

## ARBORICULTURAL ABSTRACTS

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### VARIOUS BOTANICAL AND SOCIAL FACTORS AND THEIR EFFECTS ON AN URBAN WOODLAND IN READING, BERKSHIRE

S. Skeggs

This study arose from a request by Reading Borough Council for a botanical survey and assessment of one of its urban woodlands in order to provide information for management. Historical and social elements were included to build a more complete picture of the impacts on an urban green space. The site is a mixture of woodland (parts up to 200 years old) and grassland (which is remnant of an agricultural past). Many of the communities allocated by normal National Vegetation Classification (NVC) criteria did not appear to be the best fit to reality, when taking into account the current physical environment and known historical details. By combining all the information available, communities that appear to be better fits are suggested where possible. A significant area, known as "the Plantation," is very complex due to the profound effects from long-term management. On the whole, the site is similar to many other urban woodlands all over the country. It is very under-used by the local population, with the typical visitor being under 16 or over 40 years old, mostly using it for walking dogs or as a shortcut. According to the social survey, there is considerable strength of feeling about the site, with almost everyone interviewed wanting to see a minimum management and maximum "naturalness." Those who do not visit the site value it for the same reasons as those who do—for providing somewhere that is wild and untouched by people, peaceful, a place for getting away from the built environment, and as a strong manifestation of an internal concept of nature. It is concluded that the site is not particularly valuable in terms of nature conservation, but it is very valuable because of its place in the minds and affections of the people who live locally, some of whom use it frequently and have come to build up an intense loyalty towards it. (*Arboric. J.* 1999. 23:209–231)

### THE COMBINED USE OF THE RESISTOGRAPH AND THE SHIGOMETER FOR THE ACCURATE MAPPING AND DIAGNOSIS OF THE INTERNAL CONDITION OF WOODY SUPPORT ORGANS OF TREES

W. Moore

The use of two detection instruments, the Resistograph M300 and the French version of the Shigometer, the Vitalometer, is described and the method of their use is illustrated in four case studies. Verification of dubious Resistograph results can be obtained by the combined use of the Resistograph and the Shigometer. Their combined use provides acceptable results for most tree species and allows for a more accurate identification of the internal condition of roots and stems. Because the same hole created by the Resistograph is used for taking Shigometer readings, wounding the tree is minimized. The paper concludes that there is scope for the development of a device that incorporates the technologies of both instruments. (*Arboric. J.* 1999. 23:273–287)

### THE RELATIONSHIP BETWEEN XYLEM CONDUIT DIAMETER AND CAVITATION CAUSED BY FREEZING

S.T. Davis, J.S. Sperry, and U.G. Hacke

The centrifuge method for measuring the resistance of xylem to cavitation by water stress was modified to also account for any additional cavitation that might occur from a freeze-thaw cycle. A strong correlation was found between cavitation by freezing and mean conduit diameter. On the one extreme, a tracheid-bearing conifer and diffuse-porous angiosperms with small-diameter vessels (mean diameter <30  $\mu\text{m}$ ) showed no freezing-induced cavitation under modest water stress (xylem pressure =  $-0.5$  MPa), whereas species with larger-diameter vessels (mean diameter >40  $\mu\text{m}$ ) were nearly completely cavitating under the same conditions. Species with intermediate mean diameters (30 to 40  $\mu\text{m}$ ) showed partial cavitation by freezing. These results are consistent with a critical

diameter of 44  $\mu\text{m}$  at or above which cavitation would occur by a freeze-thaw cycle at  $-0.5$  Mpa. As expected, vulnerability to cavitation by freezing was correlated with the hydraulic conductivity per stem traverse area. The results confirm and extend previous reports that small-diameter conduits are relatively resistant to cavitation by freezing. It appears that the centrifuge method, modified to include freeze-thaw cycles, may be useful in separating the interactive effects of xylem pressure and freezing on cavitation. (Am. J. Bot. 86(10):1367–1372)

