

Poster Exhibition Friday

32 - Perspective of short rotation forestry for sustaining society and environment

KG II - HS 2121 (Uni Freiburg)

IUFRO17-1936 Establishing Short Rotation Coppice on Marsh-Grassland

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Abstract: In 2013 and 2014, the Bavarian State Institute of Forestry set up experimental plots of short rotation coppice on grassland. The aim of the project was to establish poplar-SRC plantations without ploughing and tilling, and without using herbicides. Furthermore, productive SRC plantations were needed to supply the estate administration's heating system with woodchips.

The analysis of the collected data shows that the establishment of SRC plantations on grassland cannot succeed without weed control. By contrast, a bio-degradable foil used carefully to eliminate weed competition will ensure the success of the plantation. The cultivating of the planting rows, especially in combination with mechanical weed control, increases the survival rate of the cuttings too. On the other hand, conventional SRC plantations, in which the soil was ploughed and tilled prior to planting and moderate use was made of herbicides, showed higher survival rates for the cuttings and a higher yield in the first few years.

As alternatives to the foil and cultivating of the planting rows to preempt weed damage, the project tried out the planting of one- and two year-old poplar live stakes, and black and grey alder were planted. Both methods are more costly, but were successful. As natural trees, black and grey alder do of course also have a higher ecological value on these sites of considerable importance in terms of nature conservation.

Bio-Energy, Woodchips, SRC

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IUFRO17-3642 Eucalyptus grandis trees growth: Effects of nutrition and water availability and interactions with the environment in a prolonged drought period

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Abstract: In the context of climate change, survival and productivity of eucalyptus plantations are affected by prolonged drought periods. We evaluated the effects of forest nutrition (with K and Na compared to control) and water availability, and their interactions, in a real prolonged drought scenario (occurred in 2014) on the growth of *Eucalyptus grandis* trees in Brazil. In a split-plot design installed in June 2010, we evaluated trees submitted to two water regimes (without rainfall exclusion and with 37% rainfall exclusion) and three fertilizer supplies (K, Na and control). The stem diameter increment was measured every 15 days with dendrometer bands and total height, every 6 months in the period from 40th to 61st month. Soil moisture was analyzed weekly and precipitation and temperature daily. The results indicated that nutrition with K showed a higher growth rate; with Na, trees had an intermediate growth rate between K and control treatments. With the artificial exclusion of 37% of throughfall there was a negative effect on the increment growth of K fertilized trees; but in the control and Na treatments the rainfall exclusion showed no significant effect until 58th month. Rainfall influenced significantly the increment growth of the trees, followed by the minimum temperature and soil moisture. K and Na showed interaction with precipitation according to seasons: during dry season, by reducing the growth of the tree trunks with Na and its stoppage with K, and during the rainy season, with increasing growth in diameter and height of the trunk for both K and Na, compared with the control. It is shown the importance of including K in basic fertilization for higher productivity of *Eucalyptus* forest plantations, however in regions that are more arid and with a greater risk of prolonged drought, potassium and sodium could increase the drought effect.

Climate change, Water deficit, Forest nutrition

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IUFRO17-2512 Growth rate variations of Eucalyptus camaldulensis: a comparison between systems - monoculture and silvopastoral system

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Abstract: RIGHI in research developed since 2009 has proposed a three-dimensional agroforestry systems (AFS) model in order to provide a greater canopy exposure to solar radiation and higher growth. In this sense, a controlled planting time sequence would provide a controlled canopy roughness. This study aimed to analyze the *Eucalyptus*' DBH (diameter at breast height) and biomass increase rates in a silvopastoral system (SPS) related to its monoculture. The experiment had four randomized blocks containing three treatments each: 1. Witness (monoculture); 2. SPS2 with distance between rows of 24 m and; 3. SPS3 with distance between rows of 42 m. The trees were planted in October/2011 being annual inventories performed from 2015 to 2016. Monocropped trees presented an incremental DBH rate of only 1.42 cm.tree-1.year-1. In contrast, trees in SPS2 presented an increase of 1.94 cm.tree-1.year-1 and of 2.56 cm.tree-1.year-1 in SPS3. That means *Eucalyptus* in SPS3 grew 80% more in diameter compared to those in monoculture. Regarding biomass, trees in monoculture increased by 49 kg.tree-1.year-1. Trees in SPS2 presented an increment of 99 kg.tree-1.year-1 while in the SPS3 presented a growth rate of 128.5 kg.tree-1.year-1 an increase of 161% more than those in monoculture. Trees in SPS(2 and 3) presented a tremendous increase in DBH and biomass accumulation compared to those in monoculture. Planting trees in SPS is a way to produce them with a larger DBH in shorter time increasing timber value for the same volume.

production; agroforestry; trunk diameter; biomass

BOOK OF ABSTRACTS

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