

Chapter 4

Soil Incubation Studies

Soil quality cannot be measured directly because it is a broad, integrative, context-dependent concept. Instead, we analyze a variety of proxy measurements that together provide clues about how a soil is functioning as viewed from one or more soil-use perspectives. These measurements are called soil quality indicators. A set of low-cost, readily measured indicators that accurately predict soil functions of interest is called an efficient indicator set. Indicators of soil quality may include characteristics of soil solids, soil solutions, soil atmospheres, vegetation, and other soil biota, and possibly even economic analyses of land-use or ecosystem services.

Although the quantity and quality of data may differ, the process of soil quality evaluation follows the same basic steps regardless of the method used: identification of soil use issues followed by indicator selection and interpretation. More specifically, to select appropriate indicators, one must first determine the land-use objectives, and then indicators must be proposed, measured, and assessed across a representative set of land and management practices. An efficient indicator set should be used to inform land management decisions at specific sites and then be used to monitor trends in soil function after changing practices and over time.

For the determination of soil enzyme activities such as protease, cellulase, amylase, and invertase, 5 g of soil sample was placed in each test tube (25×200 mm) and 60% water-holding capacity was maintained with the addition of the required amount of distilled water into soil and tubes were kept in an incubator at 28 ± 4 °C by replacing water during incubation. Triplicate soil samples with/without effluent discharges were drawn after 0, 10, 20, 30, and 40 days of incubation to determine soil enzyme activities.