

Table 1. Environmental Fate of Chlorinated Insecticides and Their Toxicity to Aquatic Invertebrates

Insecticide	Substance group	Solubility - In water at 20°C (mg L ⁻¹)	Aqueous photolysis ^a : DT50 (days) at pH 7	Aqueous hydrolysis ^b : DT50 (days) at 20°C and pH 7	Water-Sediment DT50 ^c (days)	Soil degradation (days) (aerobic) DT50 (typical) ^d	Soil mobility ^e	GUS leaching potential index ^f	Aquatic invertebrates - Chronic 21 day NOEC (mg l ⁻¹) ^g
Chlordane ^h	organochlorine	0.1	Stable	stable	No data	365	Non-mobile	-0.77	0.07
Lindane ^h	organochlorine	8.52	28	467	90	121	Slightly to moderately mobile	2.75	0.0002
chlorfenvinphos	organophosphate	145	No data	125	No data	40	Slightly mobile	1.87	0.0001
chlorpyrifos	organophosphate	1.05	29.6	25.5	36.5	50	Non-mobile	0.15	0.0046
acetamiprid	neonicotinoid	2950	34	stable	No data	3	Moderately mobile	0.94	5
clothianidin	neonicotinoid	340	0.1	stable	56.4	545	Moderately mobile	4.91	0.12
imidacloprid	neonicotinoid	610	0.2	stable	129	191	Moderately mobile	3.76	1.8
thiacloprid	neonicotinoid	184	stable	stable	28	15.5	Slightly mobile	1.44	No data

Explanations: DT50 values refer to the time taken for the concentration of the pesticide in a defined compartment (e.g. soil, water) to decline by 50%; ^a the rate of chemical decomposition in the aquatic environment induced by light or other radiant energy; ^b the rate of chemical decomposition induced by water at pH 7; ^c the rate of chemical decomposition in water-sediment systems; ^d 'Typical values' quoted are those given in the general literature and are often a mean of all studies field and laboratory; ^e IUPAC classification; ^f leaching refers to a process by which the pesticide moves through the soil profile to the aqueous phase. The GUS index (Groundwater Ubiquity Score) is a very simple indicator of a chemical potential for leaching into groundwater. It is based on the environmental fate properties of the chemical and takes no account of environmental conditions. Calculated from the soil degradation rate (DT50) and the Organic-carbon sorption constant (Koc) where: $GUS = \log(DT50) \times (4 - \log(Koc))$ If $GUS > 2.8$ = pesticide likely to leach If $GUS < 1.8$ = pesticide unlikely to leach If $GUS 1.8 - 2.8$ = leaching potential is marginal; ^g No Observed Effect Concentration (NOEC), i.e. the highest concentration of a pesticide in the test system *Daphnia magna* that causes no observable biological effect to the target organism over a period of 21 days; ^h POP chemicals (The Stockholm Convention on Persistent Organic Pollutants (POP)). POPs are exceedingly toxic chemicals that are extremely persistent in the environment, travel long distances on wind and water currents, and concentrate up the food chain to accumulate in our bodies.

Source: IUPAC Pesticide Properties Data Base
<http://sitem.herts.ac.uk/aeru/iupac/138.htm>