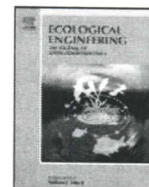


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Short communication

The use of non-dormant rods as planting material: A new approach to establishing willow for environmental applications

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ABSTRACT

In this trial we tested a new planting technique for willows used in environmental applications such as green structures in urban settings. Three commercial willow clones were planted in spring 2008 at different periods as non-dormant woody rods. Comparing the main growth parameters at the end of the season, we found that planting date may affect plant establishment depending on the clone. Based on our results, the use of non-dormant willow material collected and planted in spring is possible in our environment with several different clones. Best results were obtained with *Salix viminalis* (Sv 5027), which can be planted with a delay of about one month without showing any significant decrease in biomass production or survival rate.

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1. Introduction

In 2008, half the world's population was living in urban areas, and by 2030, there will be almost 5 billion city dwellers on this planet (UNFPA, 2007). This surge in urban population is likely to negatively affect the quality of the environment in many ways (air and soil pollution, noise, etc.). Among the various approaches to improving the quality of the environment while respecting a philosophy of sustainable development, phytotechnology is one of the most promising. The term "phytotechnology" refers to the use of plants to remedy environmental problems. This includes the use of green structures (often made with living plants), which have been shown to reduce pollution and improve the aesthetic value of the environment, thereby gaining widespread social acceptance (Labrecque and Teodorescu, 2005a). Willows, among other plants, have been shown to be suitable for a wide range of phytotechnology applications (Kuzovkina and Volk, 2009). These may involve the phytoremediation of soils polluted with organic contaminants and heavy metals (Pulford et al., 2002), on-site treatment of landfill leachate (Bialowiec et al., 2007), wastewater treatment (Perttu and Kowalik, 1997; Truu et al., 2009), erosion and sediment control (Wilkinson, 1999; Parkyn et al., 2005; Pezeshki et al., 2007) and noise or snow attenuation fences.

In Quebec (eastern Canada), several willow application projects have utilized fast-growing short-rotation woody crops (SRWC) for bioenergy purposes (Labrecque and Teodorescu, 2003, 2005b; Labrecque et al., 1994). Other studies have used willows produced in SRWC for a range of environmental applications including phytoremediation (Labrecque and Teodorescu, 2005b; Labrecque et al., 1995, 1998). Recent findings show that the establishment of urban green structures such as sound barriers, snow fences and wind breaks along highways and streets could be suitable for most urban areas of Quebec and similar regions (Labrecque and Teodorescu, 2005a). All these techniques are based on planting 1–3 m-long unrooted dormant rods aged between 1 and 3 years into 0.6–1 m deep trenches in an upright position over appropriated wooden frames that provide the structure's shape. In such cases, the rods are harvested during winter and kept in cold storage at a constant temperature (0–4 °C) until planting. This method has been used in Quebec and Ontario for many years, consistently resulting in good plant establishment and survival rates. However, because the production costs associated with refrigeration and other aspects of this technique are often rather high, alternative solutions are still being investigated. One possible solution would be to harvest willow stems (non dormant) in spring, then plant them promptly on the project site. However, no information regarding success of such an approach has been reported in the literature to date. In addition, to ensure both quick establishment and a high success rate, data on the optimum timing of the harvest of rods and planting is essential but unfortunately also lacking.

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