

RESEARCH LABORATORY TECHNICAL REPORT



Root Invigoration Program

Before and After Care

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Bartlett's Root Invigoration Program is a treatment regime intended to promote a favorable soil environment for root growth and tree performance. The program has been successful on young trees, recent transplants, maturing trees, and even some declining trees. Increased root function leads to higher levels of water and nutrient uptake, resulting in an overall improvement in tree health.

How does root invigoration promote root function?

Root growth occurs when soil conditions are favorable. Often in urban and suburban areas, soil conditions deteriorate due to turf management practices, soil compaction, lack of organic matter in the soil, lack of nutrients and low levels of mycorrhizae. Root invigoration incorporates appropriate amendments such as organic matter, biochar, prescription fertilizer, pH modifiers, and mycorrhizal fungi, while reducing soil compaction and aerating the soil. By optimizing these factors, root invigoration provides the optimum environment for root growth.

What will be done?

There are several steps involved in setting up and implementing Bartlett's Root Invigoration Program:

Site evaluation, tree evaluation and soil sampling.

The landscape and trees are examined to ensure that they are suitable candidates for the service. Not all trees will respond to this treatment and you should be especially mindful of this when considering declining trees. Soil analysis options provide information on the current nutrient, pH and organic matter levels as well as soil penetrability/density.

Program recommendations. Root invigoration will be more effective when larger areas of soil volume can be improved. Due to root distribution, we would prefer to treat the soil from the root collar out to the dripline. This is often not practical or exceeds the budget for the project. In these situations, it is often preferred to treat the soil nearest the root collar and work out to a radius of 3-5 times dbh (12" dbh = 3-5' radius treated). This may be reduced or expanded as the site and budget allow. The treated area can and should be expanded over time. The shape of the treated area may also be tailored to the site as circular areas may not work for all situations.

Irrigation. Soil moisture at the time of treatment is the most *critical factor* for efficiency and cleanliness of treatment. The ideal soil moisture is near field capacity, that is, one or two days after heavy rain. Irrigate the treatment area heavily two or three days prior to the scheduled treatment if less than an inch of rain fell during the previous week. If soils are extremely dry, soaker hoses may need to be placed and cycled several times for many hours in order to achieve sufficient water infiltration into heavy, compacted soil. Proper soil moisture is critical to allow for a more effective and less dusty treatment. If there is standing water in the landscape or if the soil is dry or frozen, treatment should be delayed.

Fertilizer Application. Bartlett's Soil Prescription Fertilization Program matches fertilizer to your soil and tree needs and provides the greatest benefits with the least environmental impact.

Soil Conditioning. On the day of treatment, a crew will arrive with a large air compressor and the materials that will be incorporated into the soil. They will cultivate the soil to a depth of six to eight inches using a tool designed to till the soil while minimizing disturbance to the roots (Figure 1). Following this operation, appropriate amendments such as organic matter, biochar, fertilizer and mycorrhizal fungi will be incorporated into the treatment zone. The root collar must be excavated so that buttress roots are visible as part of the program. Irrigation should be applied after soil conditioning to settle the soil and ensure proper soil contact with fine roots.

Figure 1: Soil conditioning underway as part of the root invigoration process



Mulching. The work area will be covered with mulch at the end of the process. Maintain the mulch level at a depth of two to four inches. Although not recommended, if it is not desirable to mulch the area, it can be seeded in ground cover, but planting grass is not recommended. Turf will inhibit tree root development and make the treatment much less beneficial.

Root Diseases. If root disease is suspected of playing a role in the tree decline, a root sample will be collected for additional diagnostic testing. Treatment recommendations will be provided at a later date, if required.

What results can be anticipated?

Every tree is a unique biological specimen, so the results of this treatment are also unique. Typically, a treated tree will have a denser and greener crown by the next growing season or with the next flush of growth. Immediately after root invigoration you may notice that water penetrates more rapidly into the treated soil, this is due to the increased soil porosity.

Declining trees may need additional treatments including pruning, borer and secondary insect treatments and tree risk assessments, especially root evaluation. Check with your Bartlett Arborist for details on additional treatments.

How can you assist in the treatment and recovery of the tree?

Irrigation prior to treatment is essential in providing an effective treatment if drought conditions exist. Irrigation after treatment will provide the moisture required for root growth. Irrigation once a week during drought periods is usually sufficient. Consider adding a dedicated irrigation zone for specimen trees.

Monitor Soil Moisture. Moisture levels are easily monitored with tensiometers or other soil moisture monitoring devices. You should notice that water is now quickly absorbed into the mulch and soil.

Weed Management. If weeds start growing in the mulch, they should be pulled or treated with an appropriate herbicide. Pre-emergent herbicides should not be applied for two months following treatment. After that period, they can be used very effectively in preventing weed growth in mulched areas.

Integrated Pest Management. The Bartlett's Monitor Integrated Pest Management Program will have an expert on your property on a regularly scheduled basis to examine all of your trees and shrubs and treat pests before they become a serious problem.

Monitor the Tree. If you notice any problems with the tree, call your Bartlett Arborist immediately.



Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.