

US EPA ARCHIVE DOCUMENT



# R.E.D. FACTS

## Pesticide Reregistration

## Norflurazon

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. The Agency develops any mitigation measures or regulatory controls needed to effectively reduce 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 explains the basis for its decision in a Reregistration Eligibility Decision (RED) document. This fact sheet summarizes the information in the RED document for reregistration case 0229, norflurazon.

## Use Profile

Norflurazon is a selective preemergent herbicide used to control germinating annual grasses and broadleaf weeds in fruits, vegetables, nuts, cotton, peanuts, soybeans, and various nonagricultural and industrial areas. Formulations include granular, flowable concentrate, and water dispersible granules.

Norflurazon is applied using aerial application, chemigation (drip and/or sprinkler), and soil treatment (broadcast and incorporation).

Use practice limitations prohibit applying norflurazon through any type of irrigation system (only for the Zorial Rapid 80<sup>®</sup> product); grazing livestock in treated areas or cut treated crops for feed; grazing or harvesting for forage or hay; and grazing or feeding for forage.

## Regulatory History

Norflurazon was first registered as a pesticide in the U.S. in 1974. EPA issued a Registration Standard for Norflurazon in December 1984 (PB86-135159). A June 1989 Second Round Review draft document was completed for norflurazon and the studies required in the Second Round Review document were eventually levied in the August 1990 Data Call-In (DCI). EPA issued subsequent DCIs in January and June 1993, requiring

additional data on groundwater monitoring and estuarine studies. Currently, eight norflurazon products are registered.

## Human Health Assessment

### Toxicity

In studies using laboratory animals, norflurazon generally has been shown to be of low acute toxicity. It is practically nontoxic by the oral and dermal routes, as well as in terms of eye and dermal irritation in rabbits. It has been placed in Toxicity Category IV (the lowest of four categories) for these effects. Studies on acute inhalation and dermal sensitization are required.

A subchronic toxicity study using rats resulted in changes in blood cell counts, increases in liver and thyroid weights, a decrease in enzyme activity, and an increase in thyroid effects at the highest dose level. In a subchronic study using rabbits, increases in enzyme activity, liver weight, and liver to body weight ratio in both sexes, and a slight redness of the skin were observed at the highest dose level.

In a chronic toxicity study using beagle dogs, liver weight increases, thyroid weight changes, increased cholesterol levels, and a decrease in red blood cell counts were noted in the high dose groups. A nine-month oral toxicity study using rats resulted in liver weight increases, an increase in the incidence of tubular degeneration, and changes in the thyroid weight.

In a 2-year carcinogenicity study using mice, increases in liver weight and liver to body weight ratio were observed. Also, increased incidences of enlarged spleen, nephritis, swollen/enlarged liver, and nodular enlargement of the liver were observed in male mice at the highest dose level, while increased incidences of an inflamed kidney (inflammation of kidney and its pelvis), enlarged liver, and cystic ovaries were observed in female mice at the highest dose level.

A chronic toxicity and carcinogenicity study using rats resulted in increases in liver weight in males and females, kidney weight increases in both sexes, and thyroid weight increases in males. Also, kidney effects were observed in the high dose males. Norflurazon was classified as a non-quantifiable "Group C" or possible human carcinogen.

A developmental toxicity study using rats caused skeletal abnormalities which were not statistically significant and are believed to be secondary to maternal effects at the high dose level. In a study using rabbits, norflurazon caused maternal effects of decreased body weight and clinical toxicity and developmental toxicity in the form of decreased mean fetal weight and skeletal abnormalities.

A one-generation reproductive toxicity study using mice showed no treatment-related effects at any dose levels. A 2-generation reproductive toxicity study in rats caused increased pup death, increased stillborn pups,

and increased pup deaths between days 5-14 of lactation at the highest dose level. Norflurazon is not considered to be mutagenic.

### **Dietary Exposure**

People may be exposed to residues of norflurazon through the diet. Tolerances or maximum residue limits have been established for norflurazon in many fruits, vegetables, and nuts, and in cotton, peanuts, and soybean commodities (please see 40 CFR §180.356). EPA has reassessed the norflurazon tolerances and found that sufficient data are available to support the established tolerances for almonds, apples, apricots, asparagus, avocados, blackberries, blueberries, cherries, citrus, cottonseed, cranberries, filberts, grapes, hops, nectarines, peaches, peanuts, pears, pecans, plums, raspberries, soybeans, soybean forage and hay, walnuts, milk, and the fat, meat, and meat-by-products of cattle, hogs, horses, and sheep.

