

An official website of the United States government.

We've made some changes to EPA.gov. If the information you are looking for is not here, you may be able to find it on the EPA Web Archive or the January 19, 2017 Web Snapshot.

Close



Chlorpyrifos

Chlorpyrifos is an organophosphate insecticide, acaricide and miticide used primarily to control foliage and soil-borne insect pests on a variety of food and feed crops.

Related Information

- [Learn about EPA's quest for Columbia's raw data on chlorpyrifos](#)
- [Read the Federal Register notice announcing our denial of a petition to revoke chlorpyrifos tolerances](#)
- [Revised chlorpyrifos human health risk assessment](#)

On this page:

- [Basic information](#)
- [Using chlorpyrifos products safely](#)
- [EPA actions and regulatory history](#)
- [Registration review schedule](#)
- [Additional information](#)

On another page:

- [Letters in support of September 2018 Department of Justice action on chlorpyrifos](#)

Basic Information

Chlorpyrifos has been used as a pesticide since 1965 in both agricultural and non-agricultural areas:

- The largest agricultural market for chlorpyrifos in terms of total pounds of active ingredient is corn.
- It is also used on soybeans, fruit and nut trees, Brussels sprouts, cranberries, broccoli, and cauliflower, as well as other row crops.
- Non-agricultural uses include golf courses, turf, green houses, and on non-structural wood treatments such as utility poles and fence posts. It is also registered for use as a mosquito adulticide, and for use in roach and ant bait stations in child resistant packaging.

Products are sold as liquids, granules, water dispersible granules, wettable powders, and water soluble packets, and may be applied by either ground or aerial equipment.

Using Chlorpyrifos Products Safely

The current chlorpyrifos labels require workers handling and applying chlorpyrifos to wear additional personal protective equipment (chemical resistant gloves, coveralls, respirators), and restricting entry into treated fields for 24 hours up to five days.

Chlorpyrifos can cause cholinesterase inhibition in humans at high enough doses; that is, it can overstimulate the nervous system causing nausea, dizziness, confusion, and at very high exposures (e.g., accidents or major spills), respiratory paralysis and death.

EPA Actions and Regulatory History

Since its first registration in 1965, chlorpyrifos has been reviewed several times by EPA for tolerance reassessment, reregistration, and most recently, as part of its ongoing [registration review](#). The following timeline summarizes the work EPA has done to ensure that, as science and technology evolve, registered chlorpyrifos products remain safe for use.

2000 – Voluntary Agreement to Eliminate, Phase Out and Modify Certain Uses

In 1996, the Food Quality Protection Act set a more stringent safety standard to be especially protective of children. After finalizing the chlorpyrifos risk assessments for reregistration, EPA identified the need to modify certain chlorpyrifos uses to meet the revised standard of safety, and to address health and environmental risks from chlorpyrifos exposure. In 2000, the registrants of chlorpyrifos voluntarily entered into an agreement with EPA to eliminate, phase out, and modify certain uses. Some examples of the voluntary cancellations and modifications in the agreement include:

- Eliminating most homeowner uses, except ant and roach baits in child resistant packaging and fire ant mound treatments, and phasing out all termiticide uses.
- Discontinuing all uses of chlorpyrifos products in the United States on tomatoes, restricting use on apples to pre-bloom and dormant application, and lowering the grape tolerance (maximum residue level) to reflect the labeled dormant application.

[Read the 2006 Registration Eligibility Decision \(RED\) for chlorpyrifos](#), which finalized the 2002 Interim RED, and includes an overview of the chlorpyrifos human health risk assessment for reregistration.

2002 – Label Changes to Ensure Environmental and Worker Safety

In 2002, EPA made a number of changes to the required safety measures that improved safety for the environment and for those applying this pesticide including:

- Use of buffer zones to protect water quality, fish and wildlife;
- Reductions in application rates per season on a variety of crops including citrus and corn; and
- Increase in amount of [personal protective equipment](#) to mitigate risk to agricultural workers.

2011 – Preliminary Human Health Risk Assessment

In 2011, as part of the registration review process, EPA completed a comprehensive preliminary human health risk assessment for all chlorpyrifos uses. This assessment included the results of extensive new research and the findings of a number of new studies that had become available since the agency's last human health risk assessment for chlorpyrifos, completed in June 2000.

