



## ORGANOPHOSPHATE AND CARBAMATE PESTICIDES

### What are ORGANOPHOSPHATE and CARBAMATE PESTICIDES?

Organophosphates are phosphoric acid esters or thiophosphoric acid esters. When developed in the 1930s and 1940s, their original compounds were highly toxic to mammals. Organophosphates manufactured since then are less toxic to mammals but toxic to target organisms, such as insects. Malathion, dibrom, chlorpyrifos, temephos, diazinon and terbufos are organophosphates.

Carbamates are esters of N-methyl carbamic acid. Aldicarb, carbaryl, propoxur, oxamyl and terbucarb are carbamates.

Although these pesticides differ chemically, they act similarly. When applied to crops or directly to the soil as systemic insecticides, organophosphates and carbamates generally persist from only a few hours to several months. However, they have been fatal to large numbers of birds on turf and in agriculture, and negatively impacted breeding success in birds. Many organophosphates are highly toxic to aquatic organisms.

### How can people be exposed to organophosphate and carbamate pesticides?

People can be exposed to organophosphates and carbamates pesticides through accidental exposure during use. People can accidentally inhale the pesticides if they are in an area where they were recently applied. The chemicals can be ingested with food or drinks that are contaminated.

### How can these pesticides exhaust affect my health?

Acetylcholinesterase is an enzyme found in the nervous system, red blood cells and blood plasma. These pesticides damage nerve function by acting as acetylcholinesterase inhibitors in the nervous system.

**Breathing** - Short-term exposure can produce muscle twitching, headache, nausea, dizziness, loss of memory, weakness, tremor, diarrhea, sweating, salivation, tearing, constriction of pupils, and slowed heartbeat.

Long-term exposure can produce delayed neurotoxicity, such as tingling and burning in the extremities. This delayed neurotoxicity can progress to paralysis and is seldom reversible. Damage to the liver, kidney, immune system and bone marrow may occur. Some carbamates are also suspected carcinogens.

### What should I do if exposed to these pesticides?

If you think you were exposed to these pesticides, contact your doctor.

### Is there a medical test to show whether I was exposed to these pesticides?

The level of cholinesterase activity in red blood cells or plasma helps physicians determine exposure to these pesticides. However, other chemicals or disease states can alter acetylcholinesterase activity. Urine or blood tests only apply if a person was exposed to a large quantity. Persons who will use these pesticides regularly should ask their physician to establish a baseline value prior to prolonged use, followed by monthly monitoring.

### References and Sources

U.S. E.P.A., Preregistration Eligibility Decision for Aldicarb -  
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<http://npic.orst.edu/factsheets/diazinontech.pdf> - Accessed 12/14/09