

## ARBORICULTURAL ABSTRACTS

### SCREENING EUROPEAN ELMs FOR RESISTANCE TO *OPHIOSTOMA NOVO-ULMI*

**Alejandro Solla, Jürgen Bohnens, Eric Collin, Stephanos Diamandis, Albrecht Franke, Luis Gil, Margarita Burón, Alberto Santini, Lorenzo Mittempergher, Jean Pinon, and An Vanden Broeck**  
 Resistance breeding of the native elms against Dutch elm disease, caused by the fungus *Ophiostoma novo-ulmi* Brasier, is a major objective in Europe for the conservation of this tree species. More than 2,500 cuttings of 324 elm clones (*Ulmus minor* Miller, *U. glabra* Huds., *U. laevis* Pall., *U. pumila* L., *U. minor* x *U. glabra*, and *U. minor* x *U. pumila*) from eight European countries, planted in several randomized two-block designed plots, were inoculated with various *O. novo-ulmi* strains. Crown wilting and dieback were recorded during the first year after inoculation. The wilting of the control trees varied among the plots, making the results difficult to compare, but analysis of variance (ANOVA) within each plot showed significant differences in disease severity among the clones tested, allowing study of the variation of the response among elm taxa. Results showed that 19 European inoculated clones recovered from *O. novo-ulmi* attack, giving hope for the reestablishment of native elms in countryside hedges and forests. (Forest Science 2005. 51(2):134–141)

### MODELING XYLEM AND PHLOEM WATER FLOWS IN TREES ACCORDING TO COHESION THEORY AND MÜNCH HYPOTHESIS

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Water and solute flows in the coupled system of xylem and phloem were modeled together with predictions for xylem and whole-stem diameter changes. With the model, we could produce water circulation between xylem and phloem as presented by the Münch hypothesis. Viscosity was modeled as an explicit function of solute concentration, and this was found to vary the resistance of the phloem sap flow by many orders of magnitude in the possible physiological range of sap concentrations. Also, the sensitivity of the predicted phloem translocation to changes in the boundary conditions and parameters such as sugar loading, transpiration, and hydraulic conductivity were studied. The system was found to be quite sensitive to the sugar-loading rate, as too high sugar concentration (approximately 7 MPa) would cause phloem translocation to be irreversibly hindered and soon totally blocked

due to accumulation of sugar at the top of the phloem and the consequent rise in the viscosity of the phloem sap. A too-low sugar-loading rate, on the other hand, would not induce a sufficient axial water pressure gradient. The model also revealed the existence of Münch “counter flow,” i.e., xylem water flow in the absence of transpiration resulting from water circulation between the xylem and phloem. Modeled diameter changes of the stem were found to be compatible with actual stem diameter measurements from earlier studies. The diurnal diameter variation of the whole stem was approximately 0.1 mm, of which the xylem constituted approximately one-third. (Trees—Structure and Function 2006. 20(1):67–78)

### STRATEGY USE AND CHALLENGES OF ECOLOGICAL DESIGN IN LANDSCAPE ARCHITECTURE

**Meg Calkins**

Despite growing interest, rhetoric, and research on ecological design in landscape architecture, practitioners in the United States are not implementing as many ecological design strategies as might be expected. To better understand this phenomenon, the Green Building Practice Survey (GBPS) was carried out among landscape architects practicing varying degrees of ecological design to determine (1) the frequency of use of common ecological design landscape strategies; (2) the obstacles and challenges that contribute to non-use; (3) significant characteristics of the firms; and (4) methods of project delivery. Phase I of the Green Building Practice Study, an on-line survey undertaken in association with the American Society of Landscape Architects, measured ecological design strategy use, identified unique characteristics of U.S. ecological design practice in landscape architecture, and quantitatively revealed many challenges and constraints that practitioners face as they try to implement strategies. Phase II of the study, discussed in a separate publication, targeted a representative sample of 44 respondents with standard-questionnaire phone interviews to elucidate methods and techniques of ecological design practice. The study revealed high-frequency use of native plants, local materials, and site protection strategies; while use of green roofs, on-site wastewater treatment, and material life-cycle analysis was quite low among the respondents. Commonly cited challenges were issues of cost; lack of information, testing and data on performance of strategies; time available for research; and resistance by project stakeholders, other consultants, and code officials. The results of this study highlight a strong

need for research demonstrating the economic and performance advantages of ecological design; strengthened information dissemination forums for practitioners; and marketing and education efforts directed to all project stakeholders. The paper presents the survey results, relates them to similar studies in allied fields, discusses strategy use and challenges within the framework of Classical Diffusion Theory, and identifies opportunities and forums where the challenges might be addressed. (*Landscape and Urban Planning* 2005. 73(1):29–48)

