

Water and Nutrients Dynamics in and around Eucalyptus Forests. Part 2

Norio Tase^{1*}, Shin-ichi Onodera², Tsutomu Yamanaka¹, Kenji Tamura¹, HAYASHI, Hisayoshi¹, Takaaki Nihei³, TAKIZAWA, Sachika¹, Seongwon Lee¹, HIRATA, Ricardo⁴, SARAIVA, Fernando⁴, TERADA, Rafael⁴, SHIROTA, Ricardo⁴

¹University of Tsukuba, ²Hiroshima University, ³Hokkaido University, ⁴University of Sao Paulo

Brazil is the biggest eucalyptus forestation country in the world, and 0.6% of a country or 3,500,000 ha is eucalypt forest already. Though there have been several studies reporting environmental impacts of eucalyptus plantation such as over-uptake of water and nutrition, biodiversity loss, volatilized or emitted harmful substances, in Brazil salient issues have not occurred. At first, this project evaluates scientific backgrounds and finds threshold conditions to environmental mal-impacts.

Based on verifying environmental functions of eucalyptus such as uptake of over excessed or contaminated nitrate from groundwater and soil erosion control, sustainable crop producing systems with coupling with eucalyptus plantation in land-use sequences could be proposed.

The study site, Rio Claro, is located 35km north of Piracicaba, Sao Paulo State of Brazil, where sugar cane field and eucalyptus forest are set out sequentially. Piracicaba area is covered by silty sand layers on the undulating peneplain. The annual mean temperature is 21.4 degree C., and average annual precipitation is 1279mm. The year of 2012 has an average annual rainfall though there was quite little rainfall in July through October. The stands of the eucalyptus are about 5 years old and their heights are around 15m. Sets of monitoring wells with 3 to 8 m-depth were installed, and groundwater chemistry is analyzed and water levels are surveyed regularly.

Water chemistry of groundwater, spring water and river water around the study site have relatively less minerals and nutrients, groundwater in the sugar cane fields are affected a little by fertilization, that is relatively high nitrate concentration.

This is partly supported by Grants-in-Aid for Scientific Research, Scientific Research(B) of JSPS, which is very appreciated..

Keywords: Eucalyptus, Land-use sequences, Groundwater contamination, Environmental conservation, Brasil