

Phorate IRED Facts

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EPA has assessed the risks of phorate and reached an Interim Reregistration Eligibility Decision (IRED) for this organophosphate (OP) pesticide. Phorate is eligible for reregistration, pending a full reassessment of the cumulative risk from OPs.

Used primarily on a variety of field agricultural crops, phorate residues from food alone do not exceed the Agency's level of concern. However, for dietary risk from drinking water, based on modeling (SCI-GROW), the maximum estimated concentrations of phorate and metabolites (sulfoxide and sulfone) in groundwater are slightly greater than the Agency's Drinking Water Level of Comparison (DWLOC) for chronic drinking water exposure. Also, the estimated concentrations of phorate and its metabolites in surface water slightly exceed EPA's DWLOC for acute exposure. However, the conservative nature of the food assessment together with extensive risk mitigation proposed in this document lead the Agency to believe that the dietary risk from food and drinking water exposure for phorate and its degradates will be below the Agency's level of concern following implementation of mitigation measures. Phorate has no residential uses. With the implementation of certain risk mitigation measures, phorate's worker and ecological risks also will be below levels of concern for reregistration.

EPA's next step under the Food Quality Protection Act (FQPA) is to complete a cumulative risk assessment and risk management decision encompassing the OP pesticides, which share a common mechanism of toxicity. The interim decision on phorate cannot be considered final until this cumulative assessment is complete. Further risk mitigation may be warranted at that time.

EPA is reviewing the OP pesticides to determine whether they meet current health and safety standards. Older OPs need decisions about their eligibility for reregistration under FIFRA. OPs with residues in food, drinking water, and other non-occupational exposures also must be reassessed to make sure they meet the new FQPA safety standard.

The phorate interim decision was made through the OP pilot public participation process, which increases transparency and maximizes stakeholder involvement in EPA's development of risk assessments and risk management decisions. EPA worked extensively with affected parties to reach the decisions presented in this interim decision document, which concludes the OP pilot process for phorate.

Uses

- Phorate is an insecticide/nematicide used to control various insects such as the Mexican bean beetle, corn rootworm, mites, European corn borers, wireworms, white grubs, cornleaf aphids, seedcorn beetles, leafminers, thrips, black cutworms, leafhoppers, white flies, nematodes,

southern corn rootworm, flea beetle larvae, psyllids, wireworms, Colorado potato beetle, lygus, chinchbug nymphs, Banks grass mites, seedcorn maggots, sugar beet root maggot, sugar beet leafhopper, grasshoppers, and Hessian Fly. Phorate is used on potatoes, corn (fresh, sweet, field), peanuts, cotton, sugarcane, wheat (spring/winter), soybeans, beans, sorghum, sugar beets, lilies (field grown), daffodils, and radishes grown for seed.

- An estimated 3 million pounds of phorate are produced annually. Crops with the highest usage with reference to pounds produced are corn (46%), potatoes (21%) and cotton (13%). Almost 2.5 million acres are treated annually. Crops with the highest percentage of acres treated include potatoes (20%), fresh sweet corn (10%) and peanuts (9%). Most of the usage is in FL, WI, CA, GA, MS, AL, TX, ID, MT, and MI.
- There are no residential uses for phorate.

Health Effects

- Phorate can cause cholinesterase inhibition in humans; 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.

Risks

- Acute and chronic dietary risks from food alone do not exceed the Agency's level of concern, however, for dietary risk from drinking water, the maximum estimated concentrations of phorate and metabolites (sulfoxide and sulfone) in groundwater and surface water slightly exceed EPA's level of concern.
- Worker risks are of concern for the mixer/loader/applicator when using open bags, open cab ground equipment and minimum Personal Protective Equipment. Aerial applicators and flaggers (without engineering controls) also have risks above EPA's level of concern.
- Ecological risks are also of concern to the Agency. Risks to birds, fish, and mammals are high. Study results indicate that ingestion of phorate poses acute and chronic risks to birds. Additionally several bird kills, some involving large numbers of birds, have been reported and linked to the use of phorate on winter wheat. Fall application seems to pose a particular risk because during winter, degradation and downward movement is expected to be slow. As a result, in the following spring, concentrations of phorate and its metabolites can occur at hazardous levels in pools on the soil surface. Acute and chronic risks to aquatic organisms resulting from surface run-off to rivers, streams and coastal areas is high based on study results. Additionally, a few fish kill incidents have been reported and indirectly linked to phorate. Risks to mammals may result from agricultural use, based on study results. Phorate is moderately to highly toxic to honey bees on an acute basis.

