ARBORICULTURAL ABSTRACTS

CANBERRA'S URBAN FOREST: EVOLUTION AND PLANNING FOR FUTURE LANDSCAPES

J.C.G. Banks and C.L. Brack

Canberra, Australia's national capital, is a planned city established on grazing lands in the southern tablelands of New South Wales. Over the past 9 decades, it has grown into a garden city of 300,000 people. Landscaping was an early priority as much of the chosen site for the city was a treeless plain. Major tree planting began in the 1920s, and today the urban forest on public lands contains 400,000 trees from over 200 species in streets and parklands. The species used have changed over time with exotic deciduous trees and conifers dominating early plantings. By the 1970s, native species, mostly eucalypts, were planted. Today, fewer species comprising an equal mix of native and exotics are used. Trees in the earlier plantings are now mature and, given the harshness of the local climate, many will come to the end of their "safe life" in the early decades of this century. This provides new challenges for urban tree managers as to how to effect tree replacement that is aesthetically pleasing, ecologically sound, and socially acceptable. To assist in this planning, a tree database and modeling system has been assembled. This system—Decision Information System for Managing Urban Trees, or DISMUT—facilitates the development of forest-level management programs by allowing the projection of change and work requirements that result from historical and current plantings over the entire urban forest. (Urban For. Urban Green. 2003. 1:151–160)

EVALUATION OF PREVENTIVE TREATMENTS IN LOW-DENSITY GYPSY MOTH POPULATIONS USING PHEROMONE TRAPS

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Pheromone traps can be used for evaluating the success of treatments that are applied to either eradicate or delay the growth of isolated low-density populations of the gypsy moth, *Lymantria dispar* (L.). We developed an index of treatment success, T, that measures the reduction in moth counts in the block treated adjusted by the change in moth counts in the reference area around it. This index was used to analyze the effectiveness of treatments that were conducted as part of the USDA Forest Service Slow the Spread of the gypsy moth project from 1993 to 2001. Out of 556 treatments that were applied during this period, 266 (188,064 ha) were selected for the analysis based on several criteria. They included 173 blocks treated with *Bacillus thuringiensis* (Berliner) variety *kurstaki* and 93 blocks treated with racemic disparlure. Analysis using general linear models indicated that disparlure treatments were significantly more effective than *B. thuringiensis* treatments in reducing moth captures. The frequency of repeated treatments in the same area was higher after *B. thuringiensis* than after disparlure applications. Treatments were more successful if the pretreatment moth counts outside of the block treated were low compared with moth counts inside the block. (J. Econ. Entomol. 2002. 95(6):1205–1215)

THE EFFICACY OF ECTOMYCORRHIZAL COLONIZATION OF PIN AND SCARLET OAK IN NURSERY PRODUCTION

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Two experiments were conducted to assess the effectiveness of ectomycorrhizae inoculation of pin *(Quercus palustris)* and scarlet oak *(Q. coccinea)* during nursery production. Experiment 1 tested inoculum and substrate protocol. Vegetative and spore inoculum of *Pisolithus tinctorius (Pt)* were applied to pin and scarlet oak seedlings. All plants were grown in 0.9 L (1 gal) containers filled with mined pine bark, sterilized milled pine bark, sterilized mineral soil, or sterilized vermiculite-based substrate. After 2 months, mycorrhizal colonization rates were assessed qualitatively. Vegetative inoculum was unsuccessful at infecting seedlings of both species when grown in all of the substrates. Best results were 90% and 60% of plants colonized with spore inoculum for pin and scarlet oak, respectively, grown in vermiculite-based substrate. Sixty percent of pin oaks were colonized by *Pt* in milled pine bark, whereas no scarlet oaks were colonized. Overall, the spore inoculum colonized pin oak at a higher rate than scarlet oak, and vermiculite-based substrate proved superior to the other three substrates for inoculating seedlings with commercial *Pt* spores. In experiment 2, *Pt* spore inoculum was applied as a bare-root dip on scarlet oak liners before transplanting into 51 L (15 gal) containers in a pot-in-pot growing system. *Pt* had a colonization rate of zero, but an indigenous mycorrhizal fungus, *Scleroderma bovista (Sb)*, colonized many of the trees. Height and trunk diameter growth during 2 years of production were similar for trees colonized and not colonized with *Sb*. Leaf water potentials were more negative, and stomatal conductance was reduced for transplanted colonized compared to not colonized trees during a l-day dry-down, imposed 50 days after transplanting. Under our conditions, mycorrhizal fungi showed no apparent benefit during production and during initial establishment. (J. Environ. Hortic. 2003. 21(1):45–50)

