NSW GOVERNMENT Department of Primary Industries

primefact

Testing soils for residues of persistent chemicals

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Animal Biosecurity and Welfare, NSW DPI

Why test soils?

Past use of persistent organic pesticides, e.g. DDT and dieldrin, means that some agricultural soils are contaminated with chemical residues. In broadacre farming, these chemicals were used directly on soil or applied to crops, contaminating soil via runoff or spray drift.

Similarly, arsenic used in cattle and sheep dip baths has contaminated soils around these facilities.

Pesticide contamination may cause residues in stock or crops raised on affected land.

Soil residue tests determine if pesticides are present and at what levels, so that the risk to livestock or crops can be assessed and managed. The core purpose of managing chemical residues is to minimise risk to the human food chain from grazing animals.

This Primefact describes the process for sampling soils and sending them to the laboratory to be tested for pesticide residues.

Before collecting samples

Contact your Local Land Services Office District Veterinarian. They will provide information on laboratories which provide a testing service for the residues in question.

If your property has been previously identified as having been contaminated and you wish to review its current contamination risk status, your District Veterinarian will assist in sampling and testing.

Submitting samples

1. Include a completed Sample Submission Form identifying each sample and the analysis that you require.
2. Samples should be placed in plastic bags with stick-on labels marked with a waterproof pen. Labels should include sample numbers or similar identification.
3. Place sample bags in a container or cardboard box and send to the laboratory.

Preparation for sample collection

The area of the site and depth of possible residues need to be considered. Samples must be representative of the site to give meaningful information about contamination.

Mapping – for large sites, a site map marked with features e.g. posts, gates, buildings, and the sample locations is helpful to relate the laboratory results to the sampling positions.

Area – Large sites should be divided into blocks or sections. The maximum size of the sampling block is determined by the pesticide application history.

Where there is varied or uncertain application history the block size should be no greater than 2 Ha. In other circumstances block sizes up to 10 Ha will provide sufficient information.

A number of core samples or slices (40 to 50 samples) are taken from each block and pooled into a composite sample as described below.

Depth – The depth of sampling will be determined by cultivation history:

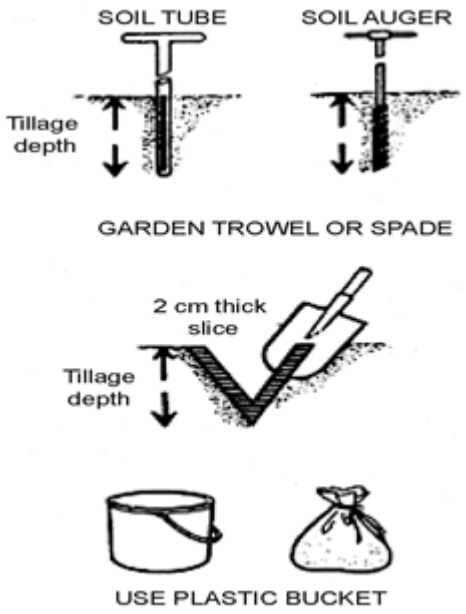
- **Cultivated soil** – Cores or slices should generally be taken down to tillage depth (up to 150 mm).
- **Uncultivated soil** -- cores or slices are taken down to a depth of 50 – 80 mm

Hotspots – if an area is suspected of containing high levels of pesticides (drum storage or chemical preparation areas, cattle and sheep dip yards, spray races and orchard packing sheds) then this spot should be sampled separately. The purpose of sampling is to locate the limits of pesticide contamination.

Equipment

Basic equipment required to take soil samples are shown in Figure 1 and includes soil tubes, soil augers, garden trowl or spade and clean buckets or plastic bags

Figure 1.Tools for taking soil samples



Sample collection

To obtain a representative sample of soil from each block, adopt the following procedures:

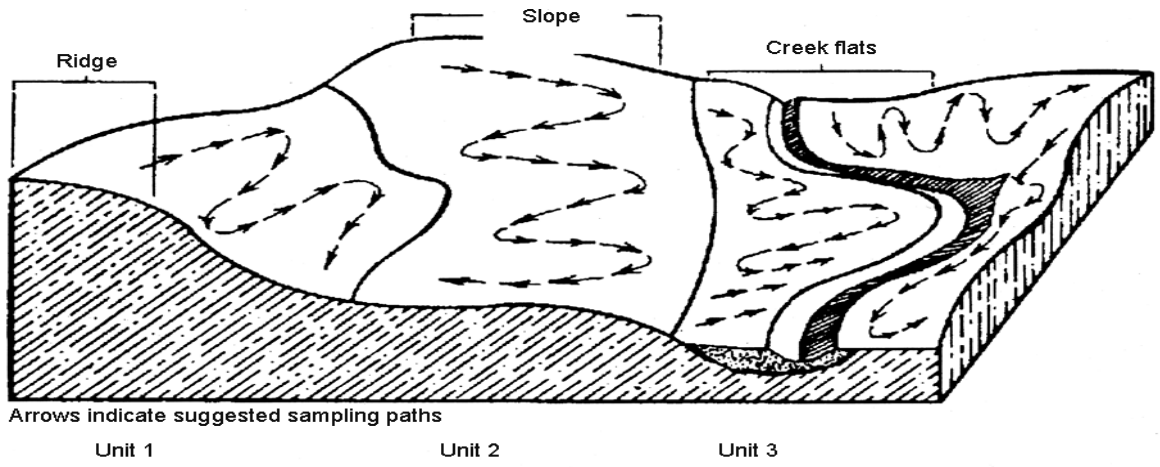
- Walk down each block in a zig-zag fashion collecting 40-50 equal sized cores or slices (at least 2cm wide) per block and covering as much of the area as possible.
- Remove the vegetation (grass) to expose the soil underneath before collecting each sample
- Place all cores or slices from the block in a clean bucket or wheelbarrow and mix thoroughly. The mixed or composite sample is considered representative of the area in question.
- Take one kilogram of the mixed sample, place in a clean, strong plastic bag and clearly label for dispatch to the laboratory

Hotspots – use a spade or trowel to take multiple individual samples (of approximately one kilogram) to a depth of 150 mm at increasing distances from the center of the suspect site. **Do not pool these samples.** The distance between each sampling site and the depth of sampling will be determined by the past pesticide usage and the purpose of the testing. Pesticide contamination can be found up to 2 m or more from livestock dip baths, especially at the sides of the entry point (splash areas) and may extend to a depth of 600 mm.

More information

State Residue Coordinator, Animal Biosecurity, Department of Primary Industries. Email: dermot.mcnerney@dpi.nsw.gov.au

Figure 2. Sample sites for chemical testing



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