The tolerance for hops, green under 40 CFR §180.356 must be revoked and a tolerance for the raw agricultural commodity hops, green and dried must be established under tolerances with regional registrations (40 CFR §180.356(x)). Tolerances for citrus molasses and dried citrus pulp must be revoked because citrus molasses is no longer considered a significant animal feed item and norflurazon does not concentrate in dried citrus pulp. The tolerance for poultry, fat, meat, and meat by-products must be revoked. A new tolerance must be established for caneberries. Existing tolerances for blackberries and raspberries must be revoked once the tolerance for caneberries (which encompasses both) is established. Additional data are required for cotton gin by-products. A food additive tolerance or Maximum Residue Limit (MRL) must be proposed for citrus oil. Several other tolerance revisions have been proposed.

The Agency is currently reviewing additional residue data required to upgrade the existing norflurazon metabolism studies on peanuts, cotton, and citrus. While the submitted storage stability data indicate that residues of norflurazon and its desmethyl metabolite are stable in plant commodities, the registrant is required to submit radiovalidation data for the animal method. Extended field trials for field rotational crops must be submitted by March 1998.

EPA has assessed the dietary risk posed by norflurazon. For the overall U.S. population and 22 subgroups, exposure from all current norflurazon tolerances represents 10% of the Reference Dose (RfD), or amount believed not to cause adverse effects if consumed daily over a 70-year lifetime. The exposure level of the most highly exposed subgroup, non-nursing infants (<1 year old), represents 47% of the RfD. Therefore, it appears that chronic dietary risk is minimal.

The Agency does not have a concern for acute dietary exposure to norflurazon because the margins of exposure (MOE) is 5,000 for females of child-bearing age. An MOE of 100 or greater is considered acceptable.

## Occupational and Residential Exposure

Based on current use patterns, handlers (mixers, loaders, and applicators) may be exposed to norflurazon during methods of application for which no data are currently available (e.g., ring drench use), or for which there are few data or data of less acceptable quality (e.g., ground application using granular drop-type spreaders; aerial application of granulars or liquids; application of dry flowable formulation using rights-of-way equipment, backpack sprayer, and low-pressure handwand sprayer; and flagger exposure to granulars). The calculations of potential daily dermal dose of norflurazon received by handlers are used to assess the risk to those handlers. It should be noted that relative to dermal exposures, the estimated inhalation exposures for norflurazon are considered insignificant.

The MOEs for short and intermediate-term occupational exposure subchronic systemic effects to norflurazon are greater than 100 for the exposure scenarios considered. There are no exposure data for the ring-drench application method. However, current information indicate that ring-drench handlers would likely receive less exposure than from rights-of-way handlers using a hose or cannon on a truck. Since exposures to handlers for the rights-of-way use of norflurazon has been calculated to yield a MOE greater than 100, the Agency expects handler exposure for the ring-drench use to also exceed 100. However, the Agency will require that chemical-resistant gloves be worn by ring-drench handlers, due to the lack of exposure data and the fact that chemical-resistant gloves are required for the other mixer/loader/applicator scenarios. Therefore, handler exposure studies are not required for norflurazon at this time.

The Agency concludes that risks from post-application exposures to norflurazon would be acceptable, provided entry does not occur immediately following application. Therefore, post-application exposure studies are not required at this time for norflurazon.

The Agency is requiring a Restricted Entry Interval (REI) of 12 hours set by the Worker Protection Standards (WPS). If the registrant petitions for a shorter REI, chemical specific post-application exposure data would be required. The Agency is requiring minimum personal protective equipment (PPE) for pesticide handlers. In addition, chemical resistant gloves are required for mixers/loaders and applicators using handheld equipment, such as handwands, hoses, or nozzles. Also, the Agency is requiring the following personal protective equipment for workers who enter the treated area before the REI has expired: coveralls, chemical resistant gloves, and shoes plus socks.

## Human Risk Assessment

Norflurazon generally is of low acute toxicity, but causes developmental and reproductive effects in animal studies and has been classified as a non-quantifiable Group C, possible human carcinogen. The registered food crop uses include fruits, vegetables, and nuts. However,

dietary exposure to norflurazon residues in foods is extremely low, as is the cancer risk posed to the general population.

