**Effect of pesticide**

## Pesticides are chemical preparations used to kill fungal or animal pests.

## Specific pesticide effects

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| --- | --- |
| **Pesticide environmental effects** | |
| **Pesticide/class** | **Effect(s)** |
| [Organochlorine](https://en.wikipedia.org/wiki/Organochlorine) [DDT](https://en.wikipedia.org/wiki/DDT)/[DDE](https://en.wikipedia.org/wiki/Dichlorodiphenyldichloroethylene) | [Endocrine disruptor](https://en.wikipedia.org/wiki/Endocrine_disruptor) |
|  | [Thyroid](https://en.wikipedia.org/wiki/Thyroid) disruption properties in rodents, birds, amphibians and fish |
|  | Acute mortality attributed to inhibition of [acetylcholinesterase](https://en.wikipedia.org/wiki/Acetylcholinesterase" \o "Acetylcholinesterase) activity |
| DDT | Egg shell thinning in raptorial birds |
|  | [Carcinogen](https://en.wikipedia.org/wiki/Carcinogen) |
|  | [Endocrine disruptor](https://en.wikipedia.org/wiki/Endocrine_disruptor) |
| DDT/[Diclofol](https://en.wikipedia.org/w/index.php?title=Diclofol&action=edit&redlink=1" \o "Diclofol (page does not exist)), [Dieldrin](https://en.wikipedia.org/wiki/Dieldrin" \o "Dieldrin) and [Toxaphene](https://en.wikipedia.org/wiki/Toxaphene" \o "Toxaphene) | Juvenile population decline and adult mortality in wildlife reptiles |
| DDT/Toxaphene/[Parathion](https://en.wikipedia.org/wiki/Parathion) | Susceptibility to fungal infection |
| [Triazine](https://en.wikipedia.org/wiki/Triazine) | Earthworms became infected with monocystid gregarines |
| [Chlordane](https://en.wikipedia.org/wiki/Chlordane) | Interact with [vertebrate](https://en.wikipedia.org/wiki/Vertebrate) immune systems |
| Carbamates, the phenoxy herbicide 2,4-D, and atrazine | Interact with [vertebrate](https://en.wikipedia.org/wiki/Vertebrate) immune systems |
|  |  |
| [Organophosphate](https://en.wikipedia.org/wiki/Organophosphate) | [Thyroid](https://en.wikipedia.org/wiki/Thyroid) disruption properties in rodents, birds, amphibians and fish |
|  | Acute mortality attributed to inhibition of acetylcholine esterase activity |
|  | [Immunotoxicity](https://en.wikipedia.org/wiki/Immunotoxicity), primarily caused by the inhibition of [serine hydrolases](https://en.wikipedia.org/wiki/Serine_hydrolase) or [esterases](https://en.wikipedia.org/wiki/Esterase" \o "Esterase) |
|  | Oxidative damage |
|  | Modulation of signal transduction pathways |
|  | Impaired metabolic functions such as [thermoregulation](https://en.wikipedia.org/wiki/Thermoregulation), water and/or food intake and behavior, impaired development, reduced reproduction and hatching success in vertebrates. |
| [Carbamate](https://en.wikipedia.org/wiki/Carbamate) | [Thyroid](https://en.wikipedia.org/wiki/Thyroid) disruption properties in rodents, birds, amphibians and fish[[](https://en.wikipedia.org/wiki/Environmental_impact_of_pesticides#cite_note-doi0354-15) |
|  | Impaired metabolic functions such as [thermoregulation](https://en.wikipedia.org/wiki/Thermoregulation), water and/or food intake and behavior, impaired development, reduced reproduction and hatching success in vertebrates. |
|  | Interact with [vertebrate](https://en.wikipedia.org/wiki/Vertebrate) immune systems |
|  | Acute mortality attributed to inhibition of acetylcholine esterase activity |
| [Phenoxy](https://en.wikipedia.org/wiki/Phenoxy) [herbicide](https://en.wikipedia.org/wiki/Herbicide) [2,4-D](https://en.wikipedia.org/wiki/2,4-D) | Interact with [vertebrate](https://en.wikipedia.org/wiki/Vertebrate) immune systems |
| [Atrazine](https://en.wikipedia.org/wiki/Atrazine) | Interact with [vertebrate](https://en.wikipedia.org/wiki/Vertebrate) immune systems |
|  | Reduced [northern leopard frog](https://en.wikipedia.org/wiki/Northern_leopard_frog) (Rana pipiens) populations because atrazine killed [phytoplankton](https://en.wikipedia.org/wiki/Phytoplankton), thus allowing light to penetrate the [water column](https://en.wikipedia.org/wiki/Water_column) and [periphyton](https://en.wikipedia.org/wiki/Periphyton" \o "Periphyton) to assimilate nutrients released from the [plankton](https://en.wikipedia.org/wiki/Plankton). Periphyton growth provided more food to grazers, increasing snail populations, which provide intermediate hosts for [trematode](https://en.wikipedia.org/wiki/Trematode" \o "Trematode) |
| [Pyrethroid](https://en.wikipedia.org/wiki/Pyrethroid) | [Thyroid](https://en.wikipedia.org/wiki/Thyroid) disruption properties in rodents, birds, amphibians and fish[[](https://en.wikipedia.org/wiki/Environmental_impact_of_pesticides#cite_note-doi0354-15) |
| [Thiocarbamate](https://en.wikipedia.org/wiki/Thiocarbamate) | [Thyroid](https://en.wikipedia.org/wiki/Thyroid) disruption properties in rodents, birds, amphibians and fish |
| [Bt corn](https://en.wikipedia.org/wiki/Bt_corn)/Cry | Reduced abundance of some insect taxa, predominantly susceptible [Lepidopteran](https://en.wikipedia.org/wiki/Lepidoptera" \o "Lepidoptera) [herbivores](https://en.wikipedia.org/wiki/Herbivore) as well as their predators and [parasitoids](https://en.wikipedia.org/wiki/Parasitoid) |
| Herbicide | Reduced food availability and adverse secondary effects on soil invertebrates and butterflies |
|  | Decreased species abundance and diversity in small mammals. |
| [Benomyl](https://en.wikipedia.org/wiki/Benomyl) | Altered the patch-level floral display and later a two-thirds reduction of the total number of bee visits and in a shift in the visitors from large-bodied bees to small-bodied bees and flies |

