

## ARBORICULTURAL ABSTRACTS

### ANALYZING THE SPREAD OF BEECH CANKER

Nicole H. Augustin, Edgar Kublin, Berthold Metzler, Elsa Meierjohann, and Georg von Wühlisch

We investigate the spread of Nectria canker of beech, which is a fungal chronic disease caused by *Nectria ditissima* Tul. et C. Tul. Data are available from a beech provenance trial. A possible influential factor on the proportion of infected trees per plot is the wind dispersal zone(s) (wdz), a categorical variable describing the distance and wind direction from diseased shelterwood, the source of infection. We investigate the effect of wdz and whether the disease incidence in the regeneration can be explained alone by the wdz using different approaches accounting for spatial correlation in the data. One method uses generalized estimating equations (GEE) where, through specification of a general variance–covariance matrix allowing for nonindependence, spatial correlation can be accounted for in the model. The second method uses generalized additive models (GAM) and the spatial autocorrelation is dealt with by modeling it as a spatial trend. The third method uses generalized linear mixed models (GLMM) with a random effect accounting for spatial correlation and heterogeneity. We show that, in the beech data, some spatial correlation is present that is over and above that accounted for by the wdz. Therefore, methods not accounting for this correlation are inappropriate. The GLMM is the most appropriate model because it manages to model the biological process best: It explains the variation in disease incidence by the wdz and by secondary infection. Hence it yields the most precise estimates. (*Forest Science* 2005. 51(5):438–448)

### FIELD EVALUATIONS OF SYSTEMIC INSECTICIDES FOR CONTROL OF *ANOPLOPHORA GLABRIPENNIS* (COLEOPTERA: CERAMBYCIDAE) IN CHINA

Therese M. Poland, Robert A. Haack, Toby R. Petrice, Deborah L. Miller, Leah S. Bauer, and Ruitong Gao

*Anoplophora glabripennis* (Motschulsky) (Coleoptera: Cerambycidae), a pest native to China and Korea, was discovered in North America in 1996. Currently, the only reliable strategy available for eradication and control is to cut and chip all infested trees. We evaluated various doses of the systemic insecticides azadirachtin, emamectin benzoate, imidacloprid, and thiacloprid for control of *A. glabripennis* in naturally infested elms (*Ulmus* spp.), poplars (*Populus* spp.), and willows (*Salix* spp.) in China between 2000 and 2002. Significantly more dead *A. glabripennis* adults were found beneath elm and poplar trees treated with imidacloprid (in 2000 and 2001) or thiacloprid (in 2001) and beneath willow trees in-

jected with imidacloprid or thiacloprid (in 2002) compared with control trees. In 2000, 4 months after injection, the density of live *A. glabripennis* was significantly reduced in poplar trees treated with imidacloprid (90%) and in willow trees treated with imidacloprid (83%) or emamectin benzoate (71%) compared with controls. In 2001, 9 months after injection, the density of live *A. glabripennis* was significantly reduced in poplar (76%) and willow (45%) trees treated with imidacloprid compared with control trees. Similarly, percentage mortality of all life stages of *A. glabripennis* feeding within trees was significantly higher on poplar trees 4 months after injection with imidacloprid (64%) in 2000 and on elms (55%) and poplars (63%) 9 months after injection with imidacloprid in 2001 compared with control trees. Imidacloprid residue levels in leaves and twigs collected at various times from 1 day to 9 months after injection ranged from 0.27 to 0.46 ppm. Injecting *A. glabripennis*-infested trees with imidacloprid can result in significant mortality of adults during maturation feeding on leaves and twigs and of all life stages feeding within infested trees. Imidacloprid is translocated rapidly in infested trees and is persistent at lethal levels for several months. Although, injection with imidacloprid does not provide complete control of *A. glabripennis*, systemic insecticides may prove useful as part of an integrated eradication or management program. (*Journal of Economic Entomology* 2006. 99(2):383–392)

