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April 2001

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TECH NOTE

Wildlife
Services

United States
Department of
Agriculture

Animal and Plant
Health Inspection
Service

Date 1 April 2001

Compound DRC-1339 Concentrate—Staging Areas

(EPA Reg. No. 56228-30)

DRC-1339 (3-chloro-4-methyl benzenamine HCl, Chemical Abstract Service Reg. No. 7745-89-3) is a slow-acting avicide that is registered with the Environmental Protection Agency (EPA) for the control of several species of pest birds including blackbirds, starlings, pigeons, crows, ravens, magpies, and gulls. Technical DRC-1339 (Starlicide Technical, EPA Reg. No. 602-134) contains 97 percent DRC-1339. DRC-1339 was developed jointly by Ralston Purina, Inc., Purina Mills, Inc., and the National Wildlife Research Center (NWRC) of the U. S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Service's (WS) program.

Full registrations (Federal Insecticide, Fungicide, and Rodenticide Act [FIFRA] Section 3) are held by PM Resources, Inc., and USDA APHIS. A number of APHIS State Special Local Need (Section 24[c]) registrations also are available to solve local problems, such as blackbirds in sunflowers and blackbirds in rice. All APHIS DRC-1339 products are prepared from Starlicide Technical. The use of all APHIS DRC-1339 registrations is restricted to APHIS personnel trained in bird control (or persons under their direct supervision). The Compound DRC-1339 Concentrate—Staging Areas registered by APHIS provides a product that can safely be used for the control of blackbirds in non-food areas.

Acute Toxicity to Birds, Mammals, and Fish

DRC-1339 was developed as an avicide because of its differential toxicity to animals. More acute avian toxicity data are available for DRC-1339 than for any other pesticide used in the world: more than 40 species have been tested. DRC-1339 is highly toxic to blackbirds and other sensitive bird species (LD_{50} s range from 1 to 10 mg/kg), allowing a toxic dose to be placed on a single bait. But it is only slightly to moderately toxic to many nonsensitive birds, most predatory birds, and most mammals (LD_{50} s range from 100 to 1,000 mg/kg). Some species, including waterfowl and gallinaceous birds, are intermediate in sensitivity to DRC-1339 (LD_{50} s range from 10 to 100 mg/kg). Many bird species that are sometimes pests, including starlings, pigeons, blackbirds, crows, ravens, and magpies, are sensitive to DRC-1339. Many other bird species, such as raptors, sparrows, and eagles, are classified as nonsensitive. Known exceptions are owls, with LD_{50} s of about 5 mg/kg, placing them in the sensitive category.

The concentration of DRC-1339 that is lethal to 50 percent of treated bluegill sunfish (LC_{50}) after 96-hours of exposure is 11 ppm; to rainbow trout, 9.7 ppm; and to water fleas, 0.079 ppm, indicating that DRC-1339 is only moderately toxic to fish, but that some invertebrates may be sensitive to the compound, so direct or indirect application to water is prohibited.

Mode of Action

The mode of action of DRC-1339 in sensitive birds is irreversible kidney and heart damage; death normally occurs within 1-3 days following ingestion. In nonsensitive species, the mode of action is quite different, and the process requires 10-100 times more DRC-1339. In these species, the central nervous system is depressed,

resulting in cardiac or respiratory arrest; death usually occurs after 2-10 hours. The kidney and heart damage that occurs in sensitive birds that ingest DRC-1339 is irreversible; however, the central nervous system depression resulting from ingestion of DRC-1339 in nonsensitive mammals and raptors can be successfully treated symptomatically.

DRC-1339 is metabolized and excreted from all animals very quickly, with at least 90 percent of the compound lost within 2 hours. DRC-1339 is not accumulated in the body; thus the compound's residues generally range from 0 to less than 0.1 ppm when death occurs.

Potential Primary Hazards

Repeated exposure to DRC-1339 in feed can result in the poisoning of sensitive species. The concentration of DRC-1339 in feed that is lethal to 50 percent of treated starlings (LC_{50}) is 4.7 ppm after 30 days of exposure and 1.0 ppm after 90 days exposure. The 5-day LC_{50} for the northern bobwhite quail, is 14.1 ppm, and for species of intermediate sensitivity, such as the mallard, the 5-day LC_{50} is 322 ppm. DRC-1339 does not appear to affect avian reproduction except at levels very close to where toxicity is expressed.

Research has shown that DRC-1339 poses little acute hazard to nontarget animals when used according to label directions. Birds that may be of risk of acute poisoning include mourning doves, cardinals, blue jays, and small gallinaceous species. The primary hazards to non-target birds are generally site-specific and can be controlled by selecting a bait and bait sites that are not used by nontarget birds. The risk to nontarget birds can be further mitigated by careful prebaiting and observation prior to application.

