Abstract

The study on influence of eucalyptus plantation on soil properties especially nitrogen mineralization and nitrification had been carried out during 1990-1992. In the area of poor lateritic soil, the physical and chemical properties were changed in slow rates caused by forest fire in the dry season and high soil erosion in the rainy season. The soil texture was poor and mainly sandy soil in the surface and clayey soil in the deeper horizon. It may induce high surface runoff in the eucalyptus plantations.

The chemical properties including acidity, cation exchange capacity, organic matter, total nitrogen, extractable phosphorus, potassium, calcium and magnesium had a little bit change as compared with the soil in adjecent forest. The soil fertility was increased slowly in the eucalyptus plantations.

The rates of nitrogen mineralization were similar to those in the adjecent dry dipterocarp forest. They had a trend of increasing with stand age. The relative rapid rates of nitrogen mineralization in the low-fertile soil under eucalyptus stands may cause nitrogen loss in the form of nitrate (NO_3-) into the stream water. The rapid rates of nitrification, varying 60-95%, produced high nitrate in the soil. Therefore, disadvantages of eucalyptus plantation in the dry-site poor lateritic soil in ecological aspect are that it increases soil fertility in very slow rates and may have high nitrate loss into the stream water. The nitrate is generally known as a pollutant in the water if it contains in high concentration.

In the highland watershed where the soil is deep and fertile called reddish brown lateritic soil, the soil properties in a 40 years old eucatyptus plantation at Doi Suthep-Pui were similar to the soil in the climax hill evergreen forest. The rates of nitrogen mineralization were also similar, but the nitrification rates were relatively higher. Eucalyptus plantation in the fertile soil may have small effects on the soil if it has high nutrient retension.