

STSM - COST ACTION FP 1301

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Host: Swedish University of Agricultural Sciences, September 2014

Management and implications of willow Short Rotation Coppice (SRC)

Background

In Sweden, the first commercial plantations of willow were established in 1980's, but the expansion period was 1991-1996. Willow has been cultivated in agricultural land for production of biomass for energy, but there are other uses besides biomass that makes willow interesting. This culture can be used as vegetation filters to treat and utilize municipal and industrial wastewaters, municipal sludge and landfill leachate and also for soil phytoremediation [2,3,4]. There are more than 25 years of experience in willow SRC in Sweden and the know-how of this can be used by other countries starting now with willow SRC production.

Purpose of the STSM

This STSM was focused on increasing the know-how on: operational management of willow SRC, evaluation of biomass productivity and phytoremediation capacity, assessment of economy issues of willow SRC

Activities

During my stay (04-13 September 2014), there were no establishment of experiment due to the period (autumn), but all the management practices for SRC (soil preparation, weed control, planting, fertilization, harvest) was discussed in detail with people involved in research projects dealing with these matters. A number of SRC plantations belong to the Department of Crop Production Ecology which I have visited. A visit to a 80 hectare plantation in Enköping area have been done. The plantation is being irrigated with municipal wastewater, and the farmer Herman Arosenius was explaining the different details of this phytoremediation project.

At the same field, a demonstrative application concerning biometric observations in order to obtain allometric equation was done.



According to the objectives of this STSM, a number of projects with different focus have been presented during my short stay at the department of Crop Production Ecology from several members of the staff:

- phytoremediation pot experiments where the impact of different kinds of waste waters on willow growth are investigated – Helen Legeby
- the relation between planting occurrence and weed control – Monika Welc
- nutrient and water use efficiency in willow – Stefanie Hoerber
- allometric equation and connection to biomass and -leaf area index- Stina Edefeldt

The evaluation of economy issues of SRC was another objective of this STSM. Fertilization costs of SRC in Sweden are ca. 18% of all cost categories (establishment, weed control, fertilization, harvesting, transport, brokerage, winding up, administration and overheads). When

applying waste residues such as wastewater or sludge to SRC, fertilization costs are reduced and increase biomass production offers economic profit and also environmental advantages [1,5].

On 4 September, a poplar-related workshop took place at the Department of Crop Production Ecology. I had the opportunity to participate to an excursion to poplar fields in Krusenberg which is located in Uppsala area.

Also, in this period I participated to a 25% PhD seminar with title “Effects of integrated pest management (IPM) on the population dynamics of perennial weeds species *Cirsium avense* (L) Scop.”



Description of the main results obtained;

In Romania the use of willows to produce biomass for energy are only at the beginning, but the management is or can be quite similar as in Sweden Drought tolerant material will be probably needed in Romania, but the Swedish breeding programme are now focusing on such issues with the ambition to develop willow clones that will be suitable for drier climates.

Better knowledge on how to estimate biomass with a combination of destructive and non-destructive methods was obtained. Furthermore, all information on the ongoing research and experience on the different management issues and the phytoremediation projects were really valuable.

Future collaboration with the host institution

Future collaborations between SLU and USAMVB will be built based on the needs for future willow implementation in Romania and the current experience in Sweden, in a form of an EU application possibly including other neighboring to Timisoara countries/areas.

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Approved by the host:

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