There is minimal concern for the risk posed to norflurazon handlers (mixers/loaders/applicators). Exposure and risk to workers will be mitigated by the use of PPE required by the WPS, supplemented by early entry PPE as required by the RED. Postapplication reentry workers will be required to observe a 12-hour Restricted Entry Interval. This is the minimum REI required for norflurazon.

## Environmental Assessment

### Environmental Fate

The environmental fate of norflurazon is fairly well understood. Several environmental fate data requirements (batch equilibrium, spray drift, and groundwater monitoring studies) remain outstanding. Norflurazon is a persistent and mobile compound. Norflurazon's primary route of dissipation appears to be photodegradation in water and on soil to desmethyl norflurazon with a half-life of 2-3 days and 12-15 days, respectively. Norflurazon is stable to hydrolysis and degrades slowly in aerobic soil with a half-life of 130 days. In an aerobic aquatic study, norflurazon degraded to desmethyl norflurazon with a half-life of 6-8 months. Under anaerobic conditions, norflurazon is persistent with a half-life of approximately 8 months. The degradate, desmethyl norflurazon, is also persistent under aerobic and anaerobic conditions.

Norflurazon is mobile to highly mobile in soil. The mobility of desmethyl norflurazon, in soils other than high organic peat, has not been adequately defined. Because desmethyl norflurazon is a major degradate of norflurazon and is persistent, a new batch equilibrium study with pure desmethyl norflurazon is required. Fish accumulation data have shown that norflurazon has a low potential to bioaccumulate in bluegill sunfish.

There is a concern that norflurazon may contaminate surface water at application via spray drift and runoff. Substantial amounts of applied norflurazon could be available for runoff several months postapplication. The Agency is not requiring any surface water monitoring studies at this time; however, due to the mobility and persistence of norflurazon and desmethyl norflurazon, a surface water label advisory is required. Due to the phytotoxic nature of norflurazon and its method of application, spray drift studies are also required.

Norflurazon is not currently regulated under the Safe Drinking Water Act (SDWA). Therefore no MCL has been established and water supply systems are not required to sample and analyze for it. Although, EPA's Office of Drinking Water has not developed health advisory levels (HALs) for norflurazon, OPP has determined an estimated HAL of 30 ppb for comparison with levels potentially found in ground water.

Norflurazon exhibits some of the properties and characteristics of chemicals that have been detected in groundwater. Data suggest that



norflurazon leaches to groundwater as a result of normal agricultural use. The Agency is concerned about the impact of norflurazon on groundwater quality. In addition, norflurazon has been detected in several wells in Florida at levels that approach or exceed the estimated Health Advisory Level (HAL) of 30 ppb. Sandoz, is currently performing groundwater monitoring studies for the Agency and the state of Florida, to better evaluate the leaching potential of norflurazon.

### **Ecological Effects**

Norflurazon is practically nontoxic to avian species on an acute oral and subacute dietary basis but causes reproductive effects in birds. Norflurazon is also practically nontoxic to mammals and insects (honeybees).

In acute oral toxicity studies, norflurazon is moderately to slightly toxic to both cold and warm water fish. In a fish early life stage study, norflurazon caused chronic effects to fish at levels as low as 1.5 ppm. In an aquatic invertebrate study, norflurazon was slightly toxic. It may cause chronic effects on aquatic invertebrate survival and offspring production. Norflurazon is slightly to moderately toxic to estuarine/marine organisms.

Norflurazon may cause detrimental effects to certain terrestrial plants. It is also highly toxic to aquatic plants. The Agency is requiring further testing to fully assess the toxicity of norflurazon to nontarget aquatic plant species.

### **Ecological Effects Risk Assessment**

Norflurazon may cause chronic risk to both endangered and nonendangered avian species for some crops. It may also cause adverse effects to small endangered mammals. Norflurazon poses minimal risk to honeybees. Regarding aquatic risks, no acute or chronic levels of concern have been exceeded for freshwater fish, aquatic invertebrates, and estuarine/marine organisms.

Although further data on the toxicity of norflurazon to nontarget aquatic plants is needed, a plant risk assessment indicates high risk and endangered plant levels of concern are exceeded for terrestrial, semi-aquatic, and aquatic plants.

