

## ARBORICULTURAL ABSTRACTS

### GENETIC EVIDENCE FOR NATURAL HYBRIDIZATION BETWEEN THE DUTCH ELM DISEASE PATHOGENS *OPHIOSTOMA NOVO-ULMI* SSP. *NOVO-ULMI*, AND *O. NOVO-ULMI* SSP. *AMERICANA*

**H. Konrad, T. Kristis, M. Riegler, E. Halmschlager, and C. Stauffer**

The Dutch elm disease pathogen *Ophiostoma novo-ulmi* is separated into subspecies *novo-ulmi*, formerly known as the Eurasian (EAN) race, and subspecies *americana*, formerly known as the North American (NAN) race. Both subspecies occur in Europe, and hybrids between them are suspected to have merged in parts of Europe where their ranges overlap. Authenticated isolates of both subspecies were examined in order to determine whether fixed mutations occur in the cerato-ulmin (cu) and in the colony type gene (col1). One and six mutations were detected between subspp. *novo-ulmi* and *americana* in cu and col1, respectively. The mutation in cu and one mutation in col1 proved to be located within restriction sites and were used for PCR-RFLP. This method provides a quick and reliable diagnostic method to differentiate the two subspecies. Seven isolates of *O. novo-ulmi* from Austria were suspected to be hybrids between subspp. *novo-ulmi* and *americana* and were tested by PCR-RFLP of their cu and col1 genes. Two of the suspected hybrids from Austria (isolates AT73 and AT146) had the cu PCR-RFLP of spp. *americana* and the col1 PCR-RFLP profile of spp. *novo-ulmi*. Furthermore, a spp. *novo-ulmi* tester isolate from Poland (P150) showed a similar hybrid pattern. This is the first evidence revealing recombination between two genes and this hybridization between two subspecies of *O. novo-ulmi* in nature. (Plant Pathol. 2002. 51:78–84)

### MODELS OF CROWN ARCHITECTURE IN *QUERCUS PETRAEA* AND *Q. ROBUR*: SHOOT LENGTHS AND BUD NUMBERS

**G.H. Buck-Sorlin and A.D. Bell**

The shape of shoot-length frequency distributions in oak can be described for each branching order using a limited number of mathematical models. In general, shoot lengths decreased with increasing branching order. The shape of these frequency curves is very similar among different species. The number of subapical buds showed very little variation, whereas that of median buds was normally distributed. The possibilities for using frequency distributions of shoot lengths and bud numbers for structural models are discussed. (Forestry 2000. 73(1))

### DEVELOPMENT AND PROGNOSIS OF DECAY IN THE SAPWOOD OF LIVING TREES

**F.W.M.R. Schwarz**

Fungal growth within reaction zones of London plane (*Platanus × hispanica*), beech (*Fagus sylvatica*), and large-leaved lime (*Tilia platyphyllos*) infected with three basidiomycetes (*Inonotus hispidus*, *Ganoderma adspersum*, *Fomitopsis pinicola*) and one ascomycete (*Ustulina deusta*) was studied in naturally colonized and artificially inoculated wood. With the exception of *F. pinicola*, the decay fungi successfully defeated the reaction zones. The mechanisms, however, of reaction zone penetration by these species were all somewhat different in nature. *Inonotus hispidus* defeated reaction zones via soft rot, bypassing blocked cell lumina without causing substantial decomposition of cell walls and polyphenols. Invasion of reaction zones by *Ganoderma adspersum* was characterized by the preferential degradation of polyphenols. In contrast, *Ustulina deusta* failed to defeat reaction zones in beech but readily penetrated reaction zones in large-leaved lime. Failure of *Fomitopsis pinicola* to invade and defeat reaction zones in beech is apparently related to the limited enzymatic ability and inflexible behavior of brown rot fungi. Mechanisms of lesion expansion are illustrated and summarized in schematic diagrams. They support former observations that decay fungi may successfully defeat reaction zones. (Arbor. J. 2001. 25:321–337)

