

Introduction to Urban Site Index

Introduction

A critical step in the successful management of the urban forest is putting the right tree in the right location. The right tree in the right location is as much about tree hardiness as it is about tree size. If an urban forester can match tough tree species to harsh sites and more sensitive tree species to higher quality sites, a community can utilize a wider variety of species in their urban forest and create a more stable, sustainable tree population.

For years urban foresters have known the need for proper site analysis to identify the growing constraints that will dictate which tree species is best suited for the site. Many urban foresters have developed their ability to recognize site limitations and effectively match trees to each site, but this skillset often comes after years of trial and error and is based on anecdotal evidence. Site analysis within the industry is often based on a few poorly defined variables and the gut-feeling of the forester doing the analyses.

Evaluation of tree toughness is somewhat more developed within the industry, but is also often based on anecdotal evidence or nursery research that does not mirror street environments. Species limitations based on site constraints are usually unrelated to the variables used by the urban forester. As a result, species selection becomes little more than a trial and error or “best guess” where mistakes are repeated with each new generation of forester.

Tree survival is critical to the success and credibility of community forestry programs. As a result, two common approaches to tree selection have surfaced. The first is to plant only tough tree species that have proven themselves in the most difficult sites. This approach limits the diversity of the urban forest and increases the susceptibility of the forest to catastrophic loss to pests. The second approach is to plant only the better quality sites. This approach retains species diversity, but limits the number of tree sites in the urban forest thus reducing canopy volume and the ecological, social and economic benefits provided by the urban forest.

Urban Site Index is a systematic approach for evaluating sites with a corresponding species evaluation. The Urban Site Index (USI) pays homage to traditional forestry's site index. Site index is a measurement used in silviculture (forest management) to gauge soil quality and better predict tree future growth. Foresters use site index to decide which species to plant or favor in a forest stand.

History

In August of 2009 Alan Siewert and Stephanie Miller, Urban foresters with the Ohio Division of Forestry, developed the Urban Site Index (USI) process, a rapid assessment tool that utilizes eight observations, four soil and four street, to assess the quality of the planting site on a tree lawn. The USI assessment assigns a number between 0 and 20 for a street or site. An entire community can be surveyed in a relatively short time.

Stephanie and Alan presented the USI process at the Urban Tree Growth Conference at Morton Arboretum, Lisle, IL in September 2011. In 2012 Oleksandre Dramova, a masters candidate at the University of Toronto, Supervisor Dr. Sandy M. Smith, used the USI process as her masters project. Ms. Dramova used the USI and concluded there is a significant relationship between USI scores and tree conditions. Dr. Burnell (Burney) Fischer of Indiana University, Bloomington is using USI protocols to test its use and correlate with their tree growth research data.

Dr. Bryant Scharenbroch, Soil Scientist, The Morton Arboretum began a study with Stephanie and Alan to assess the ability of the eight measurements to quantify the limiting factors to tree growth. In this study Dr. Scharenbroch collected the 8 USI measurements along with additional field measurement soil samples and increment cores to take back for further laboratory analyses.