Levels of concern are exceeded for chronic risk to avian species and mammalian endangered species. A high risk is posed to endangered terrestrial, semi-aquatic and aquatic plants. In order to complete the risk assessment to nontarget aquatic plants, additional data are required for the following species: *Skeletonema costatum*, *Anabaena flos-aquae*, and a freshwater diatom

### **Risk Mitigation**

The Agency has determined that the current uses of norflurazon exceed levels of concern for chronic risk to avian species and mammalian endangered species, and pose a high risk to endangered terrestrial, semi-

aquatic, and aquatic plants. There is a concern that norflurazon may contaminate ground water, as well as surface water. Norflurazon also poses a potential risk of dermal exposure to pesticide handlers.

The registrant has already implemented several risk mitigation measures (such as reduced application rates, use precaution statements, and a ground water label advisory) to decrease the risks posed by norflurazon. The registrant has agreed to further mitigate the chronic risks to birds and mammals by: 1) clarifying the current soil incorporation statements on the product labels, as well as, adding the statement to the use directions for each crop; and 2) clarifying the use directions for banded treatments. A ground water label advisory is being required on all product labels. This advisory will reduce the potential of norflurazon contaminating ground water. In addition, ground water monitoring studies are being conducted by the registrant to estimate the exposure of norflurazon to the public, as well as, to determine the persistence of residues reaching ground water. These ground water monitoring studies will determine if additional risk mitigation measures are needed. Likewise, a surface water advisory is being required to decrease the risk of norflurazon contaminating surface water via spray drift and runoff. Furthermore, the Agency is requiring a spray drift advisory to mitigate the risks to nontarget plants by reducing the potential drift. In addition, spray drift studies are being required to evaluate the exposure and risk to nontarget plants. Finally, in order to decrease the dermal risk to pesticide handlers, the Agency is requiring minimum PPE, which include long-sleeved shirt and long pants, and shoes plus socks. In addition, chemical-resistant gloves are required for mixers/loaders and applicators using hand-held equipment. And a 12-hour REI is being required to further mitigate the risk to workers and handlers. These risk mitigation measures, along with the ones already implemented by the registrant, should reduce the risks of norflurazon to humans and the environment.

### **Additional Data Required**

EPA is requiring the following additional generic studies for norflurazon to confirm its regulatory assessments and conclusions:

- Product Chemistry;
- Acute Inhalation for Technical and 78.6% DF;
- Dermal Sensitization;
- Gene Mutation (Ames Salmonella);
- Directions for Use - Label Amendment to include PHIs;
- Residue Analytical Methods - Animal (Radiovalidation data);
- Cropfield Trials - Cotton Gin By-products;
- Field Rotational Crops (in progress);
- Tier II Aquatic Plant Growth;
- Batch Equilibrium Study (Degradate);



Spray Drift;

Small Scale Ground Water Monitoring (in progress);

The Agency also is requiring product-specific data including product chemistry and acute toxicity studies, revised Confidential Statements of Formula (CSFs), and revised labeling for reregistration.

## Product Labeling Changes Required

All norflurazon end-use products must comply with EPA's current pesticide product labeling requirements and with the following. For a comprehensive list of labeling requirements, please see the norflurazon RED document.

### Worker Protection

#### ***Personal Protective Equipment/Entry Restrictions; Labeling PPE Requirements for Pesticide Handlers***

The PPE for handlers is to be based on the acute toxicity of the end-use product. The minimum PPE requirements for handlers include long-sleeved shirt and long pants, shoes plus socks, and chemical-resistant gloves.

#### Entry Restrictions - Products Intended Primarily for Occupational Use (WPS Uses)

Based on the assessment of human health risks, the Agency does not believe an increase in the REI above what is required in the Worker Protection Standard (WPS) is warranted. The current 12-hour REI, pertaining to each use of the product that is within the scope of the WPS, is to be maintained. The 12-hour REI is the minimum REI for norflurazon.

*Early Entry PPE:* The PPE for early entry are the minimum that would be required under the WPS. These are: coveralls, chemical-resistant gloves, and shoes plus socks.

#### Entry Restrictions - Products Intended Primarily for Occupational Use (NonWPS Uses)

Some registered uses of norflurazon are outside of the scope of the Worker Protection Standard (WPS). For nonWPS uses, the Agency is requiring the following:

#### **For liquid applications:**

"Do not enter or allow others to enter the treated area until sprays have dried."

#### **For granular applications:**

"Do not enter or allow others to enter the treated area until dusts have settled. In addition, if the granules are watered-in, do not enter or allow others to enter until the treated area is dry, following the watering-in."

