

Fate of Microelements Applied to a Tropical Peat Soil: Column Experiment

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Abstract

Lack of microelements is a major problem in crop production in tropical peatland. For their efficient application, the fate of copper (Cu), iron (Fe), manganese (Mn), and zinc (Zn) in a Histosol was investigated in a 3-month column experiment. Leaching of Cu, Fe, Mn, and Zn accounted for 2, -2 to 7, 28 to 32, and 21 to 23% of the amounts applied, respectively, in both the flooded and upland soils. The microelement application enhanced the leaching of calcium (Ca), potassium (K), magnesium (Mg), sodium (Na), and phosphorus (P). Replacement of exchangeable cations by the microelements was suggested in the successive extraction of elements from the soils after incubation. Under the upland conditions, 31–33% of the Cu and Fe increased in soil was extracted with diethylenetriaminepentaacetic acid/triethanolamine (bound to humus), whereas 26–31% of the Mn and Zn increased was exchangeable. Extractability was smaller under the flooded conditions for all the microelements, suggesting that fertilization in the dry season is more effective.