BLADE RUNNERS, INC.

PEST MANAGEMENT
"SAFE"
PHILOSOPHY

3150 Spring Street, Fairfax, VA  22031 • (703) 273-8873 • FAX (703) 273-8720
www.blade-runners.com
BLADE RUNNER'S PHILOSOPHY

"SAFE"

Safety:

EPA and Department of Agriculture guidelines for safety are taught and implemented on all Blade Runners jobs. Precautionary reading of all pesticide labeling; education of all signs and symptoms of common types of pesticide poisoning; emergency first aid; use of personal protective equipment; safety in handling, transporting storing and disposing of all chemicals; environmental concerns including drift, runoff, and wildlife hazards are all taught to each Blade Runners Pest Management Applicators. Your safety and theirs is our number one concern.

Accreditation:

Every one of Blade Runners Pest Management Applicators are certified by the State of Virginia’s Department of Agriculture. No one is ever allowed to apply chemicals without this certification. There are periodic inspections of all Virginia Licensees. Their knowledge and safety habit are closely watched. Our philosophy is to work every day as if it were an inspection day.

Facts:

At Blade Runners we have always considered communication with our customer and immediate response to your questions, needs and concerns our number one priority. This is of the utmost importance area of pest management, as this can sometimes be a misunderstood service. We know that when your residents call, you need the facts and you need them fast. We have published this booklet for you in an effort of answering any questions you may have. We also hope that it will give you information at your fingertips to answer any questions your residents may have. Please don’t hesitate to call with any questions you have about your Pest Management program.

Education:

All Blade Runners Pest Management Applicators are fully trained using the latest information and following the strict guidelines enforced by the Virginia Department of Agriculture. There is extensive field, equipment, spraying techniques, safety, and product familiarity and industry standards training. No Blade Runner employee can enter the field without having first completed all training and becoming fully certified by the Virginia Department of Agriculture.

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Why Pesticides?

Why Pesticides? Here's Why:

Real World Lessons: The essential role pesticides play in health protection and safety, followed are some events that emphasize the dangers of pesticides and why these products need to be avoided to the public.

1. A Salt of City Child - the story of a young man’s experience with anaphylactic shock after being stung by a bee. He suffered severe allergic reactions, including swelling of the face, throat, and tongue. The event highlighted the importance of understanding the risks associated with pesticides.

2. A Johns Hopkins study found 98% of children in the United States were exposed to pesticides, with nearly 20% reporting adverse health effects.

3. A recent study by the National Institutes of Health found that exposure to pesticides can cause respiratory issues and cancer.

Battling Pests for Health and Safety

The best approach to pest control is an overall strategy that balances prevention, sanitation, and maintenance. Integrated Pest Management (IPM) is a common-sense set of measures that allows for a variety of approaches to pest control, including the use of pesticides and other control methods.

The effectiveness of IPM is determined by the degree of pest control necessary and the ability to control pests without causing harm to the environment.

Keeping Harmful Pests in Check

Pesticides play an important role in protecting our health and safety. The use of pesticides is essential to control pests that cause damage to crops, gardens, and homes. However, it is important to use pesticides responsibly and to minimize the risk to the environment and human health.

Responsibly Industry for a Safer Environment
The Many Benefits of Specialty Pesticides

Products used by pest management professionals play a vital role in protecting public health and property. In fact, they frequently are the first line of defense in preventing a variety of vector-borne diseases including West Nile Virus, encephalitis, malaria, Lyme disease and hemorrhagic fever. Recently, ornamental horticulture has been implicated as a cause of childhood asthma, confirming the importance of keeping homes and landscapes pest-free.

Benefits:
- Pest and disease control
- Disease and pest prevention
- Increased crop yields
- Safety and environmental
- Economic benefits
- Aesthetic appeal

Pesticides are Thoroughly Reviewed and Tested for Use

Pesticides used to control weeds, nematodes, and nematodes are the most effective and the safest, as well as the most cost-effective. In addition, the Environmental Protection Agency (EPA) conducts extensive testing and research to ensure that all pesticides are safe for use. The EPA also monitors and evaluates the effectiveness of all pesticides.

The Pest Is the Problem

The risk of becoming infected from rodent, bird, or insect is real, the risks to home, office, and pets is real. Each year, more than 45,000 people, mostly children, are treated for rodent bites. Birds, bats, and insects are responsible for numerous diseases, including encephalitis, plague, bird poisons, typhus, and other vector-borne diseases. Approximately 20 percent of cases of encephalitis are infected by rodents causing either a neurological or electrical injury.

More than half of all Americans are allergic to mosquito, tick, and other vector-borne diseases. All of which can cause serious health risks and death.

Up to 200,000,000 are exposed to malaria each year at a cost of $1.8 billion. The average, untrained worker costs a hospital $1,200 for one case. The American Lyme Disease Foundation, Inc. estimates that the cost of a single case is $200,000 annually in medical costs and lost time.

Most people die each year from insect bites than from malaria. Vectors cause 250,000 deaths each year, and vectors are the cause of at least 80,000 Americans in emergency rooms annually.

Many people allergic to mosquito bites and fly bites suffer from allergic reactions such as asthma and hay fever.

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questions & answers
about pesticides

A special supplement to
GROUNDS MAINTENANCE
questions & answers about pesticides

The Need for Pesticides

Why do we use pesticides?

Pesticides (the generic term for insecticides, herbicides and fungicides) control weeds, insect pests and fungal and bacterial diseases. The benefit of pesticides lies in their ability to manage a pest (weed, insect or disease) problem that potentially could become out of control and could endanger your health or the health of your family, pet and plants, or threaten the quality of your home, lawn, school or business.

Professional Applicators

Who are professional applicators?

Professional applicators are people trained to apply or direct the application of pesticides as part of their jobs, generally for a fee. Professional applicators are those who apply pesticides to property other than their own.

What type of license or certification is required to apply pesticides?

There are two types of pesticides: general use pesticides and restricted use pesticides. General use pesticides are those purchased by the public in garden centers and retail outlets, which can be applied by homeowners without special training, just by following directions on the product label. General use pesticides are also applied by professional applicators, although professionals may have a greater choice of products or quantities from which to choose and more sophisticated application equipment.

Restricted use pesticides can be applied only by certified applicators or individuals operating under the supervision of certified applicators. To become certified, professional applicators must demonstrate, through testing, practical knowledge of pests related to the category of certification for which the individual is applying.

These minimum standards for certification are established by the U.S. Environmental Protection Agency (EPA) and each state’s and agency for pesticides is responsible for enforcing. A state may establish more stringent requirements for certification, according to needs within that particular state. Generally, it’s the Cooperative Extension Service that is responsible for training and testing pesticide applicators. Training classes are usually offered in individual counties throughout a state. Certified applicators must also renew their training regularly by attending approved continuing education programs.

Professional Products

Do professional applicators use products that are different than those used by the homeowner?

Most people are surprised to find that the pesticides regularly used by professionals are often the same as general use pesticides available to homeowners. Licensed professionals may occasionally use restricted-use products (materials not available to the general public) to solve pest problems that are not responsive to general use products and which may require more sophisticated application technology. These few restricted-use products require extra care and precaution by those who handle the concentrated material when preparing application rates. Therefore, only certified applicators may purchase and use or supervise the application of restricted-use products.

Are there risks associated with pesticide use?

How safe are the pesticides used by professionals and homeowners?

If pesticides are handled and applied with care according to label directions, they do not present an unreasonable risk in people non-target organisms or the environment. Each pesticide has met the safety testing standards set by EPA.

What can I do to minimize any risks to me or to my family?

The simplest way to minimize risk is to read the entire product label and follow all instructions, especially protective clothing requirements. Be sure to store all
pesticides securely and out of the reach of children and pets. Regardless of whether you or a professional applies the pesticide, keep people and pets away from the treated area immediately following application.

If the product requires that you stay off or away from the treated area after application, it will be stated on the label. Although many products used on home lawns have no specific area-use recommendations prescribed by the product label, a good rule of thumb is to stay off a treated area until it has thoroughly dried or settled (for granular products) following pesticide application.

Do pesticide applications harm dogs and cats?
No, not if label instructions are followed. All pesticides are carefully tested before they can be registered by the EPA and are sold. Part of this testing includes determining possible effects on non-target organisms, such as pets.

When can pets return to pesticide-treated areas?
If there are any requirements regarding when pets can return to treated areas, these instructions will be on the label. Remember, some pesticides are developed and formulated for use on pets.

Are golfers at risk from pesticides when playing on a golf course?
No. There is no scientific evidence that golfers face any health risks from the pesticides used to maintain golf courses. Once a liquid or dry product is applied and the turfgrass is dry or the product has been watered in, there is very little chance of exposure to golfers or others who enter the area.

How do we know that these products aren’t harmful to humans or wildlife?
The pesticide industry is one of the most highly regulated industries in the United States. Before a product is registered by the EPA, it must be rigorously tested for human health and environmental safety. This process can take up to 10 years and involve up to 120 different tests and studies. Today, manufacturers may invest as much as $150 to $150 million in product safety testing before a new pesticide ever comes to the market. These safety tests are required, designed, and reviewed by EPA scientists and are conducted according to EPA standards.

How can an insecticide control insects and not be harmful to people and pets?
It is a well-established medical and scientific principle that the amount of a substance used determines whether it is harmful. With pesticides, the amount of product needed to control insects is many orders of magnitude lower than an amount that would affect mammals, such as humans and pets. Remember, exposure alone does not equal risk or harm.

Do pesticides cause cancer in people exposed to low doses of pesticides over a period of time?
No. As used, pesticides do not cause cancer. Before a pesticide product can be registered and marketed, it must first be evaluated as to its potential risks, including any risk of causing cancer. Only products determined by EPA to have met the Agency’s rigid testing requirements can be registered by the EPA. There is no specialty pesticide on the market known to cause cancer in humans.

The American Medical Association Council on Scientific Affairs states that there is only conjectural evidence at best that pesticides may be carcinogenic. Dr. Bruce Ames, University of California at Berkeley, states, “There is no convincing evidence from either epidemiology or toxicology that pesticides are of interest as causes of human cancer.”

