



Micronutrient status in erosion prone Basmati rice growing soils of Jammu

AJAI P. RAI¹, ASIM K. MONDAL², P.K. RAI³ and VIKAS SHARMA⁴

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ABSTRACT

A study on DTPA-extractable micronutrients (Zn, Cu, Fe and Mn) was undertaken from different Basmati rice growing locations of Jammu district and their relationship with various physiochemical properties of the soils was also studied. The DTPA-extractable available micronutrients in these soils showed wide variation. The DTPA-extractable, zinc, copper iron and manganese in the surface (0-15cm) varied from 0.02-1.18, 0.05-3.67, 2.40-40.76 and 1.14-11.13 with mean values of 0.25, 0.82, 21.30 and 4.34 mg kg⁻¹, respectively. The available micronutrient Cu, Zn and Fe showed significant correlation with pH (-0.288**, 0.197 and -0.273). The available micronutrient Fe correlated significantly with organic carbon (0.257**) whereas the available Mn showed significant correlation with CEC (0.206*). Other physio-chemical properties of soil showed non-significant correlations with either micronutrients during the study. Zinc deficiency was observed in most of the surface samples (about 96%), whereas 10% soils were found deficient in available copper. However, DTPA-extractable Mn and Fe in the studied soils were above the critical limits.

Keywords: Copper, DTPA extractable, Iron, Manganese, Zinc, Rice

INTRODUCTION

The relatively minor problem of soil micronutrient deficiency at the beginning of the green revolution three decades ago is a factor to reckon with in present times in sustaining the productivity of rice. Proper management of the rice-wheat cropping system is a key to minimize crop yield reduction induced by micronutrient deficiency. There is a general lack of awareness among farmers on micronutrient deficiency problem.

Continued emphasis on maximization of Rice food grain production without appropriate management practices from a shrinking land resource base will result in further depletion of micronutrient reserves. The simplest solution to alleviate micronutrient deficiency is the application of micronutrient fertilizer to the crop. Micronutrient deficiency is considered as one of the major causes of the declining productivity trends observed in rice growing countries. Sodic, upland soils and calcareous coarse-textured soil with low organic matter content suffer from Fe

deficiency, besides Zn and Cu deficiency. Studies suggest that rice cultivars usually do not experience deficiency of B and Mo in majority of soils.

Micronutrients play a vital role for the growth and development of crops. Availability of micronutrients is influenced by their distribution in soil and other physico-chemical properties of the soil (Sharma and Chaudhary 2007). Thus, knowledge of status of micronutrient and their interrelationship with soil characteristic is helpful in understanding the inherent capacity of soil to supply these nutrients to plant. Besides, soil characteristics, land use pattern also plays a vital role in governing the nutrient dynamics and fertility of soils (Venkatesh *et al.* 2003).

The total micronutrient content of soils is of limited value to plant growth and responses to their application. To match the levels of micronutrient in soil with plant requirement, their available contents in soils is determined. The available micronutrient status of soils is also highly variable. Soil properties exercise a considerable influence on the availability of micronutrients.

¹Asstt. Professor, ²Professor, ⁴Associate Professor, Division of Soil Science and Agricultural Chemistry, Faculty of Agriculture, Main Campus, SKUAST-J, Jammu-180009 (J&K); ³Asstt. Professor, KVK (SKUAST-J), R.S. Pura, Jammu