

# CADMIUM SOIL SAMPLING

**Cadmium is a naturally occurring component of many phosphorus fertilisers and has the potential to accumulate in agricultural and horticultural soils. Management of soil cadmium accumulation is achieved through a tiered fertiliser management system (TFMS). For this to be effective, appropriate and accurate soil testing needs to be conducted. There are three approaches to this testing: screening, definitive testing and detailed on-farm testing.**

## Screening

Screening soil samples should be taken:

- When the farm has not been previously tested
- When previous tests have shown soil cadmium levels to be  $\geq 1.0$  ppm

Screening soil tests are done using standard soil testing transects, sampling to a depth of 75 mm. Subsequent action will depend on the results:

- Soil cadmium levels  $< 1.0$  ppm: follow the TFMS (Tier 1) and repeat the test in five years
- Soil cadmium levels  $\geq 1.0$  ppm: conduct definitive testing

## Definitive testing

Establish transects through each land management unit on the farm. There should be at least six paddocks in each transect. Take samples to a depth of 150 mm. Take 15–20 cores per paddock, and bulk them all together into a single sample for analysis. Subsequent action will depend on the results:

- Soil cadmium levels  $< 1.0$  ppm: follow the TFMS (Tier 1) and repeat the test in five years

- Soil cadmium levels  $< 1.4$  ppm but  $\geq 1.0$  ppm: follow the TFMS (Tier 2) and repeat the test in five years
- Soil cadmium levels  $\geq 1.4$  ppm: repeat the definitive testing, but this time analyse each paddock separately (i.e. do not bulk the samples)

Following definitive testing on individual paddocks, actions will depend on the results:

- Soil cadmium levels  $< 1.8$  ppm but  $\geq 1.4$  ppm: follow the TFMS (Tier 3). Resample every five years, or more frequently if levels are closer to 1.8 ppm than 1.4 ppm
- Soil cadmium levels show high variability (CV  $> 25\%$ ): conduct detailed on-farm testing
- Soil cadmium levels  $\geq 1.8$  ppm: conduct detailed on-farm testing

## Detailed on-farm testing

Sample every paddock on the farm individually, in order to better understand the mean cadmium levels across the farm. Take samples to a depth of 150 mm. Take 15–20 cores per paddock, and bulk the cores so there is one sample per paddock. Subsequent action will depend on the results:

- Soil cadmium levels  $< 1.8$  ppm but  $\geq 1.4$  ppm: follow the TFMS (Tier 3). Resample every five years, or more frequently if levels are closer to 1.8 ppm than 1.4 ppm
- Soil cadmium levels  $\geq 1.8$  ppm: no further accumulation of cadmium is permitted unless there is a detailed site-specific investigation to identify risks. Follow the TFMS (Tier 4).

The graphic overleaf summarises the cadmium soil testing strategy.

# SCREENING

Sample 1 transect per block

Bulk samples per block

In this example, two samples would be sent for analysis



If property average soil Cd < 1.0 ppm - follow Tier 1

If property average soil Cd  $\geq$  1.4 ppm - proceed to definitive testing

# DEFINITIVE

Sample at least 6 monitor paddocks per block

Bulk samples per block

In this example, two samples would be sent for analysis



If property average soil Cd < 1.4 ppm - follow Tier 2

If property average soil Cd  $\geq$  1.4 ppm - resample monitor paddocks and analyse each one individually

Sample at least 6 monitor paddocks per block

Analyse each paddock separately

In this example, 13 samples would be sent for analysis



If property average soil Cd < 1.8 ppm - follow Tier 3

If property average soil Cd  $\geq$  1.8 ppm - proceed to detailed testing

# DETAILED

Sample every paddock

Analyse each paddock separately

In this example, 51 samples would be sent for analysis



If property average soil Cd < 1.8 ppm - follow Tier 3

If property average soil Cd  $\geq$  1.8 ppm - follow Tier 4

< - less than;  $\leq$  - less than or equal to; > - greater than;  $\geq$  - greater than or equal to