



PESTICIDE DETECTIVES

ORGANOCHLORINES

Aldrin and Dieldrin

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What are aldrin and dieldrin?



www.safexchemicals.com

Aldrin and Dieldrin are synthetic organochlorine insecticides with similar chemical structures that were commonly used for agricultural practices and termite control. They are chemically stable and relatively insoluble in water. Aldrin readily converts to Dieldrin once it enters the environment or the body. In biological tissues, they accumulate in lipids, and in soils they bind to soil particles.

Uses of aldrin and dieldrin

Both chemicals were widely used against soil-dwelling pests in agriculture, on sugarcane, cotton, bananas, tobacco, apples, pears and potatoes such as termites, worms and beetles. They were also used on wooden structures for termite protection. The first restrictions on the use of dieldrin and related chemicals in Australia were introduced in 1961 - 1962. Registration was required for their use on produce animals, such as cows and chickens. 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 chemicals was restricted to sub-floor purposes against termites. In November 1997, the use of all organochlorines except for mirex was phased out in Australia.



www.yarraranges.vic.gov.au

What happens to aldrin and dieldrin when they enter the environment?



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Although use of aldrin was deregistered by 1985, dieldrin, its breakdown product still persists in the environment. Both chemicals bind tightly to soil because of their low solubility in water. The fat solubility of dieldrin means that the insecticide can bioaccumulate in animal fats and magnify up the food chain.

How do aldrin and dieldrin work?

Dieldrin causes neurotoxicity and targets the central nervous systems of vertebrates. Dieldrin has been found to be highly toxic to invertebrates.



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Aldrin and Dieldrin in the environment



Aldrin and dieldrin can enter the aquatic environment from accidental spills or leaks from storage containers at waste sites. In the past, aldrin and dieldrin entered the environment when they were used to kill pests on crops and when exterminators used these insecticides to kill termites.

The concentrations of aldrin and dieldrin in aquatic environments and drinking-water are normally less than 10 ng/litre. River sediments may contain higher amounts (up to 1 mg/kg). Contamination from industrial effluents and soil erosion during agricultural use can be attributed to higher levels of dieldrin in the environment

Sediment Quality Guideline Values for dieldrin - ESB (Equilibrium partitioning Sediment Benchmark) (ANZECC/ARCAMZ)

There are no guidelines for aldrin. For freshwater sediment: 0.12 mg dieldrin/kg (normalised to 1% organic carbon, dry weight). For marine sediment: 0.28 mg dieldrin/kg (normalised to 1% organic carbon, dry weight). Values exceeding guidelines suggest that biological effects may be occurring in the environment.

References

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