

Plenary Session I Abstracts

Developments in SRC Willow R & D in Northern Ireland, UK

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In Northern Ireland, UK, there have been Research and Development programmes on Short Rotation Coppice (SRC) willow since the mid 1970s. Much of the early work was on genotype selection and agronomy and this still continues. There are extensive *Salix* spp. genotype evaluation trails, including one planted in 2004 which incorporates fifteen genotypes from the US breeding programme. Rust (*Melampsora epitea*) still continues to be a significant problem on certain genotypes and the planting of mixed plantations, incorporating at least six diverse genotypes has become standard commercial practice. The potential of SRC willow to be used for waste management of effluents and sludges is slowly being realised. The local water utility, NIWater has been working with AFBI to set up a number of pilot scale projects, and they recognise that this may be a cost-effective and environmentally acceptable solution to numerous small-scale, inefficient waste-water treatment works. The application of nutrition rich organic wastes has raised issues of nutrient management in the context of European and UK legislation, and in particular the Nitrates Directive. Northern Ireland also has soils which are high in phosphorus, which frequently can become the limiting factor to obtaining consent to apply sludges etc. to agricultural land. Harvesting, chipping and drying to produce a consistently high quality fuel can be expensive and energy demanding. In NI most of the wood chip is being used to fuel small to medium sized boilers (100 - 750KW) which require a uniform dry (< 20% moisture) chip. During the past winter 2009 / 10 there have been prolonged periods of unusually cold weather which have made drying more difficult and expensive. Comparisons have been made between the harvest and chip method which then requires artificial drying and a whole stem harvester approach. Following harvest the stems will dry naturally to less than 30%. While savings are made by reducing drying costs the stored stem are often difficult to manipulate into an appropriate chipper. Within a newly opened Environment and Renewable Energy Centre (EREC) at the AFBI Hillsborough site willow wood chip has been compared to other biomass sources including forest brush, pine log chips and miscanthus. As well as assessing the relative calorific values of the various types of wood, measurements have been made on flue emissions. One of the biggest challenge to be addressed in N. Ireland is the development of a robust supply chain which gives farmers confidence to plant SRC willow and users confidence to install boilers etc. The added value obtained by diverting effluents and sludges to willow is important, but there is still much work to be done in convincing the water utilities that this is a cost-effective and environmentally sustainable approach.

Keywords: *Salix*, harvesting, bioremediation

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Subject Area: Production Systems and Operations

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Digging Into the Costs of Short Rotation Coppice Crops in Canada

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Bioenergy plantations are still in their infancy in Canada. Despite significant scientific efforts on the subject over the past several decades adoption of plantation approaches is minimal. This should not be surprising. The use of plantation-based sources of biomass is actually in its infancy even in parts of the world famous for its innovation.

In this paper we set out important details relevant to the economics of plantation-based sources of biomass. Although economic attractiveness may not be the only criteria for widespread adoption, it clearly is driving factor. Our work in collaboration with practitioners from different parts of Canada examines biomass production costs from short rotation coppice plantations established specifically for the purposes of bioenergy production in Canadian conditions. Our assessments also include regional variation of growth rates due to climatic suitability and heterogeneity of local site conditions. We present four different production costs and their effect on break even chip and carbon prices at farm gate.

Keywords: short rotation coppice, hybrid willow, economics, carbon sequestration

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