

EFFECT OF APPLICATION OF ZINC AND COPPER ON THE YIELD OF RICE

To study the effect of omission of micro-nutrients on sustainable crop yields and also to assess the need for these under an intensive cropping programme, treatments with micro-nutrient fertilizers of Zn and Cu were in-

cluded in a long-term fertilizer experiment (LTFE) at the Regional Agricultural Research Station, Pattambi, Kerala under the All India Coordinated Research Project in 1997. The experiment was laid out in RBD consisting

Table 1. Grain yield of rice in long term fertilizer experiment, kg ha⁻¹

Treatments	Kharif, 1998	Rabi, 1998	Kharif, 1999	Rabi, 1999
T ₁ 50 % NPK	1254	2124	216	2877
T ₂ 100 % NPK	1004	2160	2328	3059
T ₃ 150 % NPK	1080	2200	2158	2784
T ₄ 100 % NPK + zinc sulphate @ 10 kg ha ⁻¹	1434	2262	2465	2951
T ₅ 100 % NPK + copper sulphate @ 10 kg ha ⁻¹	736	2136	2240	3022
T ₆ 100 % NP	1106	2190	2067	2782
T ₇ 100 % N	1230	2404	2420	3224
T ₈ 100 % NPK + FYM @ 5 t ha ⁻¹	1488	2486	2935	3307
T ₉ 50 % NPK + FYM @ 5 t ha ⁻¹	1546	2080	1954	3224
T ₁₀ 100 % NPK + <i>in situ</i> growing of <i>Scsbania aculeata</i> green manure crop	1488	2368	2492	3098
T ₁₁ 50 % NPK + <i>in situ</i> growing of <i>Sesbania aculeata</i> green manure crop	1272	2154	1843	3160
T ₁₂ Absolute control	1437	1748	1407	2224
CD (0.05)	—	—	378.60	264.60

of 12 treatments in four replications using the high yielding rice variety Aiswarya. The soil was acidic sandy loam with a content of 0.93 per cent organic carbon. It contained 13 kg ha⁻¹ of available P and 173 kg ha⁻¹ of available K. The initial levels of DTPA extractable Zn and Cu in the soil were 3.7 and 4.1 mg kg⁻¹ respectively. The cropping sequence was rice-rice. For the first crop, the treatments applied were given in the table and for the second crop, organic manures and micronutrient fertilizers were not used. NPK was given as per the package of practices recommendations of the Kerala Agricultural University

(KAU, 1993). The grain yield recorded for the first and second crop seasons in the years 1998 and 1999 were statistically analyzed.

The data presented in the table indicated that the effect of treatments on grain yield was not significant during the first and second crop seasons in 1998 while it was significant in both seasons in 1999. In all the seasons the highest yield was obtained for the treatment with 100 per cent NPK and FYM @ 5 t ha⁻¹ (T₈). Compared to T₈, yield recorded in the treatments with ZnSO₄ (T₄) and CuSO₄ (T₅) was lower in all the seasons. Similar results

were reported by Muralidharan (1992). The general critical limits of DTPA extractable Zn and Cu for deficiency in soil were 0.6 and 0.2 mg kg⁻¹ respectively (Tandon, 1993). Since the initial levels of available Zn and Cu were above the critical limits, their application was

not having much response in a rice-rice cropping system in the rainfed lateritic low lands.

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