Does use of aquatic herbicides present a problem with fish, swimmers and drinking water quality?
No, the testing requirements for registration of an aquatic herbicide are even more restrictive than those applied to products for use on crops and ornamentals, because EPA recognizes the added sensitivity of aquatic ecosystems and the diversity of water uses. The label provides information on the chemical compound(s) comprising the active ingredient(s) of the herbicide, directions for correct use on target plant species, warnings and use restrictions. Selection of the appropriate herbicide re
requires consideration of the temporary restrictions on water use that may be required following treatment. The label will specify timing of any use restrictions to assure protection of people, animals and the environment.

Regulation of Pesticides

Who regulates pesticides and their uses?
EPA is the primary pesticide regulatory agency. Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), all products that contain pesticides must be registered with EPA before they can be lawfully sold or distributed. EPA registration means that pesticide registrants have submitted required scientific research data concerning the risks associated with the use of the pesticide, that EPA has reviewed the data and that EPA finds the data acceptable. In fact, it is illegal for EPA to grant registration to any pesticide product until the Agency is satisfied by scientific data that the product can be used safely.

Before EPA approves the use of a pesticide product, it must make a finding, based on sufficient scientific data, that the product can be used safely according to the proposed use instructions. Any new information that comes to light subsequently on possible or actual adverse effects of the product, whether to health or the environment, must be reported promptly to EPA.

Furthermore, EPA must reevaluate the safety finding each time a new use is approved or a change is made to the use instructions for the product.

The Federal Trade Commission (FTC)
The FTC has regulatory powers covering advertising in any medium, whether transmitted orally or in written form. The FTC requires that all advertising materials and claims, including sales presentations, must be scientifically accurate and not deceptive to the consumer.

State Governments
The designated state agency is usually the Department of Environmental Protection or Conservation or the Department of Agriculture. Virtually all states require licensing, testing and certification before a company can apply pesticides commercially. Many states also regulate pesticide advertising within their borders. The designated state agency also registers all pesticides to be used within the state. Pesticide companies and most professional applicators have stringent product stewardship programs to ensure the responsible use of their products. As a consumer, as with any contractor, make sure your professional applicator is properly certified and licensed. Each product must meet the EPA testing standards.

Are EPA registrations a statement of product safety?
EPA registrations are granted only after exhaustive review of the test data required for the registration process. As part of the registration process, a product label is developed. When the label is followed, the product can be used without unreasonable risk to the applicator, the public and the environment.

Are product labels adequate to allow users to use the products safely?
Product labels provide adequate information to the users about how to use these products safely. The U.S. EPA also has an ongoing Label Improvement Program that allows the Agency to require new labeling information or to require updates and revisions that make the label easier to use as possible.

Testing Products

How extensively tested are pesticides?
Pesticide production is one of the most highly regulated industries in the United States. Before a product is registered by the EPA, it must be rigorously tested for potential human health and environmental effects. This process can take up to 10 years and involves up to 120 different tests and studies.

Today, manufacturers may invest $150-$185 million or more in product testing before a new pesticide ever
comes to the market.

Most pesticides have legal rationales for multiple uses, many include uses on various food crops. This means even more testing has been done to satisfy the requirements of multiple registrations.

Are pesticides fully tested before they are used?

Yes. And, the process of pesticide registration is ongoing. Even though a pesticide is fully tested at the time it is registered, this is not the end of the process. As science advances, testing abilities change, and as new tests are developed, it is necessary to upgrade the information base on pesticides. In addition, it is not uncommon for additional tests to be required by EPA to maintain a registration or to register a product for additional uses.

The public should not be alarmed to hear that additional tests are performed for products already on the market. Rather, they should be reassured that the registration process is an ongoing effort to ensure that the information supporting the registration is always state-of-the-art.

Movement of Pesticides from Application Site

What is the likelihood that pesticides applied to lawns will get into groundwater?

There is very little likelihood that pesticides applied to lawns will end up in groundwater. Well-managed turf prevents runoff into water. In studies at The Pennsylvania State University for the U.S. Geological Survey, researchers found that the impact of well-managed turfgrass on water quality is so positive that the potential for water pollution from lawn pesticides and fertilizers is considerably less than other urban pollutants not associated with well-managed turfgrass areas.

An Ohio State University study found that thatch and other underlying soil residues retained nearly all the applied pesticides during the first two weeks after application. Residues in the soil were less than one part per million over 34 weeks of sampling. This means virtually all the applied pesticide was staying in the thatch layer and surface residues rather than moving into underground water.

Presence of pesticides in well water is minimal. There are no known reported cases of adverse health effects from pesticide-contaminated water. Even in areas where pesticide use is most heavily concentrated, the presence of pesticides in wells has been found to be minimal or nonexistent.

"Present" does not mean harmful. Advances in analytical chemistry have made it possible to detect the presence of substances at levels never thought possible. The ability to detect chemicals at parts per million has virtually been replaced by measurements at parts per billion, parts per trillion and parts per quadrillion. As a comparison, a part per million is analogous to one second in 12.5 days, part per billion is analogous to one second in 32 years, and a part per trillion is analogous to one second in 32,000 years. To find a substance present in water has more to do with the ability to detect its presence, not a determination of risk.

Isn't the wind drift a problem with pesticide application?

Drift is a concern only if proper precautions are not taken by the applicator.

Two types of drift may cause chemicals to move off target. Particle drift occurs when the wind scatters small spray droplets off the intended application site. Vapor drift occurs when chemicals evaporate and move with air currents to other sites. Vapor drift is not common among specialty products. In either case, an applicator should be aware of wind conditions that could cause drift.

If pesticides are applied to my lawn, is there risk to people in my house?

Even if there was drift or tracking, the amount of pesticide that could get into the house is very low.

In addition, maximum exposure is at the site of application, the lawn. The maximum application rates for the lawn have already been determined through required EPA testing, including the determination that this maximum rate of application will not result in unreasonable risk to humans.

Any amount of product that might get into the house will be far less than the amount allowed on the lawn. Therefore,
questions & answers about pesticide

any potential risk will be for less, or non-existent

Notification of Pesticide Application

How can I find out when pesticide applications have been made or will be made?

Upon request by the customer, professional applicators should voluntarily provide information to the homeowner regarding the pesticides used and the application schedule. Most companies will provide copies of product information at the time of sale or upon request. If you have not received such information, ask your professional.

Some states require posting following application. Several states offer a registry, which is a listing of persons who wish to be notified when adjacent properties will be treated with pesticides. Even in areas where a registry does not exist, good professional companies are willing to provide notification to individuals upon request.

Integrated Pest Management

What is IPM, and how does it work?

Integrated pest management (IPM) is a continuous system of controlling pests (weeds, diseases, insects or others) in which pests are identified, actions thresholds are considered, all possible control options are evaluated and selected control(s) are implemented. Control options—which include biological, chemical, cultural, manual and mechanical methods—are used to prevent or remedy unacceptable pest activity or damage. Choice of control option(s) is based on effectiveness, environmental impact, site characteristics, worker/public health and safety, and economics. The goal of an IPM system is to manage pests and the environment to balance benefits of control costs, public health and environmental quality. IPM takes advantage of all appropriate pest management options.

IPM System Components

IPM systems rely on accurate determination of optimum control timing and selection of appropriate methods(s). Implementation requires current comprehensive information on pests and control options. As a system, IPM programs include a series of three steps:

1. Monitor the site for presence of pest. Critical components of monitoring include accurately identifying the pest, presence of the pest, level of infestation and acquiring knowledge of requirements and life cycles of the pest.

2. Determine the action threshold below which the pest can be tolerated. Action thresholds are determined by factors such as severity of the problem caused by the pest health or property concerns related to the pest, and users needs for the site where the pest is found.

3. Initiate preventive or corrective action to avoid or poss

IPM in Schools

Pests pose serious risks to children's health in schools. At the same time, the use of pesticides in schools can be challenging because of heightened concerns and misinformation. It is important to remember pesticidal can be used safely and responsibly to control pests such as insects, rodents and weeds as part of a balanced integrated pest management program.

Cockroaches, ants, roaches and rats are the pests most commonly found in schools, and they do more than disrupt the learning environment. These pests pose increasing health and safety risks to children. Children, just by nature of their size, are more vulnerable to vector-borne diseases (carried by insects) because their immune systems are still developing. Consider some of the problems with pests in the school environment:

- Cockroaches can live and breed by the thousands in classrooms and cafeterias. They carry germs from filthy 16 questions & answers
Questions & Answers about Pesticides

Surfaces in cafeterias, tablets and classroom desks. Cockroaches are the leading cause of asthma incidents in urban youth. The more children are exposed to cockroaches the more allergic they become.

- Mosquitoes carry deadly diseases. West Nile Virus, a deadly encephalitis virus that is transmitted to people, birds and horses by virus-carrying mosquitoes, is rampaging across the country. The number of cases of West Nile Virus continues to escalate as the spread of the disease marches across the country and into Canada. The CDC reported that for the year 2004 there were 3539 total human cases of West Nile virus reported in the United States. Of these, 100 were fatal.

- Rats and mice are often found living in and under school buildings. Rodents contaminate stored food with their droppings and urine, and spread the deadly bartonella pulmonary syndrom (BPS), an infectious disease. The American Lung Association reports that "[a]s of September 2004, a total of 379 laboratory-confirmed cases of BPS have been reported in the United States, including 32 retrospectively identified cases that occurred before 1993. Thirty-six percent of all reported cases have resulted in deaths."

- Fire ants build their nests and runfle forage on school grounds, lawns, parks and even in schools, homes, health care facilities and nursing homes. These nests often contain more than 100,000 ants. During recess and physical education classes, children are often stung when they step into nests while playing. Fire ants can inflict hundreds of painful stings to children. Scientists reported at the 2003 International Fire Ant Conference that 80 human deaths have been attributed to anaphylactic shock from bites. Five of these deaths occurred in nursing homes. More than half of the U.S. population, including children, are allergic to poison ivy, poison oak and poison sumac. Contact with each of these plants causes severe skin irritation, intense itching and burning, as well as blistering. A Wisconsin school district banned the use of herbicides to control poison ivy and other weeds. The decision was later reversed when a student had to undergo a 32-day course of steroids to treat a poison ivy rash. Other weeds, such as crabgrass and dandelions, can cause injury when children trip over them on playgrounds and sports fields.

These types of problems have caused schools to implement pest management programs. Many are turning to integrated Pest Management or IPM.

