

# Characterization of Boron in some Selected Soils of Red and Laterite Zone of West Bengal

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**Abstract**—The element boron, which is absorbed by plants as borate, is unique among the essential elements in that a narrow range in concentration can mean the difference between plant deficiency and plant toxicity. The present dissertation work was undertaken to study the characterization of boron in some selected soils of red & laterite zone of West Bengal. 15 series of soil sample were collected randomly and analyzed to study the status of B and its different fractions (including total and available B) and the relationship between different B fractions and their relationship with soil properties. The available B (hot water extractable) recoveries from all the selected soils are in low to deficient ranges ( $0.28 \pm 0.21$  mg kg<sup>-1</sup> soil) and total B recoveries were ranged from  $30.14 \pm 13.87$  mg kg<sup>-1</sup> soil. The recoveries of different B fractions from the selected soils were observed within ranges of 0.12-0.82 (readily soluble B), 0.21-0.50 (specifically adsorbed B), 0.32-0.88 (oxide bound B), 0.16-0.98 (organically bound B) and 9.36-42.32 (residual B) mg kg<sup>-1</sup>. The recoveries of the hot water extractable B was observed to be significantly correlated with the recoveries of total B, residual B, specifically adsorbed and readily soluble B. Other B fractions in soil like readily soluble B, specifically adsorbed B, oxide bound B, organically bound B, residual B and total B were significantly correlated with each other in major occasions excepting the relationship of Org\_B with HWS\_B, RS\_B and Sp\_B. The HWS\_B was significantly and negatively correlated with soil pH, positively with soil organic matter, available N, P and K. The RS\_B was significantly and positively correlated with pH, organic C, clay, available P and negatively with amorphous Al, available Fe.

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*The recoveries of other B fractions were significantly and positively correlated with pH, clay, available N,P,K and negatively with Mn<sub>2</sub>O<sub>3</sub>, available Mn and Fe in most of the cases.*

**Keywords:** *Boron, readily soluble B, specifically adsorbed B, oxide bound B, organically bound B, residual B.*