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## The Role of Indigenous Highland Tree Species on Soil Fertility Management

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### Abstract

Nutrient cycling is a key process in forest ecosystems as it maintains the availability of nutrients for vegetation growth. Several studies have been reported on the influence of trees on soil fertility improvement however, there is much less information on indigenous high-altitude tree species regarding their ameliorative role on soil physical and chemical properties. *Hagenia abyssinica* (Bruce) J.F. Gmel. is one of the highland native tree species of Ethiopia with tremendous values. The study was conducted in order to assess soil quality indicators (physical and chemical properties) under this tree. Soil samples were collected beneath *H. abyssinica* trees growing in the dry Afromontane forests of Ethiopia. Soil analysis was carried out in the laboratory following a standard procedure. Soil texture was characterised as clay, silt clay, or silt clay loam with pH ranged between medium to slightly acidic type. The study found out that *H. abyssinica* trees were capable of enriching the soil with N, and organic C. Superb soil organic matter content, exchangeable base forming cations, and CEC was exhibited. This suggested that the studied soils can act as reservoirs for basic elements due to high organic matter content which resulted from greater volume of litter inputs, and high biomass production under trees. High rate of addition of litter may facilitate temporary nutrient pool in the surface soils which has important implications for long-term productivity of land. Provided that the litter cover is maintained, the organic matter will be retained consequently, the essential nutrients required by plants could be derived from this organic matter. Therefore, it can be recommended to integrate this tree species of great potential in agricultural land for fertility management. Given the low soil fertility status of the farms in the Ethiopian highlands associating such important trees is vital. Moreover, knowledge on such important tree species encourages farmers to incorporate them in their farmland. Therefore, it is imperative to take measures to protect *Hagenia* from being deforested.

**Keywords:** *Hagenia abyssinica*, soil fertility improvement, soil physical and chemical properties