Nitrogen Mineralization Along a Fertilization Gradient in Hardwood Plantations. (S07-jose113941-Oral)

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Abstract:

The increased demand for wood fiber has resulted in intensive silvicultural practices to increase wood and fiber production from tree plantations in the southeastern US. The intensified management includes irrigation, fertilization, and early weed control. Productivity increases in response to these cultural practices, especially N fertlization, have also been reported in both pines and hardwoods. However, consideration must be given to the possible alteration of nitrogen cycle by the fertilization to minimize adverse environmental consequences. We conducted a field experiment in northwest Florida to examine N mineralization along a fertilization gradient in several fast growing short rotation biomass plantations. The treatments included control, irrigation only, irrigation with 56, 112, and 224 kg N/ha/yr fertilization in six-year-old cottonwood, sycamore, cherrybark oak, and loblolly pine. Nitrogen mineralization was measured on a monthly basis from May 2001 to April 2002 using in situ soil incubation bags. Preliminary results show that the fertilization increased rates of gross nitrogen mineralization in soil. The rate of nitrogen mineralization was positively related to the initial content of nitrogen. There was a marked seasonal pattern in monthly rates of mineralization related to the soil temperature and moisture. The influence of fertilization on nitrogen mineralization was more pronounced in cottonwood and cherrybark oak stands than in sycamore and loblolly pine stands.

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