ARBORICULTURAL ABSTRACTS

NATURAL REVEGETATION OF INDIGENOUS ROADSIDE VEGETATION BY PROPAGULES FROM TOPSOIL

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Road construction degrades large areas of indigenous vegetation. Better understanding of ecosystem restoration after degradation will require development and assessment of improved restoration techniques. The potential of natural revegetation based on propagules from topsoil as a restoration technique to achieve succession toward indigenous vegetation is not fully understood and accepted as an alternative method for vegetation establishment. The aim of this study was to evaluate this restoration technique by comparing different topsoils with respect to their potentials for revegetation and to describe the early succession on these topsoils by recording change in vegetation cover and the number of species. The study road RV23 is situated in southeast Norway and runs mainly through mixed, mostly coniferous forest. The topsoil (the upper 30 cm) was removed before road construction started, stockpiled during the construction period, and then redistributed on the road verge afterward. In 1999, 10 macroplots of 25 m^2 were placed randomly on selected topsoils of different qualities, to represent the soil variation in the study area. The soil quality varied from organic-rich to organic-poor soils. Each macroplot contained four l m^2 mesoplots in which the species composition was recorded in 2000 and 2001. Univariate statistical tests were applied to reveal change in vegetation cover between macroplots within 1 year and between years 2000 and 2001. Furthermore, statistical tests were used to reveal the change in single species frequencies between the study years. Two years after deposition of topsoils, the vegetation cover was generally satisfactory from an aesthetical point of view. However, the variation in vegetation cover and species composition was considerable on different topsoils, reflecting both the local variation of the indigenous vegetation and the soil quality. A total of 121 species of vascular plants were recorded in all 10 macroplots, although not more than 59 species were found in one macroplot. Species composition and single-species frequencies changed considerably from the first year to the second. Among the 61 species that were recorded in more than five mesoplots, the frequency of 16 species increased and the frequency of 10 species decreased significantly ($P < 0.05$). Most of the decreasing species can be considered as weed species and are not represented in the present indigenous vegetation, while most of the increasing species are. The vegetation change from 2000 to 2001 apparently represents the first steps in a succession toward an ecosystem dominated by species of the indigenous vegetation. (Urban For. Urban Greening 2004. 3:29–37)

BARRIERS AGAINST WEAR AFFECT THE SPATIAL DISTRIBUTION OF TREE SAPLINGS IN URBAN WOODLANDS

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In order to maintain indigenous, self-regenerating tree populations in urban woodlands, it is essential to identify factors affecting the survival of tree seedlings and saplings. In densely populated areas, intensive recreational use may cause considerable wear of the vegetation and soil and decrease the total number of saplings. At the same time trees, high stones and other structural elements in a woodland patch can act as natural barriers and give shelter against wear. Hence, we hypothesized that with an increasing amount of wear, a greater proportion of tree saplings survive and thus are found close to these natural barriers. We tested this hypothesis with observational data and described the microhabitat associations of different sapling species in detail to define the most favorable or unfavorable microhabitats. We recorded the microhabitats of saplings and randomly chosen points in 30 medium-fertile *Picea abies* dominant woodlands in and near Helsinki, Finland. The description included location in relation to physical objects (stones, trees, topography, etc.), other saplings, vegetation, and canopy. We then compared the sapling microhabitats to those available (the random points). Our results suggest that the microhabitat associations of saplings change with increasing wear: *Sorbus aucuparia, Populus tremula, Rhamnus frangula, Picea abies*, and *Acer platanoides* saplings more often grew close to natural barriers (obstacles, 30 cm high excluding other saplings), the first three showing a statistically significant response to wear in logistic regression models. The saplings were able to grow in a variety of microhabitats, but the species also differed in their microhabitat associations. In general, saplings grew in groups, and, in worn sites, the grouping was more pronounced. With increasing wear, the saplings associated more positively with trees, canopy cover, and lush vegetation. (Urban For. Urban Greening 2004. 3:3–17)

CARBON DIOXIDE REDUCTION THROUGH URBAN FORESTRY: GUIDELINES FOR PROFESSIONAL AND VOLUNTEER TREE PLANTERS
E. Gregory McPherson, E. Gregory and James R. Simpson

Carbon Dioxide Reduction Through Urban Forestry—Guidelines for Professional and Volunteer Tree Planters has been developed by the Pacific Southwest Research Station's Western Center for Urban Forest Research and Education as a tool for utilities, urban foresters and arborists, municipalities, consultants, nonprofit organizations, and others to determine the effects of urban forests on atmospheric carbon dioxide (CO_2) reduction. The calculation of CO_2 reduction that can be made with the use of these Guidelines enables decision makers to incorporate urban forestry into their efforts to protect our global climate. With these Guidelines, they can report current and future CO_2 reductions through a standardized accounting process; evaluate the cost-effectiveness of urban forestry programs with CO_2 reduction measures; compare benefits and costs of alternative urban forestry program designs; and produce educational materials that assess potential CO_2 reduction benefits and provide information on tree selection, placement, planting, and stewardship. (Gen. Tech. Rep. PSWGTR-171. Pacific Southwest Research Station, Forest Service, USDA, Albany, CA 237 pp.)

"BOUTIQUE" FORESTRY: NEW FOREST PRACTICES IN URBANIZING LANDSCAPES
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The owners of small forests are potential clients for professional forestry services and important constituents who can affect the future of forests and forestry. Unfortunately, many owners of small forests are wary of foresters, and many foresters are cautious about practicing forestry on small forests. Nonetheless, we find encouraging evidence that a growing number of forestry professionals are forging positive and profitable relationships with these landowners. Interviews with private forestry consultants, forestry organization leaders, and public foresters, as well as with the landowners themselves, reveal opportunities and constraints for working successfully with this new clientele. Among the findings: Boutique forest owners are willing to conduct forest management activities to improve their properties. (J. For. 2004. 102(1):14–19)

TRENCH INSERTS AS LONG-TERM BARRIERS TO ROOT TRANSMISSION FOR CONTROL OF OAK WILT
By A.D. Wilson and D.G. Lester

Physical and chemical barriers to root penetration and root grafting across trenches were evaluated for their effectiveness in improving trenches as barriers to root transmission of the oak wilt fungus in live oaks. Four trench insert materials were tested, including water-permeable Typar and Biobarrier and water-impermeable Geomembrane of two thicknesses. Systemic fungicide treatments of trees immediately outside of trenches also were tested. In the first several years following trench installation, an abundance of small adventitious roots commonly formed from roots severed by trenching. These roots provided opportunities for initiation of root grafts across trenches in subsequent years. Although trench inserts did not significantly improve trenches during the first 3 years following trench installation, water-permeable inserts did effectively improve the performance of trenches beyond the third post trenching year, when trenches are normally effective, and extended trench longevity indefinitely. The water-permeable inserts were more effective root barriers because they did not direct root growth from the point of root contact. The water-impermeable materials, however, did tend to direct root growth around these barriers, leading to the development of new root graft connections and associated oak wilt root transmission across the trench. The additional cost of trench inserts above trenching costs was justified in urban and rural homestead sites, where high-value landscape trees required more protection and additional retrenching costs were avoided. (Plant Dis. 2002. 86:1067–1074)