Arboriculture & Urban Forestry 2007. 33(3):228–229.

ARBORICULTURAL ABSTRACTS

LANDSCAPE PLANNING: ITS CONTRIBUTIONS TO THE EVOLUTION OF THE PROFESSION OF LANDSCAPE ARCHITECTURE

Jon E. Rodiek

Landscape planning, a subdiscipline of the field of landscape architecture, has helped define the profession over the past twenty five years. Landscape planning endorses the tenets of the Natural Environmental Policy Act [NEPA, 1969. The National Environmental Policy Act of 1969. Public Law No. 91-190 91st Congress, second session (NEPA) pp. 1–5] and thereby promotes landscape architects and landscape planners as major players in changing landscapes. Changing landscapes is focused on developing valid designs that promote ecological integrity. Aesthetic form resulting from these changes is also a concern but must respect ecological function and structure first. Landscape planning will take on an even greater role in the future by; redefining the profession; by contributing to the knowledge base of good design decisions, and creating new advances in planning and design theory. (Landscape and Urban Planning 2006. 76(1–4):291–297)

THE IMPACT OF PARK TREES ON MICROCLIMATE IN URBAN AREAS

N.J. Georgi and K. Zafiriadis

Trees in cities have an important positive effect on people's lives. One such positive effect is the amelioration of microclimate. The aim of this research is to assess the correlation between parameters that affect the microclimate of parks during the summer. We measured air temperature, relative humidity and solar radiation in the sun and shade of the trees in urban parks in Thessaloniki, Greece. The results indicate that: the air (A) temperature reduction percentage (dTair%), air relative humidity increase (dTRh%), discontent index reduction percentage (DI%) (cooling effect) and solar radiation (L) percentage that passes through the trees' foliage to their shade creates an exponential function of dA% = a.e-bL. These functions are also applicable to the limiting variation values of the parameters. If we use L = 0 (meaning Lightsh = 0, which is the case for an extremely dense tree), then the values that we expect from this particular parameter are the maximum possible. These maximum values are a characteristic feature of the parameter variation for this particular research area. These maximum values for the trees in the parks of Thessaloniki are: maxdTair% ≈ 24%, maxdRh% ≈ 41% and maxdDI% ≈16%. (Urban Ecosystems 2006. 9(3):195–209)

EFFICACY OF SYSTEMIC INSECTICIDES FOR PROTECTION OF LOBLOLLY PINE AGAINST SOUTHERN PINE ENGRAVER BEETLES (COLEOPTERA: CURCULIONIDAE: SCOLYTINAE) AND WOOD BORERS (COLEOPTERA: CERAMBYCIDAE)

Donald M. Grosman and William W. Upton

We evaluated the efficacy of the systemic insecticides dinotefuran, emamectin benzoate, fipronil, and imidacloprid for preventing attacks and brood production of southern pine engraver beetles (Coleoptera: Curculionidae: Scolytinae) and wood borers (Coleoptera: Cerambycidae) on standing, stressed trees and bolt sections of loblolly pine, *Pinus taeda* L., in eastern Texas. Emamectin benzoate significantly reduced the colonization success of engraver beetles and associated wood borers in both stressed trees and pine bolt sections. Fipronil was nearly as effective as emamectin benzoate in reducing insect colonization of bolts 3 and 5 mo after injection but only moderately effective 1 mo after injection. Fipronil also significantly reduced bark beetle-caused mortality of stressed trees. Imidacloprid and dinotefuran were ineffective in preventing bark beetle and wood borer colonization of bolts or standing, stressed trees. The injected formulation of emamectin benzoate was found to cause long vertical lesions in the sapwood–phloem interface at each injection point. (Journal of Economic Entomology 2006. 99(1): 94–101)

UPDATING URBAN FOREST INVENTORIES: AN EXAMPLE OF THE DISMUT MODEL

C.L. Brack

Canberra is a unique city in Australia where the trees on public land that dominate the urban forest were planned for at the city's inception. In the mid-1990s, a 100% census of street and park trees was completed, and together with simple health, growth and yield models, this database formed the basis of a decision information system to support the management of the urban trees – DISMUT. The accuracy of the models was evaluated in a study in 2005 where models to predict total tree height were found to be unbiased and precise, tree crown dimension were under-estimated for small trees, and tree health was over-estimated. The over-estimate of health may be due to the relatively poor rainfall conditions over the past 10 years while the biases in crown dimension predictions are more likely due to a too simple model form. However, the existence of DISMUT predictions over all streets and parks in Canberra means that statistically efficient two-phase sampling approaches can be used to correct for any bias in the mean estimates of tree numbers and size, and also to predict the mean value of other environmental, economic or social parameters of interest that are correlated to tree size. (Urban Forestry & Urban Greening 2006. 5:189–194)

