Pesticides: What Are They?

Washington State University Urban IPM and Pesticide Safety Education Program

A pesticide is any substance or mixture of substances intended to prevent, destroy, repel, attract, or mitigate a pest. Target pests include any living organism that causes damage or economic loss, or transmits or produces disease. Pests can be animals like insects, birds or mice, unwanted plants (weeds), or microorganisms like plant diseases and viruses.

Throughout history, pests have caused problems. Diseases transmitted by insects and rodents led to epidemics of deadly diseases like bubonic plague and yellow fever. Famines resulted when locusts, molds and other pests destroyed crops. Ireland's great potato famine of 1845-1849 was caused by a fungus called late blight. Late blight is now controlled by pesticides.

People have been trying to control pests with chemicals since ancient times. Prior to World War II, common pesticides included arsenic, sulfur, and some heavy metals. After World War II, many synthetic chemicals were introduced into agriculture. The new products helped prompt the so-called "Green Revolution," increasing crop yields dramatically and making available plentiful grains and a bountiful variety of inexpensive fruits and vegetables.

However, during the 1960s, society changed its view of pesticides. Concerns about chronic health effects, environmental contamination, effects on wildlife, and the increasing immunity of some pests to chemicals led to stricter regulation. Some products, like DDT, were banned. Presently there is a greater use of reduced-risk practices that combine biological, cultural, and physical controls with judicious pesticide use to minimize economic, health, and environmental risks.

Because most pesticides are designed to be toxic to their target organisms, and because any substance can be harmful if used improperly, pesticides are closely regulated. The US Environmental Protection Agency (EPA) is the federal agency that regulates pesticide sale and use. In Washington, the Washington State Department of Agriculture (WSDA) is responsible for product registration, local use enforcement, environmental monitoring, and residue testing of fresh produce.

The word pesticide is often misunderstood to mean only an insecticide. Actually, pesticide refers to not only insecticides but herbicides, rodenticides, fungicides and even biological, pest-destroying organisms such as *Bacillus thuringiensis*. Household products account for a major portion of pesticide sales. Such familiar products

as toilet bowl cleaners, disinfectants, cleansers, bleaches, mildew removers, and ant and roach sprays are all pesticides. Herbicides are pesticides used to control weeds on lawns, and along roadways, waterways and other public areas.

Common types of pesticides and their function(s):

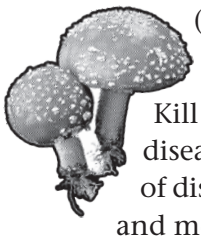
Acaricides
Kills mites (see miticides).

Algicides
Control algae in swimming pools, lakes, canals and water used industrially or stored.

Attractants
Attract pests (e.g., lure an insect or rodent to a trap). Pheromones are chemical sex attractants often used to confuse mating behavior of insects.

Biocides
Kills any organism.

Disinfectants and sanitizers
Kill or inactivate disease-producing microorganisms (bacteria, viruses, etc.) on inanimate objects.



Fungicides
Kill fungi (many of which can infect and cause diseases in plants, animals and people; examples of disease-causing fungi are rusts, mildews, blights and molds).

Fumigants
Produce gas or vapor intended to destroy insects, fungi, bacteria or rodents, used to disinfest interiors of buildings as well as soil before planting.

Herbicides
Kill weeds and other plants that grow where they are not wanted.

Insecticides
Kill insects and insect relatives like spiders and ticks.

Miticides
Also called acaricides, kill mites that feed on plants and animals.

Microbials
Microorganisms that kill, inhibit or outcompete pests, including insects or other microorganisms.

Molluscicides
Kill snails and slugs.

Nematicides
Kill nematodes (microscopic, wormlike organisms that feed on plant roots).

Ovicides
Kill eggs of insects and mites.

Repellents
Repel pests, including birds and insects (e.g., mosquitoes, fleas or ticks).

Rodenticides
Control mice and other rodent pests.

The term pesticide also includes related substances:

Defoliants
Cause leaves or foliage to drop from a plant, usually to facilitate harvest.

Desiccants
Promote drying of living tissues—unwanted plant tops or insects, for example.

Insect growth regulators
Disrupt the action of insect hormones controlling molting, maturity from pupal stage to adult or other life processes.

Plant growth regulators
Substances (excluding fertilizers or other plant nutrients) that alter the expected growth, flowering or reproduction rate of plants through hormonal rather than physical action.

This material was adapted from CalEPA/CDPR Fact Sheets and the Citizen's Guide to Pest Control and Pesticide Safety, EPA 730-K-95-001, Sept. 1995.