

## New Book Investigates History of Southern Soil

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According to *Understanding Soil Change*, a new book coauthored by soils researchers at the University of Georgia and Duke University, the human-altered soils of the former "cotton belt" have made the Southeast one of the most productive pine-growing regions in the United States.

"Given the importance of soils, there are surprisingly few long-term soil sites in which we can look at soil change in a scientific way, and I think it's a very important missing piece of science's ecological understanding," says Daniel Richter, a professor of forest soils and ecology at Duke University.

To fill in some of that missing information, Richter and his colleague Daniel Markewitz analyzed data from their field laboratory in South Carolina's Calhoun Experimental Forest.

There, the two documented how the forest's soils were altered when "primeval" woodlands were converted into farmland and then eventually allowed to regrow as pine forests.

The Calhoun Forest, says Richter, is particularly valuable for its record of how four decades of tree growth have altered soils in a number of important and sometimes surprising ways.

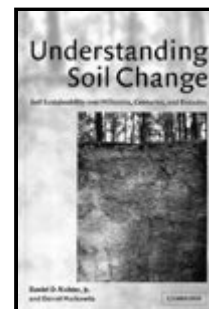
"At the Calhoun Experimental Forest, mineral-soil supplies of phosphorus and potassium—two nutrients found in the fertilizers applied when the land was used to grow cotton—have kept pace with forest uptake demands as slowly soluble minerals have contributed to plant-available phosphorus and potassium," says Richter. "However, soils have acidified substantially during the regrowth of pine, and plant-available soil calcium has been rapidly depleted. Although soil acidification is in part caused by acid deposition, the old field Calhoun soils are also readjusting to a more acidic, infertile condition that was probably common to most upland soils in the southeast prior to the coming of cotton."

According to Richter and Markewitz, such insights into the ways humans have transformed the soils of the southeast over the past two centuries can provide valuable lessons to land managers.

"Although past agriculture altered southeastern soils more than modern forest practices, forestry demands a lot from soil too," Richter and Markewitz wrote. "Historically, many of us land managers have thought of soil as being rather slow to change and even static in contrast with our view of forest trees, which we may perceive as dynamic and constantly changing."

This research, the coauthors write, has made such sentiments obsolete.

"This study has shown us that over just a few decades, within a single rotation, and certainly within a career or lifetime, that soils are responsive to our interventions in significant and



*Understanding Soil Change*, a new book by researchers from Duke University, discusses the history of the US southeastern soils and their relationship to forestry.

complex ways."

What that means, according to Richter and Markewitz, is that more research is necessary.

"We need to pay a lot more attention to soil as the ultimate source of long-term forest productivity," they wrote. We have a lot to learn about how management affects soil."

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