# Volume 31, Issue 5, September 2005

Formerly the Journal of Arboriculture, 1975 – 2005 (Volumes 1 – 31)

## **CONTENTS**



Ivan André Alvarez, Giuliana Del Nero Velasco, Henrique Sundfeld Barbin,

Ana Maria Liner Pereira Lima, and Hilton Thadeu Zarate do Couto

#### COMPARISON OF TWO SAMPLING METHODS FOR ESTIMATING URBAN TREE DENSITY......209

Abstract. Sampling can be used as a method for urban tree inventory estimation. There are several sampling methods available, and choices for urban tree inventory methods vary according to the place to be studied and the urban tree conditions. This study compared the results of simple and stratified random sampling methods with those of a total district tree census. The simple random sampling error was 17%, and the coefficient of variation was 47%. The stratified random sampling errors varied from 19% to 60%, and their coefficients of variation ranged from 32% to 70%, depending on the stratum. The Shannon diversity index (SDI ) was low in the census (3.07), as in the simple random sampling (1.27). The total number of trees and the number of trees per kilometer of sidewalk calculated by the simple random sampling were similar to those obtained by the census. Because the sampling error obtained by strat fied random sampling was higher than for that obtained by simple random sampling, the use of stratified random sampling was not advantageous when compared with simple random sampling. Furthermore, the stratified random sampling procedure was more complex.

Key Words. Inventory; Sampling; Urban Trees.

Glynn C. Percival

### THE USE OF CHLOROPHYLL FLUORESCENCE TO **IDENTIFY CHEMICAL AND ENVIRONMENTAL STRESS** IN LEAFTISSUE OF THREE OAK (QUERCUS) SPECIES......215

Abstract. During their lifetime, urban trees are susceptible to a range of environmental and chemical stresses that can result in tree decline. Chlorophyll fluorescence has been used as a nondestructive and noninvasive means of quantifying damage to the leaf photosynthetic system of deciduous and evergreen trees. Aims of this investigation were to determine whether there were unique chlorophyll fluorescence profiles for di ferent chemical (salt, herbicide) and environmental (heat) stresses in leaf tissue of three oak (Quercus) species. Results demonstrate that alter tions in the OJIP curve as a measure of electron transport within the leaf plastoquinone pool of photosystem II could be used to identify tree decline due to herbicide and heat but not to salt damage. The benefits of this system to make rapid, stress-specific diagnosis in the field for profe sionals involved in urban tree management are discussed.

Key Words. English Oak; Evergreen Oak; Heat; Herbicide; Leaf Tissue Damage; Red Oak; Salinity; Stress Detection; Quercus ilex; Quercus robur; Quercus rubra.

Hallie Dozier and Krisanna Machtmes

**ARBORISTS IN LOUISIANA, U.S.:** 

#### A BASELINE ASSESSMENT OF SAFETY AND PROFESSIONALISM ......228

Abstract. In the mostly self-regulated arboricultural industry, Louisiana, U.S., is one of a few places where arborists must possess a license to operate. Since 1993, state-licensed arborists in Louisiana have been required to attend at least one continuing education workshop each year to maintain their licenses. In 2002, the State of Louisiana assumed responsibility for providing arborist continuing education, and program planners identified increasing safety and professionalism among licensed arborists as the two primary goals for the training program. The authors collected written questionnaires from 386 licensed arborists who provided baseline data on their levels of safety and professionalism and demographic information. Analysis suggested that safety and professionalism are not separate variables among respondents, but examination of categories of questions describing different aspects of safety and professionalism is revealing. Arborists self-reported good ethical practices in dealing with customers and a perception of being safe on the job, but they did not appear to be wholly familiar with current industry standards for safety and tree care. Respondents were less inclined to engage in recommended safety practices or to promote modern cultural practices to their clients. Unfamiliarity with current industry standards may be due to low participation in pr fessional arboricultural societies among Louisiana licensed arborists and a tendency to attend the only the minimally required number of state-mandated educational events each year.

Key Words. Arboriculture; Arborist; ISA; Louisiana; Professional Development; Professional Education; Professional Membership; Professional sional Training; Program Assessment; Safety Education; Safety Training; Survey; TCIA.