THE URBANIZATION OF WILDLIFE MANAGEMENT: SOCIAL SCIENCE, CONFLICT, AND DECISION MAKING

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Increasing urbanization of rural landscapes has created new challenges for wildlife management. In addition to changes in the physical landscape, urbanization has also produced changes in the socio-cultural landscape. The greater distancing from direct interaction with wildlife in urbanized societies has led to the emergence of a culture whose meanings for wildlife are less grounded in the utilitarian/instrumental orientation of rural agrarian systems. Urban perspectives on wildlife are comprised of more highly individualized emotional/symbolic values. This shift creates two problems with respect to managing wildlife in an urbanizing landscape. First, the increased diversity in values and meanings increases the likelihood for social conflicts regarding wildlife management while at the same time making socially acceptable resolutions more intractable. This in turn requires fundamental changes in decision-making paradigms and the research approaches used to inform decision making. Second, as remaining rural communities feel the pressures of urbanization, wildlife conflicts become conflicts not just over wildlife but conflict over larger socio-political concepts such as equity, tradition, private property rights, government control, power, and acceptable forms of knowledge. This paper examines the wildlife management implications of changes associated with increasing urbanization and employs two case studies to illustrate these issues. First, a study of a controversy over urban deer management provides insights into how to map conflicting values and search for common ground in an urban culture with increasingly individualistic values for wildlife. Specifically, the analysis illustrates that common ground may, at times, be found even among people with conflicting value systems. The second case study examined a ranching community faced with predator reintroduction. This case study illustrates tensions that occur when the community of interest (i.e., a national public) is broader than the community of place in which the problem occurs. In this latter situation, the debate centers on more than just different views about the rights of animals. It also entailed the rights of individuals and communities to decide their future. The conclusion discusses the need for wildlife institutions to adapt their underlying decision-making philosophy including the way science is integrated into decision-making processes in light of the changes in social context caused by urbanization. (Urban For. Urban Green. 2003. 1:171–183)

ENVIRONMENTAL ARBORICULTURE, TREE ECOLOGY, AND VETERAN TREE MANAGEMENT

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The appreciation and management of veteran trees has been transformed in recent years by the activity of the Ancient Tree Forum (ATF). This is a UK initiative, which has brought attention to the quality and condition of the living heritage reflected in the great number of ancient tree sites found in the British Isles, which are among the finest in northern Europe. Such developments have been influenced by a multidisciplinary approach, which regards the tree as inherently linked to its ecological context. This approach is now beginning to inform mainstream arboricultural thinking and practice. The paper attempts to synthesize the various trends in current thinking that have led to new approaches in veteran tree management. These include the importance of improving the understanding of the aging process in trees to clarify the terminology that can be applied to define different states of tree development. This draws on morphology and an appreciation that aging is not a one-way process in trees, while also stressing the significance of reiterative and "phoenix" growth for tree longevity. The paper also considers the tree as a co-evolutionary organism and refers to the work of Mattheck, Rayner, and Shigo, together with environmental-philosophical views of trees to suggest a natural meeting point in the consideration and understanding of veteran trees. The incorporation of such concepts into management considerations is important when surveying and specifying works for veteran trees and, as a result, management schedules are now being projected over 30- to 100-year periods for veteran tree populations. Management practices include promotion of "phoenix" regeneration, restoration pruning, recording of tree habitat, integrated tree viability assessments, deadwood management, and the importance of fungi for tree health and recycling processes. (Arboric. J. 2002. 26:213–238)

BUFFERED PHOSPHORUS FERTILIZER IMPROVES GROWTH AND DROUGHT TOLERANCE OF WOODY LANDSCAPE PLANTS

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The effects of alumina-buffered phosphorus (AI-P) were evaluated on growth and drought tolerance of woody plants and on seedling establishment of several tree species grown in containers with soilless media. AI-P reduced phosphorus leaching in all species. Vegetative growth of rhododendron (*Rhododendron catawbiense* Michx. cv. 'English Roseum'), forsythia (*Forsythia intermedia* Zab. cv. 'Spring Glory'), Ohio buckeye (*Aesculus glabra* Willd.), and bur oak (*Quercus macrocarpa* Michx.), measured as plant height, stem caliper, or biomass, was as fast or faster with AI-P as with Osmocote (17-6-10) or monoammonium phosphate fertilizer. Imposition of summer drought during the first growth season slightly reduced growth of rhododendron, with a stronger effect in the second year, while forsythia was more affected in the first season. Rhododendron plants fertilized with AI-P wilted more slowly than controls fertilized with Osmocote. AI-P–fertilized forsythia plants grew faster than controls whether drought was imposed or not. Rhododendron plants produced more flower buds in the first year when fertilized with AI-P than with conventional phosphorus fertilizers. At the lower desorbing concentration, drought caused no reduction in the percentage of plants producing flower buds. A recharging treatment was tested at the beginning of the second season to replace P lost from the AI-P. Recharged Al-P reduced branching and flowering of rhododendron at the end of the second season, possibly as a result of damage from the recharging treatment. (J. Environ. Hortic. 2002. 20(4):214–219)