

In the interplay of the soil and the atmosphere, the soil can be both a contributor to and a recipient of the impacts of climate change. Land management has generally resulted in considerable depletion of soil organic matter and the release into the atmosphere of such radiatively active gases as carbon dioxide, methane, and nitrous oxide. Global climate change, to the extent that it occurs, will strongly impact all soil processes. At this time, the task of soil management should be to restore soil organic carbon in order to enhance soil structure and fertility and to help counter the atmospheric greenhouse effect. Management of nutrients is an important aspect of maintaining and enhancing soil. Adoption of improved nutrient management practices is essential to adapt to the changing climate, and meeting the needs of growing populations for food, fodder, fuel and fabrics. Efficient use of nutrients from commercial fertilizers, manure or other sources reduces input costs for crop production and minimizes the risk of nutrient loss to ground and surface water. Goals of effective nutrient management are to provide adequate plant nutrients for optimum growth and high-quality harvested products, while at the same time restricting nutrient movement out of the plant-root zone and into the off-farm environment. Soil testing and crop nutrient requirements are the cornerstone of nutrient management. Improved nutrient management optimizes all aspects of nutrient cycling. It attempts to achieve tight nutrient cycling with synchrony between nutrient demand by the crop and nutrient release in the soil, while minimizing losses through leaching, runoff, volatilization and immobilization. Improved fertilizer efficiency represents an economic savings for the producer and will reduce the amount of excess N fertilizer that can be lost to the atmosphere or to surface or groundwater.