

Pesticides: What Are They?



A pesticide is any substance or mixture of substances intended to prevent, destroy, repel, attract, or mitigate any 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 -- in which a third of the nation's population died--was caused by a potato fungus called late blight. Late blight can now be 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. We became aware that pesticide use had costs. 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. And, thanks to fungicides, food today is virtually free of mold and other types of fungi. Some fungi produce the most potent carcinogens yet discovered.

Here are some common kinds 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 (for example, 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: 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 (for example, 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