

US EPA ARCHIVE DOCUMENT



R.E.D. FACTS

Sodium Cyanide

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 years ago 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. The Agency imposes any regulatory controls that are needed to effectively manage each pesticide's risks. EPA then reregisters pesticides that can be used without posing unreasonable risks to human health or the environment.

When a pesticide is eligible for reregistration, EPA announces this and explains why in a Reregistration Eligibility Decision (RED) document. This fact sheet summarizes the information in the RED for Case 3086, sodium cyanide.

Use Profile

Sodium cyanide is a single dose poison used in the M-44 ejector device on pastures, range and forest land to control coyote, red fox, gray fox and wild dog populations that prey upon (or are likely to prey upon) livestock, poultry or endangered species, or that are vectors of communicable diseases.

The sodium cyanide capsule is loaded into a capsule holder which is screwed onto the ejector mechanism of an M-44 device. The capsule holder is then treated with a scent formulated to attract canids. When an animal tugs at the capsule holder, a spring-driver plunger ejects the sodium cyanide capsule into its mouth. Sodium cyanide causes death by inhibiting enzyme reactions in mammals that prevent oxygen flow to the blood.

A Restricted Use Pesticide, sodium cyanide may be applied only by trained, certified applicators under the direct supervision of a government agency, in accordance with 26 stringent use restrictions detailed in product labeling.

The U.S. Fish and Wildlife Service issued a Biological Opinion in March 1993 that proposed additional restrictions on the use of sodium cyanide to protect endangered species.

Regulatory History

Sodium cyanide was initially registered as a pesticide in 1947 to control ants, certain bacteria, insects and rodents in residential and commercial areas. However, all non-predicidal uses were canceled in 1987 in response to a generic data call-in issued by EPA.

The only currently registered uses of sodium cyanide are for toxicant-filled capsules to be placed in M-44 spring-loaded ejector devices used to kill wild canids. Use is limited to situations where canids prey upon (or are likely to prey upon) livestock, poultry or Federally-designated threatened or endangered species, or where particular canids are carriers of communicable diseases. All currently registered products are Restricted Use Pesticides with specific applicator training and certification requirements, subject to 26 use restrictions.

Prior to 1972, sodium cyanide was used to control predators in a gunpowder-fired unit called the "Humane Coyote Getter." However, this use and all other predator control uses of sodium cyanide were canceled in 1972 due to the incidence of human injuries and the occasional killing of domestic dogs.

The use of sodium cyanide capsules in the M-44 was reinstated in 1975 when it was determined that the M-44 was safer and more selective than the "Humane Coyote Getter." The reinstated uses of sodium cyanide are subject to 26 use restrictions to minimize potential adverse impacts on man and the environment. Among other things, these restrictions require that applicators be appropriately trained and certified for using sodium cyanide capsules in M-44 devices, that applicators carry antidote kits when placing or inspecting M-44 devices, and that M-44 devices not be placed in areas likely to cause adverse impacts on humans and endangered species or other nontarget species.

Human Health Assessment

Toxicity

Sodium cyanide is highly toxic to warm-blooded animals. It has been placed in Toxicity Category I, indicating the greatest degree of acute toxicity, for oral, dermal and inhalation effects. It is highly corrosive to the skin and eyes, and cyanide liquid and possibly vapor, can be absorbed through intact skin. Vapor can be absorbed extremely rapidly through the respiratory tract.

Dietary, Occupational and Residential Exposure

Based on the pesticide's use patterns, the general population will not be exposed to sodium cyanide. There are no applicator/mixer/loader or post-application exposure concerns other than following the label restriction for use by certified personnel only.

Human Risk Assessment

Because of the specific nature of sodium cyanide's registered use pattern, the Agency's primary concern is the potential risk of acute toxicity to non-target animals. Sodium cyanide is not registered for use in residential environments, so risks are not posed to the general population. Risk of acute toxicity to applicators is mitigated by the pesticide's 26 use restrictions and its classification as a Restricted Use Pesticide.

Environmental Assessment

Environmental Fate

The Agency does not anticipate significant environmental exposure to sodium cyanide when it is used as an encapsulated material together with the M-44 ejector device.

Should an accidental spill of sodium cyanide capsules occur in the field, several processes would contribute to their dissipation. Hydrogen cyanide, which is formed by reaction with moisture, will diffuse to the atmosphere and be diluted into the air. Reactions with soil compounds will convert cyanide into carbon dioxide and ammonia or other nitrogen containing compounds. Thus, the environmental impact of the pesticidal use of sodium cyanide is expected to be minimal because of its mode of application as well as its degradation pattern in the environment.

Ecological Effects Risk Assessment

Sodium cyanide works by converting to hydrogen cyanide gas when it comes in contact with moisture, which inhibits an enzyme reaction that is essential to mammalian cellular respiration. This results in central nervous system depression, cardiac arrest and gross respiratory failure.

Any animal that is able to activate the trigger of the cyanide ejector device will get a dose of sodium cyanide in the mouth and will die. Therefore, it is considered a high acute risk pesticide for terrestrial vertebrates, including nontarget and endangered birds.

While the label restrictions were designed to minimize the risk to nontarget species, the M-44 will kill nontarget animals, including some endangered species. Additional restrictions on the use of sodium cyanide have been outlined for species at risk in a March 1993 U.S. Fish and Wildlife Service Biological Opinion and are being imposed through this Reregistration Eligibility Decision.

Based on the available information, secondary poisoning of animals that ingest the body of the target animal is not expected from approved use of sodium cyanide.

Additional Data Required

EPA is requiring product-specific data including product chemistry and efficacy data, revised Confidential Statements of Formula (CSF) and revised product labeling for reregistration of products containing sodium cyanide.

Product Labeling Changes Required

All sodium cyanide end-use products must comply with EPA's current pesticide product labeling requirements. The following statements also must appear on the labels of all end-use products:

"Restricted Use Pesticide" - the 26 use restrictions must be maintained on the labels.

"This pesticide is TOXIC TO WILDLIFE. Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of wastes."

Additional endangered species labeling consistent with the recommendations of the U.S. Fish and Wildlife' Biological Opinion of March 1993.

Regulatory Conclusion

The use of registered products containing sodium cyanide will not pose unreasonable risks or adverse effects to humans or the environment, provided that these products are used in accordance with the restrictions on product labeling. Therefore, all uses of these products are eligible for reregistration. Sodium cyanide products will be reregistered once the required product-specific data, Confidential Statements of Formula and revised labeling are received and accepted by EPA.

For More Information

EPA is requesting public comments on the Reregistration Eligibility Decision (RED) document for sodium cyanide during a 60-day time period, as announced in a Notice of Availability published in the Federal Register. To obtain a copy of the RED document or to submit written comments, please contact the Pesticide Docket, Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs (OPP), US EPA, Washington, DC 20460, telephone 703-305-5805.

Following the comment period, the sodium cyanide RED document will be available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, telephone 703-487-4650.

For more information about EPA's pesticide reregistration program, the sodium cyanide RED, or reregistration of individual products containing sodium cyanide, please contact the Special Review and Reregistration Division (7508W), OPP, US EPA, Washington, DC 20460, telephone 703-308-8000.

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 8:00 am and 6:00 pm Central Time, Monday through Friday.