



Pesticide Detectives

ORGANOCHLORINES

Insecticides Aldrin and Dieldrin

What are aldrin and dieldrin?

Aldrin and dieldrin are synthetic organochlorine insecticides widely used against soil-dwelling pests on sugarcane, cotton, bananas, tobacco, apples, pears and potatoes. They were also used for termite control.

The first restrictions on the use of dieldrin and related chemicals in Australia were introduced in 1961-1962. By 1981, the use of dieldrin worldwide was limited to sugarcane and bananas and these uses were deregistered by 1985. In 1987, use of the insecticides was restricted to sub-floor purposes against termites.

In November 1997, the use of all organochlorines except for mirex was phased out in Australia.



How do aldrin and dieldrin work?

Both aldrin and dieldrin affect the central nervous systems of vertebrates and can cause neurotoxicity as well as developmental and reproductive effects. In biological tissues, they accumulate in lipids.

Dieldrin has been found to be highly toxic to invertebrates.



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What happens when aldrin and dieldrin enter the aquatic environment?

Although these insecticides were deregistered in the 1980s, their presence in the environment indicates their environmental persistence. Historically, aldrin and dieldrin may have entered the aquatic environment from accidental spills and from spray drift. They are chemically stable and relatively insoluble in water. Aldrin readily converts to dieldrin once it enters the environment or the body.



Default guideline values (DGVs) for sediment quality
ESB (Equilibrium partitioning Sediment Benchmark)
ANZECC/ARMCANZ (2000)

There are no DGV guidelines for aldrin. Values exceeding guidelines suggest that biological effects may be occurring in the environment.

For freshwater sediment: DVG value is 0.12 mg dieldrin/kg (normalised to 1% organic carbon, dry weight)

For marine sediment: DGV value is 0.28 mg dieldrin/kg (normalised to 1% organic carbon, dry weight).

References

ANZECC & ARMCANZ 2000. National Water Quality Management Strategy, Australia and New Zealand Guidelines for Fresh and Marine Water Quality. In: ZEALAND, A. A. N. Z. E. A. C. C. A. A. R. M. C. O. A. A. N. (ed.). Artarmon, NSW,

Australia: Australian Water Association. Agency for toxic substances and disease registry (ATSDR), 2002, Toxicological profile for Aldrin/Dieldrin, www.atsdr.cdc.gov.

Bates, L., Clifford, H., Coyle, R., Ertz, S., McClure, V., McKenzie, A., Hall, G., and Butler, C.D. (2008), Dieldrin and Breast Cancer: a Literature Review, The Australian National University Doctors for the Environment Australia.

Jenkins, C. 2013, A snapshot of pesticides in South Australian aquatic sediments, Environment Protection Authority, South Australia