



Government of Western Australia
Department of Health
Public Health

Department of Health guide to Organochlorine pesticide residues in home garden soils

May 2011



What are Organochlorines?

Organochlorine pesticides (OCPs) are man-made chemicals that were used to control insects in urban areas in Australia into the 1980s.

OCPs were commonly used to control termites and Argentine ants. OCPs were also used in agricultural areas to control pests on livestock and crops.

What are common OCPs?

These are a few of the most commonly found organochlorine compounds:

Aldrin Dieldrin

Chlordane

DDT (Dichlorodiphenyltrichloroethane)

Heptachlor

Are OCPs still in use?

No organochlorine pesticides are currently registered for use in the home environment in Australia.

The use of many organochlorine pesticides is now banned in many countries.

Why are OCPs still a problem?

Research completed in the 1980s showed that many of the OCPs were persistent organic pollutants which break down extremely slowly and therefore can remain in the environment for many years after application.

Generally, OCPs were applied to fence lines, the foundations of homes, along lanes and rights of ways to control termites and ants.

Not all urban areas were treated with organochlorine pesticides.

However, where they were used, OCPs remain in the soil for many years.

In the older established suburbs in Perth metropolitan areas and in rural town centres, homes and access ways may have undergone treatments with OCPs. Records of pesticide treatments may indicate if OCPs were used in your area.

What is bioaccumulation?

OCPs can bioaccumulate in ecological foodchains. For instance, when poultry dig and scratch in soils containing OCPs, they are likely to ingest some of these contaminated soils. Some of the OCPs in the soils are then absorbed by the intestinal tracts and stored in the fatty tissues.

OCPs are highly fat soluble and tend to accumulate in the fatty tissues of animals, including eggs.

When we then eat eggs that are contaminated with OCPs, these compounds can be absorbed into our fatty tissues.

Should I be concerned about OCPs in my garden?

OCPs remain in soils for many years because they are not broken down in the environment and they have very long environmental half-lives.

OCPs residues are routinely found under the foundations of homes in Western Australia. However, in the majority of cases, the residues present in these soils are not high enough to be of concern to public health.

If you are concerned about possible residues in your home garden soils, there are a few things you can do to determine if your home residence is in an area where these pesticides may have been applied.

Homeowners should determine the spray history of chemicals used on their property if they have concerns about residues.

Common OCPs treatment sites include:

- Near foundations of buildings or other timber structures (e.g. picket fences, timber verandah/carport posts, old garden sheds, etc.) that were treated for termites
- Fence lines bordering laneways that were treated for Argentine ants
- Land used as market gardens or for other agricultural purposes

What can I do to ensure my poultry and eggs are safe to eat?

OCPs can pose a problem for poultry, as they scratch and dig and ingest contaminated soils. Any OCPs present in these soils can then accumulate in fatty tissues of the hens and ducks and geese; this includes the eggs produced by these poultry.

Isolate poultry runs or poultry sheds by adding sufficient quantities of new soil.

Locate poultry runs away from areas that are likely to have been sprayed. Keep poultry away from:

the foundations of buildings

fence lines

rear lane ways, rights of way

Place a barrier over existing older soils such as a cement pad, or layers of black plastic and cover with new soil or new bedding materials for poultry and egg production.

How can I ensure my homegrown produce is safe to eat?

Plants do not bioaccumulate OCPs. If soil residues are very high, residues could be expected in plants. However, residues in fruits and vegetables do not generally exceed health limits.

If you have any doubts, you can get your fruits, vegetables and eggs tested by one of the testing laboratories. A list of testing facilities can be found in the YellowPages® under chemists – analytical; or chemists, consulting and industrial; soil testing services can be found under soil testing and investigation.

Testing soils for OCPs

OCP residues can be detected by testing the soil. If you wish to test your garden soils, it is best to contact a testing laboratory first, to make sure the sample is a good representative sample of soils in your garden.

Testing eggs for OCPs

Home owners can have eggs tested for OCPs. It is best to contact the laboratory first, in order to determine how to send the eggs for testing.

What are residue limits?

Residues are traces of pesticides that remain on soils or in plants or in animal products, such as meat, milk, eggs and offal tissues.

An extraneous residue limit (ERL) is defined as the maximum permitted limit of a pesticide residue, arising from environmental sources other than the use of a pesticide directly or indirectly, in or on a food, agricultural commodity or animal feed.

The concentration is expressed in mg/kg (milligrams per kilogram or parts per million) of the commodity. There are ERLs for selected commodities for several organochlorine pesticides no longer in use in Australian agriculture. ERLs are legal limits not health standards. ERLs are amounts allowed in produce that is sold at market.

ERLs are established by the Food Standards Australia and New Zealand (FSANZ).

As of 2011, these are the current limits for organochlorine residues measured in milligrams of residue per kilogram of the foodstuff (mg/kg).

