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Poverty-Driven Dependence on Agricultural Waste Streams: A Challenge for Soil Fertility Management to Smallholder Farmers

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Abstract

Many smallholder farmers in developing countries do not apply sufficient amounts of manure and compost on farmlands. Previous studies identified lack of education, shortage of manure and labour as the main causes. In addition, use for competitive purposes influence farmers' decision to utilise wastes as soil amendment. Thus, the objectives of the study were (i) to quantify partial nutrient balances across different urban farming systems (ii) to investigate competitive purposes of agricultural wastes and farmers' preference for waste utilisation (iii) to identify determinants that influence farmers' decision to use agricultural wastes as fertilisers (iv) to determine willingness of farmers to participate in composting of non-agricultural waste (i.e urban waste). The data were collected from 220 urban farmers in Addis Ababa, Ethiopia. Four categories of urban farmers namely, (i) subsistence farmers growing cereals (ii) vegetable producers (iii) ornamental plant growers (iv) farmers practicing mixed farming were identified using principal component and cluster analysis. Since inorganic and organic fertilisers were applied below the recommended rates, partial nutrient balances were negative for nitrogen (N) and potassium (K) and slightly positive for phosphorus (P) in all farming systems. Use of agricultural wastes for fuel, animal feed and source of income were the main causes for insufficient application of organic fertilisers. Seventy-one percent of farmers preferred to use agricultural wastes as fuel and animal feeds rather than soil amendment. Farmers' experiences with soil fertility issues, farm distance from home, sex, access to extension services and farming strategy were the socioeconomic factors that influenced farmers' decision to use agricultural wastes as fertiliser. Interestingly, about 60% of farmers were willing to apply urban waste compost on their farmlands. Nevertheless, willingness of farmers to contribute money/labour for production of urban waste compost varied significantly ($p < 0.01$) across different farmer categories. Education, access to extension service, land tenure and farmers' perception towards compost influenced farmers' willingness to participate in urban waste composting programs. Therefore, urban waste compost should be considered as alternative soil amendment and we recommend that it is supported through economic incentives or legislation.

Keywords: Competitive use, compost, manure, organic resources, smallholder urban farmers, urban waste