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*What Is the Most Cost-Effective Way to Reclaim Desertified Soil?*

Soil desertification is a common problem in arid, semi-arid, and over grazed lands around the world. Desertified soil, composed of almost all sand, lacks silt and especially clay components that allow soil to retain water. In order to regain desertified soil to growing condition, it not only must hold moisture but also must be replenished with organic material and nutrients. Starting with sterilized sand (mimicking a worst-case desertification), silt and clay components were added until the soil reached sandy-clay loam consistency. Varying levels of common soil additives, peat and sheep manure, were added to the soil. Pine ash, naturally supplied in Colorado, was also tested as an additional additive to each of the various concentrations. Legumes, housing nitrogen-fixing bacteria, are often planted in virgin soil in order to build its nitrogen levels. Clover was chosen as the primary plant to be grown in the newly reformed soils. After two weeks' growth in various soil compositions, the clover plants were removed and, mirroring natural succession and a real desertification reclamation project, the soil was replanted with grass seed. After three weeks' growth, the grass was removed from the soil. The dry mass, stalk height, and root length were taken for both the clover and grass as measurements of growth. This growth was then compared to the cost that each soil composition took to produce. The most cost-effective soil, producing the most growth per dollar, was determined to be the soil containing 1.0% peat and pine ash.