

## ARBORICULTURAL ABSTRACTS

### **MULTIPLE BENEFITS OF LARGE UNDEVELOPED TRACTS IN URBANIZED LANDSCAPES: A NORTH CAROLINA EXAMPLE**

**G.B. Blank, D.S. Parker, and S.M. Bode**

In North Carolina's Research Triangle region, development pressure threatens open space. Expanding municipalities and suburban sprawl have isolated public lands as private landowners subdivide or sell to developers. Large holdings owned by a private corporation and amassed to buffer a nuclear power plant facility and its reservoir remain intact. These holdings provide unexpected public benefits and foster conservation of a rare plant community type revealed through interdisciplinary research. The landowner's support for research and restoration underscore the important role private corporations can plan in achieving community conservation plans. (*J. For.* 2002. April/May:27-33)

### **SEASONAL PATTERNS OF DISPERSAL OF ASCOSPORES OF *CRYPHONECTRIA PARASITICA* (CHESTNUT BLIGHT)**

**L. Guerin, G. Froidefond, and A.M. Xu**

Infected barks of chestnut blight cankers, caused by *Cryphonectria parasitica*, were collected from a naturally infected orchard and incubated at different temperatures. Cankers started to discharge ascospores about a week after incubation at 15°C to 25°C; most ascospores were collected at 20°C and 25°C. When incubated at 5°C, 10°C, or 30°C, only a few cankers released a small number of ascospores and only during later stages of incubation. However, the rate of formation of perithecia was not affected by the incubation period. The number of airborne ascospores was monitored using a volumetric spore trap in a chestnut orchard during 1996 and 1997. In both years, the number of ascospores trapped daily varied greatly, but in general it increased sharply from March onwards, reached a peak in May, and then declined steeply. There was a significant correlation between daily counts of ascospores and air temperature. Time-series transfer function (TF) analysis showed a positive association of the daily number of ascospores with increasing temperature, rain events, and wet/humid conditions. In general, values predicted by the TF model agreed well with the observed pattern. However, a multiple regression equation based on TF analysis failed to provide a satisfactory prediction of the daily number of ascospores. (*Plant Pathol.* 2001. 50:717-724)

### **THE PHYSIOLOGICAL RECOVERY PATTERNS OF SOME TRANSPLANTED TREES**

**E. Philip, M. Marzalina, and P.N. Avadhani**

A study was undertaken to record the recovery patterns of six transplanted forest trees. Results obtained indicated that these species were able to recover from the transplanting shock. Photosynthesis and stomatal conductance values showed an increase after 10 months of being transplanted. Fluorescence measurements made further substantiated that the root systems were functioning as normally. (*Arboric. J.* 2002. 26:91-97)

### **NITROGEN FORMS IN BARK, WOOD, AND FOLIAGE OF NITROGEN-FERTILIZED *PINUS SYLVESTRIS***

**A. Nordin, C. Ugglä, and T. Näsholm**

Cycling of soluble nonprotein compounds is thought to be indicative of the N-nutritional status of trees. We determined the major forms in bark, wood, and foliage and estimated the dependence of prevalent N forms on N availability in *Pinus sylvestris* trees from northern Sweden. Trees subjected to severe N limitation and trees that had been fertilized with an average of 64 kg N ha<sup>-1</sup> year<sup>-1</sup> for 25 years were analyzed. Bark and wood samples were collected by tangentially cryo-sectioning of the trunk into 30-µm thick sections, from the bark to the functional xylem. Soluble amino compounds were extracted from the sections for analysis. Sap samples from twigs were obtained by centrifugation, and bark samples from twigs were obtained by tissue extraction. In both needles and bark, arginine dominated the amino-N pool. Because arginine concentrations in needles increased with N fertilization, arginine dominance of the amino-N pool in needles was higher in N-fertilized trees than in control trees. In bark, N-fertilization resulted in a large increase in glutamine concentration, so that glutamine accounted for a larger proportion of the amino-N pool in bark in N-fertilized trees than in control trees. Glutamine dominated the amino-N pool in wood of control trees. Nitrogen fertilization resulted in an increased proportion of arginine in the wood amino-N pool. We conclude that the composition of the amino-N pools in bark, wood, and foliage is highly sensitive to N supply. The composition of the amino-N pools can contribute to the regulation of tree N-nutritional status, which is mediated by shoot to root signaling by long-distance transport of amino compounds. (*Tree Phys.* 2001. 21:59-64)

## **VISUAL ASPECTS IN URBAN WOODLAND MANAGEMENT**

**A.K. Ode and G.L.A. Fry**

This paper presents a study of woodland management guidelines analyzed for their inclusion of visual aspects. The aim of the study was to identify approaches toward the management in urban woodland. For the study, 24 management guidelines from Sweden and the United Kingdom were reviewed for scale, degree of operational detail, the visual concepts used, and their emphasis and justification. The review revealed that there exists a diversity of approaches toward managing visual aspects regarding the selection and emphasis of visual concepts as well as the scale at which they are applied and degree of operability. Some general differences between Sweden and United Kingdom were identified. These differences in treatment of visual aspects were mainly related to the use of different scale levels, different levels of abstraction and the basis for justifying the importance of visual qualities in management. These differences are discussed in relation to the wider management context, including landowner structure, landscape history, and forestry traditions. We conclude that studying urban woodland management in

another context (e.g., geographical and historical) can provide new insights for visual management. We also believe that transferring management strategies across cultures will result in them being altered at the policy and operational levels by the change of context. We further suggest that the use of visual concept could provide one approach for better integration of visual qualities in urban woodland management. (*Urban For. Urban Green* 2002. 1:15–24)

## **A NEW FAILURE CRITERION FOR NONDECAYED SOLITARY TREES**

**C. Mattheck, K. Bethge, I. Tesari, and R. Kappel**

Trees strive for a homogeneous load distribution on their surface and restore this state by load adaptive growth. If, however, trees grow up in a dense stand, they compete for light and grow phototropic more into height than thickness. Thereby, the axiom of uniform stress can no longer be realized for energetic reasons. On the basis of a height/diameter (H/D) ratio, a new failure criterion is presented that relates a higher mechanical safety and a better biological supply with water and assimilates to trees with a lower H/D ratio. (*Arboric. J.* 2002. 26:91–97)