

What is triclopyr ?

Triclopyr is a man-made [herbicide](#) used to control both broadleaf and woody plants. It was first registered in 1979 for use in forestry and it is used in both agricultural and non-agricultural settings. Certain products may have limited use for campsites, roadside applications, and some ornamental lawns. [Always read the label](#) for your product's use sites and instructions.¹

Broadleaf weeds often controlled with triclopyr include nettles, docks, brambles, and woody plants. Triclopyr is a selective herbicide, meaning it only controls certain types of plants. Grasses tend to be less sensitive to triclopyr than other weeds.²



photo credit: blickpixel, pixabay

What are some products that contain triclopyr ?

There are over 200 [products](#) containing triclopyr.³ Many of these products have other [active ingredients](#) in addition to triclopyr. Products may be ready-to-use, concentrated liquids, granules, or mixable powders. Products with triclopyr can be applied aerially or by ground application. They may be applied on tree bark, injected into tree trunks or soil, or sprayed on plant leaves.⁴

Products with triclopyr may have acid, salt, or ester forms. These forms tend to behave similarly in terms of toxicity and their movement in the environment.^{5,6}

Triclopyr is commonly used on pastures and rice. It is also commonly used for turf, landscaping, and [lawn care](#).¹ One type of triclopyr (a salt form) can be used on aquatic weeds.⁷ Triclopyr is not allowed for use in certified organic production.⁸

How does triclopyr work ?

Triclopyr is a systemic herbicide. It affects actively growing plants by mimicking a specific type of plant growth hormone, known as an auxin.⁹ Plants rapidly take in triclopyr through leaves and roots. It causes uncontrolled plant growth and plant death.⁴ After absorbing the herbicide, plants die slowly (within weeks).¹⁰

How might I be exposed to triclopyr ?

If you are in an area during or shortly after application, you could contact it, breathe it in, or get it in your eyes. Most triclopyr incidents that were reported to the US Environmental Protection Agency (EPA) from 2000 to 2014 involved homeowners who were mixing or applying products.¹¹

While accidents can happen, [following label instructions](#) and taking steps to [minimize exposure](#) can help reduce risks. If any exposures occur, be sure to follow the First Aid instructions on the product label carefully. For additional treatment advice, contact the Poison Control Center at 800-222-1222. If you wish to [discuss a pesticide problem](#), please call 800-858-7378.

What are some signs and symptoms from a brief exposure to triclopyr?

The salt form of triclopyr can cause permanent eye damage. The ester form of triclopyr may cause eye irritation. All forms of triclopyr were low in toxicity on the skin.⁵ Rabbits had some skin irritation when exposed to triclopyr for 24 hours.¹² The salt and ester forms are dermal sensitizers, meaning after multiple exposures there could be signs of allergic reactions.⁵



Triclopyr is low in toxicity if inhaled.⁵ Rats that inhaled moderate doses for four hours had teary eyes and salivation.¹²

If eaten, triclopyr is low in toxicity.⁵ Rats showed signs of lethargy, teary eyes, and shallow breathing after eating large doses of triclopyr.¹²

What happens to triclopyr when it enters the body?

Triclopyr is not absorbed well through the skin. A study with rabbits measured that 1.5% of a dose was absorbed through skin. In a study with human skin, it was estimated that less than 2% of the dose was absorbed.⁵

Triclopyr residues were measured in fat, ovaries, livers, and kidneys of rats that had eaten triclopyr.^{5,12} The EPA sets tolerances, which are legal limits for the amount of triclopyr that can be in milk and other animal products.¹³

Triclopyr mainly leaves the body in urine.⁵ Within 24 hours, 93-94% of a single dose eaten by rats was excreted.¹²

Is triclopyr likely to contribute to the development of cancer?

More studies may be needed to determine if triclopyr exposures could be linked to human cancer risks. The EPA has determined triclopyr is "unable to be classified as to human carcinogenicity."⁵ There is only weak evidence for breast cancer in female rats and kidney tumors in male rats.^{5,7} Tests show triclopyr is unlikely to damage genetic material.⁵

Has anyone studied non-cancer effects from long-term exposure to triclopyr?

