Annals of Arid Zone 32 (4) 251–252 1993

Short Communications

Distribution of Available Sulphur in Red Loam Soils of Mewar and Their Relationship with Important Soil Characteristics

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With the cultivation of high yielding varieties of crops, intensive and multiple cropping and use of S free fertilizers led to wide spread deficiency of sulphur in vaious parts of India (Kanwar & Mudahar 1985). The response of S application in soils of Rajasthan has been reported by Singh and Sahu (1986). Attempts has been made earlier to estimate sulphur status of some Rajasthan soils (Shukla & Gheyi 1971). The status of available S in soils of Mewar regions (Rajasthan) and its relationship with important soil characteristics are reported in this communication.

One hundered and seven (84 of Udaipur and 23 of Chittorgarh districts) surface soil samples (0-20 cm) were collected and analysed for important soil properties viz. pH, EC, Organic C, $CaCO_3$ available P and K by standard methods (Jackson 1975). Available S was extracted by mono calcium phosphate (500 ppm) and estimated turbidimetrically (Chesin & Yien 1950).

The soils were mildly to moderately alkaline (pH 7.0 to 8.4), mostly non-saline (EC 0.1 to 1.1 dSm^{-1}) and slightly calcareous (0.125 to 3.50% $CaCO_3$). The organic C, available P and K varied from 0.03 to 1.44%, 13.44 to 132.16 kg P_2O_5 ha^{1} and 104.80 to 953.68kg K_2O ha^{-1}, respectively.

The available S content varied from 2.25 to 69.75 ppm in the soils of Udaipur district and 2.25 to 43.75 ppm in the soils of Chittorgarh district. Majority of the soils (85 56%) showed available S content between 6.75 to 43. 50 ppm. Considering 14 ppm S as critical level (Sharma *et al.* 1988), 46% soil samples under study were found to be deficient in available S to crop for optimum growth and yield. The surface soils of Udaipur and Chittorgarh districts were deficient in available sulphur to the tune of 35 and 65%, respectively.

The study revealed that available sulphur content of these soils showed negatively significant (p= 0.01) correlation with pH (r= -0.648) and $CaCO_3$ content (r= -0.508) and was highly positively correlated with organic carbon (r = 0.593), EC (r = 0.377) and available P_2O_5 (r = 0.559). However, significant relationship of available S with K was absent. Shukla and Gheyi (1971), Reddy *et al.* (1985) and Pandey *et al.* (1989) also reported similar relationship.

The stepwise multiple regression analysis indicated that soil characteristics under study (pH, EC, $CaCO_3$ and orgaic C) account for 53.40% variation in the status of available S in these soils. Among these, the pH is the major factor to control availability of S (Table 1). The combined influence

Table 1 *Stepwise multiple regression showing that available sulphur content of soils influenced by different soil properties*

Step	Independent variable involved	Regression equation	R^2
Region as whole			
	pH	170.87 – 19.43pH	0.420
	pH + EC	158.08 – 18.00pH + 4.53 EC	0.492
	pH + EC + Org. carbon	113.39 – 13.29 pH + 3.93 EC + 14.16 Org. carbon	0.533
	Over all	108.72 – 12.47pH + 3.98 EC – 0.91 $CaCO_3$ + 13.52 Org. carbon	0.534

of pH and EC revealed that the variation in available sulphur incresed from 42.0 to 49.20% (Table 1). Thus, combined impact of these two factors, i.e. pH and EC on available S were recorded to the tune of 92.19%. The influence of $CaCO_3$ was negligible on the availability of S which may be due to low content in the soils.

The results reveals that 46% of the soils of Mewar region (Rajasthan) are unable to supply adequate quantity of S to the crops grown in the region.

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(Received June 1993 Accepted October 1993)