**MANAGEMENT OF COTTONWOOD LEAF BEETLE (COLEOPTERA: CHRYSOMELIDAE) WITH A NOVEL TRANSPLANT SOAK AND BIORATIONAL INSECTICIDES TO CONSERVE COCCINELLID BEETLES**  
**Emily G. Tenczar and Vera A. Krischik**

Biorational foliar sprays and a novel application method of soaking transplants in imidacloprid were evaluated for control of adult and larval cottonwood leaf beetle (*Chrysomela scripta* F.) on hybrid poplar, with emphasis on conservation of coccinellid predators. Foliar sprays of four biorational insecticides killed adult and larval *C. scripta*: *Bacillus thuringiensis* (Bt) var. *tenebrionis* (Novodor), Bt var. *kurstaki* (Raven), spinosad (Conserve SC), and azadirachtin (Azatin XL) (larvae only) but did not kill two species of coccinellids, *Hippodamia convergens* Guérin-Meneville and *Harmonia axyridis* (Pallas). Only imidacloprid (Admire 2) and carbaryl (Sevin XLR Plus) killed two species of coccinellids and adult and larval *C. scripta*. We evaluated a novel stick soak method for systemically applying imidacloprid by soaking poplar sticks in Admire 2 solutions of 3 and 6 mL/L for 48 h before planting. The imidacloprid in the sticks was translocated to the leaves and reduced survivorship of adult and larval *C. scripta* for 10 mo without any symptoms of phytotoxicity. The novel stick soak method did not kill two species of coccinellids when foraging on leaves. (*Journal of Economic Entomology* 2006. 99(1):102–108)

**LEARNING PREFERENCES, JOB SATISFACTION, COMMUNITY INTERACTIONS, AND URBAN FORESTRY PRACTICES OF NEW ENGLAND (USA) TREE WARDENS**  
**Robert M. Ricard and David V. Bloniarz**

The first state-legislated and mandated municipal urban forestry officials in the United States were tree wardens. Massachusetts state law enabled municipalities to appoint tree wardens first in 1896 and mandated their appointment beginning in 1899; five other states passed similar legislation shortly thereafter. These municipal officials have jurisdiction over most, and sometimes all, public trees in the municipality they serve. This study used a structured mail survey to explore ways tree wardens acquire professional information, what modes of learning they prefer, how they interact with their communities, and what urban forestry tasks they do. Results suggest that New England tree wardens acquire in-

formation in several ways, including the Internet, yet prefer traditional outreach education tools such as workshops and conferences, especially those that involve more than one speaker, informational handouts, and both indoor and outdoor lectures and exercises. Tree wardens highly value interacting with other tree wardens and depend on peers and colleagues for information and assistance in decision making. They also value other organizations, such as the Cooperative Extension system, state forestry agencies, and state tree warden associations, for information. Results further suggest that public safety is their primary motivation and that they spend most of their time on associated tasks such as risk tree assessment and removal. They recognize the value of tree replacement and certain urban forestry planning practices such as tree risk assessment and inventories. Tree wardens place less importance on municipal shade tree ordinances and shade tree or urban forest committees or commissions. It is recommended that people and organizations responsible for tree warden education conduct activities that bring tree wardens together frequently and combine social and educational activities and emphasize traditional outreach education delivery systems. (*Urban Forestry and Urban Greening* 2006. 5:1–15)

**RESIDENTS AND URBAN GREEN SPACES: THE CASE OF BARI**

**Giovanni Sanesia and Francesco Chiarello**

The total area of public green spaces in the city of Bari, Italy, is more limited than in most other Italian cities (2.9 m<sup>2</sup>/inhabitant). This fact makes it an interesting subject for research into the general perception that the residents of the city have of green spaces and their behavior patterns when using them. A questionnaire (27 questions) was presented by telephone to a representative sample ( $n = 351$ ) of the population of Bari. The aims of the study were (1) to gain insight in the perception of green spaces with particular reference to those green areas within the city itself; (2) to examine behavior during visits to parks and gardens and means of transport used to reach them; and (3) to investigate what kind of relationship should be set up between the local authority and the population regarding information and participation. The results show that respondents perceive the green areas as a life quality enhancer in accordance with some previous studies carried out in Italy and in other countries. Citizens are moreover conscious of the limitations in quality and quantity of green areas in their own city, although this result needs to be more closely analyzed in the future. Patterns in the use of public green areas proved to be strictly connected with age, sex, marital status, and area of residence. Another conditioning factor was the system of mobility. The results underline how citizens see the public and private green areas as single beneficial system. The research also demonstrates the potentials of applying telephone surveys in studies concerning urban forests. (*Urban Forestry and Urban Greening* 2006. 4:125–134)