Communication is Key

To be effective, a pest management team has to establish clear lines of communication and designated roles of responsibility. Often, the school board sets the overall pest management policy, provides funding and monitors the results. It is important that the school board have an understanding of IPM. Sometimes school boards are pressured to completely eliminate the use of pesticides by activists politically opposed to pesticides. School boards try this approach, only to discover that the judicious use of pesticides is needed to economically and effectively control pest populations found in and around schools.

Extensive research and solid science show pesticides pose little or no risk to the health of children or adults when used according to label instructions. Thus, pesticides are an essential component of successful IPM.

Establishing a Program

In addition to effective communication, an IPM program must include a written policy and a knowledgeable coordinator. A written policy is essential. IPM is doomed to fail without broad understanding and commitment by all stakeholders, including faculty, staff, board members and parents. A written policy helps to gain consensus and provides continuity.

Once a policy is in place, a staff person should coordinate the overall program. Whether the entire program is implemented internally or if heavy reliance is placed on pest control professionals, it is critical to have a knowledgeable person on staff.

Success of IPM in schools is also dependent upon full cooperation of administrators, faculty, maintenance/custodial staff, parents and students.

BISRE is the national association representing the manufacturers, formulators, distributors and other industry leaders involved with specialty pesticide and fertilizer products used in turf, ornamental, pest control, aquatic and terrestrial vegetation management and other non-food/fiber applications.

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DUPONT

GROUNDs MAINTENANCE
Pets and Pesticide Use

Pet owners often use pesticides in or around their homes to control a variety of pests. Owners also may apply pesticide products directly to pets to control parasites. While many pesticide products are beneficial, poor planning or improper use of a product can harm pets.

Indoor use: Animals are exposed to pesticides when they breathe in the product, absorb it through the skin, or ingest the product. Therefore, remove pets from any areas that you plan to treat with pesticides. Also remove pet toys and chew bones from the area. Keep them away from treated areas until the pesticide is completely dry and the area is well ventilated. Always read pesticide labels for specific instructions as to how long to keep the animals out of the house or treated area.

Cover fish tanks to prevent liquid vapors from entering the tank. If you use foggers, always remove animals from the house and turn off fish tank pumps.

Place baits in areas where pets cannot reach them.

Outdoor applications: Do not allow pets in sprayed areas until the pesticide has dried completely. Granular products may have specific instructions for watering the granules in and keeping the pets off the treated area for 24 hours or longer. Read the label to determine re-entry time. Because animals can be exposed from eating a product or absorbing it through their skin, take care that animals do not eat or lick a product and that they do not enter an area until it is completely dry.

Body applications: Use care when applying pesticides directly to pets. Follow the label carefully, and be sure to use the correct amount of product for the animal being treated. Most topical formulations are applied according to the animal’s weight. Use sprays as the label instructs.

Be aware that over-treating animals can poison them. Products labeled for use on “dogs only” should never be used on cats or other animals. Products designed for adult cats or dogs should never be used on kittens or puppies unless the label states that the product may be used on younger animals.

Wear protective clothing as stated on the label to minimize your exposure to the pesticide. Keep children away from the animals for the specified waiting period on the label.

Signs of Poisoning: Sometimes even careful use of a product can cause harm to a sensitive, ill, or injured animal. If the animal seems listless, has increased salivation or drooling, stumbles when it walks, or has muscle tremors or convulsions, contact a veterinarian or the ASPCA Animal Poison Control Center immediately. The Animal Poison Control Center can be contacted at 1-800-548-2423. A consultation fee of $60* per case may apply which can be charged to a credit card.

Date reviewed: January 1998
For more information, call or write: NPIC
Oregon State University
333 Weigner Hall
Corvallis, Oregon 97331-6502

Phone: 1-800-858-7378
Fax: 1-541-737-0761
Email: npic@acc.orst.edu
Internet: NPIC at http://npic.orst.edu

*Consultation Fee is subject to change without notice.

NPIC is sponsored cooperatively by Oregon State University and the U.S. Environmental Protection Agency. Data presented through NPIC documents are based on selected authoritative and peer-reviewed literature. The information in this profile does not in any way replace or supersede the restrictions, precautions, directions, or other information on the pesticide labeling or other regulatory requirements.
Homeowners, Wildlife & Pesticides

Wildlife live in a variety of habitats, including parks, residences, agriculture, range lands, lakes, forests, wetlands, and golf courses. They forage for food, seek shelter, and raise their young in these areas. Some of these areas are treated with pesticides. If wildlife are exposed to enough of a given pesticide (e.g., while living in or migrating through a recently treated area), it may cause adverse health effects for them. The routes of pesticide exposure are ingestion, inhalation, or absorption through the skin or eye. Wildlife may ingest a pesticide by eating treated crops or contaminated food items such as insects, contaminated water such as water droplets off treated plants, or while grooming. The pesticide may also affect the health of wildlife indirectly through habitat degradation, which may decrease the availability of certain plants or insects important in the diet of some animals or habitat requirements such as cover.

The United States Environmental Protection Agency (EPA) requires pesticide manufacturers to perform many tests in order to have their products registered. The EPA-required tests determine whether a pesticide product has adverse effects on people, the environment, or non-target organisms (1). Wildlife, or any other organism that is not the target of a given product, is called a non-target organism. If the EPA determines that a pesticide product may be hazardous to wildlife, the product must have an Environmental Hazards statement on its label which guides the user in application or the EPA may restrict its use (1).

Prior to a pesticide application, homeowners should take the time to choose an appropriate pesticide product to control the pest. Once a suitable product is chosen, the directions for use located on the label must be read and followed thoroughly to ensure that the pesticide product is applied correctly. Choosing the correct pesticide product and carefully applying it can minimize potential exposures to non-target organisms. An example of a non-target organism is honey bees. Consequently, there is often a precautionary statement on pesticide labels about this insect.

Homeowners can also minimize pesticide exposure to non-target organisms by applying the minimum amount of pesticide the fewest number of times, but at a level which is still capable of controlling the pest. Incorporating Integrated Pest Management (IPM), which is an approach that centers on long-term control of pests using physical, mechanical, cultural, biological, chemical, and educational methods to prevent and control pests, can also reduce the risk to non-target organisms. Sometimes methods exist for controlling a pest that don’t involve the use of pesticides (e.g., snap traps for rat and mice).

Pesticide applications to agricultural areas can also be done in a manner aimed at minimizing exposure. Non-target contact with pesticides can be decreased in agricultural areas by decreasing the frequency of applications over an entire area (broadcast), using buffer zones (untreated areas), and avoiding drift.

Prior to any pesticide application, always read the label and follow the instructions every time it is used. Pay particular attention to statements on the label dealing with wildlife. If you apply a pesticide near wildlife habitats, try to avoid applications near sensitive areas like ponds, drainage ditches, and wetlands. Do not wash pesticide application equipment in these areas. Avoid applications to areas where animals might be living, nesting, or feeding.

Date reviewed: December 1999
# Blade Runners Agronomic program details

This is the most common delivery of our agronomic program. More details and product labels can be found in the "Blade Runners agronomic application best practices manual". With that said, the methods and products used can change according to weather, plant health, and environmental conditions of the area. This varied approach gives us the ability to provide the best results for the areas of need in your community.

## Lawn Treatments

<table>
<thead>
<tr>
<th>Treatment name</th>
<th>Purpose</th>
<th>Time Frame</th>
<th>Products used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liming of Turf (C4 Spec)</td>
<td>Adjust PH in the soil</td>
<td>1/1 - 12/31</td>
<td>Solulcal (granular lime)</td>
</tr>
<tr>
<td>Turf Crabgrass, fertilization, weed control (C1 Spec)</td>
<td>Prevent Post emergent Broadleaf weed control.</td>
<td>4/1-5/15</td>
<td>Cool Power Ester 1.5oz per 1,000sq ft; Gallery .25oz per 1,000sq ft</td>
</tr>
<tr>
<td>Turf Crabgrass, fertilization, weed control (C1 Spec) #2</td>
<td>Provide pre-emergent control to crabgrass, Post emergent weed control of broadleaf weeds</td>
<td>5/15-6/1</td>
<td>Dimension 1oz per 1,000sq ft; Momentum FX 1.5oz per 1,000sq ft</td>
</tr>
<tr>
<td>Turf Crabgrass, fertilization, weed control (C1 Spec) #3</td>
<td>Fertilizer</td>
<td>6/1-7/1</td>
<td>Fertilizer (Granular)</td>
</tr>
<tr>
<td>Turf Crabgrass, fertilization, weed control (C1 Spec) #4</td>
<td>Post emergent control of broadleaf weeds, crabgrass, and nutsedge</td>
<td>7/1-8/30</td>
<td>Pyliex .02oz per 1,000sq ft</td>
</tr>
<tr>
<td>Power Seeding/ Aeration &amp; Starter Fertilizer (C5 Spec)</td>
<td>Spot seeding of bare/ this areas</td>
<td>9/1-10/20</td>
<td>Shade and Transitional Seed, Starter Fertilizer 14-14</td>
</tr>
<tr>
<td>Turf Crabgrass, fertilization, weed control (C1 Spec) #5</td>
<td>Post emergent control of cool season weeds</td>
<td>10/20-12/15</td>
<td>Cool Power Ester 1.5oz per 1,000sq ft; Gallery .25oz per 1,000sq ft</td>
</tr>
</tbody>
</table>

## Shrub Treatments

<table>
<thead>
<tr>
<th>Treatment name</th>
<th>Purpose</th>
<th>Time Frame</th>
<th>Products used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree and Shrub Fertilization (C3 Spec)</td>
<td>Fertilize Trees and shrubs</td>
<td>1/1-12/31</td>
<td>Fertilizer</td>
</tr>
<tr>
<td>Tree, Shrub and Dormant Applications (C2 Spec) #1</td>
<td>Control of eggs on Plants</td>
<td>3/1-4/1</td>
<td>Dormant oil</td>
</tr>
<tr>
<td>Tree, Shrub and Dormant Applications (C2 Spec) #2-5</td>
<td>Control of pests and Mites</td>
<td>4/1-9/30</td>
<td>Diluted Bieact P .1oz per gl; Diluted Safari P .1oz per gl</td>
</tr>
</tbody>
</table>

## Bed, Crack weed and growth regulation Control

<table>
<thead>
<tr>
<th>Treatment name</th>
<th>Purpose</th>
<th>Time Frame</th>
<th>Products used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-emergent bed weed control #1</td>
<td>Pre-emergent control of Weeds in Pavement Cracks</td>
<td>3/1-12/15</td>
<td>Sureguard .16oz per Gl</td>
</tr>
<tr>
<td>Pre-emergent bed weed control #2</td>
<td>Growth Regulator application to turf in obstacle and difficult areas Growth Regulator application to Selected shrubs</td>
<td>4/15-6/15</td>
<td>Anew 1.2oz per gl; Atimec .75oz per gl</td>
</tr>
<tr>
<td>Pre-emergent bed weed control #3</td>
<td>Pre-emergent control of Weeds in Pavement Cracks</td>
<td>3/1-12/15</td>
<td>Sureguard .16oz per Gl</td>
</tr>
<tr>
<td>Pre-emergent bed weed control #4</td>
<td>Pre-emergent control of Weeds in Beds</td>
<td>11/1-12/15</td>
<td>Sureguard .16oz per Gl</td>
</tr>
</tbody>
</table>
Brand Name: Anuew

Manufacturer: Nufarm

EPA Number : 1001-91

Non Restricted Use

Control of growth of grassy plants

Product Category type: Liquid

The following page is the specimen label. Please follow the link for more information about this product.
http://www.cdms.net/Idat/IdC9R002.pdf
Anuew™

Plant Growth Regulator

For managing growth, improving quality and stress tolerance of turf.

