ABSTRACT BOOK

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Poster Exhibition Friday

60 - Open Session

KG II - HS 2121 (Uni Freiburg)

IUFRO17-129 **Relations between gas exchanges and variation of foliar temperature of young Tachi-Branco plants (Sclerolobium paniculatum) submitted to water stress**

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Abstract: A study was made about the relations between leaf temperature variation associated to water stress on the gas exchange of young tachi-branco plants (*Sclerolobium paniculatum* Vogel) plants, a fast growing native species from the Brazilian Amazon region with potential use for energy production. The study was carried out with acclimatized seedlings for four months in a greenhouse at Embrapa Amaz ônia Ocidental, Manaus, Brazil. After this period, they were submitted to three water regimes (maintained irrigated, irrigation suspended for eight and 14 days) and leaf temperature variation, obtained by means of the portable photosynthesis meter. The rate of liquid assimilation of CO_2, leaf transpiration, stomatal conductance and water use efficiency, were evaluated. There was a reduction in the liquid CO_2 assimilation rates in function of the elevation of leaf temperature and suspension of irrigation. After eight days of irrigation suspension the reductions of the liquid CO_2 assimilation rates were 62, 65, 75, 58, 50 and 64% and at 14 days were 80, 85, 85, 84, 86 and 93% compared to plants maintained irrigated at temperatures of 25, 30, 35, 40, 45 and 50 °C, respectively. The physiological behavior of gas exchanges of *Sclerolobium paniculatum* showed variations both in relation to the effect of leaf temperature and irrigation suspension.

photosynthesis, hydric stress, Amazonia

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IUFRO17-3212 **Rooting space, soil water availability, sapflow and leaf area development regulate climate response of trees on boreal reclamation sites**

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Abstract: Surface mining for belowground resources in the boreal forest results in severe disturbance of the forest ecosystem, requiring landscape and soil reconstruction before forest cover can be reestablished. Often these landforms are constructed using overburden materials considered unsuitable for plant growth, which are capped with subsoil and top soil materials that can sustain a forest cover. These sites create unique opportunities to study the impact of rooting space on ecophysiological variables in plants. Soil capping depth influences rooting space and with that resource availability. As forests and leaf area develops, water availability could become a limiting factor. In this study we link sap flow and tree productivity over two growing seasons with soil moisture availability and rooting space. We explored climatic variables as the drivers of water availability and tree performance. White spruce (Picea glauca) and trembling aspen (Populus tremuloides) were planted on a reclaimed slope in 1999 treated with two different soil capping depths (35 and 100 cm cap) placed over saline-sodic overburden material. Trees along the slope were equipped with heat ratio method sap flow sensors over the 2014 and 2015 growing seasons. Varying tree characteristics and growth were measured, as well as soil moisture availability and weather variables. Slope position and capping depths affected the trees' wood volume and leaf area production over the two growing seasons. Sap flow over the whole growing season followed trends similar to the soil water availability for both species. Interestingly trembling aspen had greater water uptake at the top of slope, which was not observed for white spruce. Diurnal cycles of sap flow during dry-down and wetting-up periods provide a general and species specific patterns of water uptake during the growing season and highlight potential consequences of reclamation practices on tree performance.

Sap flow;boreal forest;mining;aspen;white spruce

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IUFRO17-1425 **Soil security of a tropical montane rainforest in a changing world**

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Abstract: Tropical montane forests are mainly concentrated on higher elevations (> 1000 masl) with low mean annual temperatures of 10-18 °C and high precipitation rates. They boast thick organic soils overlying mineral layers and contain rich montane biodiversity in terms of flora and fauna. Currently, the increasing population and the improvement of gross income of locals have led to expansion of agricultural lands for food and the development of tourism industry in the highland forests. The changing climate of extreme weather patterns has also caused land erosion due to rainy season and the drying of water catchment areas due to drought. Poor management of highland rainforests has caused flash floods, soil erosion and disasters that have affected the livelihood of locals. Good management practices and innovative strategies are needed to be implemented in order to protect the declining rainforest ecosystem from extinction. Preventive measures include creating buffer zones, terracing, preventing encroachments, monitoring systems, geotextile structures, educating the public and other approaches. The aim of this study is to analyse and provide strategies to conserve tropical montane forests for soil security and sustainability, taken into consideration current economic activities and preventive measures proposed.

tropical forest, threats, conservation, climate