Productivity of Second Rotation Loblolly Pine Plantations in Response to Intensive Culture. (S07-kelting170307-Oral)

Authors:

- R.Rubilar* - *North Carolina State University*
- H.L.Allen - *North Carolina State University*
- D.L.Kelting - *North Carolina State University*

Abstract:

The impacts of harvesting, site preparation, and fast growing pine plantations on nutrient cycling and sustained productivity have been of broad concern in the southern USA. However, research efforts commonly speculated about long-term effects based solely on short-term assessments of nutrient removals. We report the eighteen-year development of a second rotation loblolly pine plantation investigating the effects of harvesting type (CT:complete tree, ST:stem-wood only), site preparation (CB:chop/burn, SH:shear/pile/disk, SC:scalping) and two cultural treatments (WC:weed control/insecticide, NC:none) on nutrient capital. After burning, between 220-490 kg/ha of total N were lost (63-93%) from forest floor (FF) but only CB treatments showed significant lower FF reductions. In addition, CB treatments increased mineral soil P availability by 28-35 kg/ha. After eighteen years, only WC showed significant differences ($p<0.01$) in growth and yield. However, declines in early WC gains and growth in all treatments suggest site nutritional limitations. Biomass analyses suggest P as the major limiting element. Unexpectedly, this nutrient shortage was not related to large FF nutrient removals.

Corresponding Author Information:

Daniel Kelting
North Carolina State University
3108 Jordan Hall
Raleigh, NC 27695

phone: 9195134044
fax: 9195156193
e-mail: dan_kelting@ncsu.edu

Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 9:00 am

Keywords:
nutrient pools, nutrient availability, sustainability, long-term study