ACTIVE INGREDIENT:
Prohexadione calcium [calcium 3-oxido-5-oxo-4-propionylocyclohex-3-enecarboxylate] ......................................................... 27.5%
OTHER INGREDIENTS: .................................................................................................................. 72.5%
TOTAL: ........................................................................................................................................ 100.00%

KEEP OUT OF REACH OF CHILDREN
CAUTION
Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.
See booklet for FIRST AID and PRECAUTIONARY STATEMENTS)

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300
For Medical Emergencies Only, Call (877) 325-1840

EPA Reg. No. 1031-91

Manufactured for
Cleary Chemicals, LLC
11901 S. Austin Ave.
Alsip, IL 60803

Nufarm Grow a better tomorrow.
Brand Name: Atrimec

Manufacturer: PBI Gordan

EPA Number : 2217-776

Non Restricted Use

Control of growth of shrubs

Product Category type: Liquid

The following page is the specimen label. Please follow the link for more information about this product.
http://www.cdms.net/ldat/l60B000.pdf
ATRIMMEC®

PLANT GROWTH REGULATOR

For Growth Regulation of Landscape Plants & Trees

ACTIVE INGREDIENT:
Dikegulac-sodium (Sodium salt of 2,3,4,6-bis-O-(1-methylethylidene)-a-L-xylo-2-hexuluronic acid) ........... 18.5%
OTHER INGREDIENTS: ........................................... 81.5%
TOTAL 100.0%

THIS PRODUCT CONTAINS:
1.67 lb. dikegulac-sodium per gallon or 200 grams active ingredient per liter. (1.55 lb. dikegulac acid equivalent per gallon or 17.1%)

KEEP OUT OF REACH OF CHILDREN

CAUTION

READ THE ENTIRE LABEL FIRST. OBSERVE ALL PRECAUTIONS AND FOLLOW DIRECTIONS CAREFULLY.

PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals
CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing.

Personal Protective Equipment (PPE)
Mixers, loaders, applicators, and other handlers must wear:
long-sleeved shirt, long pants, shoes and socks.

User Safety Requirements
Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

User Safety Recommendations
• Users should wash hands thoroughly with soap and water before eating, drinking, chewing gum, using tobacco, or using the toilet.
• Users should remove clothing/ PPE 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.

First Aid
If in eyes:
• Hold eye open and rinse slowly and gently with water for 15-20 minutes.
• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
• Call a poison control center or doctor for treatment advice.

If Inhaled:
• Move person to fresh air.
• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
• Call a poison control center or doctor for treatment advice.

If on skin or on clothing:
• Take off contaminated clothing.
• Rinse skin immediately with plenty of water for 15-20 minutes.
• Call a poison control center or doctor for treatment advice.

(cont. on next column)

Environmental Hazards
For terrestrial uses: Do not apply directly to water, or to areas where water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

DIRECTIONS FOR USE
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
• 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.
• For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.
• Do not apply through any type of irrigation system.
• Do not use on food or fodder crops.

Agricultural Use Requirements
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170.
This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statement on this label about personal protective equipment and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.
Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.
PPE required for entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as soil or water, is:
• coveralls,
• protective eyewear
• chemical-resistant gloves made of any waterproof materials and
• shoes plus socks

Non-Agricultural Use Requirements
The requirements in this box apply to users of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses. Reentry Statement: Do not enter or allow people (or pets) to enter the treated area until sprays have dried.

1. Product Description
What Atrimmec® Plant Growth Regulator Does:
• This product is a growth retardant for use on hedges, shrubs, trees and groundcovers. It can also be used on certain trees and shrubs to prevent flowering and undesired (nuisance) fruit set.
• This product temporarily stops shoot elongation and promotes lateral branching. This reduces the need for trimming and pruning. It can also improve the appearance of landscape ornamentals by gradually filling in growth and providing a more uniform, compact shape.
• This product is a systemic plant growth regulator applied as a foliar spray that reduces or breaks apical dominance and enhances lateral branching.
• This product is a systemic plant growth regulator applied as a foliar spray. It is absorbed by the leaves and translocated to the shoot tips. Growth retardant effect is limited to sprayed branches.
BRAND NAME: BISECT L

- Manufacturer: Loveland products
- EPA Number: 34704-955
- Non Restricted Use
- Isecticide/Miticide for the control of respective pests
- Product Category Type: Liquid

The following page is a specimen label. please follow the link for more information about this product

Crop Data Management, System, Inc
http://www.cdms.net/LabelsMsds/LMDefaults.aspx?t=
To control pests indoors and outdoors on residential, institutional, public, commercial, and industrial buildings, greenhouses, animal confinement facilities/livestock premises, kennels, food handling establishments, and lawns, ornaments, parks, recreational areas and athletic fields.

When used as a termicid, individuals/firms must be licensed by the state to apply termicid products. States may have more restrictive requirements regarding qualifications of persons using this product. Consult the pest control regulatory agency of your state prior to use of this product.

- Provides up to 1 month residual control of house flies
- Kills fleas for up to 3 months

**ACTIVE INGREDIENT:**

Bifenthrin* .......................... 7.9%

**OTHER INGREDIENTS:**

TOTAL 100.0%

Contains 0.6 pound active ingredient per gallon.

*Cls isomers 97% minimum, trans isomers 3% maximum.

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

**FIRST AID**

If swallowed:
- Call poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by the poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

If inhaled:
- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.
- Call a poison control center or doctor for further treatment advice.

If on skin or clothing:
- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15 to 20 minutes.
- Call a poison control center or doctor for treatment advice.

If in eyes:
- Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

**FOR MEDICAL EMERGENCY INVOLVING THIS PRODUCT, CALL: 1-866-944-8565**

**NOTE TO PHYSICIAN** - This product is a pyrethroid. If large amounts have been ingested, the stomach and intestine should be evacuated. Treatment is symptomatic and supportive. Digestible fats, oils, or alcohol may increase absorption and so should be avoided.

**EPA REG. NO. 34704-955**

**EPA EST. NO. 34704-M3-002**

**NET CONTENTS 1.9 GAL (3.78 L)**

061313 V1D 07B13
Brand Name: Cool Power

Manufacturer: NuFarm

EPA Number: 228-317

Non Restricted Use

Control of Broadleaf weeds in cooler temperatures

Product Category type: Liquid

The following page is the specimen label. Please follow the link for more information about this product.

http://www.cdms.net/ldat/lid45S003.pdf
Cool Power®

Selective Herbicide

A three-way post-emergent selective broadleaf herbicide for use on golf courses, parks, ornamental turf lawns, roadsides, and similar turf areas.

Controls (or kills) dandelions, chickweeds, plantains, oxalis, spurge and many other broadleaf weeds, some of which are listed on this label.

CONTAINS MCPA, TRICLOPYR AND DICAMBA
ONE GALLON COVERS UP TO 3.2 ACRES

ACTIVE INGREDIENT:
Isooctyl (2-ethylhexyl) Ester of 2-Methyl-4-Chlorophenoxyacetic Acid* ......................................................... 56.14%
Butoxyethanol Ester of 3,5,6-Trichloro-2-Pyridinloxyacetic Acid** ................................................................. 5.00%
Dicamba (3,6-Dichloro-o-Anisic Acid)*** ........................................................................................................... 3.60%

OTHER INGREDIENTS: ................................................................................................................................. 35.26%

TOTAL: ......................................................................................................................................................... 100.00%

Isomer Specific AOAC Method, Equivalent to:
* 2-Methyl-4-Chlorophenoxyacetic Acid ...................................................... 36.0%, 3.0 lbs./gal.
** 3,5,6-Trichloro-2-Pyridinloxyacetic Acid ........................................... 3.6%, 0.3 lbs./gal.
*** 3,6-Dichloro-o-Anisic Acid .......................................................................... 3.6%, 0.3 lbs./gal.

KEEP OUT OF REACH OF CHILDREN

CAUTION

SEE INSIDE BOOKLET FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS

EPA Reg. No. 228-317

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

Grow a better tomorrow.
BRAND NAME: Dimension 2EW

- Manufacturer: Dow AgroScience
- EPA:62719-542
- Non Restricted Use
- Provides control of annual grasses and broadleaf weeds in established lawns and ornamental turf and pre emergent of crabgrass

- Product category type: Liquid

The following page is a specimen label. Please follow the link for more information about this product.
Non-WPS Uses: Applicators and other handlers, mixers and loaders who handle this product for any use not covered by the Worker Protection Standard (40 CFR Part 170) – in general, agricultural plant uses are covered - must wear:
- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves >14 mils such as barrier laminate or butyl rubber

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them. Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls
When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.410(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations
Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- 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.

First Aid
If on skin or on clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-929-5394 day or night, for emergency treatment information.
Note to Physician: Contains petroleum distillate. Vomiting may cause aspiration pneumonia.

Environmental Hazards
This product is toxic to fish and highly toxic to other aquatic organisms including oysters and shrimp. Use with care when applying to turf areas adjacent to any body of water. Drift and runoff from treated turf may be hazardous to aquatic organisms in water adjacent to treated areas. 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 apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwater or rinsate.

