

Research Article

Spatial variability of fertility status of soils of upper Brahmaputra valley zone of Assam

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Received : 21.06.2014; Revised : 18.05.2014; Accepted : 29.05.2014

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Summary

A study of the fertility status of the soils of Upper Brahmaputra Valley Zone of Assam representing Jorhat, Sivasagar and Golaghat district was made during 2010-11 using GPS and GIS technique. About 10 per cent villages were selected from each block of each district and a total of 1339 geo-referenced surface (0-15 cm) soil samples were collected from selected identified farmer's fields. The collected soil samples were analysed for available major nutrients and micronutrients. The available nitrogen (N) ranged from 178.16-439.04, 178.16-344.96 and 184.56-398.56 kg ha⁻¹ for Jorhat, Sivasagar and Golaghat districts, respectively. Similarly, available P₂O₅ and K₂O varied from 14.81-39.49 and 102.63-244.18 kg ha⁻¹, 10.54-34.21 and 101.30-241.20 kg ha⁻¹, 14.28-36.38 and 138.76-316.07 kg ha⁻¹ for Jorhat, Sivasagar and Golaghat districts, respectively. In respect of micronutrients, the DTPA-extractable Iron, Manganese, Zinc and Copper ranged from 10.68-168.56, 3.52-52.39, 0.26-0.88 and 0.22-10.88 mgkg⁻¹, respectively for Jorhat district, 11.25-129.15, 3.52-52.39, 0.25-2.68 and 0.26-12.08 mgkg⁻¹, respectively for Sivasagar district and 23.45-201.90, 8.96-30.68, 0.23-1.25 and 1.09-10.88 mgkg⁻¹, respectively for Golaghat district. Hot water soluble boron (HWSB) varied from 0.29-0.95, 0.29-0.96 and 0.21-0.63 mgkg⁻¹ for Jorhat, Sivasagar and Golaghat districts, respectively. Irrespective of all the districts, soils exhibited deficiency in N, P₂O₅ and K₂O content ranging from 6.0 to 16.0 per cent for N, 11.0 to 15.0 per cent for P₂O₅ and 14.0 to 17.0 per cent for K₂O. Based on the critical levels of micronutrients, all soils were adequately supplied with DTPA extractable Fe, Mn and Cu. However, zinc was found to be mostly deficient nutrient in all these three districts followed by boron. Available zinc was found about 34 per cent, 23 per cent and 34 per cent deficient in Jorhat, Sivasagar and Golaghat district, respectively, whereas, in case of boron, it was recorded as 21 per cent, 17 per cent and 49 per cent in Jorhat, Sivasagar and Golaghat district, respectively. Correlation studies indicated that major nutrients showed positive and significant correlation with pH, while significant negative correlation was observed with micronutrients. Highly significant positive correlation was observed in between organic carbon and N, P₂O₅ and K₂O (r=0.231**, 0.120*, 0.385** for Jorhat district, r=0.487**, 0.142**, 0.159* for Golaghat district and r=0.150*, 0.175*, 0.108* for Sivasagar district). Similar significant positive trend was also recorded in between micronutrients and organic carbon.

Key words : Soil Macro, Micro nutrients, Assam soil

How to cite this article : Basumatary, A., Baruah, Rashmi and Medhi, B.K. (2014). Spatial variability of fertility status of soils of upper Brahmaputra valley zone of Assam. *Asian J. Soil Sci.*, 9(1): 142-148.