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EFFECT OF FIRES ON SOIL PROPERTIES AT HANTHANA HILL

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Forest fires have become a regular phenomena due to activities of man as shifting cultivation and intentional burning. In Hanthana these have become frequent events during the dry season. Eventhough information is available on the regeneration of forests after occurrence of fires, its effect on soil properties has not been studied in detail. Studying the effect of fires on soil properties will help in understanding forest regeneration patterns and facilitate management of natural and plantation forests. Therefore, the objective of this study was to study the effect of fires on selected soil physical and chemical properties in a grassland and pinus plantation.

This study was conducted in pinus and grassland area of Hanthana hill in 1998. The soil profiles of these two sites were characterized to identify the major horizons. Soil properties as soil acidity, nitrogen, potassium, phosphorus, organic matter and aggregate stability were measured. The area was burnt and similar measurements were conducted with soil samples obtained just after fire and three months after the occurrence of the fire.

Soil pH increased after burning in the surface soil and was more pronounced in the pinus plantation where it increased from 4.6 to 5.1. Soil nitrogen decreased with burning while the available P increased in the 0-15 cm layer. The organic matter content decreased with burning.

Aggregate stability was given more emphasis in this study as it is an indication of susceptibility or resistance to soil erosion in these slopy lands. The mean weight diameter of soil aggregates obtained after dry sieving was higher in the grassland (2.9 mm) than in pinus (1.81 mm) showing higher resistance to wind erosion in grasslands. The mean aggregate size decreased significantly with burning in pinus plantation increasing the susceptibility to erosion further but the aggregates developed to the original size in one month after burning. The wet aggregate stability also decreased with burning in pinus plantation showing increased susceptibility to erosion by water. The dry and wet aggregate stabilities did not show any significant difference with burning in the grassland area.

This study reveals that burning increased susceptibility to soil erosion by wind and water in pinus plantations for a short period. This was mainly related to the soil organic matter. Susceptibility to soil erosion was not effected in the grassland with burning. In addition there were significant losses of soil nitrogen with burning.