SOIL HEALTH IN AMERICAN SPORTS FIELDS AND GOLF COURSES

M. Barnes[1], B. Hopkins[1]
[1]Brigham Young University

ABSTRACT

Healthy soils are essential for sustaining the world's ecosystems and maintaining human lifestyles. The adoption of biological, chemical, and physical analyses to assess soil health is a relatively new concept with a paucity of scientific work assessing how well these tests can predict and influence soil health. Golf and sports turf are arguably the most intensively managed soil systems in the world, including fertilizer and pesticide use. Excess fertilizer and pesticide application can cause extreme environmental degradation, with concerns regarding soil health. Soil samples (105) were collected between September 2021 and April 2022 from various golf courses and sports fields, as well as farm fields, non-sport urban, and undisturbed native soils (forests, deserts, beaches, and golf sand traps). The samples were then analyzed for chemical, biological, and physical properties, including pH, micronutrients, electroconductivity, aggregate stability, potentially mineralizable nitrogen, autoclave-extractable protein, beta glucosidase, and texture. General linear statistical models were then used to evaluate these differences in soil properties based on field type. Sport, golf, farm, and urban lawn soils were microbially active as indicated by reasonable levels of PMN; which is in contrast with sand soils with no plants that had very low PMN. However, football, baseball, intermural, and urban lawn had somewhat lower PMN than forest soils; while soccer, softball, and golf were not lower. Sport, golf, and urban lawn soils had significantly higher soil test P (STP) than non-fertilized sand and forest soils. Sport (other than softball) and urban lawn soils had significantly higher STP than farm soils. Sport, golf, farm, and urban lawn soils did not have lower stable aggregates than forest soils, although farm, urban lawn, and intermural did have a lower fraction of stable to unstable aggregates. The data collected, and comparisons made, will add to scientific and community understanding of soil health as a function of land management.