The economic, social, and environmental circumstances of the 1970s and 1980s have compelled American agriculture to assess the sustainability of its land use and production systems. Different perspectives, however, have yielded varying ideas as to what constitutes a sustainable management system. For many, sustainable management means stability in production and profitability. For others, the intrinsic goal of sustainable management is to protect and enhance the natural resource base, both biotic and abiotic. For others, maintenance of the social order (e.g., family farm) is essential for sustainability. In short, the concept of sustainability is multidimensional. Thus, sustainable management requires that these and other important concepts must be addressed simultaneously.

Although considerable activity is currently aimed at development and evaluation of sustainable management systems, these efforts are hampered by a lack of agreement on what constitutes credible measures of sustainability. The means to evaluate the sustainability of management systems, both in terms of design and performance, are not yet determined (Larson & Pierce, 1991; Pierce & Larson, 1993). In addition, until measures of sustainability are established, it is not possible to assess how the various components should be weighted in determining sustainability. The latter may deal, for example, with the question of how farm profitability issues should be tempered by environmental concerns and vice versa.

Soil quality is a critical component of sustainable agriculture. While the term soil quality is relatively new, it is well known that soils vary in quality and that soil quality changes in response to use and management. The soil system is characterized by attributes that both range within limits and functionally interrelate. Therefore, these attributes can be used to quantify soil quality.