

Trees

Mycorrhizal Management of Golf Course Trees

Why given the amount of specialist time, money and considerable effort in creating the 'right' environment does tree transplant failure happen?

The answer can often be found in the microbial activity under your feet. More than 75% of a tree's survival system is found in its roots, so healthy roots mean healthy trees.

The symbiotic relationships between trees and plants and bacteria and fungi in nutrient exchange in the natural forest habitat have evolved over hundreds of millions of years. This complementary microbial activity is especially helpful in times of reduced soil fertility, drought, temperature extremes and other forms of stress.

SOILS AND STRESS

Soils especially in the new golf course environment often contain very few of the desirable characteristics of forest soil and often suffer from compaction, salt, drought, low organic matter and undesirable pH,

So it is little wonder that at the time of greatest stress when trees are transplanted from a protected nursery into to a recently built fairway that transplant failure happens.

Whips or small trees that are moved from a benign nursery habitat, lose up to 90% of their root mass and are then placed into soil typically devoid of many of the natural support mechanisms which ensure survival in the forest environment.

Recent advances in environmental biotechnology using natural fungi and bacteria from the forest have produced a range of products to help improve the transplant process and reduce subsequent maintenance costs.

EXPAND YOUR ROOTS

University studies over the last 30 years have shown that certain fungi form special associations with plant roots. These are mycorrhizal fungi that have developed a natural survival strategy to help 99% of all trees, plants and grasses survive stress and promote healthy growth.

Mycorrhizal fungi create enhanced root structures that greatly increase the absorptive surface area to several hundred times larger than non-mycorrhizal roots. This increases the plants' absorption capacity and enables increased nutrient assimilation and water absorption.

Healthy trees and plants naturally have mycorrhizae associated root systems which provide better tolerance to drought, heavy metals, salt, toxins and pH extremes, i.e. the conditions commonly found in the urban or roadside environment. Healthy trees have increased resistance to microbial and nematode root pathogens.

There are two main types of mycorrhizae - endomycorrhizae and ectomycorrhizae. Endomycorrhizae are the most common, of this type vesicular-arbuscular mycorrhizae VAM occur on more plant species than any other, particularly agricultural crops, grasses, fruit trees and hardwoods.

Ectomycorrhizae occur on about 10% of the world's flora but are just as important commercially to the urban arboriculturist and landscape architect. This is because they colonise the trees typically used for transplanting including pine, oak, chestnut, beech, birch, willow and poplar.

NEW PRODUCTS TO HELP THE ARBORIST

Transplant failure happens in spite of a host of precautionary activities to prevent it. Now a variety of ecto and endo mycorrhizae are available,

commercially, to landscape contractors, nurseries and arborists to help prevent transplant failure, or save and promote healthy growth in mature trees under stress.

Mycorrhizae are plant specific so you must ensure that you inoculate with the correct species for your plant or purchase a cocktail of species which will work on most plants.

Plants should be inoculated prior to planting. This can be done in three ways:

1. By inoculating the soil in the nursery.
2. By dipping whips in a root dip on site immediately prior to planting.
3. Pouring the spores around the rootzone when planting 1-2" calliper trees with balled roots.

Mature trees under stress can also be revived by inoculating the root zone with the appropriate mycorrhizae and nutrients.

Inoculating trees and flowerbeds is a very cost-effective way of improving results while reducing costs. Whips can be inoculated for a few pence by dipping into a solution containing the relevant mycorrhizae, biostimulents, and water retaining polymers to ensure everything is in place to help with a healthy start.

Inoculation of container trees or balled trees of 1" or 2.5cm calliper costs less than £2.00 and usually trees only need to be inoculated once in their lifetime.

Typically case studies show transplant failure in inoculated plants, not subject to vandalism, can be reduced by over 50%.

INNOVATIONS

Mycorrhizal inoculation helps but new technologies provide further assistance to ensure transplant success, and reduce costs, particularly in manpower by simplifying maintenance in the early years.

Slow release water retaining gels are very helpful to young plants that have lost part of their root system on transplanting or are subject to desiccation during transit or establishment by the roadside. As the gels expand and contract they also open the soil and help aeration, they also hold many times more water than peat and make up to 90% available to the plant.

For further information please contact:

Martin Ward

Symbio

38 Bookham Industrial Park, Bookham, Surrey KT23 3EU

Tel: 01372 456 101

Fax: 01372 456 099

Email Martin@symbio.co.uk