RPG Times

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Wire Baskets: Why leave them intact?

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As members of the Roots Plus Field-growers Association of Florida (RPG) we are often asked questions about various tree related issues. One commonly asked question is; "Should wire baskets be removed from trees at planting?" As members of the field-grown tree industry we depend on wire baskets because they provide the best system of handling, planting, and establishing newly planted trees while maintaining a high quality, tight root system. Wire baskets have been used for at least 40 years in our industry and millions of trees have been planted with wire baskets during that time. We believe that wire baskets are not detrimental to trees after planting and that recent hurricanes and storms have in fact proven that trees planted in wire baskets are superior performers in the landscape. While we do draw upon years of experience, the following response to questions about wire baskets is also based on scientific evidence and recent research into whether or not leaving wire baskets intact is detrimental to tree health.

First we would like to address the function of a wire basket on a field-grown tree. Wire baskets were designed to support a root ball on the top and sides. The top and side wires support the root ball during loading, shipping, and transplanting, insuring the root ball arrives at its planting site intact. They also provide support to the tree during the time it is establishing in the landscape. This support provided by the basket, along with the weight of the root ball, is the reason field-grown trees rarely need to be staked. When wire baskets are removed entirely or the top tiers of wire are removed, the advantage of the weight of the root ball helping to hold the tree in the ground is lost. After removal of the wire the trees will need to be staked (like most container trees are) and will be subject to blowing over during significant storm events. Not only does staking add significant cost to a tree planting project, it can also add liability with guy

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Establishment, Irrigation & Water Restrictions

Establishment

Tree establishment refers to the point a newly transplanted tree has grown roots into the surrounding soil a distance equal to approximately 3 times the distance from the trunk to the branch tips. During the establishment period, shoots and trunk grow slower than they did before transplanting. When their growth rates become more or less consistent from one year to the next, the tree is considered established. It is important to consider establishment time when planting trees in any landscape.

In moist climates, by the end of the establishment period a tree has regenerated enough roots to keep it alive without supplemental irrigation. Trees provided with regular irrigation through the first growing season after transplanting require approximately 3 months (hardiness zones 9-11) per inch of trunk diameter to fully establish roots in the landscape soil. Trees that are underirrigated during this establishment period are likely to require additional time to establish because roots grow more slowly. Most trees are underirrigated during the establishment period. Because roots are not fully established, be prepared to irrigate through the entire establishment period, especially in drought. Since most root growth occurs in summer, be sure soil moisture is appropriate during this crucial season.

Irrigation

Irrigation capabilities at the planting site should be considered before selecting trees. It is virtually impossible to plant and establish a thriving tree in our climate without an irrigation system in place. Regular irrigation after planting encourages rapid root growth that is essential for tree establishment. Irrigation helps maintain and encourage the desirable dominant leader in the tree canopy on large-maturing trees. Instead of a dominant leader, trees that are underirrigated during the establishment

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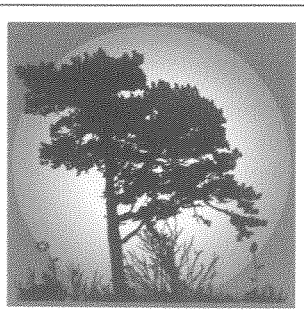

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-Planting and establishment techniques

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wires becoming tripping and mowing hazards. Also, we have all seen staking materials not removed in a timely manner that eventually can girdle and destroy a tree.

The wire basket also serves one other very important purpose; it provides a means for lifting the tree by the root ball so that the tree is not lifted by strapping on the trunk. The significance of this advantage to using wire baskets cannot be overstated. In fact, some of the largest container nurseries in the state have looked into using a type of wire basket inside of the container to help provide a safe way of handling larger container trees. A wire basket is designed to support the tree by distributing the weight over the entire root ball. Professionals agree this is the preferred method of lifting trees; lifting the entire weight of a tree by strapping directly around trunk can cause damage to the trunk and cambium. Sometimes this damage may not be noticed immediately and symptoms of this unseen damage can appear years later as the tree declines or dies in the landscape.

