ARBORICULTURAL ABSTRACTS

COMPREHENSIVE CONCEPT PLANNING OF URBAN GREENING BASED ON ECOLOGICAL PRINCIPLES: A CASE STUDY IN BEIJING, CHINA

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Greenspace is an important part of complex urban ecosystems and provides significant ecosystem services. It benefits urban communities environmentally, esthetically, recreationally, and economically. Beijing Province is in north of China and has a total area of 16,807.8 km^2 and a population of about 13.8 million. This paper aims to develop a comprehensive conceptual framework for urban greening of Beijing Province based on landscape ecological principles. It attempts to answer how to establish an urban greening plan at the regional, city, and neighborhood levels to achieve long-term sustainability. At the regional level, a big, natural and semi-natural forest area in the northwest and an ecological buffer belt in the southeast are planned to protect the environmental quality of Beijing and provide habitats for wildlife. At the city level, a green network system of green wedges, parks, and green corridors has been proposed. This green network helps to limit future urban expansion, improve urban environmental quality, and serve as habitats and migration routes for wildlife. At the neighborhood level, green extensions and connections of riverside greenway, road greenway, parks, and vertical greening permeate into the built-up areas. They provide open space close to residential areas and offer places for recreation. This three-level green system constitutes an integrated ecological network for urban sustainable development of Beijing. For future development of Beijing, urban parks, forestry, agriculture, water, and infrastructure should be planned and designed in an integrated way. After this greenspace plan is legislated and completely realized, Beijing will develop an interconnected and integrated network of urban greenspaces. It has the prospect of achieving the aim of "Green Olympic City 2008" and the long-term goal of developing Beijing toward an "Eco-City."(Landsc. Urban Plann. 2005. 72(4):325–336)

DEVELOPMENT OF A DISEASE SEVERITY RATING SCALE FOR PLANE TREE ANTHRACNOSE

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Anthracnose, caused by the fungus *Apiognomonia veneta* (Sacc. et Speg.) Höhnel., is the most important and frequent disease affecting mature ornamental plane trees (*Platanus* × *hybrida* Brot. = *P.* × *acerifolia* (Ait.)Willd.) of central Spain. Symptoms of the disease are leaf vein and petiole necrosis, bud death, defoliation, proliferation of shoots growing in whorls, short internodes, cankers, necrotic lesions, and twigs and branches growing in angles. Based on our previous experience, a disease severity rating scale (DSRS) has been established, consisting of six levels: 0 = healthy, 1 = initial, 2 = low, 3 = medium, 4 = high, and 5 = dead. In order to achieve a better and more efficient measure of disease intensity, we tried to quantify this visual scale using mathematical criteria. In 2000, 610 mature trees up to 200 years old, divided into four age classes, were selected and systematically evaluated using a visual estimation based method. The trees were located in central Spain, mainly in two periurban areas of the town of Aranjuez (south of Madrid) and in three urban areas of Madrid city. Trees were observed in late spring, summer, and winter. We recorded visual estimation of disease severity, foliage cover, healthy new shoots, dead branches, shoot growth in whorls, and branch growth in angles. The statistical relationship between the parameters, disease severity, and all the variables recorded (defoliation, healthy new shoots, etc.) has been evaluated. "Leaf density," "dead branches," and "healthy shoots" were the variables that help to discriminate better among the different levels of the DSRS. A clearer definition of the different phases of disease severity will facilitate the application of possible control methods and the prediction of the behavior of other *Platanus* spp. (Urban For. Urban Green. 2005. 3(2):93–101)

WOOD GRAIN PATTERNS AT BRANCH JUNCTIONS: MODELING AND IMPLICATIONS

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We apply a recent model of wood grain pattern formation to the junction between two tree branches. In model simulations, the export of indole-3-acetic acid (IAA) from a branch into the junction is necessary to maintain the continuity between the grain pattern of the branch and the grain of the subjacent stem. Increased IAA export corresponds to a larger effect on the overall grain pattern. Conversely, if IAA export stops, the grain pattern diverts around the branch. These results do not depend on specific values for the model parameters and appear to be quite general. Since long-range water transport is largely parallel to the wood grain, greater IAA export from a branch is expected to give improved access to the water resources of the tree. IAA export thus emerges as a likely regulator of branch vigor. In this way, the basipetal flux of IAA through a branch, and its morphological consequences at branch junctions, may play an important role in several aspects of tree form. (Trees Struct. Func. 2004 18(5):493–500)