Triclopyr is moderate in toxicity over long-term ingestion exposures. Rats fed moderate doses of triclopyr for 90 days had changes in their kidneys. Parts of kidneys that filter salts and vitamins from the blood were affected. Dogs fed moderate doses for a year had changes in their blood, liver function, weight gain, and kidney weights.⁵

Studies show that dogs were more sensitive to triclopyr than rats when fed triclopyr over longer periods of time.⁷ Results of one study suggest that it may be more difficult for dogs to excrete triclopyr compared to other animals.¹⁴ Always take steps to minimize your pets' exposure when using pesticides.

Triclopyr is low to moderate in developmental toxicity and moderate in reproductive toxicity. When moderate doses of triclopyr were fed to pregnant rabbits daily for 13 days, some pregnancies were lost and there were changes in fetal skeletal growth. Similar effects were seen when high doses were fed to pregnant rats for 10 days.⁵

In another study, two generations of male and female rats were fed triclopyr daily for 10 to 12 weeks before mating. There were fewer offspring and more lost pregnancies in both generations.⁵

The EPA has not tested triclopyr for endocrine disruption potential.¹⁵

Are children more sensitive to triclopyr than adults?

There is no evidence to suggest that children are more sensitive to triclopyr than adults.⁵ However, young children may act in ways that put them at greater risk of being exposed. For example, they may spend more time near the floor or ground. They may also be more likely to place their hands in their mouths after touching treated surfaces. Take steps to keep children away from pesticides.

What happens to triclopyr in the environment?

Ester and salt forms of triclopyr rapidly turn into the triclopyr acid form in the environment. Most triclopyr is [soluble in water](#), meaning it dissolves easily. However, the ester form is less soluble. Triclopyr has a low [vapor pressure](#), meaning it is not likely to release fumes into the environment.⁵

Triclopyr in water breaks down faster with light. The [half-life](#) of triclopyr in water with light is around 1 day.⁵ Without light, it is stable in water with a half-life of 142 days.⁴

Triclopyr breaks down relatively quickly in soils. It is mainly broken down by microbes.⁵ The [soil half-life](#) ranges from 8 to 46 days.^{5,10} In deeper soils with less oxygen, the half-life is longer.⁵ Triclopyr is mobile in soils.^{2,5} However, movement studies show that triclopyr was not measured in soils deeper than 15 to 90 centimeters (about 6 to 35 inches).^{4,5} Its movement in soil is affected by the amount of compost and rain, among other factors.^{10,16} Use NPIC's Herbicide Properties Tool ([HPT](#)) to find out how triclopyr can move in the environment.

As a systemic herbicide, triclopyr is absorbed through plant leaves and roots. It tends to accumulate in the growing points in a plant. The half-life in plants can vary widely with the type of plant. Barley and wheat plants broke down 85% of triclopyr within 3 days of application.¹⁰ The half-life in grass was between 5 and 20 days.¹⁶ The half-life in plants ranges from 3 to 24 days.^{2,5,16}

Can triclopyr affect fish or other wildlife?

Triclopyr is practically non-toxic to slightly toxic to birds.⁵ Long-term exposures to birds (acid form) may affect eggshell thickness.⁴ While the salt form is practically non-toxic to slightly toxic to shellfish, the ester form is moderately to highly toxic.⁵ All forms of triclopyr can be toxic to algae.⁴

For fish, the acid and salt forms are practically non-toxic, but the ester form is moderately to highly toxic.⁵ The ester form can bioaccumulate (build up) in fish.⁴ However, the ester form rapidly degrades to the acid form in the environment and fish are not likely to contact large amounts of the pesticide.^{4,5} A breakdown product of triclopyr called TCP* is slightly to moderately toxic to fish and shellfish.^{4,5}

For water fleas, the acid and salt forms are practically non-toxic, but the ester form is slightly to moderately toxic.⁵



photo credit: Larry Perez, National Park Service

Triclopyr is practically non-toxic to bees.^{4,5} Data is not currently available on the long-term toxicity of triclopyr to bees.⁴ Changes in vegetation, rather than toxicity of triclopyr itself, may affect populations of beetles, butterflies, and spiders.⁷

*TCP: trichloropyridinol

Where can I get more information?

For more detailed information about triclopyr please visit the list of [referenced resources](#) or call the National Pesticide Information Center, Monday - Friday, between 8:00am - 12:00pm PT (11:00am - 3:00pm ET) at 800-858-7378 or visit us on the web at npic.orst.edu. NPIC provides objective, science-based answers to questions about pesticides.

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