



# SAMPLING SOILS FOR PESTICIDE RESIDUES AT AGROCHEMICAL FACILITIES

## FACT SHEET

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The strategy used in sampling soils suspected of containing high levels of pesticide residues varies with each facility. Decisions regarding the type of analysis, sampling intensity, the location and depth of samples need to be made. Factors influencing these decisions include the size of the facility, the history of pesticide handling practices and the amount of information needed.

A map showing facilities, wells, and areas of suspected contamination should be made before sampling begins. Contamination may be found at: 1) mixing and loading areas, 2) in areas where water collects or pools, 3) in drainage and road ditches, and 4) in areas where tanks and sprayers are stored.

The following instructions were excerpted with permission from, *Soil Sampling for Pesticide Residues in Soils at Agrichemical Mixing and Loading Facilities*, by Dr Thomas Bicki, Assistant Professor of Agronomy, University of Illinois.

### NUMBER OF SAMPLES

The number of soil samples required to accurately evaluate the kinds and amounts of pesticide residues depends on the size of the facility and the history of pesticide handling practices. For small facilities, (less than 1 acre in size), with no history of spills or leaks, and a rinsewater recycling system, I would recommend at least 6 sampling sites, randomly distributed across the site. Larger facilities without a history of spills and without rinsewater recycling systems, should sample a minimum of 2 locations at each mixing and loading area, water pooling area and sprayer storage areas.

### SAMPLING DEPTH

Most pesticides readily adsorb (chemically attach themselves) to organic matter or clay in soil. As a result, pesticide residues tend to concentrate near the surface and decrease with depth. Pesticide concentration in the soil, therefore, depends on the depth of sample collection. Field studies in Illinois indicate that under normal field application rates, pesticide leaching in dark-colored, prairie soils is principally restricted to the upper 12 inches of the soil and in light-colored, forest soils, pesticide leaching is principally restricted to the upper 24 inches of the soil. At extremely high application rates, such as might occur with a spill, pesticides can leach to greater depths. Felsot, Liebel and Bicki (1988) reported relatively high concentrations of pesticides below a depth of 12 inches at a facility in Platt County, Illinois.

When sampling soil at chemical handling facilities, it is advisable to sample in 6 inch increments. If the soil surface is covered with gravel or other permeable material, it should be removed and sampling should begin at the surface of the soil. A soil sample weighing approximately 500g (1 lb) should be collected in the upper 6 inches of the soil. If relatively high concentrations of pesticides (>25ppm) are found in the upper 6 inches of the soil, the area should be resampled to a depth of at least 24 inches and additional pesticide screening tests should be performed.

### SAMPLING TOOLS

Soil sampling can be performed with a shovel, bucket auger, or push probe. Several equipment supply companies currently stock sampling equipment specifically designed for pesticide residue sampling. Most samplers contain a plastic or acetate liner which is inserted into the sampler to prevent contamination of successive soil samples. Alternately, the sampler can be thoroughly cleaned with methanol (methyl alcohol) between samples.

### SHIPPING INSTRUCTIONS

A & L Great Lakes must be informed if there is a suspicion that samples contain high levels of pesticide residue. Our lab personnel are required to use special handling procedures for these samples.

It is preferable, though not mandatory, to freeze the samples and pack them in ice for shipment. An instruction form should be completed and enclosed with the samples. The legal integrity of the sample can be maintained by including a chain of custody form such as the one on the following page. Ship the samples using a dependable courier service.

Sampling and shipping supplies are available from A & L Great Lakes Laboratories upon request.

