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Ian F. Spellerberg, Nils E. Eriksson, and Vincent St. A. Crump

Silver Birch (*Betula pendula*) Pollen and Human Health: Problems for an Exotic Tree in New Zealand 133

Abstract. Silver birch (*Betula pendula*) is commonly used as a street tree in temperate climatic regions. However, the medical literature contains a wealth of reports on the health effects of pollen from silver birch. In many countries such as New Zealand, silver birch is the main tree that causes allergic symptoms, including seasonal hayfever, asthma, and other health conditions such as food allergies (the oral allergy syndrome). Exposure to pollen from silver birch is more likely to occur in cities because of the numbers of the trees and the human population density. Even if there were doubts about the extent of the problem and the costs associated with the problem, the precautionary principle should apply. The health-related problems of silver birch should be promulgated and trees should be removed.

Key Words. Allergies; Human Health Problems; Silver Birch Pollen.

Jamee L. Hubbard and Daniel A. Potter

Managing Calico Scale (*Hemiptera: Coccidae*) Infestations on Landscape Trees 138

Abstract. Calico scale, *Eulecanium cerasorum* (Cockerell), an invasive pest of shade trees, has reached outbreak levels in landscapes and on horse farms in Kentucky, U.S. We evaluated efficacy and timing of conventional and reduced-risk foliar insecticides as well as trunk injected or soil-applied systemics for managing *E. cerasorum*. Acephate, bifenthrin, carbaryl, cyfluthrin, and pyriproxyfen killed young settled crawlers on individually sprayed shoots. Whole-canopy pyrethroid sprays, however, gave <66% control, underscoring the difficulty of reaching settled crawlers within large shade trees. Horticultural oil and insecticidal soap were relatively ineffective even with full spray coverage. Preventive sprays with bifenthrin or pyriproxyfen in mid-May, at first egg hatch, intercepted crawlers before they settled on leaves. Dormant oil failed to control overwintered nymphs or reduce subsequent numbers of adults or crawlers. A plant antitranspirant applied in late March provided 33% suppression. Trunk-injected imidacloprid was ineffective, whereas dicofen (bidrin) gave at best <50% control. Soil injection with imidacloprid in November, December, or March failed to reduce subsequent densities of adults on branches or crawlers on leaves. Reasons why it is difficult to eliminate calico scale in mature landscape trees are discussed in the context of the pest's feeding sites and behavior.

Key Words. Calico Scale; *Eulecanium cerasorum*; Integrated Pest Management; Microinjection; Plant Health Care; Scale Insects; Systemic Insecticide.

Gregory A. Dahle, Harvey H. Holt, William R. Chaney,
Timothy M. Whalen, Daniel L. Cassens, Rado Gazo, and Rita L. McKenzie

Branch Strength Loss Implications for Silver Maple (*Acer saccharinum*) Converted from Round-Over to V-Trim 148

Abstract. Trees converted from round-over to V-trims could develop a canopy of potentially weak watersprouts growing on parent stems with a high probability of decay. This study was conducted to determine if the conversion from round-over to V-trimming predisposes silver maple (*Acer saccharinum* L.) trees to failure, and if decay is more likely to occur in watersprouts arising after heading cuts than in branches arising from lateral buds. Watersprouts were mechanically pulled from converted trees and found to be 49% weaker than normally occurring branches. Branch strength at failure (stress) decreased as watersprouts grew in size, and decay was present in over one-half of the watersprout at the point of failure. The conversion from round-over to V-trimming appears to predispose silver maple trees to failure.

Key Words. Decay; Line Clearance; Round-Over; Silver Maple; Strength Loss; Stress; Topping; Utility Arboriculture; V-trimming; Watersprout.

Stephen Frank, Glenn Waters, Russell Beer, and Peter May

An Analysis of the Street Tree Population of Greater Melbourne at the Beginning of the 21st Century 155

Abstract. An audit of the street tree population of Melbourne, Victoria, Australia, was undertaken to establish its size and botanical composition as a reference point for future studies. The 31 independent municipalities that comprise metropolitan Melbourne were approached to provide information on their respective street tree populations. Where available, data from individual municipalities on population, area, and total street length were also collected. Of the 31 municipalities surveyed, 23 had undertaken some form of street tree inventory or audit. These individual data sets were combined into a single database. Data queries were then undertaken to obtain a range of information. A total of 922,353 trees, comprising 1127 taxa, were captured in this superset of data. Australian native plants made up the majority of the trees with 60% of the total. Of the Australian native taxa, wattles (*Acacia* spp.), gums or eucalypts (*Eucalyptus* spp.), paperbarks (*Melaleuca* spp.), bottlebrush (*Callistemon* spp.), and Queensland brush box (*Lophostemon confertus* [R. Br.] Peter G. Wilson and Waterhouse) comprised 394,730 individuals (43% of all trees). Of the exotic taxa, *Prunus* spp. were the most common with 86,227 individuals (9% of the total). Queensland brush box was the most common taxon surveyed with 61,959 individuals. Purple-leaf cherry plum (*Prunus cerasifera* Ehrh. 'Nigra') was the most common exotic taxon with 35,402 individuals. An analysis of the diversity of this population showed that it meets a set of minimum diversity criteria apart from the dominance of the Myrtaceae at the family level.

