

A B S T R A C T

The sulphur status of eight West Indian soils has been investigated. An examination was made of carbon, nitrogen and sulphur relationships. There was a close relationship between organic carbon, total nitrogen and total sulphur and correlations were highly significant thereby indicating that most of sulphur was in the organic form.

All the soils released sulphur when incubated at room temperature (Ca. 30°C). A rapid flush of mineralization of both sulphur and nitrogen took place when some of the soils were incubated in the laboratory. High correlation coefficients between organic carbon and mineralized nitrogen as compared with mineralized sulphur do not support the hypothesis that nitrogen and sulphur are mineralized at the same rate in these soils.

Sulphate-sulphur adsorbed from solutions containing 25 to 200 ppm S fits Freundlich isotherms. The adsorption was highly dependent on concentration for all soils except Montserrat clay. The data also indicated that sulphate retentive soils do not possess adsorption maxima nor definite anion exchange capacities, at least up to 200 ppm S. In desorption studies, the amount of sulphate released decreased with each successive extraction. As much as 20.7 per cent and 49.4 per cent of the initially adsorbed sulphate could be extracted in the first KH_2PO_4 extraction in Montserrat clay and Montreal sandy loam, respectively. The amount of clay, silt + clay and free iron oxide in these soils significantly correlated with sulphate sorption.

Greenhouse studies were made to find the response of pak-choi (Brassica chinensis^{L.}) to added sulphur on West Indian soils. Pak-choi responded to sulphur on all soils. Sulphur deficient plants were stunted and erect in appearance; upper leaves were an abnormal yellow green. Two crops were harvested. Dry matter increased significantly in both crops on all soils at various levels of sulphur application. Per cent yield was highly significantly correlated with per cent sulphur in the first crop. Good correlations were also obtained between L values for soil sulphur and per cent sulphur in both crops.

The amount of sulphur extracted by different procedures from these soils are in the order: $\text{MgCl}_2 < \text{LiCl} < \text{KH}_2\text{PO}_4 < \text{Ca}(\text{H}_2\text{PO}_4)_2 < \text{Water} < \text{Heat soluble} < \text{NH}_4\text{OAc} < \text{Organic} < \text{Total}$. The 10 days incubation test for producing sulphate-sulphur was the most promising in assessing the sulphur status of West Indian soils.