**Air**

Pesticides contribute to air pollution. Pesticides that are applied to crops are [volatilize](https://en.wikipedia.org/wiki/Volatilisation) and are blown by winds into nearby areas, potentially threat to wildlife. Weather conditions at the time of application as well as temperature and relative humidity change the spread of the pesticide in the air.

**Soil**

The extensive use of pesticides in agricultural production degrade and damage the community of microorganisms living in the soil, particularly when these chemicals are overused or misused as chemical compounds build up in the soil. The effect of pesticides on soil microorganisms is impacted by the persistence, concentration, and toxicity of the applied pesticide, in addition to various environmental factors. Many of the chemicals used in pesticides are persistent [soil contaminants](https://en.wikipedia.org/wiki/Soil_contaminant), whose impact endure for decades and adversely affect [soil conservation](https://en.wikipedia.org/wiki/Soil_conservation).

**Effect on Plants**

[Nitrogen fixation](https://en.wikipedia.org/wiki/Nitrogen_fixation), which is required for the growth of [higher plants](https://en.wikipedia.org/wiki/Higher_plant), is hindered by pesticides in soil. The insecticides [DDT](https://en.wikipedia.org/wiki/DDT), [methyl parathion](https://en.wikipedia.org/wiki/Methyl_parathion), and [pentachlorophenol](https://en.wikipedia.org/wiki/Pentachlorophenol) interferes with [legume](https://en.wikipedia.org/wiki/Legume)-[rhizobium](https://en.wikipedia.org/wiki/Rhizobium" \o "Rhizobium) chemical signaling. Reduction of this symbiotic chemical signaling results in reduced nitrogen fixation and thus reduced crop yields. pesticides have some direct harmful effect on plant including poor root hair development, shoot yellowing and reduced plant growth.

**Effect on animals**

Many kinds of animals are harmed by pesticides. Animals including humans are poisoned by pesticide residues that remain on food. Residues travel up the [food chain](https://en.wikipedia.org/wiki/Food_chain). Some pesticides [bioaccumulate](https://en.wikipedia.org/wiki/Bioaccumulation" \o "Bioaccumulation), or build up to toxic levels in the bodies of organisms.

### Birds

Some pesticides come in granular form. Wildlife eat the granules, mistaking them for grains of food. A few granules of a pesticide kill small bird. The [herbicide](https://en.wikipedia.org/wiki/Herbicide) [paraquat](https://en.wikipedia.org/wiki/Paraquat" \o "Paraquat), when sprayed onto [bird eggs](https://en.wikipedia.org/wiki/Bird_egg), causes growth abnormalities in [embryos](https://en.wikipedia.org/wiki/Embryo) and reduces the number of chicks that hatch successfully, but most herbicides do not directly cause much harm to birds. Herbicides endanger bird populations by reducing their habitat.

