GPFARM Cycling of Crop Residues. (S06-shaffer143522-Oral)

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Abstract:

Crop residue dynamics on the soil surface and within the soil are extremely important to agriculture from the standpoints of water availability and conservation, nutrient cycling and availability, erosion control, carbon sequestration, maintenance of soil organic matter, weed control, and soil temperature management. The Great Plains Framework for Agricultural Resource Management Decision Support System (GPFARM DSS) is a windows application that can simulate crop residue cycling along with environmental and economic impacts of strategic management decisions on a farm or ranch. GPFARM simulates decomposition of residue carbon (C) and nitrogen (N) to form soil organic matter and mineral forms of C and N. In this study, GPFARM validation runs tested crop dry matter production and surface residue mass for various dryland crop rotations and tillage systems using the Alternative Crop Rotation (ACR) study data from the ARS Central Great Plains Research Station (CGPRS), Akron, CO. Rotations included various combinations of winter wheat, corn, proso millet, sunflower and fallow under no till or reduced tillage. Results indicated that residue production by the crops and mass decay of residues on the soil surface were adequately simulated by the model.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 3:45 pm

Keywords:

carbon, nutrient, soil organic matter, nitrate