United States Environmental Protection Agency | Prevention, Pesticides And Toxic Substances (7508C) | EPA 738-F-99-005 March 1999

R.E.D. FACTS

Vernolate

Pesticide Reregistration

All pesticides sold or distributed in the United States must be registered by EPA, based on scientific studies showing that they can be used without posing unreasonable risks to people or the environment. Because of advances in scientific knowledge, the law requires that pesticides which were first registered before November 1, 1984, be reregistered to ensure that they meet today's more stringent standards.

In evaluating pesticides for reregistration, EPA obtains and reviews a complete set of studies from pesticide producers, describing the human health and environmental effects of each pesticide. To implement provisions of the Food Quality Protection Act of 1996, EPA considers the special sensitivity of infants and children, as well as aggregate exposure of the public to residues of the pesticide from all sources, and the cumulative effects of the pesticide and other compounds with a common mechanism of toxicity. The Agency develops any mitigation measures or regulatory controls needed to effectively reduce each pesticide's risks. EPA reregisters pesticides that meet the safety standard of FQPA and can be used without posing unreasonable risks to human health or the environment.

This fact sheet serves as and explains EPA's Reregistration Eligibility Decision (RED) for Vernolate (2735), which consists of a voluntary cancellation of this pesticide. Vernolate was scheduled for a reregistration decision in 1999. However, the registrants supporting vernolate's registration have requested voluntary cancellation. The public had 30 days to comment on the voluntary cancellation of vernolate beginning on March 3, 1999. In addition, the registrants have been granted a one year existing stocks provision, as detailed in the March 3, 1999, Federal Register notice.

The following information is based on a cursory review of the existing information on vernolate. As a result of the voluntary cancellation, a thorough review for reregistration will not be completed.

Use Profile

Vernolate is a selective herbicide used to control a variety of weeds as their seeds germinate. These weeds include: annual broadleaf weeds, annual grasses, and perennial grasses. Agricultural crop use sites include: soybeans and peanuts. Vernolate is formulated into two products: Vernam® 10-G, a granule, and Vernam® 7-E, an emulsifiable concentrate. The application rate for Vernam®

10-G is 20-25 lbs/acre, and for Vernam® 7-E, the application rate is 2-3 lbs/acre. There are no residential uses for this herbicide.

Regulatory History

Vernam® 10-G and 7-E were first registered in 1987, although some canceled vernolate products were registered as early as 1964. Tolerances for vernolate were established on July 20, 1981. Further changes to the reregistration case came when the registrant decided not to support the uses on sweet potato and corn.

Human Health Assessment

Toxicity

Vernolate is in Acute Toxicity Category III for the oral, dermal and inhalation routes of exposure, and Acute Toxicity Category IV for primary eye and skin irritation. Developmental toxicity was observed in the rat, which included decreased mean fetal weights and a decreased number of normal pups as determined by skeletal analysis. The rat reproduction study showed additional effects including increased incidence of urinary tract variants in the pups of the P_0 and P_1 second matings. Neurotoxicity was observed in the acute neurotoxicity study exhibited as neuronal cell lesions and clinical signs which were consistent with acute cholinesterase inhibition. There was no evidence of carcinogenicity in the mouse study; a rat carcinogenicity study is not available.

Dietary Exposure

The reference dose (RfD) for vernolate is 0.001 mg/kg/day based on the results of a 2-generation rat reproduction study in which decreased body weight was observed at the LOAEL of 5 mg/kg/day. The NOAEL from this study was 1 mg/kg/day. A safety factor of 1000 was used in calculating the RfD to account for inter- and intra-species variability (100-fold) and an additional 10-fold safety factor was included to account for missing chronic studies in dogs and rats. Dietary exposure to vernolate could occur from residues in peanuts and soybeans, the only two remaining crops on which vernolate is used. However, the Agency has not estimated dietary risks for this chemical using the newer Dietary Risk Evaluation System software.

Occupational and Residential Exposure

Based on the use patterns of vernolate, occupational exposures could occur. While there is concern for exposures to thiocarbamate pesticides such as vernolate, new risk estimates for vernolate were not completed.

Environmental Assessment

Environmental Fate

Volatility appears to be the major route of dissipation for vernolate, and aerobic soil metabolism appears to be a minor pathway. Vernolate is stable to hydrolysis, photolysis in water and on soil, and anaerobic soil metabolism. The Agency has no data on aquatic aerobic metabolism. In sandy loam soil, the first and second aerobic soil half-lives were 40 days and 139 days. Vernolate sulfoxide and sulfone were the only identified degradates; these degradates were only

detected at low levels. Parent vernolate is moderately mobile in soil, but volatility may prevent leaching under most conditions. Field dissipation half-lives were 8 and 9 days in sandy loam soils in California, and volatility may have contributed to these short half-lives.

Based on the available data, the Agency concludes that the potential for ground water or surface water contamination from vernolate is very low based on its mobility and persistence characteristics. If vernolate were to reach surface water, it is expected to volatilize readily.

Ecological Effects

Vernolate is slightly toxic to mammals and practically nontoxic to birds. Vernolate soil residue concentrations are not expected to exceed levels that would cause any significant toxicological effects on birds or mammals. Toxicity to freshwater, estuarine, and marine organisms is moderate. The estimated environmental concentration of vernolate in surface water is not expected to have any significant acute toxic effects on freshwater, estuarine, or marine organisms.

The chronic effects on freshwater, marine, and estuarine organisms have not been determined. The peak expected environmental concentration in water (0.036 ppm) is greater than 1% of the lowest acute LC_{50} for aquatic organisms (1.8 ppm for *Daphnia magna*). Although vernolate is expected to volatilize readily, exposure to the peak Estimated Environmental Concentration might be expected to cause chronic effects to freshwater, estuarine, or marine organisms.

Based upon the estimated environmental concentration and the plant toxicity endpoint values, the toxic effect of vernolate on aquatic plants is expected to be minimal.

Additional Data Required

There are several outstanding data requirements for vernolate. At a minimum, a 90-Day neurotoxicity study, chronic toxicity studies, several residue chemistry studies, and several ecotoxicity studies would be required if this chemical were to continue with reregistration.

For More Information

For more information about EPA's pesticide reregistration program or the pesticide vernolate, please contact Kathleen Meier at the Special Review and Reregistration Division (7508C), OPP, US EPA, Washington, DC 20460; telephone 703-308-8017.

Electronic copies of this fact sheet and other REDs are available on the Internet. Please see http://www.epa.gov/REDs.

For information about the health effects of pesticides, or for assistance in recognizing and managing pesticide poisoning symptoms, please contact the National Pesticides Telecommunications Network (NPTN). Call toll-free 1-800-858-7378, between 9:30 am and 7:30 pm Eastern Standard Time, seven days a week. The NPTN website is http://www.ace.orst.edu/info/nptn.