Directions for Use
It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.
REFORMULATION OR REPACKAGING OF THIS PRODUCT IS PROHIBITED.
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. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements
Use this product only in accordance with its labeling and with the Worker Protection Standard, 43 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on the label about personal protective equipment, restricted-entry interval, and notification to workers (as applicable). The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard. Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.
BRAND NAME: Dormant Oil

- Manufacturer: AgriSOLUTIONS

- EPA: 9779-251

- Non Restricted Use

- An Emulsifiable Concentrate Useful for the control of certain insect pests and as an Additive to certain Fungicidal Sprays

- Product category type: Liquid

The following page is a specimen label. Please follow the link For more information about this product.
Dormant Oil 435
An Emulsifiable Concentrate Useful For The Control Of Certain Insect Pests And As An Additive To Certain Fungicidal Sprays

ACTIVE INGREDIENT
Mineral Oil* ................................................................. 98.8%
OTHER INGREDIENTS ...................................................... 1.2%
TOTAL ............................................................................. 100.0%

Contains petroleum distillate
*Unsulfonated Residue 92% Min.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID

IF IN EYES:
• Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing.
• Call a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING:
• Take off contaminated clothing.
• Rinse skin immediately with plenty of water for 15-20 minutes.
• Call a poison control center or doctor for treatment advice.

IF SWALLOWED:
• Call a poison control center or doctor immediately for treatment advice.
• Do not induce vomiting unless told to by a poison control center or doctor.
• Do not give anything to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor or going for treatment.
You may also contact 1-877-424-7452 for emergency medical treatment information.

Note to Physician: Do not induce vomiting. May cause aspiration pneumonia hazard. Contains petroleum distillate.

Read Additional PRECAUTIONARY STATEMENTS

EPA Reg. No. 9779-251
CA Reg. No. 9779-251-AA

EPA Est. No.

Distributed By:
Winfield Solutions, LLC
P.O. Box 64589, St. Paul, MN 55164-0589

NET CONTENTS
Gals.
With corrections as accepted by EPA 7-20-09
0/0720/9
Brand Name: GALLERY 75®

- Manufacturer: Dow AgroSciences LLC
- EPA Number: 62719-1445
- Non Restricted Use
- Control of certain broadleaf weeds in established Turfgrass, Landscape Ornamentals, Groundcovers/Perennials, Ornamental bulbs & non-cropland areas
- Product Category Type: Liquid

The following page is a specimen label. Please follow the link for more information about this product:

Crop Data Management Systems, Inc.
http://www.cdms.net/LabelsMsds/LMDefault.aspx?t=

Blade Runners, Inc. 3151 Spring Street, Fairfax, VA 22031 * (703) 273-8873   * (703) 273-8720
www.blade-runners.com
Specimen Label

Trademark of Dow AgroSciences LLC

A preemergence herbicide for control of certain broadleaf weeds in:
- Established Turfgrass
- Landscape Ornamentals
- Container Grown Ornamentals
- Field Grown Ornamentals
- Groundcovers/Perennials
- Non-Cropland
- Ornamental Bulbs
- Non-Bearing Fruit and Nut Trees and Non-Bearing Vineyards
- Christmas Tree/Conifer Plantations

Active Ingredient:
- Imazethapyr (1-chloro-1-methylpropyl)-5-(3,5-diazinol)-2,6-dichloropyrazine and isomers 
- 75%

Other Ingredients: .................................................. 25%
Total: ................................................................. 100%

Contains 0.75 lb active ingredient per pound.
U.S. Patent Nos. 5,000,184 and 4,633,949

EPA Reg. No. 92719-143

Keep Out of Reach of Children

CAUTION PRECAUCION
Si cauca no esté listo para aplicar, suséptil que el producto cause daño a plantas o a su propiedad. Tenga en cuenta que esto no se aplica a las personas que no entiendan lo que puede causar daño a la propiedad.

Precautionary Statements
Hazard to Humans and Domestic Animals

Causes Eye irritation • Harmful If Inhaled
Avoid ingestion, breathing dust or spray mist, and contact with skin, eyes, or clothing.

Personal Protective Equipment (PPE)
Applicants and other handlers must wear:
- Long-sleeved shirt and long pants
- Shoes plus socks

Follow manufacturer's instructions for dosing/maintaining PPE. If no wash 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.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid
If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.
If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
If on skin or clothing: Take off contaminated clothing. Wash skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
If inhaled: Move person to fresh air. If person is not breathing, call 911 or get immediate medical attention. If not unconscious, give artificial respiration preferably by mouth-to-mouth method, if possible. Call a poison control center or doctor for further treatment advice.

Have this product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-858-8435 for emergency medical treatment information.

Environmental Hazards
Dilute concentrate water when disposing of equipment washwaters. Dilute apply directly to soil, to areas where water is present or to intertidal areas below the mean high water mark. Drift may result in reduced germination or emergence of non-target plants adjacent to treated area.

Notice: Read the entire label. Use only according to label directions. Before using this product, read Warranty Disclaimers, Inherent Risks of Use and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.

In case of emergency endangering health or the environment involving this product, call 1-800-432-9898. If you wish to obtain additional product information, visit our web site at www.downtoearth.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.
Brand Name: Merit® 0.5G

- Manufacturer: Bayer Environmental Science
- EPA Number: 432-1328
- Non Restricted Use
- Control of soil inhabiting pests of Turfgrass in sites such as lawns, office complexes, shopping complexes, playgrounds & athletic fields
- Product Category Type: Granular

The following page is a specimen label. Please follow the link for more information about this product:

Crop Data Management Systems, Inc.
http://www.cdms.net/LabelsMds/LMDefault.aspx?b=
Merit® 0.5 G Insecticide

For systemic insect control in turfgrass and landscape ornamentals.

ACTIVE INGREDIENT:
*Imidacloprid, 1-[6-Chloro-3-pyridinyl]methyl]-N-nitro-2-imidazolidinimine.................................................. 0.5%

OTHER INGREDIENTS: ................................................................. 99.5%

100.0%

*Protected by U.S. Patent No. 4,744,060

EPA Reg. No. 432-1326

STOP - Read the label before use.
Keep out of reach of children.

CAUTION

FIRST AID

If swallowed
• Call a poison control center or doctor immediately for treatment advice.
• Have person sip a glass of water if able to swallow.
• Do not induce vomiting unless told to do so by a poison control center or doctor.
• Do not give anything by mouth to an unconscious person.

If on skin or clothing
• Take off contaminated clothing.
• Rinse skin immediately with plenty of water for 15 to 20 minutes.
• Call a poison control center or doctor for treatment advice.

If in eyes
• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
• Call a poison control center or doctor for treatment advice.

In case of emergency call toll free the Bayer Environmental Science Emergency Response Telephone No. 1-800-334-7477. Have a product, container or label with you when calling a poison control center or doctor, or going for treatment.

Note To Physician: No specific antidote is available. Treat the patient symptomatically.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if swallowed or absorbed through skin. Causes eye irritation. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This product is highly toxic to aquatic invertebrates. 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 contaminate water when disposing of equipment washwaters.

This chemical demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not formulate this product into other end-use products.
Brand Name: Momentum FX

Manufacturer: Lesco

EPA Number: 228-447-10404

Non Restricted Use

Control of Broadleaf weeds to include difficult weeds

Product Category type: Liquid

The following page is the specimen label. Please follow the link for more information about this product.

LESICO®
MOMENTUM® FX²
HERBICIDE

FOR THE CONTROL OF ANNUAL AND PERENNIAL BROADLEAF WEEDS IN ORNAMENTAL TURF.

CONTAINS 2,4-D, TRICLOPYR, AND FLUROXYPYR.

ACTIVE INGREDIENTS:
- Trisopropylamine Salt of 2,4-Dichlorophenoxyacetic Acid* 44.20%
- Triethylamine Salt of 3,5,6-Trichloro-2-Pyridinyloxyacetic Acid** 3.86%
- 1-Methylethyl Ester of Fluoroxypr: [(4-amino-3-5-dichloro-6-fluoro-2-pyridinyloxy)]acetic Acid, 1-methylethyl Ester*** 4.20%

OTHER INGREDIENTS: 47.74%

TOTAL 100.00%

By Isomer Specific AOAC Method, Equivalent to:
- *2,4-Dichlorophenoxyacetic Acid 23.70%, 2.254 lbs./gal.
- **3,5,6-Trichloro-2-Pyridinyloxyacetic Acid 2.77%, 0.263 lbs./gal.
- ***[(4-amino-3-5-dichloro-6-fluoro-2-pyridinyl)oxy]acetic Acid 2.92%, 0.278 lbs./gal.

INTENDED FOR USE BY PROFESSIONAL TURF MAINTENANCE PERSONNEL, LANDSCAPING OR COMMERCIAL APPLICATORS ONLY. DO NOT SELL, DISTRIBUTE OR USE THE PRODUCT IN NASSAU AND SUFFOLK COUNTY IN NEW YORK.

KEEP OUT OF REACH OF CHILDREN DANGER - PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que le explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

SEE INSIDE BOOKLET FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS

#088511
NET CONTENTS: 1 gal (3.79 L)

EPA REG. NO. 228-447-10404
EPA EST. NO. 228-IL-1

Distributed by: LESCO, Inc. • 1301 East 9th Street • Cleveland, OH 44114-1849

LESICO is a registered trademark and the sweeping design is a trademark of LESCO Technologies, LLC. Momentum is a registered trademark and used by LESCO, Inc. with permission of the trademark owner.
Brand Name: Pylex

Manufacturer: BASF

EPA Number : 7969-327

Non Restricted Use

Control of Broadleaf weeds, crabgrass, other grassy weeds.

Product Category type: Liquid

The following page is the specimen label. Please follow the link for more information about this product.

http://www.cdms.net/Idat/IdB65006.pdf
For postemergence control of broadleaf and grass weeds in select turfgrass species on golf courses, sod farms, and residential turfgrass

Active Ingredient:
topramezone: [3-(4,5-dihydro-isoxazolyl)-2-methyl-4-(methylsulfonyl)phenyl][6-hydroxy-1-methyl-1H-pyrazol-4-yl]methanone. .................................................. 29.7%
Other Ingredients: ................................................................. 70.3%
Total: ............................................................................. 100.0%
1 gallon contains 2.8 pounds of topramezone free acid.

EPA Reg. No. 7969-327 ......................................................