[Read the 2011 human health risk assessment for chlorpyrifos](#).

2012 – Spray Drift Mitigation and Changes to Application Rates

In 2012, EPA significantly lowered the aerial pesticide application rates and created “no-spray” buffer zones for ground, airblast and aerial application methods around public spaces, including recreational areas, schools, homes and other sensitive areas to be protective of children and other bystanders.

[Read the 2012 Spray Drift Mitigation Decision for chlorpyrifos](#).

2014 – Revised Human Health Risk Assessment

In 2014, as part of the registration review process, EPA completed a revised human health risk assessment for all chlorpyrifos uses. The assessment updated the June 2011 preliminary human health risk assessment based on new information received, including public comments. EPA factored in exposures from multiple sources including from the exposures from food and water, from inhaling the pesticide and through the skin. EPA considered all populations including infants, children, and women of child-bearing age. EPA incorporated information from a 2012 assessment of spray drift exposure and as well as new restrictions put into place to limit spray drift.

[Read the 2014 human health risk assessment for chlorpyrifos](#).

2016 – Revised Human Health Risk Assessment

After receiving public comments on the 2014 risk assessment and feedback from the FIFRA Scientific Advisory Panel, EPA revised its human health risk assessment for chlorpyrifos in 2016.

[Read the 2016 human health risk assessment for chlorpyrifos](#).

2017-2019 – Denial of Petition to Revoke Tolerances

In March 2017, EPA denied a petition that asked us to revoke all pesticide tolerances (maximum residue levels in food) for chlorpyrifos and cancel all chlorpyrifos registrations. The Agency concluded that despite several years of study, the science addressing neurodevelopmental effects remains unresolved and further evaluation of the science during the remaining time for completion of registration review is warranted. As a part of the ongoing registration review, we will continue to review the science addressing neurodevelopmental effects of chlorpyrifos.

[Read the Federal Register notice announcing our response to the petition](#).

On Aug. 9, 2018, the U.S. Ninth Circuit Court of Appeals ordered EPA to ban chlorpyrifos within 60 days. The following month, the Department of Justice requested a rehearing before an *en banc* panel of the court's judges (an 11-judge panel), which was granted on Feb. 6, 2019, effectively vacating the earlier ruling. After hearing oral argument on March 26, on April 19, 2019, the court ordered EPA to issue a final

decision with respect to the petition objections within 90 days and did not otherwise address the issues raised in the case.

[Read letters in support of September 2018 Department of Justice action on chlorpyrifos.](#)

Registration Review Schedule

Currently, chlorpyrifos remains registered as it undergoes registration review, a program that re-evaluates all pesticides on a 15-year cycle. Registration review ensures pesticides will not cause unreasonable adverse effects when used according to label directions and precautions and that there is a reasonable certainty of no harm from dietary and residential exposure. All documents related to the registration review can be located in the registration review docket [EPA-HQ-OPP-2008-0850](#) located at www.regulations.gov. We will continue to evaluate the potential risks posed by chlorpyrifos as part of the ongoing registration review and intend to complete our assessment by the statutory deadline of October 1, 2022. Anticipated milestones in the completion of the chlorpyrifos registration review include:

- Revise the Human Health Risk Assessment (HHRA);
- 60-day Public Comment on the HHRA;
- Response to comments document and Benefits Assessment;
- Proposed interim decision (PID) outlining any proposed mitigation;
- 60-day Public Comment on the PID;
- Address public comments received on the PID, develop Interim Decision, and include required mitigation; and
- Revise the 2006 organophosphate cumulative risk assessment after the single chemical risk assessments and Interim Decisions for all the organophosphates are completed.

Additional Information

- Chemical Search (EPA risk assessments, decisions, and other documents)
- Registration Review Docket for chlorpyrifos EPA-HQ-OPP-2008-0850 at www.regulations.gov
- Tolerance Rulemaking Docket for chlorpyrifos EPA-HQ-OPP-2015-0653 at www.regulations.gov

LAST UPDATED ON JULY 25, 2019