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Effect of organic amendments on aldicarb sorption-desorption and soil-bound residue

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Understanding the behaviour of pesticides in the environment is of great importance for their application and regulation. Therefore this research was carried out to study the sorption-desorption isotherms of aldicarb and formation of the soil-bound residues in three common Egyptian soil types. Also, the effect of different organic amendments; litter compost, sludge compost, animal manure and chicken manure with different rats; 5, 10 and 20 % on sorption-desorption processes was evaluated. Aldicarb was determined by colorimetric analysis at 530 nm. The results of the research indicated that the adsorption isotherm forms of clay, litter compost and sludge compost were S-type while that of calcareous soil, sandy soil, animal manure and chicken manure were C-type. The composting process increased sorption capacity of organic amendments. Adsorption of aldicarb was found to conform to Freundlich equation. In addition, the magnitude of adsorption was found to be in the order: clay soil $>$ calcareous soil $>$ sandy soil. This relation is consistent with the organic matter content of the different soils. According to the values of adsorbent organic carbon partition constant (K_{oc}), it could be suggested that the low amounts of organic amendment may greatly influence aldicarb sorption when added to the soil, which is relatively poor in organic matter. The desorbed amounts of aldicarb from different tested soils were higher than the extracted ones. In contrast the extracted aldicarb quantities from tested organic amendments were higher than desorbed amounts. The aldicarb bound residues can be presented in the order: clay soil $>$ calcarous soil $>$ sandy soil. On the other hand, litter compost $>$ sludge compost $>$ animal manure $>$ chicken manure. All organic amendments, proportionally with their concentration increased the soil bound aldicarb residue particularly in calcareous and sandy soils. It is important to use the sorption-desorption kinetics, mechanism and capacity determined from soil and effect

of organic amendment on the sorption properties for pesticide fate and bioavailability predictions