TREE HEALTH MAPPING WITH MULTISPECTRAL REMOTE SENSING DATA AT UC DAVIS, CALIFORNIA

Qingfu Xiao and E. Gregory McPherson

Tree health is a critical parameter for evaluating urban ecosystem health and sustainability. Traditionally, this parameter has been derived from field surveys. We used multispectral remote sensing data and GIS techniques to determine tree health at the University of California, Davis. The study area (363 ha) contained 8,962 trees of 215 species. Tree health conditions were mapped for each physiognomic type at two scales: pixel and whole tree. At the pixel scale, each tree pixel within the tree crown was classified as either healthy or unhealthy based on vegetation index values. At the whole tree scale, raster based statistical analysis was used to calculate tree health index which is the ratio of healthy pixels to entire tree pixels within the tree crown. The tree was classified as healthy if the index was greater than 70%. Accuracy was checked against a random sample of 1,186 trees. At the whole tree level, 86% of campus trees were classified as healthy with 88% mapping accuracy. At the pixel level, 86% of the campus tree cover was classified as healthy. This tree health evaluation approach allows managers to identify the location of unhealthy trees for further diagnosis and treatment. It can be used to track the spread of disease and monitor seasonal or annual changes in tree health. Also, it provides tree health information that is fundamental to modeling and analysis of the environmental, social, and economic services produced by urban forests. (Urban Ecosystems 2005. 8(3–4):349–361)

RESTORATION OF THE URBAN FORESTS OF TOKYO AND HIROSHIMA FOLLOWING WORLD WAR II

Sheauchi Chenga and Joe R. McBride

The urban forests of Tokyo and Hiroshima were devastated by American bombing during World War II. Approximately 160 km^2 of Tokyo were burned by more than 100 fire bombings, while an area of 12 km^2 was leveled and burned by one atomic bomb in Hiroshima. Tokyo's street tree population was reduced from 105,000 to approximately 42,000 by the end of the war. In the years immediately following the war, the street tree population dropped to 35,000 in Tokyo due to a combination of further tree mortality and the cutting of trees for fire wood. No estimates of pre-war street tree populations are available for Hiroshima. Examination of pre- and post-atomic bombing photographs of Hiroshima suggests an even higher percentage of the trees in the city were destroyed. Post-war reconstruction of the urban forests of each city developed along different pathways. Plans for the redevelopment of Tokyo were rejected by the general public who wanted a return to pre-war conditions. Few streets were widened to accommodate traffic and allow for new street tree planting. Plans for new parks were shelved or only partially achieved. Some streets were replanted by private citizens. Initial survival rates of replanting were low. Trees in Tokyo's municipal tree nurseries, which had not been converted to vegetable gardens during the war, were often larger than the optimal size for transplanting, but were used as no other trees were available. A more concerted effort to reconstruct the urban forest came following the 1959 decision to site the 1964 Olympic Games in Tokyo. Many streets were widened and planted with trees. New tree-lined boulevards were also created. In contrast, Hiroshima sponsored an international competition for the design of a Peace Park and a major tree-lined boulevard. Several wide streets were built with space for street trees. Major plans were also drawn to create greenways along the rivers and to build additional parks. Trees were initially donated by local farmers and nearby towns for planting the parks and the boulevard since municipal tree nurseries had been converted to vegetable gardens during the war. Survival rates were very low due to the rubble content of the soil and difficulties in watering the transplanted trees. Strong support from the mayors of Hiroshima contributed to the success of urban forest reconstruction in Hiroshima. The historical significance of the destruction caused by the first atomic bomb to be dropped on an urban area also contributed to Hiroshima citizens' will to reconstruct both the city and its urban forest. Species and location of trees determined the survival of trees after war in both cities. Species with strong resprouting ability and thick bark survived the bombing and fire. In Tokyo trees located in open areas avoided the fire, while in Hiroshima trees standing behind tall concrete buildings were shielded from radiation and the heat wave. In addition to the difficulties faced during the city-wide replanning process, constraints of urban forest recovery included severe financial restriction, short supply of proper large-sized trees for planting and lack of labor for planting and post-planting tree care. Hiroshima used public participation and community involvement to restore the urban greenery successfully and, until today, has maintained a program to conserve the trees that survived the atomic bomb. (Urban Forestry & Urban Greening 2006. 5:155–168)