for this plant to recover its root system from the shock of transplanting, the energy drain could push this tree or shrub over the edge from unhealthy to dead.

How do you know if it's healthy? If the foliage is undersized for the species, it may not be healthy. If the canopy (branches with leaves) is sparse for the species, it probably isn't very healthy. If there is a lot of branch die-back, it's probably not healthy. If there is decay in the stem/s, infestations of boring insects and/or infectious diseases of the stem or leaves...transplant it to the chipper.

SOME plant species just do better if moved in the spring:

<p>Stick with Spring Carpinus (hornbeam) Magnolia Populus (poplar, aspen) Quercus (most species) (oak) Chamaecyparis (false cypress) Crataegus (hawthorn)</p>	<p>Spring best, Autumn w/care Acer rubrum (red maple) Betula (birch) Cornus (dogwood) Prunus (plum, cherry) Pyrus (pear) Salix (willow) Tilia tomentosa (silver linden)</p>	<p>Early Autumn Berberis (barberry) Cotoneaster Ilex (holly) Pinus (pine) Rhododendron Taxus (yew) Tsuga (hemlock) Viburnum</p>
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How can I improve the chances of a successful transplant?

Build up the health of the plant before the move. If you're planning on moving the plant in the spring, start with the health program the preceding autumn or summer. If it's nutrient-stressed, fertilize it. Don't allow it to become water-stressed...keep the soil uniformly moist. Control any insect pests or diseases. Prune out any dead wood and/or weakly attached branches. Mulch as much of the root zone as you can stand. This gets rid of grass competition, lessens the need for constant watering, and keeps the soil warmer into late autumn (for best root growth).



Root pruning completed.
Photo credit: Gary Johnson

Root prune the plant, at least one season (spring or autumn) before the move. Root pruning woody plants encourages a more compact and dense root system. Therefore, when you finally move it, the tree or shrub will have a higher percentage of its most important roots contained within a smaller soil volume.

As a rule of thumb, for each inch of stem caliper, root prune at a distance of 10-12 inches out from the stem of the plant. For instance, if the tree has a one inch stem caliper, the diameter of the root pruned area would be 20-24 inches. Simply determine the appropriate distance from the stem, draw a circle around the stem with this distance as the radius, and sink the blade of your digging spade down as deep as you can go all the way around this circle. This one practice will dramatically reduce the transplant shock on the plant when it is finally transplanted the following season or year.

You've sold me on the idea of transplanting, but the tree is just too big for me to move it. Are there companies that specialize in transplanting large trees and shrubs?

Yup. There are several companies in Minnesota that specialize in transplanting large plants with various sizes of tree spades. However, these companies are busy, and it would be smart to include contacting them at least one season before the transplant date.

A Partial Listing of Companies That Transplant Large Trees and Shrubs in Minnesota:

A telephone survey of possible tree moving companies in the Twin Cities, Minnesota:

Minnesota Valley Landscape, Shakopee, 952-445-4004

Halla Nursery, Chaska, 952-445-6555

Witzel Tree Moving, 651-459-4581, 651-769-1759

Strese's Tree Service, Dennison, Mn, 507-645-6137, cell 612-282-3526....variety of spade sizes.

Bob Matiski Tree Moving, 651-436-1709, serving the St. Croix River valley, moves up to 5 inch caliper trees

This list was compiled from the telephone book and someone called to verify. No endorsement is expressed or implied by the University of Minnesota Extension Service, the author, or Yard & Garden Line. Tree moving firms not included are invited to contact the author at grjonson@umn.edu for addition to the list.