Carbon Storage in Fertilized and Unfertilized Loblolly Pine Plantations on Contrasting Soils. (S07-kelting165315-Oral)

Authors:

- Z.Holmes - *North Carolina State University*
- D.L.Kelting - *North Carolina State University*

Abstract:

Fertilization and soil textural class may function independently and/or collaboratively to have a positive effect on a forest ecosystem's carbon (C) storage. This effect often results from greater biomass production in response to fertilization. The magnitude of the increase in C storage should vary by soil texture, as finer textured soils have more C retention capacity. The effects of fertilization and/or soil texture on C storage were evaluated in an 11-year-old loblolly pine plantation that compared 45N+50P kg/ha at planting versus no fertilization on well drained sand and clay soils. Fertilization increased standing volume, forest floor C, and soil C (surface 50cm) by 47, 23, and 13%, respectively, averaged across sites. The response to fertilization varied by soil texture, with standing volume increasing by 53 and 40% on the clayey and sandy soils, respectively. Although the sandy soil had the highest relative increase in soil C with fertilization, the clayey soil had a greater increase on an absolute basis. Fertilization should increase C storage and the magnitude of increase will vary depending on site-specific factors like soil texture.

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

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