A concern frequently expressed about wire baskets is how the basket may or may not interfere with the tree's root system. The question is, does the wire girdle the tree's root system or trunk and cause the tree to decline? The simple answer to this question is NO. Research has shown that a root growing near the wire will eventually grow into the wire. It will initially be indented by the wire and, as it continues to grow, will grow around the wire completely. The root then grows new tissues on the other side of the wire and the xylem vessels reconnect. Researchers considered several factors to determine if this was damaging to the tree. The researchers did not assume that because the root grew completely around the wire it was still a functioning root. They compared xylem vessels in roots that grew around wire to roots that did not grow around wire and found them to be nearly similar. They also used dye flow tests to show that water movement through these roots was not impeded.

Dr. Glen Lumis published the results of his research into root growth around wire baskets, as well as the results of similar root research, in an article titled "Wire Baskets: A Further Look, Research sheds new light on the wire-basket controversy" which was published in American Nurseryman magazine. The following is an excerpt from this article:

After several years of field and laboratory study, I have made the following conclusions about wire baskets and their effects on root growth.

Roots grow around basket wire, forming a complete union of bark and wood tissue; roots are not permanently girdled.

Root tissue formed after growing over wire permits translocation.

There appears to be no injury to, or break in, the root periderm that would allow pathogens to enter a tree.

Basket wire remains intact in soil for many years, and wire strength diminishes slowly.

Removing wire baskets at planting time is not necessary to assure growth and survival of large tree roots. However, you should remove any rope across the top of the ball, and bend back or remove basket loops.

Using a correctly sized basket for each root ball is imperative. The top horizontal wire should be at least several inches above the top of the soil ball.

RPG members agree completely with Dr. Lumis's research and further believe the more than 40 years of successful tree planting and establishment in wire baskets throughout the world further backs up his conclusions. We also agree that removing any rope from the top of the root ball and bending back of the loops on the top of the basket are appropriate measures to take after the tree is established in the landscape to avoid possible girdling at a future date. Once again it is important to leave the rope intact during establishment to gain all of the stability advantages a field grown tree can provide.

Another article titled "Should wire baskets be removed from trees?" was published in the FNLGA Greenline in September of 1995. This article addressed many of the same topics as well as mentioning a survey done by Dr. Edward Gilman of the University of Florida. The articles states that Dr. Gilman looked at 14 inch caliper trees that had been planted 12 years previous as 4 in caliper trees in 44 inch wire baskets. This survey found that welds holding the wire together were mostly broken but that the wire itself was strong and mostly intact. Dr. Gilman found in this survey that "the spacing of the wire in the baskets appeared to provide ample room for roots to expand with no interference or restriction of roots." The article goes on to say that " there was no evidence the wire was affecting the root system or the tree." The following excerpt is from "Should wire baskets be removed from trees?":

When a tree declines or dies, look at all possible causes. There are an estimated 40 million trees transplanted within the last 35 years in wire baskets. There are few confirmed reports of trees declining from damage or restrictions of roots caused by the use of wire baskets. Root tissue appears to grow around the wire and reconnect.

Concern with wire baskets should focus on their real function, that being a proper method of lifting the tree and the support the top wire gives to the root ball during windy conditions and the establishment of the tree. It has been observed that improper removal of the wire can result in serious damage to the root system which outweighs any benefit received by removal of wire. Proper staking and guying can usually prevent this. It is also understood why most growers and landscape contractors have refused warranties when baskets are removed or cut away.

Dr Gilman has had 12 years experience looking at trees since the 1995 article. In Gainesville at the GSTC demonstration site he showed us more than 40 trees he planted in 1992 in 32" baskets. All trees are now more than 2 feet in trunk diameter and growing vigorously with no signs of stress from wire baskets. In fact you can not find any sign of the baskets when digging into the soil around the root flare because the roots have completely engulfed and grown around the wire.

As members of RPG we believe that years of evidence, both scientific and observational, show that wire baskets provide a superior system for transplanting and establishing trees. We hope this information has helped to clarify the issue and always welcome your input or observations about how our product is working for you in your landscapes. We also welcome the opportunity to speak to your local industry groups, municipalities or landscape architects about this or any other issue related to tree production.