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Alisha M. Autio and Michael E. Day

Cytokinin Phytohormonal Effects on Crown Structure 1

Abstract. This literature review explores the relevance of cytokinins to tree canopy form, integrating scientific research with current and potential applications to tree care methods. Current and most popular tree care methods call for growers to physically alter the shape of a tree by staking, pruning, and pinching, which can be time-consuming and expensive. Application of phytohormones (also known as plant growth regulators, PGRs) can provide ornamental growers and arborists with alternative methods to manipulate tree crown characteristics. Following a digest of the science of cytokinin activity, the review investigates the current and potential uses of phytohormones as a cost-effective, alternative method of manipulating tree shape. It discusses how the different forms of cytokinin PGRs, acting alone and in concert with other PGRs, can be used, what they can be used for, methods of application, and timing of applications within the phenological cycles of trees. By integrating current basic and applied literature, the review seeks to summarize understanding of cytokinin regulation of crown structure, while exploring potential applications in the tree care industry.

Key Words. Branching; Bud Formation; Crown Alteration; Cytokinin; Plant Growth Hormones; Plant Growth Regulators; Tree Physiology.

Johan Östberg and Johan Sjögren

The Linear Index of Tree Appraisal (LITA) Model for Economic Valuation of Large Urban Trees in Sweden 21

Abstract. Economic valuation of urban trees is important for their management and to ensure that such trees are maintained and protected. However, numerous models for valuing urban trees are currently available, which has led to great variation in the final price. It has also resulted in multiple models being used within the same country, thus confusing the courts. Against this background, researchers examined whether the horizontal cross-sectional area of the tree should be used as the basis for extrapolating tree replacement cost in a linear fashion. Researchers also developed a model, the Linear Index of Tree Appraisal (LITA) model, which uses tree cross-sectional area to extrapolate from a band of known prices to a base price for any desired tree size, which can then be adjusted using an appropriate factor depending on tree vitality/damage.

The LITA model is easy to use and to update, does not have any limitations concerning tree species or sizes, and does not rely on subjective judgments except in assessment of tree damage. It provides a simple method for determining the replacement cost of urban trees and is thus designed to work where 'soft' values are sometimes difficult to justify.

Key Words. Appraisal; Management; Scandinavia; Sweden; Tree Valuation; Urban Trees.

Edward F. Gilman, Maria Paz, and Chris Harchick

Effect of Eight Container Types and Root Pruning During Nursery Production on Root Architecture of *Acer rubrum* 31

Abstract. There is a general understanding that roots deflect when striking solid nursery container walls, and that on trees with good vitality this occurs within weeks of shifting into larger containers. Root architecture is poorly understood when observed in containers with walls constructed of porous plastic and of materials other than plastic. The objective of this study was to measure impacts of container type, root pruning when shifting to a larger container, and cardinal direction on root architecture in nursery containers up to the #45 size (approximately 170 L). Trunk diameter in #45 containers varied less than 5 mm among eight container types and was not impacted by root pruning. More root growth occurred in the northern than southern half of containers. Container type had a small impact on root architecture; in contrast, root pruning by shaving the periphery of the root ball at each shift had a large impact. Shaving when shifting dramatically reduced the percentage of trees graded as culls and suppressed stem-girdling root formation compared to not shaving. Shaving shifted deflected woody root mass from the interior of the root ball to the exterior, making it simple to remove peripheral roots when planting into the landscape.

Key Words. *Acer rubrum*; Circling Roots; Containers; Descending Roots; Porous-Walled Containers; Red Maple; Root Collar; Shaving; Solid-walled Containers; Straight Roots.

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Abstract. With the majority of Canada's population concentrated in cities, it is important to determine what people consider important in urban nature. The concept of values can help illustrate what people consider important in urban nature beyond utilitarian considerations. This is the case for urban forests. However, many studies about public opinion on urban forests do not capture expressions of importance, focus on all the trees of the city, or provide respondents with a direct experience of urban forests. In Canada, most assumptions about Canadian urban forest values are based on results from the United States.

In this study researchers present and analyze urban forest values data gathered with a sidewalk interception survey in the cities of Fredericton, New Brunswick; Halifax, Nova Scotia; and Winnipeg, Manitoba, Canada, to address some of these limitations. Respondents were asked to rate the level of importance of urban forests and mention the reasons. Results show that respondents rate the urban forest at a high level of importance and the reasons for this are aesthetics, air quality, shade, and naturalness, among other themes. There was a tendency for older people, women, and non-students to rate urban forests at a higher level of importance. Weather, related to time of year of survey delivery, has a discernible influence on the way value themes are distributed in the data. The study authors infer that this method helps capture data on respondents' psychological states instead of their intellectual awareness as to what they consider important about urban forests.

Key Words. Canada; Fredericton; Halifax; Public Perception; Street Intercept Surveys; Survey; Urban Forest Attitudes; Urban Forest Values; Winnipeg.

Keith N. Turnquist, Les P. Werner, and Brian L. Sloss
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Abstract. The process of urbanization may alter the ability of microorganisms to supply nutrients to plants. However, both the composition and structure of soil biological communities, and the extent of variation within these communities, is not clear in urban areas. Therefore, baseline information regarding the impact of urban land management practices on soil microbial communities is essential to improving individuals' ability to manage urban soils and the plants they support. This study examined soil microbial communities over five urban land uses with different degrees of urbanization in metropolitan Milwaukee, Wisconsin, U.S. The objectives were to 1) determine if differences exist in bacterial and fungal community composition, biological activity, and the soil physical and chemical environment across five urban land uses, and 2) determine if differences in the bacterial and fungal compositions compare to differences in the soil's physical and chemical characteristics. Bulk density, soil organic matter, pH, magnesium, sodium, total nitrogen, and C:N ratio displayed significant differences between streets and forests. Microbial biomass did not differ between land uses, and the differences in bacterial and fungal community composition reflect only a small portion of the total microbial pool. The decomposition of transposed leaf litter showed significant decline in C:N ratio over time, but no statistical differences between land use were observed. The results display a highly redundant microbial assemblage, and suggest that in locations with adequate levels of soil carbon and where parent material and soil forming processes are homogeneous, urbanization and landscape management have less impact on soil microbiology than expected.

Key Words. PLFA; Soil; Soil Bacteria; Soil Fungi; Soil Microbiology; TRFLP; Urbanization; Wisconsin.