#### Karel A. Jacobs

#### THE POTENTIAL OF MULCH TO TRANSMIT THREE TREE PATHOGENS......235

Abstract. Field transmission of Sphaeropsis tip blight, Botryosphaeria canker, and Armillaria root rot was evaluated in a 6-year study of 30 sa lings each of Austrian pine (Pinus nigra), eastern redbud (Cercis canadensis), and red oak (Quercus rubra) mulched with diseased needles, bark chips, and wood chips collected from mature trees. Half of the saplings were mulched with fresh mulch materials; half with materials first heated to 60°C (140°F). Sphaeropsis tip blight was the only disease that developed during the study, and pines mulched with heattreated materials developed significantly fewer ( $P \le 0.001$ ) blighted tips than those mulched with fresh materials (6.8% versus 15.1%). Naturally occurring inoc lum of S. sapinea and B. ribis were highly tolerant of heat in laboratory tests and remained viable after 6 weeks and 48 h exposure, respectively, to 55°C (131°F). Armillaria gallica mycelium and rhizomorphs did not withstand temperatures above 35°C (95°F) and 37°C (98.6°F), respectively. The heated mulch treatment was associated with a significant ( $P \le 0.001$ ) growth boost in redbuds and oaks during the first two growing seasons. Redbuds averaged two times more height and diameter increment than plants mulched with fresh bark and wood chips. Heating diseased mulch to 60°C (140°F) diminished the threat of tip blight transmission and likely killed all forms of the pathogens. Key Words. Armillaria gallica; Botryosphaeria ribis; Cercis canadensis; Composting; Disease Transmission; Fungi; Heat Inactivation; Pasteuriza-

tion; Pinus nigra; Quercus rubra; Sphaeropsis sapinea.

### Christopher J. Fettig, Jeffrey G. Fidgen, and Scott M. Salom WHAT DO PEOPLE WANT FROM THEIR COMMUNITY FORESTS? RESULTS OF A PUBLIC ATTITUDE SURVEY IN MISSOURI, U.S. ......243

Abstract. A self-administered survey of randomly selected recipients in 44 Missouri, U.S., communities found that most Missourians were very concerned about the quality of natural resources and having trees on streets and in parks. Respondents felt that Missouri was not doing well at making sure fewer trees are lost during development and at managing stormwater runoff. Residents in communities with a population of 50,000 or more, in the St. Louis and Kansas City suburbs, and in the cities of St. Louis and Kansas City show strong support for a ballot issue establishing a tree fund supported by a tax of US\$5 or less. Missourians in communities with a population greater than 5,000 showed support for protecting or replacing trees during development through passage of a tree preservation ordinance. They lack basic knowledge of their community's tree program and could not correctly say whether their community was certified by The National Arbor Day Foundation as a Tree City USA. They are most likely to seek information on trees from their local garden center. The results of the survey, together with recent surveys of community forestry officials and street tree inventories, are used to make recommendations to state agencies charged with managing community forests. Key Words. Missouri, U.S.; Public Attitude; Survey Research; Tree Program; Urban and Community Forestry.

# Jack Eric Vandenbroucke, Catherine Gaucher, and Norbert Major

## **BIOLOGICAL VEGETATION MANAGEMENT:**

#### AN ALTERNATIVE TO CHEMICAL PESTICIDES ......251

Abstract. We present data collected at 3 and 6 years on a rightsof- way project with Myco-Tech™ paste. This paste is based on a naturally occu ring fungus (Chondrostereum purpureum (Pers. ex Fr.) Pouzar) in temperate climates that initiates wood decay. The project was done in Ste Agathe, Québec, Canada, in 1998. After 6 years in the treated area, sprouting was sparse (density = 22,500 stems/ha [9,000 stems/ac]), and mean height was approximately 2.6 m (8.6 ft). In the control area, sprouting was uniform (density > 132,500 stems/ha [53,000 stems/ac]) and mean height was approximately 6 m (20 ft). According to Hydro-Québec's clearance standard at that site, the control area should have been cut last year. In the treated area, clearing is not needed for at least 3 to 4 years. Key Words. Biological Vegetation Management; Chondrostereum purpureum; Competitive Deciduous Species; Contour Maps; Herbicide, Inte-

grated Vegetation Management; Mechanical Cutting; Myco-Tech<sup>TM</sup>; Pesticide; Resprouting; Rights-of-Way; Stump Treatment.

#### Jerald S. Bricker and Jean C. Stutz

### HOST RANGE AND DISTRIBUTION OF THE PHYTOPLASMA CAUSING ARIZONA ASH DECLINE ......257

Abstract. Ash decline (AD), caused by a phytoplasma, is a progressive dieback disease previously reported in Fraxinus velutina. The host range and distribution of AD is discussed based on samples collected from ash trees sampled from across the state of Arizona, U.S., inclu ing both wild-type F. velutina in riparian areas and F. velutina cv. Modesto, F. velutina cv. Rio Grande, and F. uhdei in landscaped areas. The results of the statewide survey indicate that AD is found in native and cultivated ash trees, with F. velutina cv. Modesto exhibiting the hig est (100%) level of disease in the Phoenix metropolitan area. Wild-type F. velutina and F. velutina cv. Rio Grande also exhibited AD symptoms but with lower frequency and severity. Fraxinus uhdei did not exhibit symptoms of AD. Phytoplasma infection was detected in all tree types of F. velutina trees using DAPI staining and polymerase chain reaction (PCR) but was not detected in F. uhdei. Higher frequency of phytoplasma infection was detected in tree canopies versus roots in contrast to previous results reported in white ash. PCR was found to be more efficient at detecting the low-titer infection levels typical of F. velutina in comparison to DAPI staining. Key Words. Ash Yellows; Fraxinus; Fraxinus velutina; Fraxinus uhdei; Host Specificity; Shamal Ash; Velvet Ash.