KEEP OUT OF REACH OF CHILDREN
CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se le explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See inside for First Aid, Precautionary Statements, Directions For Use, Conditions of Sale and Warranty, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:
Brand Name: Roundup PRO®

- Manufacturer: Monsanto Company
- EPA Number: 524-475
- Non Restricted Use
- Broad-Spectrum control of many Annual weeds, Perennial weeds, Woody brush and Trees
- Product Category Type: Liquid

The following page is a specimen label. Please follow the link for more information about this product:

Crop Data Management Systems, Inc.
http://www.cdms.net/LabelsMsds/LMDcfault.aspx?t=
ATTENTION:
This product label is provided for general information only.

- This product may not be available or approved for sale or use in your area.
- Read and follow all label instructions. The information on this label may differ from the information found on the product label you are using.
- Always follow the precautions and restrictions for use on the label of the product you are using.

Complete Directions for Use

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED ROD-WOODY ROOTS OR PARTS OF COMBS, DESIRABLE PLANTS AND TREES. BECAUSE OF INJURY OR DESTRUCTION IS LIKELY TO OCCUR.

EPA Reg. No. 590-425

Read the entire label before using this product.

Use only according to label instructions.

No other products are recommended on this label. See your area or California. Check registration status of each product in California before using.

Read the LIMIT OF WARRANTY and LIABILITY statement at the end of the label before buying or using. If errors are not acceptable, return to store customer.

This is a non-ionic product. WASH HANDS AND FACE BEFORE EATING, DRINKING, SMOKING, OR USING TOILET. WASH IMMEDIATELY IF EXPOSED. WASH CLOTHING AFTER USE. DO NOT STORE CONTAMINATED MATERIALS. KEEP OUT OF REACH OF CHILDREN.

Inhalation

- Get fresh air. If not breathing, give artificial respiration. If heart stops beating, give cardiac compressions.

Skin

- Wash thoroughly with soap and water. If irritation continues, seek medical attention.

Ingestion

- Get fresh air. If unconscious, give artificial respiration. If heart stops beating, give cardiac compressions.

Eye

- Wash eyes with water for 15 minutes. If irritation continues, seek medical attention.

Hazardous to Humans and Domestic Animals

- Keep out of reach of children.

CAUTION!

CAUSES EYE IRRITATION.

Avoid contact with eyes or clothing.

FIRST AID: Call a poison control center or doctor for treatment advice.

1. INHIBITION

- Get fresh air. If not breathing, give artificial respiration. If heart stops beating, give cardiac compressions.

2. SKIN

- Wash thoroughly with soap and water. If irritation continues, seek medical attention.

3. EYE

- Wash eyes with water for 15 minutes. If irritation continues, seek medical attention.

4. INGESTION

- Get fresh air. If unconscious, give artificial respiration. If heart stops beating, give cardiac compressions.

Hazardous to Domestic Animals

- This product is dangerous to all pets and other domestic animals. If ingestion is suspected, consult a veterinarian immediately. Do not treat with any household or other chemical or veterinary product. Consult a veterinarian immediately.

Personal Protective Equipment (PPE)

- Wear appropriate protective clothing, especially when handling this product. Do not use in confined spaces.

User Safety Recommendations

- Use protective clothing when handling this product.

3.0 Precautionary Statements

3.1 Hazards to Humans and Domestic Animals

- Keep out of reach of children.

CAUTION!

CAUSES EYE IRRITATION.

Avoid contact with eyes or clothing.

FIRST AID: Call a poison control center or doctor for treatment advice.

1. INHIBITION

- Get fresh air. If not breathing, give artificial respiration. If heart stops beating, give cardiac compressions.

2. SKIN

- Wash thoroughly with soap and water. If irritation continues, seek medical attention.

3. EYE

- Wash eyes with water for 15 minutes. If irritation continues, seek medical attention.

4. INGESTION

- Get fresh air. If unconscious, give artificial respiration. If heart stops beating, give cardiac compressions.

Hazardous to Domestic Animals

- This product is dangerous to all pets and other domestic animals. If ingestion is suspected, consult a veterinarian immediately. Do not treat with any household or other chemical or veterinary product. Consult a veterinarian immediately.

Personal Protective Equipment (PPE)

- Wear appropriate protective clothing, especially when handling this product. Do not use in confined spaces.

User Safety Recommendations

- Use protective clothing when handling this product.

3.2 Environmental Hazards

- Do not apply directly to water, to areas where surface water is present in or on residential areas below the mean high-water mark. Do not contaminate water when cleaning equipment is at disposal of the current or previous location.

3.3 Physical or Chemical Hazards

- Exposure to solutions of this product may be hazardous. Avoid exposure to solutions of this product in living areas or on surfaces that may contact water. Do not use in confined spaces.
BRAND NAME: Safari 2G Insecticide

- Manufacturer: VALENT PRODUCTS

- EPA:59639-149

- Non Restricted Use

- For Systemic Insect control in ornamental plants for greenhouse plantscape, nursery and outdoor landscape use

- Product category type: Liquid

The following page is a specimen label. Please follow the link For more information about this product
**USER SAFETY RECOMMENDATIONS**

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- 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.

**ENVIRONMENTAL HAZARDS**

This pesticide is toxic to shrimp. 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 apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in water adjacent to treated areas. Do not dispose of equipment washwaters or rinsate into a natural drain or water body. Do not contaminate water when disposing of equipment washwaters or rinsate.

This compound is toxic to honey bees. The persistence of residues and potential residual toxicity of dinofeturan in nectar and pollen suggest the possibility of chronic risk to honey bee larvae and the eventual instability of the hive.

This product is toxic to bees exposed to treatment for more than 38 hours following treatment. Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants during this time period, unless the application is made in response to a public health emergency declared by appropriate state and federal authorities.

Dinofeturan and its degradate, MNG, have the properties and characteristics associated with chemicals detected in ground water. The high water solubility of dinofeturan, and its degradate, MNG, coupled with its very high mobility, and resistance to biodegradation indicates that this compound has a strong potential to leach to the subsurface under certain conditions as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. Periodic monitoring of shallow groundwater in the use area is recommended.

**PERSONAL PROTECTIVE EQUIPMENT (PPE):**

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear: Long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material and shoes plus socks.

**USER SAFETY REQUIREMENTS**

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions exist for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.
Brand Name: Snapshot® 2.5 TG

- Manufacturer: Dow AgroSciences LLC
- EPA Number: 62719-175
- Non Restricted Use
- Control of certain Broadleaf Weeds and Annual Grasses in container and Landscape Ornamentals, Groundcovers/Perennials and non-cropland areas
- Product Category Type: Granular

The following page is a specimen label. Please follow the link for more information about this product:

Crop Data Management Systems, Inc.
http://www.cdms.net/LabelsMsds/LMDefault.aspx?t=
Specimen Label

Dow AgroSciences
Snapshot® 2.5 TG

Specialty Herbicide
Trademark of Dow AgroSciences LLC

A selective preemergence herbicide for control of certain broadleaf weeds and annual grasses in:
- Landscape Ornamentals
- Christmas Tree Plantations
- Container Grown Ornamentals
- Field Grown Ornamentals
- Groundcovers/Perennials
- Non-Bearing Fruit and Nut Trees
- Non-Bearing Vineyards
- Non-Cropland

Active Ingredients:
- Imazethapyr 2.5% (dithranol, Al-dimethylamine)
- Atribquat 45% (4-(3-ethyl-1-methylpropyl)-5-
isoazolyl) 2,2-dimethoxybenzamide
and isomers

Other ingredients

Total

Contains 1.25 lb active ingredient per 50 lb bag.
EPA Reg. No. 82719-175

Keep Out of Reach of Children

CAUTION PRECAUCION
Si usadas incorrectamente la etiqueta, búsquese alguien para que le explique el uso en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Precautionary Statements

Hazards to Humans and Domestic Animals

Causes Moderate Eye Irritation • Harmful If Swallowed Or Inhaled • Prolonged Or Frequently Repeated Skin Contact May Cause Allergic Reaction In Some Individuals

Avoid breathing dust or spray mist and contact with eyes or clothing. Wash thoroughly with soap and water after handling.

Personal Protective Equipment (PPE)
Applicators and other handlers must wear:
- Long-sleeved shirt and long pants
- Shoes plus socks

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions are available, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls
When handling use closed systems or encased containers in a manner that meets the requirements listed in the Ventilation Protection Standard (VPS) for agricultural pesticides (40 CFR 170.240 (a) (4-6)), the handler PPE requirements may be reduced or modified as specified in the VPS.

User Safety Recommendations

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately at pesticide gas makes. Then wash thoroughly and put on clean clothing.
- Users should remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15 minutes. Remove contact lenses, if present, after the first 5 minutes then continue rinsing eyes. Call a Poison Control Center or doctor for treatment advice.
If swallowed: Call a Poison Control Center or doctor immediately for treatment advice. Have a person take a glass of water to swallow. Do not induce vomiting unless told to do so by a Poison Control Center or doctor. Do not give anything by mouth to an unconscious person. If inhaled: Move person to fresh air. If person is not breathing, call EMT or an ambulance then give artificial respiration, preferably mouth-to-mouth if possible. Call a Poison Control Center or doctor for further treatment advice.

Have the product container or label with you when calling a Poison Control Center or doctor or going for treatment. You may also contact 1-800-925-8005 for emergency medical treatment information.

Environmental Hazards

This pesticide is extremely toxic to fish and aquatic invertebrates including shrimp and oyster. 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 apply in a manner which will directly expose crustaceans, fishes, mussels, crabs, or echinoderms to aerial drift. Do not contaminate water when cleaning equipment or disposing of equipment washwater.
Brand Name: Suregaurd

Manufacturer: Nufarm

EPA Number : 11773-1a-01

Non Restricted Use

Pre-emergent control of weeds for pavement cracks and bed areas.

Product Category type: Powder

The following page is the specimen label. Please follow the link for more information about this product.

GROUP 14 HERBICIDE

SureGuard® HERBICIDE

FOR USE IN CONTAINER AND FIELD GROWN CONIFERS AND DECIDUOUS TREES, AROUND ESTABLISHED WOODY ORNAMENTALS IN LANDSCAPES, TO MAINTAIN BARE GROUND NON-CROP AREAS AND DORMANT TURFGRASS

Active Ingredient By Wt.
*Flumioxazin .......................... 51%
Other Ingredients .................. 49%
Total 100%

*2-(7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H,1,4-benzoxazin-6-yl)-4,5,6,7-tetrahydro-1H-isooindole-1,3(2H)-dione

SureGuard® Herbicide is a water dispersible granule containing 51% active ingredient.