## Other Labeling Requirements

### *Products Intended Primarily for Occupational Use*

The Agency is requiring the following labeling statements to be located on all end-use products containing norflurazon that are intended primarily for occupational use.

#### Application restrictions

"Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application."

#### Engineering controls

"When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS."

#### User safety requirements

"Follow manufacturers' instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry."

#### User safety recommendations

- "Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet."
- "Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing."
- "Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing."

#### Optional soil incorporation statement

"Exception: if the product is soil-injected, soil-incorporated or watered-in, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated."

## End-Use Labeling

### Soil Incorporation

The following soil incorporation label statement must be added to the specific use directions for **each crop** on the Solicam DF® product label:

"Solcam must be moved into the weed seed germination zone to be effective. If no rainfall occurs within 4 weeks

after application, the product must be incorporated by flood or sprinkler irrigation."

The following soil incorporation label statement must be added to the specific use directions for **each crop** on the Zorial Rapid 80® product label:

"Zorial Rapid 80 must be applied and incorporated by tillage, irrigation or rainfall before weeds germinate."

#### Banded Treatments

The following label statement must be added in the "Application Equipment" section of the norflurazon Solicam DF® and Zorial® product labels to clarify the formulas for the row (banded) treatment calculation:

"The solution should be mixed to the maximum label rate and **at no point on the field** should the solution be applied at a concentration any lower or higher than the maximum label rate."

#### **Environmental Hazard Statements**

The following labeling statements must be added to "Environmental Hazards" section of all norflurazon end-use product labels:

##### Labeling for Wetlands

"Do not contaminate water when disposing of equipment washwaters. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not allow this material to drift onto neighboring crops or noncrop areas or use in a manner or at a time other than in accordance with label directions because animal, plant or crop injury, illegal residues or other undesirable results may occur."

##### Labeling for Surface Water

"Norflurazon can contaminate surface water through spray drift. Under some conditions, norflurazon may also have a high potential for runoff into surface water (primarily via dissolution in runoff water), for several months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, 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, and areas over-laying tile drainage systems that drain to surface water."

### Labeling for Ground Water

"This chemical is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination."

### **Spray Drift Labeling**

The following language must be placed on each product label that can be applied aerially:

"Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions."

"The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations."

1. "The distance of the outer most nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor."

2. "Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees."

"Where states have more stringent regulations, they should be observed."

The applicator should be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory Information.

The following aerial drift reduction advisory information must be contained in the product labeling:

[This section is advisory in nature and does not supersede the mandatory label requirements.]

#### ***Information on Droplet Size***

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

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### ***Controlling Droplet Size***

- Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of Nozzles - Use the minimum number of nozzles that provide uniform coverage.
- Nozzle Orientation - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

### ***Boom Length***

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

### ***Application Height***

Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

### ***Swath Adjustment***

When applications are made with a crosswind, the swath will be displaced downward. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.)

### ***Wind***

Drift potential is lowest between wind speeds of 3-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application

should be avoided below 3 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

#### ***Temperature and Humidity***

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

#### ***Temperature Inversions***

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

#### ***Sensitive Areas***

The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

### **Regulatory Conclusion**

Based on the risks assessments in the RED, several risks concerns were identified. There is the potential risk of dermal toxicity to pesticide handlers. There is also a concern for norflurazon contaminating ground water and surface water. And the levels of concern are exceeded for chronic avian species, endangered mammals, and terrestrial, semi-aquatic and aquatic plants (high risk to endangered species). Although these risks exist, the Agency concludes that all uses of products containing norflurazon, once amended to reflect the risk mitigation measures imposed in this RED, are eligible for reregistration.



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Norflurazon products will be reregistered once the required product-specific data, revised 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 norflurazon 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.

Electronic copies of the RED and this fact sheet can be downloaded from the Pesticide Special Review and Reregistration Information System at 703-308-7224. They also are available on the Internet on EPA's gopher server, *GOPHER.EPA.GOV*, or using ftp on *FTP.EPA.GOV*, or using WWW (World Wide Web) on *WWW.EPA.GOV*.

Printed copies of the RED and fact sheet can be obtained from EPA's National Center for Environmental Publications and Information (EPA/NCEPI), PO Box 42419, Cincinnati, OH 45242-0419, telephone 513-489-8190, fax 513-489-8695.

Following the comment period, the norflurazon RED document also 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 norflurazon RED, or reregistration of individual products containing norflurazon, 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 9:30 am and 7:30 pm Eastern Standard Time, Monday through Friday.