EMERGING RESEARCH FRONTS - 2009

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Tristram O. West talks with *ScienceWatch.com* and answers a few questions about this month's Emerging Research Front Paper in the field of Agricultural Sciences.

Article: Soil organic carbon sequestration rates by tillage and crop rotation: A global data analysis
Authors: West, TO;Post, WM
Journal: SOIL SCI SOC AMER J, 66 (6): 1930-1946 NOV-DEC 2002
Addresses: Oak Ridge Natl Lab, Div Environm Sci, POB 2008, Oak Ridge, TN 37831 USA.
Oak Ridge Natl Lab, Div Environm Sci, Oak Ridge, TN 37831 USA.

SW: Why do you think your paper is highly cited?

The paper quantitatively estimates soil carbon sequestration rates following changes in cropland management. Potential changes in soil carbon stocks differ with land management, environmental variables, and across climate regimes. Analyzing existing data from previously published literature helped confirm that changes in soil carbon did exist and were indeed measurable.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

The paper estimates soil carbon sequestration rates as a function of crop rotation, tillage intensity, and time. New methods were described that allowed for synthesis of disparate data. These methods allowed for the synthesis of data related to changes in soil carbon.

In research disciplines where experimental field work occurs, there tends to be a large amount of data published on related and sometimes non-related issues. The compilation and analysis of all existing and relevant data surrounding a specific issue rarely occurs. I am convinced that the compilation and analysis of already existing data can address many current problems that have remained unsolved.

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SW: Would you summarize the significance of your paper in layman's terms?

The paper provides statistical evidence that changes in soil carbon, associated with changes in crop rotation and tillage intensity, can be estimated over large regions.

SW: How did you become involved in this research and were any particular problems encountered along the way?

The project began under the Dept. of Energy Consortium for Carbon Sequestration in Terrestrial Ecosystems, and was conducted in order to compare and contrast

experimental results related to changes in cropland soil carbon.

The primary problem encountered was that the analysis required long-term field experiments. While long-term experiments existed, many of the experiments were not developed to track changes in soil carbon and soil carbon was not measured on a regular basis. Because of inconsistent measurements, obtaining a timeline of soil carbon change following changes in management was only possible when combining data from all existing experiments.

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SW: Where do you see your research leading in the near future?

Accounting for changes in soil carbon has led to carbon accounting for many different components in agricultural management, and also carbon accounting outside of terrestrial ecosystems. There is a need to integrate carbon accounting methods across time and space scales in order to quantify national carbon dynamics in a manner that enables us to understand and manage sources and sinks of carbon.

SW: Do you foresee any social or political implications for your research?

Social implications currently result from the adoption of carbon sequestration or carbon emission reduction practices. These practices are already taking place. Policies to increase soil carbon and to monitor, record, and verify changes in the sources and sinks of carbon dioxide are currently being negotiated on a regular basis.

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