EPA Reg. No. 59639-120
EPA Est. 11773-IA-01®, 39578-TX-01®, 5905-IA-01®
Superscripts first letter of lot number.

KEEP OUT OF REACH OF CHILDREN
CAUTION
SEE BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing dust and spray mist. Avoid contact with skin, eyes or clothing.

FIRST AID

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 800-852-0059 for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Some of the materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear: long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride, shoes and socks. Follow manufacturer's instructions for cleaning/maintaining PPE. If there are 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.
• Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS:

This product is toxic to non-target plants and aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to non-target plants and aquatic organisms in neighboring areas. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters.

This pesticide is toxic to plants and should be used strictly in accordance with the drift and runoff precautions on this label in order to minimize off-site exposures.

SureGuard Herbicide

Page 1

2015-SGD-0001
Brand Name: Talstar® F

- Manufacturer: FMC Corporation Agricultural Products Group
- EPA Number: 279-3162
- Non Restricted Use
- Insecticide/Miticide for the control of respective pests
- Product Category Type: Liquid

The following page is a specimen label. Please follow the link for more information about this product:

Crop Data Management Systems, Inc.
http://www.cdms.net/LabelsMsds/LMDefault.aspx?t=
Only for Use and Storage by Commercial Applicators. To control insect pests and mites indoors, in interior spaces and outdoors on ornamentals and lawns in landscaped areas around residential, institutional, public, commercial, and industrial buildings, parks, recreational areas and athletic fields.

EPA Reg. No. 279-3162
EPA Est. 279-

Active Ingredient:
Bifentrin® ........................................... 7.9%

Inert Ingredients: ...................................... 92.1%

100.0%

Talstar® F contains ½ pound active ingredient per gallon
*68% isomer 97% minimum; trace isomers 3% maximum. U.S. Patent No. 4,278,506

KEEP OUT OF REACH OF CHILDREN

CAUTION

See other panels for additional precautionary information.

NOT FOR USE IN NEW YORK STATE WITHOUT THE PRODUCT BULLETIN FOR TALSTAR F INSECTICIDE/MITICIDE.

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Use a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger, or if available by administering syrup of ipecac. If person is unconscious, do not give anything by mouth and do not induce vomiting.

IF INHALED: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

IF ON SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

IF IN EYES: Flush with plenty of water. Contact a physician if irritation occurs and persists.

Note to Physician:
This product is a pesticide containing carboximide. It has been ingested, the stomach and intestinal tract may be damaged by contact. Supportive and supportive. Differential diagnosis. The oral route may increase absorption and an injection with a catheter may be necessary.

For Emergency Assistance call (800) 331-3148.
For information Regarding the Use of this Product Call 1-800-321-FMC (3621)

PRECAUTIONARY STATEMENTS

Hazard to Humans (and Domestic Animals)

CAUTION

Harmful if swallowed, inhaled or absorbed through skin. Causes moderate eye irritation. Avoid breathing vapor or splash. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash clothing before reuse.

Environmental Hazards

This pesticide is extremely toxic to fish and aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to interior areas below the mean high water mark. Drift and run-off from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment wash/water. Care should be used when spraying to avoid fish and reptile pets in and around ornamental ponds.

This product is highly toxic to bees exposed to treated material or residue on blooming crops or weeds. For use of this product or allow to drift to blooming crops if bees are visiting the treatment area.

Physical and Chemical Hazards

Do not apply water-based dilutions of Talstar F to electrical conduits, motor housings, junction boxes, switch boxes or other electrical equipment because of possible shock hazard.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Do not apply this product through any kind of irrigation system.

Do not apply by air.

Do not apply in greenhouses and nurseries.

Not for use on sod farm turf, golf course turf, or grass grown for seed.
Pesticide Resources

- **Poison Control Center** ------- 1800 492-2414 This is an emergency number operating 24 hrs a day for questions on treatment of poison from any cause, including pesticides. [www.aapcc.org](http://www.aapcc.org)

- **Chemtrec** ------------------- 1800 424-9300 This is a 24 hr emergency hotline for questions dealing with chemical spills. [www.chemtrec.com](http://www.chemtrec.com)

- **Animal Poison Control Center** --- 1 217 337-5030 This number is operated 24 hrs a day by the University of Illinois as an emergency hotline. [www.aspca.org/pet-care/poison-control/](http://www.aspca.org/pet-care/poison-control/)

- **National Pesticide Telecom** ------- 1800 858-7378 This Number is a free service operating Monday through Friday 9:30 AM until 7:30 PM EST. It may be called by non-professionals. This number provides non-emergency information on product chemistry, protective equipment, safety, health and environmental effects. It is founded by the EPA and operated by Oregon State University. [http://apic.ornst.edu](http://apic.ornst.edu)

- **The Safety Drinking Water Hotline**—1800 426-4791 This line is available to answer questions concerning the Safe Drinking Water Act. [www.epa.gov/safewater/](http://www.epa.gov/safewater/)
**What are Signal Words?**

Signal words are found on pesticide product labels and they describe the acute (short-term) toxicity of the formulated pesticide product. The signal word can be either: DANGER, WARNING, or CAUTION. Products with the DANGER signal word are the most toxic. Products with the signal word CAUTION are lower in毒性. The J.S. Environmental Protection Agency (EPA) requires a signal word on most pesticide product labels. They also require it to be printed on the front panel, in all capital letters, to make it easy for users to find. The only pesticide products that are not required to display a signal word are those that fall into the lowest toxicity category by all routes of exposure (oral, dermal, inhalation, and other effects like eye and skin irritation). See the table below titled "Toxicity Category." CAUTION means the pesticide product is slightly toxic if eaten, absorbed through the skin, inhaled, or it causes slight eye or skin irritation.

<table>
<thead>
<tr>
<th>Toxicity Category (Signal Word)</th>
<th>Signal Word</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Toxicity (DANGER) Signal Word</strong></td>
<td></td>
</tr>
<tr>
<td>Acute Oral</td>
<td>Up to and including 50 mg/kg (≤ 50 mg/kg)</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Up to and including 0.05 mg/L (≤ 0.05 mg/L)</td>
</tr>
<tr>
<td>Dermal</td>
<td>Up to and including 200 mg/kg (≤ 200 mg/kg)</td>
</tr>
<tr>
<td>Primary Eye Irritation</td>
<td>Corrosive (irreversible destruction of ocular tissues) or corneal involvement or irritation persisting for more than 21 days</td>
</tr>
<tr>
<td>Primary Skin Irritation</td>
<td>Corrosive (tissue destruction into the dermis and/or scarring)</td>
</tr>
<tr>
<td><strong>Moderate Toxicity (WARNING) Signal Word</strong></td>
<td></td>
</tr>
<tr>
<td>Acute Oral</td>
<td>Greater than 50 through 500 mg/kg (&gt;50 - 500 mg/kg)</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Greater than 0.05 through 0.5 mg/L (&gt;0.05 - 0.5 mg/L)</td>
</tr>
<tr>
<td>Dermal</td>
<td>Greater than 200 through 2000 mg/kg (&gt;200 - 2000 mg/kg)</td>
</tr>
<tr>
<td>Primary Eye Irritation</td>
<td>Corneal involvement or other eye irritation clearing in 8-21 days</td>
</tr>
<tr>
<td>Primary Skin Irritation</td>
<td>Severe irritation at 72 hours (severe erythema or edema)</td>
</tr>
<tr>
<td><strong>Low Toxicity (CAUTION) Signal Word</strong></td>
<td></td>
</tr>
<tr>
<td>Acute Oral</td>
<td>Greater than 500 through 5000 mg/kg (&gt;500 - 5000 mg/kg)</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Greater than 0.5 through 2.0 mg/L (&gt;0.5 - 2.0 mg/L)</td>
</tr>
<tr>
<td>Dermal</td>
<td>Greater than 2000 through 4000 mg/kg (&gt;2000 - 5000 mg/kg)</td>
</tr>
<tr>
<td>Primary Eye Irritation</td>
<td>Corneal involvement or other eye irritation clearing in 7 days or less</td>
</tr>
<tr>
<td>Primary Skin Irritation</td>
<td>Moderate irritation at 72 hours (moderate erythema)</td>
</tr>
<tr>
<td><strong>Minimal Toxicity (CAUTION) Signal Word</strong></td>
<td></td>
</tr>
<tr>
<td>Acute Oral</td>
<td>Greater than 5000 mg/kg (&gt;5000 mg/kg)</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Greater than 2.0 mg/L (&gt;2.0 mg/L)</td>
</tr>
<tr>
<td>Dermal</td>
<td>Greater than 5000 mg/kg (&gt;5000 mg/kg)</td>
</tr>
<tr>
<td>Primary Eye Irritation</td>
<td>Minimal effects clearing in less than 24 hours</td>
</tr>
<tr>
<td>Primary Skin Irritation</td>
<td>Mild or slight irritation at 72 hours (no irritation or erythema)</td>
</tr>
</tbody>
</table>

NPIC is sponsored cooperatively by Oregon State University and the U.S. Environmental Protection Agency. Data presented through NPIC documents are based on selected authoritative and peer-reviewed literature. The information in this profile does not in any way release or supersede the applications, provisions, directions, or other information on the pesticide labeling or other regulatory requirements.
How are Signal Words Chosen?

Before the EPA can determine the appropriate signal word for a pesticide product, the manufacturer performs research on laboratory animals to determine the toxicity of the formulation. Required studies include oral exposure (eating the product), inhalation exposure (breathing in the product), dermal exposure (spreading the product on the skin) and exposures to the skin and eyes to check for irritation. The study that shows the highest toxicity is used to determine the signal word. For example, if a product demonstrated low toxicity when eaten, moderate toxicity when inhaled, and high toxicity when applied to skin, the EPA would assign the signal word DANGER, based on the most sensitive route of entry. In this example it was the skin.

See the text box on LD₅₀/LC₅₀ for more details about the required toxicity tests.

How are Signal Words Useful?

Signal words help alert users to special hazards of a pesticide product. The signal word can be used by shoppers to select the least toxic product(s) of those that are sufficiently effective.

