

Aluminium Release from Acidic Forest Soil following Deforestation and Maize Cultivation in Ghana, West Africa

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Abstract

Acidic tropical soils often have high Al^{3+} concentrations in soil solutions, which can be toxic to plants and, thereby, reduce agricultural yields. This study focuses on the impact of deforestation and cultivation on the short and long-term Al geochemistry of acidic soils in Ghana, West Africa. Site-specific investigations were made at two sites covered with forest and one site cultivated with maize (*Zea mays* L.). The capacity of soil to resist acidification was investigated in a leaching experiment and the corresponding release of aluminium quantified. Field results revealed a significant acidification and Al mobility in the root zone of the cultivated site as compared to the forest sites. The leaching experiment showed that further acidification would significantly enhance Al-release and, consequently, the presence of Al^{3+} in soil solution. It is concluded that deforestation and cultivation in the study area has resulted in increasing levels of Al^{3+} and a lowering of the soils capacity to resist further acidification. This may be critical in relation to land-use management and long-term agricultural productions.