

A Soil Sampling Method for Use in Pesticide Leaching Studies

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Currently, there is much interest in studying the extent of downward movement of field-applied pesticides which may contaminate groundwater. This is especially true in sandy soils with shallow water tables as are found on Long Island, New York. Contamination of groundwater there by the insecticide, Temik, used for control of soil insects of potatoes has especially drawn attention to this problem.

Sampling soil at varying depths by digging or use of an auger can result in contamination of deeper layers by pesticide-laden surface particles falling in. This may falsely indicate downward movement of pesticides by leaching. A method was devised to obviate the problem and is described here.

EXPERIMENTAL

The sampling device consisted of a schedule 80 (high pressure), 1.5 inch (3.8 cm) PVC pipe, 30 inches (76.2 cm) long. The outer edge of one end of the pipe was beveled inward using a lathe to have a cutting edge to facilitate driving into the soil. The pipe was driven 24 inches (61 cm) vertically into the soil with a sledge hammer using a block of wood to protect the upper end when being hammered. The pipe was then withdrawn, both ends plugged with cheesecloth and the pipe and soil contents frozen. After freezing, the pipe was placed in a vice and cut with a pipe cutter at 6-inch (15.2 cm) segments beginning at the bottom. (It is important to remove any oil deposits from the cutting edge of the pipe cutter beforehand.) As soon as the cutter severed the plastic wall, the segment was cracked off with the frozen inner soil core breaking neatly with very little crumbling or fragmentation. The inner soil was then easily removed by striking one end of the cut pipe on a hard surface covered with polyethylene. Alternatively, the pipe segments may also be allowed to thaw after which the soil is easily poured or scooped out. In this way, four, 6-inch portions of the intact-soil profile were obtained for analysis.

DISCUSSION

The pipe sampling method is an advantageous procedure since it obviates contamination and allows numerous replicate soil samples to be taken in small plots close to growing plants if

desired with a minimum of soil disruption. Adequate sample size is provided for most analyses even if soil cores 3 or 4 inches in length are cut off for study. Some compression of the soil core may occur as the pipe is driven into the soil. The extent of this may be easily determined, however, by measuring the final length of the core within the pipe before cutting it. The pipe was able to be driven into and withdrawn from the soil with little difficulty. Sampling the soil when moist facilitates the process. Gravel up to 1 inch in diameter did not impede movement of the pipe downward. The method is presently being used to study the possible downward movement of field-applied pesticides in sandy soils.

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