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EVALUATION OF CHEMICAL EXTRACTANTS FOR THE ESTIMATION OF AVAILABLE ZINC AND COPPER

V. Pavanasasivan, N. Selvarajah *and* **K. A. Nandasena**
(*Department of Agricultural Chemistry, University of Peradeniya*)

A greenhouse pot experiment was conducted to evaluate five chemical extractants, viz : 1N NH_4 OAc (pH 4.6), 0.01M EDTA (pH 8.6), 0.01M $CaCl_2$, 0.05N HCl and 0.2M $MgSO_4$ for 'available' Zn and Cu in paddy soils. Nine soils from different parts of the country, containing varying amounts of native Zn and Cu were used. Each pot contained 3 kg soil, and two paddy varieties (Bg 94-1 and Bg 400-1) were grown under lowland conditions with four plants per pot. The pots were arranged on a completely random design with four replicates.

Soils were extracted three times—prior to flooding (dry), and four and eight weeks after transplanting (wet). One plant per pot was harvested during each of the latter two soil sampling times and analysed for its Zn and Cu contents. Soil extractable Zn and Cu were correlated with the plant contents by regression analysis.

All the extractants gave significant correlation between soil Zn and plant Zn concentration. However, NH_4OAc and HCl gave the highest r value (0.9385 and 0.9800 respectively). Because of the ease of preparation and extraction, 0.05N HCl is recommended for Zn. The Zn extractable from dry soil was an equally good indicator of plant available Zn as that from wet soil.

Copper extracted from dry soil by any of the extractants did not correlate significantly with plant Cu concentration, but the total Cu uptake at this stage showed good correlation with HCl and EDTA ($r=0.383$ and 0.359 respectively). Plant copper concentration during the second harvest, however, correlated significantly with Cu extractable from dry soil by NH_4OAc and EDTA ($r=0.352$ and 0.316 respectively).