Role of Carbon and Nitrogen as Ecological Drivers in Sustainable Cropping Systems. (A08-sanchez162948-Oral)

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Abstract:

In this study we investigated if managing C and N through fertilization, pesticide applications, and varying levels of residue diversity would impact productivity and environmental quality. Four agronomic management types ranging from conventional to transition organic were applied to two cropping systems (a corn-corn-soybean-wheat rotation and continuous corn). The continuous corn plots under Conventional and Integrated Fertilizer managements received the lowest level of residue diversity. In contrast, diversity was highest in the rotation plots of the Transitional Organic and Integrated Compost that used cover crops. Specific objectives of this study were to determine if diverse systems induce higher soil C and N concentrations than less diverse systems, to determine whether these systems differ in their ability to provide N to a growing crop, and whether they affect yield and NO3 leaching loss. Agriculture systems that enhance C and N recycling such as crop rotations, cover crops, reduced tillage, and application of organic amendments are likely to increase the quality of soil and environment without reducing yields.

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