

Dicrotophos Facts

EPA 738-F-02-006

May, 2002

EPA has assessed the risks of dicrotophos and reached an Interim Reregistration Eligibility Decision (IRED) for this organophosphate (OP) pesticide. Provided that risk mitigation measures are adopted, dicrotophos' individual, aggregate risks are within acceptable levels based on assessed benefits of use. Dicrotophos also is eligible for reregistration, once cumulative risks are considered.

EPA's next step is to consider the cumulative risks of the OP pesticides, which share a common mechanism of toxicity. The interim decision on dicrotophos will not be final until these cumulative risks also are considered. Further risk mitigation may be warranted at that time.

Used on cotton and as a tree injection treatment on non food bearing trees, dicrotophos use does not result in risk concerns from residues in food and drinking water. Low concentrations of dicrotophos have been detected in surface waters, but total dietary risk is at acceptable levels. Although dicrotophos can be used as a tree injection treatment around residential areas, the treatment should not result in significant exposures to children and others. Without further mitigation limiting children's and others' exposure through food, and drinking water, dicrotophos fits into its own "risk cup". With other mitigation measures, dicrotophos's worker and ecological risks will still be above levels of concern, but the risks are balanced by strong benefits of dicrotophos to cotton production.

EPA is reviewing the OP pesticides to determine whether they meet current health and safety standards. Older OPs require decisions about their eligibility for reregistration under FIFRA. OPs with food, drinking water, residential, and any other non-occupational exposures must be reassessed to make sure they meet the new FFDCA safety standard, effected by the Food Quality Protection Act (FQPA) of 1996.

The dicrotophos 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.

Uses

- Dicrotophos is used as an insecticide to control flea hoppers, aphids, thrips, stink bugs and plantbugs in cotton. Dicrotophos can also be applied by tree injection to control insects on ornamental and non food bearing trees.
- Annual domestic use is approximately 550,000 pounds of active ingredient per year. The bulk of this use is on cotton in the southeast, Texas, and Arkansas. Dicrotophos is not registered for use in California and Arizona.

Health Effects

- Dicrotophos 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. Dicrotophos causes cholinesterase inhibition at very low concentrations and this inhibition can last for up to two weeks from a single exposure.

Risks

- **Dietary Risks:** Exposures to dicrotophos from food alone are well within acceptable levels for all populations. Dietary exposures from water assessed from screening level modeling concentrations are within acceptable ranges. Extremely limited monitoring data are in the same order of magnitude as modeled concentrations. Dicrotophos residues were frequently detected at low levels in the monitoring studies where samples were analyzed for dicrotophos.

A tolerance has been established for cotton seed and a tolerance for cotton gin by-products has been proposed.

- **Worker Risks:** EPA has risk concerns for workers who mix, load, and/or apply dicrotophos to cotton. Because of the high toxicity of dicrotophos, small amounts of exposure will result in high levels of risk. Applicators and handlers have high risk from potential exposure during mixing, loading and applying aerial applications of dicrotophos. The highest single application rate for ground applications also results in risks which are of concern to the EPA; however, this rate is considered to be necessary for adequate pest control.

Workers may enter the fields without additional protective clothing 6 days after application. Exceptions to this 6 day re-entry interval can be made for scouts who do not spend long periods of time in the treated fields and for workers who are doing "low contact activities" such as mechanical cultivating and spraying.

- **Wildlife Risks:** Wildlife concerns for dicrotophos are mainly for birds and mammals. While dicrotophos may be expected to be found at low levels in surface water, dicrotophos is not as toxic to fish and aquatic invertebrates as other OPs.

Dicrotophos was shown to be acutely toxic to birds and mammals at very low concentrations. In fact, any dicrotophos use may result in exposures that could acutely impact individual birds or small mammals. On a chronic basis, dicrotophos has been shown to have reproductive effects on birds causing reduced egg production, embryo viability, hatchling production and survival, and eggshell thickness.

Beneficial insects may also be affected by use of dicrotophos.

Risk Mitigation

To reduce risks to workers and to wildlife, the following mitigation measures are required.

To mitigate risks to agricultural workers:

- closed systems are required for mixing and loading dicotophos
- aerial applications are prohibited after January, 2005
- re-entry intervals are set at 6 days post-treatment

To mitigate ecological risks:

- limit total seasonal use to 0.83 lb ai/A
- limit total use prior to August 1 of any year to 0.5 lb ai/A.

To limit all risks:

- annual production is limited to the average amount produced in the years 1999-2001.

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 dicotophos IRED therefore is issued in final, without a formal public comment period. (Please see www.epa.gov/pesticides/reregistration/status.htm). The docket remains open, however, and any comments submitted in the future will be placed in this public docket.
- When EPA has considered the cumulative risks of the OP pesticides, the Agency will issue its final tolerance reassessment decision for dicotophos and may request further risk mitigation measures. For all OPs, tolerances will not be raised or established until cumulative risks have been considered.