

A Closer Look at Organophosphorus Pesticides

About 70% of the insecticides in current use in the United States are organophosphorous (OP) pesticides, a total of around 90 million pounds per year. The OP pesticides work by interfering with the nervous system of insects, a mechanism that also affects the human nervous system when people are exposed. Other health effects of individual OP pesticides vary; some are highly acutely toxic, some cause development or reproductive harm, and some are known or suspected endocrine disruptors.

What are organophosphorus pesticides?

As many of the first-generation organochlorine pesticides were banned in the 1970s, the agrochemical industry turned to the less persistent, but more acutely toxic organophosphate (OP) and carbamate compounds to control insect pests. Use of these pesticides has increased rapidly, and today about 79% of insecticides applied nationwide are OPs and (closely related) carbamate compounds.

Detailed information on specific OP pesticides is available at <http://www.pesticideinfo.org/>.

Products containing OPs include Dursban and Lorsban (containing the OP chlorpyrifos), Spectracide (containing the OP diazinon), and Sevin (containing the carbamate carbaryl). Most residential uses of chlorpyrifos and diazinon were recently banned by the U.S. Environmental Protection Agency (EPA).

How are organophosphorus pesticides used?

OP pesticides are applied to crops, buildings, ornamental plants and lawns. Agricultural uses include field applications on corn, cotton, canola, alfalfa, produce and nuts. Exterminators use OP pesticides in residential and commercial structures, and some pest control products for cats and dogs contain organophosphorus compounds.

How do we know organophosphorus compounds get into our bodies?

Data collected by the U.S. Centers for Disease Control and Prevention (CDC) and analyzed in the *Chemical Trespass* report documents that most people in the U.S. have breakdown products of OP pesticides in their bodies. Because OP pesticides generally do not persist in the environment for long periods of time and do not build up in the body fat of humans and other animals, the fact that these pesticides were found in such a high percentage of test subjects indicates that most people are exposed to these chemicals on a very regular basis.

People are commonly exposed to OP pesticides through eating fresh and processed vegetables, contacting pesticide-contaminated surfaces, breathing air near pesticide applications (both indoors and outdoors), and drinking pesticide-contaminated water. The multiple uses and ubiquitous nature of these chemicals result in routine exposures to many different OP pesticides for most people.

How do OP pesticides affect our health?

OPs are chemically similar to chemical warfare agents originally produced during World War II, and they work by interfering with the nervous system of insects, as well as mammals, birds, and fish. Symptoms of exposure include nausea, headaches, twitching, trembling, excessive salivation and tearing, inability to breathe because of paralysis of the diaphragm, convulsions, and at higher doses, death.

OPs are among the most acutely toxic pesticides sold today, with most of these chemicals classified by the EPA as toxicity class I (highly toxic) or toxicity class II (moderately toxic). In addition, some OP pesticides cause developmental or reproductive harm, some are carcinogenic, and some are known or suspected endocrine disruptors.