

Editorial

The theme of the papers in this issue addresses the potential for using farmland and forest management for long-term removal of significant quantities of carbon dioxide (CO₂), a major greenhouse gas, from the atmosphere. The rising levels of CO₂, primarily from energy production worldwide, have been linked to global warming that, if allowed to continue, may eventually adversely impact food supplies and create major environmental hazards such as increased severity of drought and wind erosion, and rising ocean levels. Long-term sequestration of C in agriculture by crops and trees, through its retention and conversion in the soil to organic matter, helps to enhance soil quality that, in turn, increases plant productivity and decreases erosion by wind and water. It is well known that the organic matter content of soils can be increased through selective crop and plant residue management along with reduced tillage or, better yet, no-till farming practices. The same holds true in the management of agroforestry and forest systems. Sustainable agriculture, which is ecologically based and well known for its environmental enhancement, is strongly dependent on practices that promote C conservation in the soil; thus, C sequestration is a major benefit of these farming systems.

These five papers, with their lead-off introduction, explore various prospects for increasing C sequestration in agricultural, agroforestry and forest systems through changes in traditional management practices under diverse land-use settings. Considerable emphasis is given to the incentives required under different economic conditions to induce land managers to participate in an effective C sequestration program. These include a comparison of payments to US farmers to change management practices to conserve C on lower- versus higher-producing soils, and payments that may induce farmers to re-establish forest cover on often flooded bottomlands that have been cleared for marginally yielding soybean production. Two papers from Indonesia deal with the costs of conserving the C sequestered in the remaining pristine and community-managed forests, and emphasize the need for removing current policy disincentives for growing trees. These papers also provide valuable information on C measurement protocols, and, as stated by Carpentier in her introductory paper, 'coverage of . . . the real, additional, verifiable, and permanent issues to qualify as "certifiable emission reduction".' Finally, a paper on the Canadian perspective investigates the effectiveness of several management alternatives for increasing C sequestration on agricultural lands and, if applied, their overall impact on the national economy.

Finally, we wish to express our thanks and appreciation to Dr Chantal Line Carpentier for her outstanding leadership in organizing this special issue, for her own lead introduction paper, and to the authors of the five papers that have presented some of the most advanced conceptual and real-world perspectives on the effectiveness and feasibility for sequestering C on agricultural and forestry lands.

Professor Robert I. Papendick
Editor-in-Chief
Email: papendick@wsu.edu

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