### Aquatic life

Fish and other aquatic biota harmed by pesticide-contaminated water. Application of herbicides to bodies of water cause [fish kills](https://en.wikipedia.org/wiki/Fish_kill) when the dead plants decay and consume the water's oxygen, suffocating the fish. Herbicides such as [copper sulfite](https://en.wikipedia.org/w/index.php?title=Copper_sulfite&action=edit&redlink=1) that are applied to water to kill plants are toxic to fish and other water animals at [concentrations](https://en.wikipedia.org/wiki/Concentration) similar to those used to kill the plants. Repeated exposure to sublethal doses of some pesticides cause physiological and behavioral changes that reduce fish populations, such as abandonment of nests and broods, decreased immunity to disease and decreased predator avoidance.

Application of herbicides to bodies of water kill plants on which fish depend for their habitat.

### Amphibians

Pesticide mixtures have a cumulative toxic effect on [frogs](https://en.wikipedia.org/wiki/Frog). [Tadpoles](https://en.wikipedia.org/wiki/Tadpole) from ponds containing multiple pesticides take longer to [metamorphose](https://en.wikipedia.org/wiki/Metamorphosis) and are smaller when they do, decreasing their ability to catch prey and avoid predators. Exposing tadpoles to the [organochloride](https://en.wikipedia.org/wiki/Organochloride" \o "Organochloride) [endosulfan](https://en.wikipedia.org/wiki/Endosulfan" \o "Endosulfan)  in habitats near fields sprayed with the chemical kills the tadpoles and causes behavioral and growth abnormalities. The herbicide [atrazine](https://en.wikipedia.org/wiki/Atrazine" \o "Atrazine) turn male frogs into [hermaphrodites](https://en.wikipedia.org/wiki/Hermaphrodite), decreasing their ability to reproduce.

### Humans

Pesticides enter the body through inhalation of [aerosols](https://en.wikipedia.org/wiki/Aerosol), dust and [vapor](https://en.wikipedia.org/wiki/Vapor) that contain pesticides; through oral exposure by consuming food/water; and through skin exposure by direct contact. The [effects of pesticides on human health](https://en.wikipedia.org/wiki/Effects_of_pesticides_on_human_health) depend on the toxicity of the chemical and the length and magnitude of exposure. Farm workers and their families experience the greatest exposure to agricultural pesticides through direct contact. Every human contains pesticides in their fat cells. DDT and its breakdown product DDE disturb estrogenic activity and lead to [breast cancer](https://en.wikipedia.org/wiki/Breast_cancer). Insecticides targeted to disrupt insects have harmful effects on mammalian nervous systems.

**Persistent organic pollutants**

[Persistent organic pollutants](https://en.wikipedia.org/wiki/Persistent_organic_pollutant) (POPs) are compounds that resist degradation and remain in the environment.pesticides,including [aldrin](https://en.wikipedia.org/wiki/Aldrin), [chlordane](https://en.wikipedia.org/wiki/Chlordane), [DDT](https://en.wikipedia.org/wiki/DDT), [dieldrin](https://en.wikipedia.org/wiki/Dieldrin), [endrin](https://en.wikipedia.org/wiki/Endrin), [heptachlor](https://en.wikipedia.org/wiki/Heptachlor), [hexachlorobenzene](https://en.wikipedia.org/wiki/Hexachlorobenzene), [mirex](https://en.wikipedia.org/wiki/Mirex) and [toxaphene](https://en.wikipedia.org/wiki/Toxaphene), are considered POPs. Some POPs have the ability to volatilize and travel great distances through the atmosphere to become deposited in remote regions. Such chemicals have the ability to [bioaccumulate](https://en.wikipedia.org/wiki/Bioaccumulation" \o "Bioaccumulation) and [biomagnify](https://en.wikipedia.org/wiki/Biomagnification" \o "Biomagnification) . POPs affect non-target organisms in the environment and increase risk to humans by disruption in the [endocrine](https://en.wikipedia.org/wiki/Endocrine_system), [reproductive](https://en.wikipedia.org/wiki/Reproductive_system), and [respiratory systems](https://en.wikipedia.org/wiki/Respiratory_system).