

What Do Pesticides Really Do in the Garden?

1. We don't need pesticides to have beautiful gardens
2. Pesticides are counterproductive, damaging Mother Nature's delicate and highly interdependent natural balance, and predisposing our plants and gardens to more diseases than before.

Pesticides are poisons, their purpose is to kill. Different types of poisons are used to kill different types of organisms; so we use insecticides to kill insects, miticides to kill mites, fungicides to kill fungi, herbicides to kill plants, piscicides to kill fish, avicides to kill birds, and so on. Collectively they are called pesticides.

For the most part, pesticide **formulations** are composed of one or more active ingredients, that is, the actual poisons whose job is to kill the intended organisms and some other substances collectively called adjuvants. Even though these adjuvants may be highly toxic themselves, in the pesticide formulation they have different jobs. Because the exact combination of ingredients in a pesticide formulation is considered to be a trade secret, the nature and toxicity of these adjuvants is not required to be disclosed.

Ironically, our plants are probably hurt more by the pesticides themselves than by the few aphids on the buds or black spots on the leaves! The fact is - most pesticides are highly toxic to plants, impairing the health of the very organisms we are trying to protect.

Here are some common pesticide poisoning symptoms in plants: stunted or distorted growth, direct injury to leaves, flowers and fruit, and death. While the pesticide was used with the **intent** to kill only specific troublesome insects, microbes or plants, its **action** is much more far reaching, and affects thousands upon thousands of other species on plant surfaces and in the soil. Some of these species will be immune to the poison, but for others whole populations will be either severely decimated or completely eliminated. This not only destroys the whole delicate balance of the ecosystem, but also impacts the important food and defense alliances of our plants.

We must understand that the selective destruction of any microbial or animal population creates - at least temporarily - an empty ecological niche. This niche will be filled, and it will be filled by a population that finds plenty of food. In effect pesticide use breeds plant-feeding bacteria, fungi and insects, because the greatest source of food in gardens are our plants themselves. And we've just made the plants more vulnerable by spraying them with the pesticides.

Here are a couple of examples:

The herbicides Roundup and atrazine are known to repress mycorrhizal fungi, and to decimate nitrogen fixing bacteria. This directly affects not only the natural fertility of the soil, but also the plants' ability to absorb soil minerals, **and** destroys their first line of defense against such virulent root diseases as take-all disease and pythium. Even the relatively benign insecticidal soaps kill the beneficial leaf-dwelling microbes and dissolve the waxy surface of the leaf. This destroys the plant's first **and** second lines of defense against invading plant feeding microbes, and predisposes it to diseases and further insect attacks.

We've known for decades that insecticide use invariably leads to a resurgence of insect populations because, along with the insects, **their** predator populations are also affected by the pesticide. Additionally, pesticide use leads to the creation of **new** pests, as insect populations that had previously been unnoticeable, grow out of control because their predators have also been killed. In an effort to rid our roses of aphids we may now be blessed with aphids **and** mites **and** scale.

With repeated exposure many insect and microbe populations become immune to the pesticides used to kill them. This leads to the constant development of newer and ever more poisonous pesticides, as the older ones become ineffective.

For instance, most of the popular pesticides sold to control mites are now completely ineffective. Those that do work are too toxic to be sold in the retail environment. Species far removed from the actual use of pesticides suffer, and whole populations of animals are decimated through their exposure to pesticide residues in the soil, water and air.

For example, scientists are observing important changes in hormones and reproductive systems among fish and other waterborne creatures exposed to pesticides. The two most popular pesticides, Roundup and atrazine are known to cause mutations and a serious decline in frog populations. Roundup is also associated with reduced sperm counts, miscarriages and premature births in mammals. In North America, nearly 180 million pounds of these herbicide products were applied to our ornamental landscapes and agricultural fields in the year 2002.

How far reaching is this environmental pollution by pesticides?

Since the late 1970s, researchers in the U.S.A. have found residues from more than 139 different pesticides in groundwater, with concentrations of some compounds frequently exceeding allowable levels in drinking water. A 1999 U.S. Geological Survey found an average of 20 pesticides in each river and stream tested, and nearly half of all pesticides targeted for research were found to be present in stream sediment.

Pesticides are also present in the air we breathe. Nearly every pesticide that has been investigated has been detected in the air, rain, snow, or fog across the continent at different times of year. Some highly volatile pesticides, such as diazinon, actually increase their drift concentrations as time passes, with the greatest amount of drift showing up two to three days after spraying. Although levels eventually diminish, pesticide drift can last for weeks, and sometimes months after application.

So how long do pesticides actually remain poisonous?

For decades we've been told that pesticides quickly break down or become deactivated in the soil. And most of them do, but it's not always that simple. For the most part pesticides break down through the activity of microbes. However, if one has dutifully cleaned up all leaf litter, and then substituted for the resulting lack of natural fertility with synthetic fertilizers, chances are the soil may not have the diversity of microbes to quickly break down these poisons. In these soils some pesticides can persist for many months. On the carpet – brought in by our pets or children after walking through a recently treated lawn or flower bed – they can remain active for years. Pesticides of the chemical group called organochlorines persist in the environment in the bodies of animals, where they accumulate in the fatty tissues faster than they can be metabolized. Organochlorines become more concentrated as they move up through the food chain, with the highest levels found in fish-eating birds and marine mammals and humans. In fact 64 percent of all pesticides researched were found in edible fish, mollusks, and other aquatic life.

As they break down many pesticides combine with other substances in the air, water and soil, where they undergo chemical reactions to form new, and often even more toxic, substances

So here it is:

Every time we use a pesticide we hurt our plants and our gardens, our pets, and the birds, bees and butterflies.

Our storm water runs off into storm sewers, and from there into rivers and the Ocean. Our chemical battle with a few dandelions affects fish and frog populations hundreds of miles away. For all our good intentions we've caused the death of millions of organisms, and widespread environmental disease.

What are the alternatives?

"A new type of thinking is essential if humankind is to survive."

Albert Einstein (1879 - 1955), 1921 Nobel Prize Recipient in Physics

<http://www.ipcmv.ca/>

<http://www.ceedcentre.org/>

<http://www.organiclandcare.org/vancouver/vancouver.html>