### ROLE OF URBAN GREENWAY SYSTEMS IN PLANNING RESIDENTIAL COMMUNITIES: A CASE STUDY FROM EGYPT

Khalid Zakaria El Adli Imam

Greenways have long played a significant role in the development of urban and sub-urban areas. They help mitigate the loss of “natural” space, often have scenic qualities, provide for recreation, education, a sense of well-being, and preservation of the natural habitat. This article explores the concept, history and development of urban greenways. The article illustrates the concept of linked parks and urban greenways in structuring urban and sub-urban developments while suggesting a methodological blueprint for their implementation in the planning process. A case study of a suburban development west of the city of Cairo, Egypt is presented to demonstrate the role of urban greenway systems in planning residential communities. An in-depth investigation of the planning process, context, approach, and development concept is followed by an overview of the rationale and significance of the method. The objective of this article is thus twofold. First, to

illustrate the concept of urban greenway systems in structuring communities; and second, to suggest a model for the integration and proper application of the concept of linked parks and urban greenway systems in planning residential communities. In conclusion, the article identifies a step-by-step procedure for integrating natural, recreational and cultural greenways and corridors in planning future residential developments. (*Landscape and Urban Planning* 2006. 76(1-4):192-209)

### **PUBLIC GREEN SPACE AND DISABLED USERS**

**Klaus Seeland and Simone Nicole**

Social statistics indicate that the proportion of disabled people in the economically developed societies of the Western world is increasing. Thus more and more people are relying on special assistance and services. Environmental pollution and individual stress pose significant burdens to the majority of the constantly increasing urban population, especially the disabled, because they are dependent on suitable environments to serve their needs. These problems need to be remedied through planning and management. An empirical survey of the Isle of Mainau, located on Lake Constance in Southern Germany, shows that people with officially recognized disabilities feel stigmatized by green space that is specially designed for visitors with handicaps. People with lighter handicaps would like to have more attention and services rendered to them. 'Standard users', particularly those of higher income with better education, are reluctant to concede the entire island park's design and infrastructure to accommodate the needs of disabled visitors. (*Urban Forestry and Urban Greening* 2006. 5:29-34)

### **INSTITUTIONALIZING URBAN FORESTRY AS A "BIOTECHNOLOGY" TO IMPROVE ENVIRONMENTAL QUALITY**

**David J. Nowak**

Urban forests can provide multiple environmental benefits. As urban areas expand, the role of urban vegetation in im-

proving environmental quality will increase in importance. Quantification of these benefits has revealed that urban forests can significantly improve air quality. As a result, national air quality regulations are now willing to potentially credit tree planting as means to improve air quality. Similarly, quantification of other environmental benefits of urban trees (e.g., water quality improvement, carbon sequestration) could provide for urban vegetation to be incorporated in other programs/regulations designed to improve environmental quality. (*Urban Forestry and Urban Greening* 2006. 5:93-100)

### **IMPROVING DISEASE RESISTANCE OF BUTTERNUT (*JUGLANS CINEREA*), A THREATENED FINE HARDWOOD: A CASE FOR SINGLE-TREE SELECTION THROUGH GENETIC IMPROVEMENT AND DEPLOYMENT**

**Charles H. Michler, Paula M. Pijut, Douglass F. Jacobs, Richard Meilan, Keith E. Woeste, and Michael E. Ostry**

Approaches for the development of disease-resistant butternut (*Juglans cinerea* L.) are reviewed. Butternut is a threatened fine hardwood throughout its natural range in eastern North America because of the invasion of the exotic fungus, *Sirococcus clavigignenti-juglandacearum* Nair, Kostichka and Kuntz, which causes butternut canker. Early efforts were made to identify and collect putatively resistant germ plasm, identify vectors and to characterize the disease. More recently, molecular techniques have been employed to genetically characterize both the pathogen and the resistant germ plasm. Much of the host resistance may originate from hybridization with a close Asian relative, Japanese walnut (*Juglans ailanthifolia* Carr.), and from a few natural phenotypic variants. Further genetic characterization is needed before classical breeding or genetic modification can be used to produce canker-resistant trees. (*Tree Physiology* 2005. 26: 121-128)