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Soil Conditioners and Pesticide Mobility in the Environment

New soil management practices are needed to develop and expand our knowledge and technical means of agricultural production related to the fate and transport of agricultural chemicals. A field study was conducted on a Lowell silty loam soil at Kentucky State University Research Farm. Eighteen plots (22 × 3.7 m each) were established on a 10% slope. Runoff water was collected and quantified at the lower end of each plot using tipping-bucket runoff metering apparatus. Pan-lysimeters were installed to collect infiltration water from the vadose zone. Three soil management practices were used 1) municipal sewage sludge, 2) yard waste compost, and 3) a no-mulch control to study the impact of soil amendments on pesticide movement into runoff and infiltration water. Devrinol 50-DF "Napropamide" was applied as a pre-emergent herbicide, and the plots were planted with 60 d broccoli seedlings. Surface runoff water and napropamide residues in surface water were significantly reduced ($p < 0.05$) by the sewage sludge treatments. Yard waste compost treatments significantly increased water infiltration and napropamide residues in the vadose zone. Addition of sewage sludge to soil may reduce napropamide contamination of groundwater, especially in areas with a high water table or heavy rainfall events. A substantial amount of runoff was being retarded by the two soil amendments that would otherwise have been transported down hill into streams and rivers.

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