

Significance to the Horticulture Industry

Transplant Establishment

Landscape Establishment for Baldcypress, Red Maple, and Chaste Tree is Delayed for Trees Transplanted from Larger Containers. Lauren M. Garcia Chance, Michael A. Arnold, Leonardo Lombardini, W. Todd Watson, Sean T. Carver, and Andrew R. King. *Journal of Environmental Horticulture* 35(2):43–57.

With a large array of container size stocks available for transplanting to landscapes or nursery fields as liners, it is important to determine times required for successful establishment of differing-sized container stock and the trade-offs associated with initial size and establishment requirements. The objective of the current study was to quantify post-transplant stress levels expressed among trees transplanted from a wide range of container sizes within three differing taxa during landscape establishment and to document the rapidity of establishment (recovery and resumed growth) among trees from the various container sizes within each species. This information will help to better inform the industry regarding relative advantages of different container sizes for nursery growers, landscape contractors and consumers relative to post-transplant establishment in the landscape. Results from this study indicate a more rapid establishment for all three species (chaste tree, red maple, bald cypress) when transplanted from 11.7 (#3) or 23.3 L (#7) containers compared to trees from 97.8 L (#25) or 175.0 L (#45) containers. Industry professionals and consumers must determine if the immediacy of aesthetic impacts in the landscape from installation of larger 97.8 L (#25) or 175.0 L (#45) containers outweigh the advantages of less expensive smaller size trees from 11.7 (#3) or 23.3 L (#7) containers which have more rapid establishment after transplanting.

Microwave Radiations Applicator

Determining the Microwave Radiations Exposure Level Needed for Weed Control Using a Stationary and Running Belt Microwave Radiations Applicator System. Aman Rana and Jeffrey F. Derr. *Journal of Environmental Horticulture* 35(2):58–65.

Microwave radiations are a potential means of nonchemical weed control. Information is needed on the dose required for effective control. A running belt system was developed to more uniformly distribute the microwave energy to all plant tissues, allowing for improved calculations of energy required compared to stationary units, where hot and cold zones probably result from uneven distribution. The running belt system bypassed the lag period during generation of microwave radiations application. Results are thus closer to actual field conditions where a microwave applicator will move continuously over a weed population.

Alternative Organic Amendments

Assessing Alternative Organic Amendments as Horticultural Substrates for Growing Trees in Containers. Miles Schwartz Sax and Bryant C. Scharenbroch. *Journal of Environmental Horticulture* 35(2):66–78.

This paper explores the use of a variety of alternative materials (biochar, biosolids, compost, wood chips and fertilizer) as a supplement to a peat-based greenhouse medium. A comprehensive assessment of these materials was conducted to determine

biochemical properties, water release characteristics and effect of substrate additions on growth of container-grown trees. This research indicates that these alternative materials can successfully be used as a partial substitute for sphagnum peat moss and composted pine bark to grow *Aronia melanocarpa* ‘Viking’ and *Acer saccharum* in containers. Many of the amendments assessed in this paper performed as well and in some cases better than the traditional peat plus pine bark horticultural substrate. The results of this paper are promising, considering the future supply of sphagnum peat moss and composted pine bark are in question, and that the potential environmental degradation associated with the harvest of these materials could be avoided.

Root Hydraulic Conductance

Effects of Tree Production Method and Transplanting on Root Hydraulic Conductance. Jingjing Yin, Richard W. Harper, Nina L. Bassuk. *Journal of Environmental Horticulture* 35(2):79–83.

This research investigated the effect of tree production methods on transplanting, specifically by measuring the specific hydraulic conductance (K_s) of tree roots after transplanting and subsequent shoot growth and leaf area. Choosing the best production method to ensure adequate growth post transplanting would be a significant advantage for landscape managers, especially for more difficult to transplant trees. Our results indicated that although newly-installed container-grown trees had the highest root K_s at transplanting, extra care may be required by stakeholders to maintain post-transplant water availability, possibly due to the interface between container media and the surrounding mineral soil. Meanwhile, considering the relatively lower post-transplant mortality rate and greater shoot growth compared to bare-root trees, BNB trees would be a good option for urban foresters tasked with planting trees that are known to be difficult to transplant.

Decision Support Systems

Decision Support Systems for Plant Disease and Insect Management in Commercial Nurseries in the Midwest: A Perspective Review. Matthew Wallhead and Heping Zhu. *Journal of Environmental Horticulture* 35(2):84–92.

The decision of whether or not and when to apply a pesticide for a given insect pest or plant disease is not always obvious. Decision-support systems are tools that help growers to decide which management options to employ and to make spray decisions. To date, no decision-support systems have been developed to aid in the management of insect pests and plant diseases for commercial nursery production. As the development and implementation of decision-support systems takes considerable time and resources, the authors reviewed and propose four decision-support systems originally developed for orchards that have the capacity to be adapted for use in commercial nursery production. Additionally, the authors propose the development of a consensus forecast model, by combining the information generated from multiple independent models into a single spray-decision recommendation. The model will assist nursery managers, extension agents, consultants, and other agricultural clientele in the management of plant diseases and insect pests to solve problems under complex and uncertain conditions.

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