

# *Understanding the Soil Rx Prescription Fertilization Soil Analysis Report*

*E. Thomas Smiley, Ph.D., Plant Pathologist*

The Bartlett Tree Research Laboratories now return all soil analysis reports on the Soil Rx Analysis Report. The report provides a comprehensive assessment of the levels of plant nutrients in the sampled soil. In addition, the soil organic matter levels and pH are reported. Using this report, Bartlett Technicians can provide true prescription fertilization, conventional Boost fertilization or use natural products, where available.

The purpose of the Soil Rx Prescription Fertilization program is to determine plant health goals, identify deficient nutrients, pH problems and organic matter problems and then treat those identified problems with just the nutrients needed to achieve the established goals. This reduces the potential for applying unnecessary nutrients and assures that application rates will address the nutrient problem.

## **INTERPRETING THE RESULTS**

**Soil pH** is a measure of acidity or alkalinity of the soil. Most plants require a slightly acidic pH for optimum

health. Both the current pH and the ideal range for the species sampled are listed. If the pH is either too high or too low for the species, a pH adjustment is recommended below. Changing the soil pH can be a difficult and lengthy process if the soil is highly buffered. The Nutrient Retention Capacity (CEC) of the soil is one measure of the soils buffering capacity; if the reported number is high it will be difficult to make dramatic changes to the pH.

**Nitrogen (ENR) level.** Nitrogen is the most commonly deficient nutrient for landscape plants. It is also one of the most difficult to measure in a soil analysis. This is due to the numerous forms that nitrogen can take in the soil (e.g. nitrate, ammonium or urea) and available to the plant. Even under ideal sampling and testing conditions, the analyses often do not correlate with plant response to fertilization. The Soil Rx reports show the Estimated Nitrogen Release (ERN) value as a rough indication of the nitrogen determined from the soil organic matter level. Due to the poor correlation between analysis levels and plant response to fertilizer,

the nitrogen recommendation is based more on the goal than on the ERN. So, if Nitrogen is reported as high and there is still a recommendation of application of nitrogen, the amount recommended is strictly at a maintenance level. If the goal or analysis values indicate a higher need, higher fertilizer levels are prescribed.

**Phosphorus (P), Potassium (K), Magnesium (Mg), and Calcium (Ca) levels** were determined by extracting the soil using a common standard procedure (Bray 1). Since other laboratories may use different extraction methods, direct comparison of numbers from other laboratories may be difficult. The number presented in the nutrient level are in part per million (ppm). The interpretation words (e.g. very low, medium, high) correlate to the probability of plant response. For example, if the interpretation is Very Low there is a very high probability of plant response, if it is High there is an unlikely probability of response. If the reported level is Medium or less, a fertilizer recommendation is made.

Analysis of the **microelements (Iron, Manganese, Copper and Zinc)** and salts may or may not appear on the report depending on if the arborist thought that these elements could be deficient or in excess amounts. If they are present, they are also reported in parts per million with an interpretation. If very high levels are reported that are in the range that could be toxic to the plant, which is also noted.

**Soil organic matter (OM)** is usually seen as the “lackness” in soil. If there

are high levels of organic matter, there will usually be high levels of beneficial soil microorganisms and nutrients available to the plant. The reported level is a percent of the weight of the soil. Three percent is the minimum required for most plants, higher levels are beneficial. Organic matter is added using mulch or large amounts of organic fertilizers.

### **Recommendation**

Fertilizers that should be applied to correct or begin correction of nutrient deficiencies are listed. In some cases more than one material is listed. The selection of the material is based on the application equipment to be used. All of the products are selected to provide maximum benefit to the plant by having the longest retention time in the soil. This allows the plant to absorb the nutrients, as they are needed. When “O.O” is listed, the element is not required.

When the report is used to guide conventional fertilization, rates for Boost, Boost Granular and Milorganite (or equivalent organic fertilizer) are listed. Even when conventional fertilizers are used supplemental additions of Gypsum, Lime, Sulfur, or chelates are recommended if listed on the report.

If the organic matter level was low for the plant, the addition of mulch or other organic matter is recommended.

## Frequently Asked Questions

- Q. I have had Bartlett fertilizing my trees and shrubs for years with Boost, now I am told that additional products are required. Why has my fertilizer program changed?
- A. With advancing soil analysis technology and our increased ability to deliver a better service, we now try to identify and correct deficiencies of nutrients other than just nitrogen, phosphorus and potassium. This should increase the health of the plants allowing them to live longer and be more attractive in the landscape.
- Q. My trees look green, but the soil analysis says that there is a nutrient deficiency. Do I really need to fertilize?
- A. Nutrient deficiencies may not always be apparent from visual observation. Many trees in urban areas lose large amounts of nutrients when fallen leaves are removed in autumn. The resulting mild deficiencies may be detrimental to plant health even though the leaves appear green. When trees are grown with adequate amounts of all elements essential for plant growth, they tend to live longer and be healthier.