#### TAXA OF LEAFHOPPERS CARRYING PHYTOPLASMAS AT SITES OF ASH YELLOWS OCCURRENCE IN NEW YORK STATE

G.T. Hill and W.A. Sinclair

Leafhopper (Homoptera: Cicadellidac) populations were sampled and leafhopper carriers of ash yellows (AshY) phytoplasmas were identified as first steps toward vector identification. Nearly 5,000 leafhoppers were collected in malaise traps at two sites of high AshY incidence in New York state in 1996 and 1997. These insects comprised 33 taxa, including representatives of 13 genera known to contain phytoplasma vectors. The most abundant genus was *Scaphoideus*, with numbers about six times greater than any other genus. A total of 1,632 insects was assayed individually for phytoplasmas by polymerase chain reaction (PCR) amplification of phytoplasmal 16S rDNA and restriction fragment length polymorphism analyses of PCR products using restriction enzymes *TaqI* and *RsaI* separately. Phytoplasmas were detected in 35 insects, all but one in the subfamily Deltocephalinae. AshY phytoplasmas were detected in 19 of 812 individuals of *Scaphoideus* spp. and 1 of 87 of *Coliadonus clitellarius*. Phytoplasmas of the *Prunus* X-disease group were detected in 1 *Scaphoideus* sp., 4 individuals of *C. clitellarius*, and 4 of 83 *Scapirytopus acutus* individuals. Phytoplasmas of the aster yellows group were detected in 1 of 68 individuals of *Gyponana* spp., and 5 of *S. acutus*. AshY phytoplasma carriers merit testing for possible vector ability. (Plant Dis. 84(2)134–138)

#### SEEDLING GROWTH OF ATLANTIC WHITE-CEDAR AS INFLUENCED BY PHOTOPERIOD AND DAY/NIGHT TEMPERATURE

L.G. Jull, F.A. Blazich, and L.E. Hinesley

Seedlings of Atlantic white-cedar [*Chamaecyparis thyoides* (L.) B. S. P.] were grown in controlled-environment chambers for 12 weeks under short- or long-day conditions with 9-hr days at 18, 22, 26, or 30°C (64, 72, 79, or 86°F) in factorial combination with 15-hr nights at 14, 18, 22, or 26°C (57, 64, 72, or 79°F). Dry-matter production was influenced by photoperiod and day/night temperature. For all day temperature  $\times$  photoperiod interactions, except root:shoot ratio, growth was highest under long days. Day  $\times$  night temperature interactions occurred for all growth measurements except root dry weight. Root dry weight was highest at 30/22°C (86/72°F); top (shoot) dry weight at 26/22°C (79/72°F). Nights of 14°C (57°F) resulted in the lowest top dry weight. Total plant dry weight was highest at nights of 22°C (72°F) for all day temperatures. At days of 30°C (86°F), total plant dry weight was highest with nights less than or equal to 22°C (72°F); however, data for 30/22°C (86/72°F) and 26/22°C (79/72°F) were similar. The highest root:shoot ratio occurred at nights of 14°C (57°F) with days less than or equal to 26°C (79°F). Mean relative growth rate was highest at nights of 22°C (72°F) with days of 26°C (79°F) or 30°C (86°F). Maximum stem caliper occurred at days of 22°C (72°F) with nights greater than or equal to 18°C (64°F). Height and crown width were highest at 26/22°C (79/72°F). A day/night cycle of 30/22°C (86/72°F) with long days was optimal for seedling growth. (J. Environ. Hortic. 1999. 17(3):107-113)

#### TREATMENT OF OAK DECLINE USING PRESSURIZED INJECTION CAPSULES OF ANTIFUNGAL MATERIALS

R. Fernandez-Escobar, F.J. Gallego, M. Benlloch, J. Membrillo, J. Infante, and A. Perez Algaba

*Quercus ilex* and *Quercus suber* trees growing at several sites in Extremadura, Western Spain, that were showing symptoms of oak decline were injected with po-

tassium phosphonate, quinosol, or carbeodazim using a low-pressure method of trunk injection composed of a pressurized capsule system. A team of four people injected between 120 and 189 trees per day, depending upon the density of the undergrowth vegetation. This labor cost represented, approximately, 15% to 20% of the total cost of the treatment. The trees injected with potassium phosphonate showed a significant improvement in vegetative growth within 2 years of the injection treatment, and they also showed some

recovery from the decline symptoms during the third year. Only one injection treatment of an average of 3.5 capsules (corresponding to 24.5 g phosphonic acid) per tree of approximately 36 cm in diameter, was necessary to reduce the disease severity significantly. Indirectly, these results corroborate the implication of *Phytophthora cinnamomi* in oak decline within Spanish *Quercus* woodlands. (Eur. J. For. Pathol. 1999. 29(1): 29–38)