### MEASURING INTEGRATED PEST MANAGEMENT PROGRAMS FOR PUBLIC BUILDINGS

**A. Greene and N.L. Breicsh**

Integrated pest management (IPM) tends to be perceived by different stakeholder groups either as a methodology for effective pest control or as an ideology of responsible environmental stewardship. The IPM process has never been subjected to a rigorous empirical test as a control methodology in buildings; published studies have either tested isolated program components or have presented uncontrolled, sequential descriptions of IPM replacing traditional pest control procedures. Because ideological measurement is simpler, cheaper, and more relevant than methodological testing to evaluate structural IPM in the public sector, data on pesticide use/risk and customer satisfaction, rather than control efficacy, are used by the General Services Administration (GSA) IPM program to demonstrate success compatible with Government Performance and Results Act (GPRA) guidelines. Implementation of IPM in 1989 resulted in significant decreases both in quanti-

ties of pesticide applied indoors and requests for pest control service by building occupants throughout the first decade of the program. Although these results do not provide an empirical test of structural methodological superiority as a means of reducing pest populations, they indicate that replacing sprayed insecticide formulations with baits and using client reporting as the primary pest surveillance method can successfully achieve the policy goals of a large-scale IPM program for public buildings. (J. Econ. Entomol. 2002. 95(1):1–13)

### **GROWTH STRESS DISTRIBUTION IN LEANING TRUNKS OF *CRYPTOMERIA JAPONICA***

**Y.S. Huang, S.S. Chen, T.P. Lin and Y.S. Chen**

The distribution of growth stresses in leaning trunks of *Cryptomeria japonica* was determined by measuring the stresses released by the kerf method with strain gauges glued at specific positions along the trunks. Effects of both tree height and peripheral positions on the surface of leaning trunks on surface growth stress were determined. The inner residual growth strains in leaning trunks were also measured. We found high compression stresses in the lower side of leaning trunks that differed greatly from the tensile stresses in normal erect trunks. However, transverse compression stress was found around the tree trunk in both normal and compression wood. In leaning trees, the distribution on internal stresses in the bent trunk position differed from that in the erect trunk portion, being compressed on the outside and tensile on the inside. The resistant moment introduced by compression stress generated in compression wood is released by the bending of the leaning trunk. The bending stresses are then superimposed on the original internal growth stress. We demon-

strated that Poisson's effect of longitudinal stresses should be considered when evaluating transverse surface growth stresses. The existence and intensity of compression wood development can be assessed by growth stress measurements. We conclude that the compression force of compression wood functions physiologically to give an upward-righting response in a leaning trunk. (Tree Physiol. 2001. 21:261–266)

### **PUBLIC PERCEPTIONS OF URBAN FORESTS IN IBADAN, NIGERIA: IMPLICATIONS FOR ENVIRONMENTAL CONSERVATION**

**L. Popoola and O. Ajewole**

This work examines the public perception of urban forests in Ibadan *vis-à-vis* environmental conservation. It covers the five Local Government Areas (LGAs): Ibadan North-West, Ibadan South, Ibadan South-West, and Ibadan South-East. Data for the study were obtained from a random sample of 370 respondents through structured questionnaire-based interviews. The results showed that 99% of the respondents are aware of, and believe, that these urban forests serve some purpose in meeting the socioeconomic and physiological needs of the urban populace. Moreover, 94% expressed their support for continued preservation of these forests. Of this total, 38%, 36%, and 26%, respectively, based their support on the fact that these forests can protect the environment, supply physical needs, and be used for recreation. The chi-square test of independence as  $P = 0.05$  revealed that the public perceptions of these forests are dependent on the respondents' residence proximity to at least one of these forest reserves ( $P = 0.05$ ). Public perceptions may be capitalized on by governments and other change agencies for the sustainable management of the remnants of Ibadan urban forests. Arboric. J. 2001. 25:1–22)