ARBORICULTURE & URBAN FORESTRY

Volume 49, No. 4, July 2023

Formerly the Journal of Arboriculture, 1975 – 2005 (Volumes 1 – 31)

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Vitória Carolina Dantas Alves, Abimael Gomes da Silva, Edilson Costa, Thaise Dantas, Flávio Ferreira da Silva Binotti, Murilo Battistuzzi Martins, Eduardo Pradi Vendruscolo, and Gustavo Haralampidou da Costa Vieira

Influence of Different Protected Environments and Reflector Material on Cultivated Oiti (*Licania tomentosa* [Benth.] Fritsch) Seedlings 159

Abstract. Background: Oiti (*Licania tomentosa* [Benth.] Fritsch) is an option for urban forestation and rural environments that require shading by plants, so studying the plant environment to obtain quality seedlings is essential. The present study aimed to evaluate oiti seedlings in different protected environments with or without reflective material on a cultivation bench. Methods: The following protected environments were evaluated: an agricultural greenhouse covered with a low-density polyethylene film and a thermo-reflective screen with 42%/50% shading under the film; an agricultural screenhouse with an aluminized screen with 35% shading; an agricultural screenhouse with a black screen with 30% shading; and an agricultural screenhouse with a black screen with 18% shading. Production systems with and without photosynthetically active radiation-reflecting material (aluminized screen, Aluminet®) on the cultivation bench were assessed in each protected environment. Results: There was no interaction between the environmental factors; however, the environments influenced height, stem diameter, root dry matter, and total biometric relationships and growth rates. The reflective material did not improve the quality of oiti seedlings. The ratio of shoot and root dry matter was, on average, 71% for the shoots and 29% for the roots. The photosynthetically active radiation received by oiti seedlings ranged from 600 to 1,100 µmol m^{-2} s^{-1}. Conclusions: The greenhouse with 42%/50% shading screen under the film and the black screen with 30% shading were the best environments for the formation of *Licania tomentosa* seedlings. The reflective material on the cultivation bench did not result in better quality oiti seedlings.

Keywords. Chrysobalanaceae; Greenhouse; Luminosity; Screenhouse.

Dr. Coralie Farinas Simmt, Dr. Davis Sydnor, Elizabeth L. White, Alexis Wooten, Dr. Francesca Peduto Hand, and Dr. Pierluigi (Enrico) Bonello

Field Resistance of American Sycamore 'Davis' to Canker Pathogens 170

Abstract. American sycamores (*Platanus occidentalis* L.) are found in many ecosystems and planted in urban landscapes worldwide. The trees are highly susceptible to anthracnose and canker pathogens, causing leaf blight and branch dieback. On The Ohio State University campus in Columbus, Ohio, an American sycamore was observed to thrive among many symptomatic sycamores. The healthy tree, subsequently protected as cultivar 'Davis,' was vegetatively propagated and tested for field resistance to natural infection of canker pathogens compared to the wildtype. Incidence and severity of leaf necrosis, incidence of dieback, and tree death were evaluated for 2 consecutive seasons. The incidence of leaf necrosis was disconnected from the incidence of dieback and tree mortality, as little to no leaves were produced on the wildtype trees. By the end of the second season, 7 out of 12 wildtype trees were dead, while all 12 'Davis' trees were alive. Several canker pathogens were recovered from both 'Davis' and the wildtype, including *Apiognomonia platani* and *Diaporthe eres*. The latter had not been previously reported on American sycamore. Pathogenicity tests confirmed that *D. eres* is indeed pathogenic on sycamores and also that 'Davis' is significantly more resistant than wildtype to canker development and should be preferred over the wildtype in the urban landscape.

Keywords. Anthracnose; *Apiognomia platani*; Canker; *Diaporthe eres*; Disease Resistance; Sycamore.

Glynn C. Percival, Sean Graham, and Emma Franklin

The Influence of Soil Decompaction and Amendments on Soil Quality 179

Abstract. Urban soil is often compacted during anthropogenic activities, which presents a challenging substrate for tree growth. Two techniques for decompacting soils (air spading and vertical mulching) were evaluated alone and in combination with the soil amendment biochar and/or a woodchip mulch. Effects on soil quality (bulk density, organic matter, vegetation ground cover, cotton strip degradation, root dry mass, and earthworm counts) were monitored over 5 years. A combined treatment of air spading, biochar, and a woodchip mulch layer proved optimal in improving the soil quality of a heavily compacted soil over the 5-year period. This treatment was, however, the most expensive and

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time-consuming. A woodchip mulch was the most effective of the individual treatments and the most cost-effective. Air spading alone proved reasonably effective in improving soil quality over the 5-year study period. Effects of air spading could be improved by addition of a woodchip mulch. Vertical mulching alone or in combination with biochar had little influence on soil quality over 5 years. Results demonstrated that effective long-term soil decompaction measures exist for arborists to improve compacted soils.

Keywords. Air Tillage; Compaction; Plant Health Care; Root Growth; Soil Biological Activity; Soil Management; Urban Soils.

Samiya Tabassum, Linda J. Beaumont, Farzin Shabani, Leigh Staas, Gwilym Griffiths, Alessandro Ossola, and Michelle R. Leishman

Which Plant Where: A Plant Selection Tool for Changing Urban Climates............................ 190

Abstract. Background: Use of vegetation in urban areas for climate change adaptation is becoming increasingly important; however, urban vegetation is itself vulnerable to the effects of climate change. Better understanding of which species will survive and thrive in urban areas with projected climate change will increase confidence in choosing climate-ready species for resilient urban greening outcomes. Plant selector tools based on the suitability of species for future climates, however, are lacking. Methods: The Which Plant Where plant selector webtool (www.whichplantwhere.com.au) was created by combining sophisticated species distribution models and trait and environmental tolerance data from a variety of sources to allow users to select appropriate species which are climatically suitable for Australian urban environments for 3 different time periods (2030, 2050, and 2070). The tool allows users to calculate co-benefits afforded by planting palettes and offers suggestions for alternative species based on climate suitability to help diversify plantings and provide options where substitutions may have to be made. Results: The tool contains information for over 2,500 unique plant entries (encompassing species, subspecies, cultivars, varieties, and hybrids) from 9 different growth forms (trees, shrubs, palms, ferns, cycads, climbers, succulents, grass, and herbs). The tool contains many resources to design and maintain resilient urban green spaces, from the planning stage up to monitoring and maintenance. Conclusion: Which Plant Where was designed to allow practitioners and urban forest managers to confidently identify climate-ready species now to ensure urban green spaces remain diverse and resilient into the future.

Keywords. Climate Suitability; Ecosystem Services; Species Selection; Urban Greening; Urban Management.

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