FSANZ ERLs 2011

ERLs for:	fruits	vegetables	eggs
Aldrin + Dieldrin	0.05	0.1	0.1
Chlordane	0.02	0.02	0.02
DDT & metabolites	1.0	1.0	0.5
Heptachlor	0.01*	0.05*	0.05

*Check the food standards code for specific variations for some fruits and vegetables

Interpretation of results from testing of soils and eggs

Officers from the Toxicology Unit within the Environmental Health Directorate can assist with the interpretation of laboratory results. Contact details are provided at the end of this document.

IF eggs test positive for OCPs

Eggs can not be sold where the extraneous residue limits are above those set for the OCPs:

Aldrin + Dieldrin > 0.1 mg/kg

Chlordane > 0.02 mg/kg

DDT & metabolites > 0.5 mg/kg

Heptachlor > 0.05 mg/kg

Eggs that contain OCPs above the ERLs, indicates that the poultry meat is also contaminated with these pesticides.

In this case, the Department of Health recommends that the poultry is not consumed. Owners are advised to replace poultry that have laid eggs contaminated with OCPs.

IF soils test positive for OCPs

In order to protect public health, there are standards for soils, just as there are standards for foodstuffs. These soil standards include a safety factor which takes into account a margin of safety for the protection of human health.

The National Environment Protection Council (NEPC) sets health standards called National Environment Protection Measures (NEPMs) to ensure sound environmental management practices by the community which includes regulators, land owners, developers and industry.

A series of health standards referred to as "Health-based Soil Guidelines for individual substances" was developed for different land use situations. These Health-based investigation limits (HILs) are established for these environments:

National Environment Protection

Health Based Investigation Levels (HILS)

(HIL A) 'Standard' residential with garden/accessible soil (home-grown produce contributing less than 10% of vegetable and fruit intake; no poultry): this category also includes children's day-care centres, kindergartens, preschools and primary schools.

Current soil health-based investigation limits (HIL A) for standard residential areas:

Current HIL (A) for soils

Aldrin + Dieldrin	10 mg/kg
Chlordane	50 mg/kg
DDT + DDD + DDE	200 mg/kg
Heptachlor	10 mg/kg

Please seek professional advice on what to do in cases where you suspect high levels of OCPs in your garden soils.

(HIL B) Residential with substantial vegetable garden (contributing 10% or more of vegetable and fruit intake) and/or poultry providing any egg or poultry meat dietary intake. Evaluation of these conditions requires site specific soil contamination assessments and generic HILs have not been derived for this setting.

(HIL C) Residential with substantial vegetable garden (contributing 10% or more of vegetable and fruit intake); poultry excluded. Evaluation of these conditions requires site specific soil contamination assessments and generic HILs have not been derived for this setting.

Before comparisons with these soil criteria are made, there should be sufficient characterisation of the site so a comparison is meaningful and appropriate.

These agencies provide useful guidance and assistance to the public concerning organochlorine pesticides in soils and foods.

Need further information?

Environmental Health Officers at your local government authority, shire offices or town council can be helpful in providing health information pertaining to the application of food standards and may provide guidance on collecting soils for testing.

WA Health

The Department of Health's Environmental Health Directorate (EHD) can provide advice and interpretation of testing results for soils, eggs and food products. The EHD can also provide advice on management and general information on OCPs.

Environmental Health Directorate

Phone: 9388 4999

Fax: 9388 4902

Email: ehinfo@health.wa.gov.au

Website:

<http://www.public.health.wa.gov.au>

Department of Environment and Conservation

The Department of Environment and Conservation can provide advice and guidance on soil testing and contaminated soil removal processes.

Removal of soils containing high residues of organochlorine pesticides requires special permits and involves a highly regulated disposal process. Advice should be sought from the Department of Environment and Conservation prior to this option being undertaken.

Australian Pesticides and Veterinary Medicines Authority (APVMA)

The APVMA is a Commonwealth agency responsible for the registration of all pesticides before they can be legally supplied, sold, or used in Australia.

Web site :

http://www.apvma.gov.au/publications/factsheets/docs/chemicals_food_safety.pdf

Food Standards Australia and New Zealand (FSANZ)

FSANZ establishes, reviews, and up-dates food standards on a regular basis. A list of the current FSANZ residue limits for organochlorine pesticides can be found in Schedule 2 Maximum Residue Limits (Australia only) website:

http://www.foodstandards.gov.au/srcfiles/Standard_1_4_2_MRLs_part_4_Sched%202-4_v116.pdf

NEPC and NEPMs

Information about the NEPC and the formulations of the current NEPM guidelines can be found at this website:

http://www.ephc.gov.au/sites/default/files/ASC_NEPMsch_01_Investigation_Levels_199912.pdf

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