Key Words. Biodiversity; Street Tree History; Street Tree Inventory; Street Trees.

E. Thomas Smiley, Lisa Calfee, Bruce R. Fraedrich, and Emma J. Smiley

Comparison of Structural and Noncompacted Soils for Trees Surrounded by Pavement..... 164

Abstract. Trees in areas surrounded by pavement often have inhospitable rooting environments, which shorten their useful life expectancy. This trial was established to compare five different soil treatment options under pavement. Snowgoose cherry (*Prunus serrulata*) and Bosque lacebark elm (*Ulmus parvifolia*) were planted into 5.4 m³ (189 ft³) of medium containing compacted soil, gravel/soil mixture, Stalite, Stalite/soil mixture, or noncompacted soil and covered with concrete. A variety of growth and health parameters were measured after 14 months. It was found that there was more trunk diameter growth with the noncompacted treatment than the Stalite and Stalite/soil treatments; more twig growth in the noncompacted and gravel/soil treatments than all others; higher relative chlorophyll rating in the noncompacted treatment than all others; and more root growth in the noncompacted treatment (elms only). Suspended pavement over noncompacted soils provided the greatest amount of tree growth and health and should be considered when designing urban planting sites for trees.

Key Words. Biobarrier; Bosque Lacebark Elm; CU Soil; Geotextile; Planting pits; *Prunus serrulata*; Skeletal Soil; Snowgoose Cherry; Soil Compaction; Stalite; Structural Soil; Suspended Pavement; Suspended Sidewalks; *Ulmus parvifolia*; Urban Plaza; Urban Tree Planting.

Kathleen L. Wolf and Nicholas Bratton

Urban Trees and Traffic Safety: Considering U.S. Roadside Policy and Crash Data..... 170

Abstract. In the mid to late 20th century, U.S. transportation agencies focused on traffic planning and design practices intended to achieve high levels of traffic capacity and safety for roads at lowest cost. Intangible values of the roadside such as community character and environmental systems were often overlooked, including the urban forest. Context Sensitive Solutions is a U.S. national policy intended to better incorporate local community values into transportation planning processes and products. The starting point for community-based roadside design is adequate research. This study analyzed national traffic collision data to address concerns about urban trees and traffic safety, including crash incidence and severity. Distinctions of urban and rural conditions were explored using descriptive, comparative, and predictive analysis methods. The findings acknowledge the serious consequences of tree crashes but distinguish urban/rural situations. Circumstances of tree crashes in urban settings are not well understood. Conclusions address future applications of flexible transportation design. The clear zone philosophy has been widely applied in rural settings but may need modification to better incorporate community values in urban design. Future research needs include testing of trees as a mitigation technology in safe roadside design and risk assessment as a community expression of value.

Key Words. Context Sensitive Solutions; Risk; Roadside; Safety; Transportation; Urban Forestry.

Bryant C. Scharenbroch and John E. Lloyd

Particulate Organic Matter and Soil Nitrogen Availability in Urban Landscapes 180

Abstract. Toward developing nitrogen management in amenity tree care, we studied soil organic matter, microbial biomass, and carbon and nitrogen mineralization in an attempt to characterize the plant available nitrogen under a variety of landscape management conditions. Fine particulate organic matter (POM) fractions were significantly correlated with microbial biomass, carbon mineralization, and nitrogen mineralization (R^2 values ranging from 0.42 to 0.89). These urban landscapes were assigned a site quality index based on landscape age and management practices. Fine POM, microbial biomass N, and N mineralization were significantly and positively correlated with the site quality index (R^2 values of 0.86, 0.90, and 0.84, respectively). We propose that with refinement and further testing, a fine POM measurement can be used to accurately predict soil nitrogen availability in urban landscapes. This research shows that urban landscapes are quite variable in terms of nitrogen availability. As a result of this variability, we recommend that urban landscapes be assessed on a per-site basis for proper nitrogen management.

Key Words. Microbial Biomass and Activity; Nitrogen Mineralization; Particulate Organic Matter; Soil Nitrogen Availability.
