Role of Microbial Biomass  
Carbon and Nitrogen  
in Soil Quality\(^1\)

Charles W. Rice  
*Kansas State University*  
*Manhattan, Kansas*

Thomas B. Moorman  
*USDA-ARS National Soil Tilth Laboratory*  
*Ames, Iowa*

Mike Beare  
*New Zealand Institute for Crop and Food Research*  
*Christchurch, New Zealand*

Microbial biomass in soil is the living component of soil organic matter. Many models of organic matter formation include microbial biomass as a precursor to the more stable fractions of organic matter (Parton et al., 1987). Because as much as 95% of the total soil organic matter is nonliving and, therefore, relatively stable or resistant to change, decades may be required to observe a measurable change in soil organic matter. Microbial biomass has a turnover time of <1 yr (Paul, 1984) and therefore, responds rapidly to conditions that eventually alter soil organic matter levels. Thus, the size of the microbial biomass may indicate degradation or aggradation of soil organic matter (Powlson et al., 1987; Sparling, 1992).

As an active component of soil organic matter, soil microbial biomass is involved in nutrient transformations and storage. Nutrients released during turnover of the microbial biomass are often plant available. In native terrestrial ecosystems, where internal cycling of N predominates, microbial biomass is responsible for transforming organic N to plant-available forms. Agricultural systems that rely upon internal sources of N require microbial biomass and its activity to supply N to the crop. In fertilized systems, microbial biomass can be a significant source and sink of N. Carbon contained within the microbial biomass is

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