

“Up by Roots - Healthy Soils and Trees in the Built Environment” Workshop Outline:

8:30 - 10:15 Session 1 - Soil science and tree biology:

This introductory session is an overview of the relationship among trees, soil, and water. Trees require healthy soil in sufficient volumes to grow and become the large, long-lived organisms that cool urban environments, absorb and clean rain water, and make cities livable. A “healthy” soil is one that is suitably well-drained, with adequate water and nutrient-holding capability. It has sufficient organic content to support healthy soil biology. Trees respond to these ideal growing conditions by producing fine, absorptive roots that harvest resources and larger roots that utilise the soil for structural support.

Many factors must be in balance to sustain a healthy soil. Soils rarely attain perfection in all categories and urban soil is normally deficient in many attributes. Almost all soils, however, can be improved to better support plants if the deficiencies and requirements are understood. Aspects of soil to be included in the discussion include:

Physical Properties

- ☐ Texture
- ☐ Structure
- ☐ Profile
- ☐ Compaction
- ☐ Water / soil relationships

Chemical Properties

- ☐ 16 essential elements required for plant growth
- ☐ pH

Biological Properties

- ☐ Organic matter
- ☐ Soil biology Soil food web

Interrelationships

- ☐ Soil colour
- ☐ Soil odour
- ☐ Aggregation

Tree / soil relationships

- ☐ Soil / rooting efficiency
- ☐ Tree / moisture requirements
- ☐ Tree size / soil volume relationships

10:15 - 10:30 Break

10:30 - 12:00 Session 2 - Urban soil analysis:

When working with urban soils, quick field assessments of soil conditions often must be made by a landscape architect or arborist. In making these assessments, few practitioners have a trained soil scientist on hand to assist them. Soil samples sent to a soils lab can reveal only a portion of the information needed in the decision making process. Reasonably accurate assessments can be made and methods, both traditional and non traditional, to determine soil conditions will be discussed. Non-

traditional methods often rely on reading the landscape to find past soil disturbances.

Traditional analysis tools

- ☐ Soil surveys
- ☐ Testing and direct observations
- ☐ Tools
 - Soil augers
 - Bulk density samples
 - Penetrometers
 - Proctor testing
 - Soil sampling kits
 - pH sampling

Non-traditional analysis tools - Reading the landscape

- ☐ Existing excavations and construction sites
- ☐ Plants as soil indicators
- ☐ Topography
- ☐ Geotechnical soil reports
- ☐ Historic maps, soil surveys and photographs
- ☐ Aerial photography
- ☐ Oral histories

12:00 - 1:00 Lunch

1:00 - 2:30 Session 3 - Field walk and Soil Assessment:

Attendees will walk to several sites where they will be introduced to the use of soil augers and other soil-assessment tools. Field observations will be used to facilitate discussion on the existing soil conditions and characteristics. Participants will get their hands dirty learning different soil conditions that are critical to soil/tree relationships. (Need several sites where we can dig in soil.)

Soil Assessment Field Activities

- ☐ Soil Texture by Feel
- ☐ Soil profiles and soil augers
- ☐ Soil bulk density
- ☐ Soil colour and odour
- ☐ Reading the landscape to make soil determinations
- ☐ Nursery and planting practices
- ☐ Mature trees

2:30 - 2:45 Break

2:45 – 4:30 Session 4 - Practical soil applications:

Once the basic soil data has been gathered, the conditions must be assessed to find appropriate treatments to support the goals of the project. Suggestions to restore or improve soil functions will be discussed for the following situations.

- ☐ Drainage
- ☐ pH

- ☐ Soil biology
- ☐ Soil fertility
- ☐ Clay and fine-grained soils
- ☐ Compaction
- ☐ Planting soils under pavements

4:30 – 5:00 Summary - Up by Roots Designing soils for healthy trees:

As a final wrap-up, attendees will be encouraged to discuss the concepts and methods presented. Any concerns regarding implementation of techniques learned may be issues for debate. Past examples include time limitations, product and equipment availability, cost, and effectiveness of techniques used.

Workshop text: "Up By Roots – Healthy Soils and Trees in the Built Environment"