USE OF BIO-ORGANIC MATTER FROM URBAN WASTES TO PREVENT THE LEACHING OF HERBICIDES TO GROUND WATER

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The herbicides terbuthylazine and metolachlor, often applied as mixture, are widely used to control many annual grasses and broad-leaved weeds. Several studies report that both the herbicides have been found in ground water at concentrations above the authorized limits. The aim of the present study was to test the capacity of the soluble (SBO) and insoluble (IOR) fractions deriving from urban wastes of different origin to reduce the leaching of the herbicides by promoting adsorption processes. The urban waste were different origin composts and sludges which humic-like soluble fraction (SBO) was obtained by basic extraction. SBO have shown promise as chemical auxiliaries for a number of technological applications in the chemical industry and in environmental remediation while the solid residue (IOR) of extraction could found useful applications in agricultural and environmental fields. Adsorption studies were performed on a silt loam soil, (pH 7.8, 0.8 % OC) mixed with different amounts (2 to 16 %) of SBO and IOR. Suspensions of samples of amended soil in aqueous solution of the herbicides were equilibrated for 24 h at 25 °C. The amount of herbicide left in solution was determined by LC-MS. The extent of adsorption of both the herbicides on the non amended soil was about 25 % of the applied amount. This value increased at increasing amount of SBO and IOR to up to 80 %. The results confirm that the studied organic materials, exhibiting affinity to both soil surfaces and organic molecules, could improve adsorption of herbicides on soil aggregates, slowing down their release in the soil solution, therefore reducing their dispersion in the environment.

Keywords: terbuthylazine, metolachlor, herbicides