Soil organic matter consists of compounds or fractions that vary widely in susceptibility to decomposition (Fig. 7–1). The decomposability of organic matter fractions likely varies along a continuum, but current methods identify at least two fractions of organic matter that decompose at different rates. The fractions may be categorized as either “actively cycling,” or “resistant to decomposition” during one decade.

Actively cycling fractions of soil organic matter receive inputs of fresh plant and microbial residues and are susceptible to rapid decomposition. These fractions release mobile compounds that may function as plant nutrients, water pollutants, precursors for more stable soil organic matter, or precursors for gases that are released to the atmosphere. Consequently, changes in the actively cycling fractions may foreshadow shifts in the quantity and overall composition of whole soil organic matter.

Humans have a profound influence on terrestrial ecosystems through management, which alters the structure and function of ecosystems to achieve specific goals. In a traditional sense, management refers to agronomic and silvicultural practices designed to optimize production in agriculture and forestry. In a broader sense, management also includes: interconversion of forest and agricultural land, range management, mitigation of pollution, and management of parks and nature preserves. Holling (1986) views management activities as external pressures that elicit changes in ecosystem structure and function, thereby exposing the inner workings of the ecosystem. Comparative studies of soils under contrasting management regimes help to develop sound management practices and to elucidate the inner workings of soils and terrestrial ecosystems. The distinction between