

IMPACT OF CITY WASTE (SOLID) APPLICATION ON SOIL FERTILITY STATUS AND HEAVY METAL ACCUMULATION IN SALINE-SODIC AND SODIC SOILS

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ABSTRACT

Lahore city waste was added @ 300 M g ha⁻¹ to a silt loam (Satghara series, Typic Halorthides) soil to study its effect with time on soil organic matter, extractable Phosphorus (P) and potassium (K) under saline-sodic and sodic conditions. City waste application resulted an increase in soil organic matter (OM) content and extractable P and K concentration. Extractable amounts of P and K decreased 50 per cent after 470 days of waste application while decrease in OM levels was slightly slow and progressive from 5 per cent level to about 1 per cent at the end of the project time. It was also observed that decay of organic materials was slightly slower in saline-sodic soil than in sodic conditions. Plant analytical data revealed high concentrations of cobalt (Co), cadmium (Cd), chromium (Cr) and lead (Pb) in rice plants grown on waste treated fields as compared to non-treated fields.

INTRODUCTION

Annual population growth rate in Pakistan is more than 3 per cent and it is estimated that with this growth rate city waste production increases at the rate of 4.8 per cent (Maung, 1978). Consequently the disposal / management of waste is becoming important issue and serious threat to the environment. Presently conventional way of city waste disposal is filling of low lying areas. The sewage water is disposed off into river or set free on barren lands. No measures are being practiced to process and recycle city waste so that it can be

long term experiment and manure application resulted in large losses of N, increased K levels and availability of P. Hannapel *et al.*, (1964) accounted increased P movement in calcareous soils due to organic matter application. However, city wastes contain not only essential plant nutrients but also toxic substances, including heavy metals (Kurihara, 1978). Therefore, special attention is needed to supervise their uptake by crops.

Keeping these findings in view an effort was made to study the impact of city waste application on a site near Lahore where city waste was applied indiscriminately and in huge quantity and normal rice-wheat rotation was practiced. The purpose was to observe soil organic matter status developed by city waste application, to monitor the levels of extractable soil P and K as a result of decomposition and mineralization of OM fraction, and also, to note the heavy metal contents in project soil and in plants grown on it.

MATERIALS AND METHODS

Study was conducted at a village situated 20 Km North-East of Lahore city in Pakistan on a Typic Halorthids soil (Satghara series), having silt loam texture and average OM contents 0.43 per cent at surface layer (0-15 cm). City waste was transported, stored in bulk heaps during 1989 and was mixed approximately at the rate of 300 M g ha⁻¹ and was evenly distributed at the surface soil and was mixed through ploughing in the surface layer