Fertilising Trees

Introduction

Fertilising trees refers to the practice of adding supplemental nutrients (chemical elements) required for normal growth and development.

You can't " feed " a tree, since trees produce their own sugar via photosynthesis, for which they use nutrients as part of the process.

A reasonably fertile soil will have enough nutrients to satisfy the requirements of growth on most established trees. Trees adjust their growth and development rates to the level of nutrients present in the soil, and will usually grow vigourously as long as the roots can continue to grow.

In nature, trees get nutrients from air, recycled organic matter, beneficial microbes, and soil minerals. In urban settings, the recycling of organic matter is often reduced, beneficial microbes may be minimal, and some minerals can be unavailable because of the soil pH.

Lack of water and organic matter, and soil compaction often limit growth of urban trees much more than nutrient levels.

Infertile soils are most common in new building areas, both commercial and residential, where the 'natural' soil has been altered. Altered soils display poor physical and chemical properties for tree and shrub growth. Soil modifications, where required, along with proper fertilisation may improve nutrient uptake of plants.

Fertilising a tree can improve growth; however, if fertiliser is not applied wisely, it may adversely affect the tree. Mature trees making satisfactory growth may not require fertilisation.

Adding fertiliser, especially nitrogen, around stressed or root damaged trees can be harmful unless you have determined that the stress is due to nutrient deficiency.

Harm can occur when a tree in decline with low energy reserves attempts to incorporate nitrogen into cell components. Since this process requires energy expenditure, reserves can be lowered further. This could lead to a further decline in health as trees with low energy reserves have reduced ability to deal with the effects of injury and pests.

Determining the need for fertilisation

Some symptoms that indicate the need for certain nutrients include leaves smaller than usual, light green (chlorosis) or off-colour foliage, ends of branches that contain dead twigs, short elongation of branches during the growing season, and a general lack of vigour. To determine the need for fertiliser, three analyses should be considered before selecting a fertiliser: soil and foliar nutrient analyses and a pH test. Analysing of soil and foliar nutrients will indicate health status. When analyses indicate nutrient deficiencies, a pH test can help further pinpoint the problem. The pH analysis will determine if the soil is either acidic (less than 7.0) or alkaline (greater than 7.0), which is useful in determining treatment for micro-nutrient deficiencies but not nitrogen deficiencies.

When considering supplemental fertiliser, it is important to know which nutrients are needed and when and how they should be applied.

When to fertilise

Fertilisers should be applied so that nutrients are available when roots are growing. To have the greatest value to trees and shrubs fertilisers should be applied in late autumn (April to May) or in early spring (mid-September to October).

Types and rates of fertiliser

The two types of general nitrogen fertilisers are slow-release and quick-release. Slow-release fertilisers are composed with at least 50% water-insoluble nitrogen and are the preferred over quick-release (ANSI A300). Quick-release fertilisers are composed with less than 50% water-insoluble nitrogen (ANSI A300). Fertilisers with a salt index of less than 50 are preferred. Lawn fertilisers should not be used as tree and shrub fertiliser, since many contain herbicides for weed control that

can damage or even kill trees and shrubs. The same herbicide that kills broadleaf weeds in your lawn is picked up by tree roots and can harm or kill your broadleaf trees if applied incorrectly.

Slow-release general fertilisers should be applied at rates between 1 and 2 kilograms of actual nitrogen per 100m3 per application and shall not exceed 2.75 kilograms of actual nitrogen per 100m3, annually (ANSI A300).

If the plant health objective is not met with slow-release general fertilisers, quick-release general fertilisers may be used. Rates for quick-release fertilisers should be between 0.5 and 1.4 kilograms of actual nitrogen per 100m3 per application and shall not exceed 1.8 kilograms actual nitrogen per 100m3 annually (ANSI A300). Preferred general fertilisers are fertilisers with nitrogen contents between 12% and 30%, with phosphorus and potassium contents between 3% and 12%.

Mature trees have expansive root systems that extend from 2 to 3 times the size of the canopy. A major portion of actively growing roots is located outside the tree's drip line. It is important to understand this fact when applying fertiliser to your trees as well as your turf, i.e. fertilise around the outer circumference of the root zone, and outwards from the dripline.

Application Methods

The simplest and fastest way to fertilise trees and shrubs is to broadcast granular fertiliser evenly over the defined area or root zone. Subsurface applications of dry or liquid fertiliser are no more effective than broadcast methods in most circumstances, but can help where turf or ground cover exist or to prevent fertiliser runoff from a steep slope or near a water source.

Injections and implants. Products shall be applied as low as practicable on the trunk or root flare. Holes shall be made as small and shallow as practicable with sharp drill bits. Small diameter trees and drought-stressed trees shall not be treated with injections or implants.

Other methods include, placing fertiliser in evenly distributed holes, soil injected in solution, and sprayed on foliage.

Always consult manufacturers instructions prior to any application of fertiliser.

Application intervals should be at least one year apart and timing of treatment should be at the proper growth stage to achieve fertilisation objectives.

General Guidelines

- When all branches on mature trees have foliage to their tips, and foliage is green, there is little reason to add fertiliser. When foliage shows deficiency symptoms, determine what element is missing and apply treatments accordingly. When you suspect a deficiency, have the soil or foliage tested for nutrient status before prescribing a fertiliser treatment.
- Newly planted trees and shrubs, and those with severe root damage from recent trenching or construction, should not be fertilised. The root systems of these plants need to be established or re-established before any fertilisers can be applied.
- Plants having restricted root zones because of sidewalks, driveways, or building foundations should not be fertilised. Plants must maintain an equal ratio between root growth and shoot growth.
- Young deciduous trees benefit from some additional nitrogen.
- Conifers rarely need fertilisation at all, since most are genetically adapted to low-nutrient soils.
- A layer of organic matter (mulch) maintained under the tree crown will increase soil fertility, microbial activity, soil air, and water retention; all factors that increase tree growth.
- Serious pest and structural problems can result on trees that are over fertilised, especially when a predominantly water-soluble fertiliser is used.
- Surface application is the easiest and cheapest method of fertilising ornamental trees.
- Trees surrounded by turf benefit from the application of additional nitrogen every few years, because grass competes well against trees. Soil-injected fertilisation can put the nutrients just below the grass roots so that the trees benefit the most.
- Fertilising is one of the most important aspects of palm tree care. Ideally use a 15:5:15 NPK ratio, with supplemental magnesium and calcium. Preferably use a slow release fertiliser. Use amount as prescribed by the manufacturer.

References

Fertilizing Trees Northeast Centre for Urban & Community Forestry as seen February 2008 at http://www.umass.edu/urbantree/factsheets/13fertilizingtrees.html

American National Standards Institute, 1998. Fertilization - ANSI A300 Part 2-2004, revision of ANSI A300 Part 2-1998.

Struve, D. K. 2002 A review of shade tree nitrogen fertilization research in the United States. Journal of Arboriculture 28(6) pp. 252-263.