

VERTICAL NUTRIENT FLUXES IN SOILS OF URBAN AGRICULTURE: A STUDY OF N, P, K AND PESTICIDES LEACHING IN BOBO DIOULASSO (BURKINA FASO)

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Urban agriculture (UA) increasingly supplies food and non-food values to the rapidly growing West African cities. However, with its typically heavy use of agrochemicals, untreated municipal waste and sewage as inputs for crop and vegetables production, UA bears severe risks of soil and ground water contamination. This study aims at a consistent quantitative characterisation of vertical transfer of nitrogen (N), phosphorus (P), potassium (K), and pesticides in the soil of different types of UA crop with special emphasis on their seasonal and spatial variation in order to minimize negative side effects on environmental health. The study was carried out in Bobo-Dioulasso with South-soudanian climate type. The following methodology was used: in four representative gardens, some TDR soil moisture probes, together with CTN soil temperature probes installed horizontally at 10; 30 and 60 cm depth were used to monitor rapid changes in soil moisture and total solute concentration. Vertical leaching losses of N, P and K were determined concurrently with the water balance study over 12 months. Leachates were collected with Si-Carbide suction plates, analyzed for total P, N, and K and periodically checked for pesticides residues. The selected sites were equipped below the crops' rooting depth with anion/cation exchange resin cartridges for monitoring the leaching of K, NO₃, NH₄, and PO₄. Four vegetable cultivation crops were evaluated: Tomato, Cabbage, Carrot and lettuce. Three treatments were used: - T100: normal amount of organic and mineral fertilizers (gardener's practice), - T70: 70 % of normal amount of organic and mineral fertilizers, and T0: no fertilization.

The preliminary results shown that the reduction of amount of fertilization didn't significantly affect crop production and that the initial nutrients in soil can support two crop cycles before fertilization. The reduction of the amount of fertilization significantly reduced the amount of N total and K total in soil solute samples collected below the rooting depth (30 cm).