



Pesticide Detectives

SYNTHETIC PYRETHROIDS

Bifenthrin, Permethrin and Fenvalerate

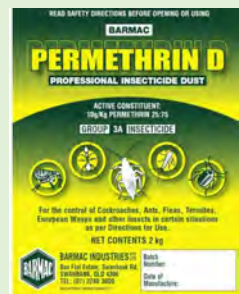


What are synthetic pyrethroids?

Pyrethrins are a natural form of pesticide found in some chrysanthemum flowers. Bifenthrin, permethrin and fenvalerate are a class of synthetic chemicals that are structurally similar to and mimic the action of pyrethrins. Bifenthrin was first registered for use in 1985 by the United States Environmental Protection Agency (U.S EPA). Permethrin and fenvalerate were registered for use in 1970s by the US EPA.

Uses of synthetic pyrethroids

Synthetic pyrethroids (SPs) are now found as an active ingredient in many household insecticides in Australia. They are used on pets, on wool carpets, on clothing, for mosquito control and in agriculture. These pesticides are also used in new housing estates for termite control. Bifenthrin, permethrin and fenvalerate are not authorised for use in the EU.



<https://pestcontroldiy.com.au>

How do synthetic pyrethroids work?

SPs are effective by contact or ingestion. They affect the central and peripheral nervous system of mammals and invertebrates.





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What happens to synthetic pyrethroids when they enter the environment?

SPs tend to bind to soil or sediment because of their low water solubility. SPs can enter aquatic systems via direct application, drift and runoff. The likelihood for SPs to accumulate in sediments of non-flowing aquatic systems such as wetlands and ponds is increasing due to their increased use in urban environments. SPs are highly toxic to fish and aquatic invertebrates. Bifenthrin is also highly toxic to bees.

Sediment quality guideline values for bifenthrin



<https://www.mundi.net.au>

Sediment quality guideline values do not exist for bifenthrin, permethrin and fenvalerate. For bifenthrin, the median lethal effect concentration (LC50) to laboratory-based amphipods exposed to wetland sediment was 1.09 $\mu\text{g/gOC}$. For amphipoda survival, the LC50 was 1.91 $\mu\text{g/gOC}$ bifenthrin (Jeppe et al., 2017).

References

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- Sharp, S., Townsend, K., Boyle, R., and Pettigrove, V. (2019). Sediment quality assessment program 2018 update. Draft report – January 2019. Aquatic Pollution Prevention Partnership. RMIT University Technical Report.
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