The risk of primary poisoning to mammals is extremely low because of the low level of toxicity of DRC-1339 to most mammals, the baits that are used, bait dilution factors, and minimal treatment rates. The acute poisoning risk to mammals, such as dogs, cats, foxes, raccoons, and skunks, is minimal because the recommended baits are not readily accepted by these species.

Potential Secondary Hazards

WS has been monitoring the use of all DRC-1339 products since 1968. There have

been no documented secondary poisonings of mammalian or avian scavengers and predators with DRC-1339, except for one crow that may have scavenged the gut contents of a recently treated pigeon. NWRC has conducted long-term feeding studies where birds poisoned by DRC-1339 were collected and fed to raptors and scavenger mammals for 30 to more than 200 days. No symptoms of poisoning or mortalities occurred.

Special precautions may be warranted when using DRC-1339 where owls and cats may be exposed to poisoned birds. Although it is possible that a cat or owl could ingest a lethal dose of DRC-1339 if fed birds poisoned by the compound exclusively for more than 100 days, the actual risk is minimal because exposure to DRC-1339-poisoned birds occurs over a few weeks or less. To reduce any potential hazard, poisoned birds should be retrieved, then burned or buried, in a manner consistent with Federal, State, and local regulations.

Stability in the Environment

DRC-1339 is unstable in the environment and degrades rapidly when exposed to direct sunlight, heat, ultraviolet radiation, or moisture. The useful life of exposed baits can vary from a few hours under high humidity and direct sunlight conditions to more than a week under dry, dark conditions. DRC-1339 is highly soluble in water but does not hydrolyze. Photodegradation occurs in water with a half-life that ranges from 6.5 to 41 hours, depending upon the season (faster in summer, slower in winter). DRC-1339 is very tightly bound to soil (70-90 percent) and has low mobility. The half-life of DRC-1339 in biologically active soil is about 25 hours, and identified metabolites have low toxicity. Because DRC-1339 degrades rapidly in soils, does not persist, and binds tightly to soils, it is unlikely that DRC-1339 is translocated into plants.

Endangered Species Considerations

There is no evidence that the use of DRC-1339 treated grain baits in and around staging areas will have an impact on any threatened or endangered species. Before authorized applicators use DRC-1339, they should follow existing labeling and contact local, State, and Federal wildlife agencies to verify that no threatened or endangered species are present that could be harmed by baiting.

Prebaiting

Prebaiting (placing untreated baits at the site) is required before treating with DRC-1339 unless a bait site has consistent use by target birds and unless the birds are accustomed to feeding on foods that are the same as the bait selected for treatment. Prebaiting by WS personnel or others can establish and maintain a bait site while nontarget observations are being conducted. WS personnel should also observe the roosting habits of the target species during prebaiting.

Bait and Site Selection

DRC-1339 treated baits can be used when blackbirds are problems in grains crops such as corn, sunflower, and rice. Baits allowed for blackbirds include, but are not limited to, cracked corn and brown rice. Label restrictions on baits should be read and followed carefully. Cracked corn should not be used in areas frequented by nontarget granivorous birds likely to select this bait. WS personnel have documented that few nontarget birds are attracted to rice baits.

Most blackbird-control operations occur in or around grain crops and roost sites. Placing bait near shelterbelts, woodlots and wetlands increases hazards to nontarget species, especially to ground-feeding granivorous species.

The selection of baits must be based on observations of acceptability by target species, availability of similar foods or feeds in the diet of target birds, rejection of baits by nontarget birds, or the absence of nontarget species.

Bait Formulation, Preparation, and Dilution

WS personnel can order quantities of DRC-1339 baits from the Pocatello Supply Depot. Alternatively, DRC-1339 baits can be prepared locally in cement mixers, in plastic bags, or on plastic drop-cloths. Persons mixing bait must wear protective clothing including dust mask, rubber gloves and boots. Detailed mixing instructions can be found on the appropriate label.

To lessen the potential of poisoning nontarget birds with DRC-1339 baits, dilution with untreated bait is required. Dilution factors were developed by determining the amount of bait that could be ingested by target birds at a

single feeding. The appropriate label should always be referenced for the exact bait materials, preparation, and dilution rates.

Sources of Information

Additional information on this product can be found in the April 1994 ADC Final Environmental Impact Statement (Appendix P), in Material Safety Data Sheets supplied by the Pocatello Supply Depot, and in the 1995 Handbook on Prevention and Control of Wildlife Damage. Specific information on this product can be obtained through the National Wildlife Research Center (NWRC) (970-266-6000) or through the NWRC web site <http://www.aphis.usda.gov/ws/nwrc>. For further information about the availability of this product, contact your WS State Director, or the Pocatello Supply Depot.