Risk Mitigation

In order to support a reregistration eligibility decision for phorate, the following risk mitigation measures listed below are necessary. Although most of the mitigation measures are directed to a specific risk scenario (worker risk, ecological risk, or drinking water concern), some measures will reduce risk in more than one area of concern:

- To mitigate risks to agricultural workers:
 - Require the use of engineering controls such as enclosed loading and enclosed application systems and use of closed cabs.
 - Phase out open bag use.

- Prohibit aerial application.
 - Prohibit use of phorate on peanuts at pegging.
 - Prohibit use on wheat.
 - Require soil incorporation.
 - Allow sidedress use on cotton only in Arizona and California.
 - Allow only one application per season.
 - EPA believes that a more thorough assessment of exposure to re-entry workers is needed. The Agency is requiring efficacy data and additional agricultural practice data to help define if any activities could result in post application exposure. Pending review of the efficacy data, EPA believes that application rates should be reduced up to 25 % unless the studies show that the reduced rates are not efficacious. After reviewing the additional agricultural practice data, EPA also reserves the right to require guideline 132-1 (foliar residue dissipation study) and 133-3 (dermal exposure upon reentry study) data. In the interim, the reentry intervals will remain unchanged since several of the uses are preplant.
- To mitigate ecological risks the following label modifications are required:
 - "Environmental Hazards: This pesticide is very highly toxic to fish and wildlife. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high-water mark. Runoff may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment wastewater or rinsate. Birds and mammals may be killed if granules are not properly covered with soil in all areas of the treated field and in loading areas."
 - "Do not apply in wet soil conditions that may prevent the equipment from covering pesticide granules."
 - Under some conditions phorate may have a high potential for runoff into surface water for several days post application. Do not apply in the following situations:
 "Frequently flooded areas"
 "Areas where intense or sustained rainfall is forecasted to occur within 48 hours"
 - Use Best Management Practices for minimizing surface runoff in the following areas:
 "Poorly draining or wet soils with readily visible slopes toward adjacent surface water"
 "Areas over-laying extremely shallow ground water"
 "Areas with in-field canals or ditches that drain to surface water"
 "Areas not separated from adjacent surface waters with vegetated filter strips"
 "Areas over-laying tile drainage systems that drain to surface water"
 - When used on erodible soils, best management practices for minimizing runoff should be employed. Consult your local soil conservation service for recommendations in your use area
 - In particular, where highly erodible land (HEL) is adjacent to aquatic bodies, a 66 foot buffer/setback area should be left in grass or other natural vegetation.
 - Do not apply within 50 feet of any drinking water well to minimize potential contamination.
 - Do not wash, load, or empty application equipment near any well, as this practice is a potential source of ground water contamination.

The OP Pilot Public Participation Process

The organophosphates are a group of related pesticides that affect the functioning of the nervous system. They are among EPA's highest priority for review under the Food Quality Protection Act.

EPA is encouraging the public to participate in the review of the OP pesticides. Through a six-phased pilot public participation process, the Agency is releasing for review and comment its preliminary and revised scientific risk assessments for individual OPs. (Please contact the OP Docket, telephone 703-305-5805, or see EPA's web site, [Pesticide Reregistration Status](#).)

EPA is exchanging information with stakeholders and the public about the OPs, their uses, and risks through Technical Briefings, stakeholder meetings, and other fora. USDA is coordinating input from growers and other OP pesticide users.

Based on current information from interested stakeholders and the public, EPA is making interim risk management decisions for individual OP pesticides, and will make final decisions through a cumulative OP assessment.

Next Steps

- Numerous opportunities for public comment were offered as this decision was being developed. The phorate IRED therefore is issued in final (see www.epa.gov/opprrd1/REDS/ or www.epa.gov/pesticides/op), without a formal public comment period. The docket remains open, however, and any comments submitted in the future will be placed in this public docket.
- When the cumulative risk assessment for all organophosphate pesticides is completed, EPA will issue its final tolerance reassessment decision for phorate and may request further risk mitigation measures. The Agency will revoke 21 tolerances and amend 7 tolerances for phorate now. For all OPs, raising and/or establishing tolerances will be considered once a cumulative assessment is completed.