

***Research Notes:***

**MICRONUTRIENT STATUS OF SOIL AND LEAF OF COCONUT PALMS  
GROWING ON RECLAIMED MARSHY SOIL**

Soil testing and tissue analysis are the two important tools usually employed for detecting nutrient deficiency in plants. Pisharody (1965) reported that the acid soils of Kerala are adequately supplied with available Mn. Nair (1970) found that the levels of available Cu and Zn in the soils of Onattukara and Kuttanad were satisfactory. But Aiyer *et al.* (1975) observed that 90% of the Kuttanad soils were deficient in available Cu and 50% were deficient in available Zn. Pillai *et al.* (1975) pointed out that Zn was found in significantly higher concentration in root (wilt) free areas of reclaimed soil type.

Contradicting views on micronutrient status of reclaimed marshy areas have been reported. The present study was therefore carried out with a view to assess the micronutrient status of soil and leaf of coconut palms at Kumarakom in Kottayam district.

Soil and leaf samples of 75 coconut palms (var. West Coast Tall) of the age group 30 to 40 years of the Regional Agricultural Research Station, Kumarakom were collected in 1981. Soil samples from a depth of 0 to 50 cm were drawn from the basins of coconut palms and composited giving one composite sample for each palm. Leaf samples were collected from the 14th frond of the palm and only the leaf lamina was taken for analysis (Chapman, 1964). From the soil, B was extracted in the hot water and determined colorimetrically (Jackson, 1958), Fe, Mn, Cu and Zn were extracted with 0.005 M DTPA (Lindsay and Norwell, 1978) determined using atomic absorption spectrophotometer. For the determination of B in leaf, the plant sample was ashed and extracted with 0.1 N HCl while Fe, Mn, Cu and Zn were determined 1:1 nitric perchloric extract of the sample. The range and mean values of micronutrients of soil and leaf are presented in Table 1.

The soils are reclaimed alluvial in nature, the soil reaction being strongly acidic with pH values ranging from 3.3 to 5.8 and percentage of organic carbon varied from 1.15 to 1.54. The DTPA extractable Fe content of the soils varied from 90.40 to 196.06 ppm with a mean value of 143.83 ppm which indicated that the available Fe is plentiful in these soils. In the case of Mn, the range observed was 1.18 to 12.40 ppm with a mean values of 5.02 ppm. Considering the critical limit of 1 ppm (Lindsay and Norwell, 1978) the level of available Mn in Kumarakom soils can be considered satisfactory. This is in conformity with the observations of Aiyer *et al.* (1975) who observed a satisfactory level of exchangeable Mn in Kuttanad soils of Kerala. The level of Zn varied from 1.22 to 3.38 ppm with a mean values of 1.92 ppm. The content of Cu in the soil showed variations ranging from 3.84 to 19.08 ppm the mean value being 7.31 ppm. Judging from the critical limit of

0.8 ppm and 0.2 ppm for available Zn and Cu respectively these soils can be considered sufficient with regard to level of these nutrients. The hot water extractable B in the soils ranged from 0.11 to 0.79 ppm. According to Reisenauer *et al.* (1973) the critical limit of B is 1 ppm.

Table 1

Levels of micronutrients in soil and leaf of coconut palm, ppm  
(Range and mean of 75 samples)

	Fe	Mn	Zn	Cu	B
<i>Soil</i>					
Mean	143.83	5.02	1.92	7.31	0.40
Range	94.40 to 196.06	1.18 to 12.40	1.22 to 3.28	3.84 to 19.08	0.11 to 0.79
Critical limits	4.50	1.00	0.80	0.20	1.00
<i>Leaf</i>					
Mean	249.79	112.99	28.14	21.11	6.06
Range	189.00 to 318.00	82.60 to 121.70	12.20 to 38.80	11.00 to 55.70	traces to 12.65
Critical limits	50.00	60.00	10 to 50	2.5	12 to 40

The content of Fe in leaf varied from 189.00 to 318.00 ppm with a mean value of 249.79 ppm. In the case of Mn, the range observed was 82.60 to 121.70 ppm with a mean of 112.99 ppm. Values for Zn ranged from 12.20 to 38.80 ppm with a mean of 28.14 ppm while Cu levels varied from 11.00 to 55.70 ppm. The B content of leaf varied from traces to 12.65 ppm with a mean value of 6.06 ppm. A comparison of these values obtained for the various nutrient elements with the IRHO critical levels revealed that in the case of Fe, Mn and Cu the levels of these elements in leaf were much above the critical limits while in the case of Zn it is within the level prescribed. In the case of B, the mean value obtained is below the critical level suggested. The soils of Kumarakom area are extensions of the Kuttanad region and consist mainly of clayey reclaimed alluvium fairly rich in organic matter. The high levels of micronutrients except B in leaf obtained in the present study can be attributed to the higher content of these elements in the soil supplied by the organic matter and the strongly acidic and reducing conditions prevailing in the soil which have been congenial for greater dissolution of these elements in soil and their absorption and accumulation in the leaf.

### സംഗ്രഹം

കുമാരകം തെങ്ങുഗവേഷണ കേന്ദ്രത്തിലെ മണ്ണിലേയും തെങ്ങോലകളിലേയും സൂക്ഷ്മ മൂലകങ്ങളുടെ അളവ് പരിശോധിക്കുകയുണ്ടായി. മണ്ണിലെ സൂക്ഷ്മ മൂലകങ്ങളുടെ അളവ് തൃപ്തികരമാണെന്ന് മനസ്സിലായി. തെങ്ങോലകളിൽ ഇരുമ്പ്, മാംഗനീസ്, നാക്, ചെമ്പ് എന്നീ സൂക്ഷ്മ മൂലകങ്ങളുടെ അളവ് തൃപ്തികരമായും ബോറോൺ മൂലകത്തിന്റെ അളവ് കുറവായും കാണപ്പെട്ടു.

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