Regardless of the signal word on the pesticide product, it is important to remember that every product still has the potential to poison (i.e., is harmful at high doses). Special care should be taken to carefully follow all of the directions on the label, each time a pesticide product is used.

Date Reviewed: July 2008

References:
What are pesticide formulations?

- A pesticide formulation is a mixture of chemicals which effectively controls a pest.
- Formulating a pesticide involves processing it to improve its storage, handling, safety, application, or effectiveness (1). See box on Some formulations.

What makes up a formulation?

- The pesticide formulation is a mixture of active and other ingredients (previously called inert ingredients).
- An active ingredient is a substance that prevents, kills, or repels a pest or acts as a plant regulator, desiccant, defoliant, synergist, or nitrification inhibitor (4). Pesticides come in many different formulations due to variations in the active ingredient’s solubility, ability to control the pest, and ease of handling and transport.
- Synergists are a type of active ingredient that are sometimes added to formulations (4). They enhance another active ingredient’s ability to kill the pest while using the minimum amount of active ingredient, but do not themselves possess pesticidal properties. For example, insecticides containing the active ingredient pyrethrins often contain piperonyl butoxide or n-ethyl (1- racemic) dimefoximide as a synergist.

- Other (or inert) ingredients may aid in the application of the active ingredient. Other ingredients can be solvents, carriers, adjuvants, or any other compound, besides the active ingredient, which is intentionally added (4). These are many types of other ingredients: solvents are liquids that dissolve the active ingredient, carriers are liquids or solid chemicals that are added to a pesticide product to aid in the delivery of the active ingredient, and adjuvants often help make the pesticide stick to or spread out on the application surface (i.e., leaves) (5). Other adjuvants aid in the mixing of some formulations when they are diluted for application.

What do manufacturers consider when creating a formulation?

The type of surface, training, equipment, runoff, drift, habits of the pest, and safety are considered when a manufacturer designs a pesticide formulation (3).
Type of surface
- Some formulations are more effective on certain surfaces than others. Discoloration or pitting of the surface of plants or other surfaces may occur with some formulations (6, 7).

Training and equipment
- Many pesticide products that the public purchases and uses are ready-to-use (RTU) formulations which require no dilution and can be applied quickly and conveniently. Examples of ready-to-use formulations used by homeowners are granules for insect and wood control and baits for rodent control.

- Many of the formulations used by farmers and commercial applicators (like pest control companies) need to be applied with certain equipment. These formulations also may require certification or training for individuals performing the application. For example, termicide applicators may be required by the Department of Agriculture in each state to complete specific training in the use of termicides.

- Some liquid pesticide formulations commonly used by farmers and commercial applicators are applied with a compressed air sprayer, fogger, or soil injector (6). Other liquid pesticide formulations used by farmers may require the use of aircraft, low pressure boom sprayer, high-pressure sprayer, or an ultralow-volume sprayer (6).

- The equipment required for the application is listed on the label.

Runoff or drift
- Rain soon after an application may cause the pesticide to run off and contaminate lakes, rivers, streams, or ponds (7).

- Wind may carry or drift the pesticide during the application onto adjacent property, bodies of water, people, or animals.

- Specific environmental precautionary statements may be present on the label describing how to avoid run off or drift.

Safety to people, animals, and the environment
- Individuals who apply, handle, transport, or dispose of pesticides should know the proper manner in which to deal with them. Safety gear is important to minimize potential exposure to pesticides during an application. An applicator’s proper personal protective equipment (PPE) may include a long sleeve shirt, pants, closed-toe shoes, chemically-resistant rubber gloves, a respirator, and/or eye protection. The equipment required for an application will be listed on the label.

- In addition to the safety of those working with pesticides, the safety of people, pets, and the environment near the site of application need to be taken into account (7). To facilitate this, the label often has precautionary statements to protect wildlife and other non-target species.

Habits of the pest
- The pest needs to be identified. Information on how the pest feeds, its reproductive habits, and its life cycle will help the manufacturer determine which formulation would be the most effective (7).

Can pesticides be mixed together?
- The pesticide product label will list any chemicals that it should not be mixed with (i.e., incompatible with) or containers that it should not be mixed in (4). For example, wettable sulfide should not be mixed with Loribin or Merustan because they are incompatible (6).

- Some pesticides can be mixed together (i.e., they are compatible with each other).

- Not all pesticides can be mixed together (incompatible) because they separate out of the solution, gel, caked, or clog the equipment during application.

- Pesticides that are physically different (i.e., dust versus liquid) are typically incompatible.
How are incompatibilities avoided?

- Verify with the pesticide label what types of pesticide formulations to avoid mixing. Formulated pesticide products that are ready-to-use (RTU) liquids and concentrated liquids that have been diluted according to label instructions can be mixed together. However, undiluted liquid concentrates should not be combined.

- To reduce incompatibilities of flowable, wettable powder, and water-dispersible granule formulations, regularly shaking is needed (2).

- If you have questions about compatibility or other pesticide related issues contact your State Department of Agriculture or your local County Cooperative Extension Service for more information.

Date reviewed: December 1999

For more information contact: NPTN
Oregon State University, 333 Weniger Hall, Corvallis, Oregon 97331-6502.
Phone: 1-800-858-7378 Fax: 1-541-737-0761 Email: npta@ace.orst.edu
NPTN at http://aces.orst.edu/info/npta/ EXTOXNET at http://aces.orst.edu/info/extoxnet/

References
NPTN fact sheets are designed to answer questions that are commonly asked by the general public about pesticides that are regulated by the U.S. Environmental Protection Agency (US EPA). This document is intended to be educational in nature and helpful to the public for making decisions about pesticides.

Inert or “Other” Ingredients

The Pesticide Label: Labels provide directions for the proper use of a pesticide product. Be sure to read the entire label before using any product. A signal word, on each product label, indicates the product’s potential hazard.

| GAUTION - low toxicity | WARNING - moderate toxicity | DANGER - high toxicity |

What is an inert ingredient?

- An inert ingredient is a chemical in a pesticide product that does not have direct pesticidal activity against the target pest (1). See Pesticide Products box.
- Active ingredients and inert ingredients are combined to make a product formulation (1).
- Inert ingredients are also known as “other” ingredients (2).
- The total percentage of inert ingredient(s) is listed on each pesticide label.

Why is an inert ingredient(s) included in a product?

Inert ingredients are added to products for a variety of reasons, including the following:

- To improve product performance.
- To make them easier to apply.
- To help the pesticide dissolve in water.
- To help the pesticide spread over the surface or stick to leaves and soil.
- To help move the pesticide into insects’ bodies.
- To stabilize the product for longer shelf-life (1).

Why is the inert ingredient name not listed on the product label?

- Unless an inert ingredient is determined to be highly toxic, it is not required by law to be identified by name or percentage on the label, but the total percentage of such ingredients must be declared (2).
- Pesticide companies keep the inert ingredient(s) secret to be competitive in the marketplace. The inert ingredient(s) is considered confidential business information or a trade secret (3).
- The EPA has formed the Inert Disclosure Stakeholder Workgroup to advise the Pesticide Program Dialogue Committee on ways of making information about inert ingredients more available to the public (4).
Are inert ingredients toxic?

- Inert ingredients can range in toxicity from extremely toxic to practically non-toxic (5). Each inert ingredient has its own level of toxicity. See Dose response box.
- Some inert ingredients are toxic when swallowed or inhaled; some are toxic when absorbed through the skin.
- An inert ingredient may irritate or otherwise cause harm to skin or eyes.
- The U.S. Environmental Protection Agency (EPA) has established several inert ingredient lists based on the relative toxicity of the chemical substance (5).

What are the EPA lists of inert ingredients?

- The EPA has compiled a list of all inert ingredients allowed in pesticide products (5, 6).
- The list was broken down in 1987 into four lists based on the overall toxicity hazard to humans or the environment. See Inert Ingredient Lists box (6).
- Six chemicals are listed as inert ingredients of highest health concern (List 1); one example is formaldehyde.
- Examples of inert ingredients of minimal health concern (List 4) are hard, sawdust, and oyster shells (5).

**EXAMPLES OF INERT INGREDIENTS AND CATEGORY LISTING**

<table>
<thead>
<tr>
<th>Category list</th>
<th>Substance</th>
<th>CAS No.</th>
<th>Category List</th>
<th>Substance</th>
<th>CAS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>List 4</td>
<td>Common wax</td>
<td>8018-86-9</td>
<td>List 2</td>
<td>n-Cresol</td>
<td>95-18-7</td>
</tr>
<tr>
<td></td>
<td>Diatomaceous earth</td>
<td>61790-53-2</td>
<td>Fuel oil, No.2</td>
<td>Isopropyl alcohol</td>
<td>68476-36-2</td>
</tr>
<tr>
<td></td>
<td>Ferric oxide</td>
<td>13109-37-1</td>
<td>Isopropyl alcohol</td>
<td>618-43-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Titanium metal</td>
<td>59899-77-5</td>
<td>Methyl isobutyl ketone</td>
<td>101-10-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Magnesium sulfate</td>
<td>7487-88-9</td>
<td>Nitrostyrene</td>
<td>79-24-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Polypropylene glycol</td>
<td>25327-69-4</td>
<td>Pantene</td>
<td>64771-72-8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Polyethylene glycol</td>
<td>8066-25-5</td>
<td>Propylene glycol monobutyl ether</td>
<td>29387-86-8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Petrolatum B</td>
<td>1318-00-9</td>
<td>Toluene</td>
<td>108-88-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vermiculite</td>
<td>9001-18-9</td>
<td>Xylose</td>
<td>1330-20-7</td>
<td></td>
</tr>
<tr>
<td>List 3</td>
<td>Agar</td>
<td>8024-32-6</td>
<td>List 1 Diethyl phthalate</td>
<td>117-84-0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avocado oil</td>
<td>97553-00-9</td>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cod Oil</td>
<td>81790-51-6</td>
<td>Hydroquinone</td>
<td>123-31-9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethoxydized lanolin</td>
<td>1490-94-6</td>
<td>Rosin</td>
<td>78-59-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Menthol</td>
<td>61789-60-4</td>
<td>Nonylphenol</td>
<td>25154-52-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pitch</td>
<td>7632-00-0</td>
<td>Phenol</td>
<td>108-88-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sodium nitrate</td>
<td>90185-90-7</td>
<td>Rhodamine B</td>
<td>81-88-9</td>
<td></td>
</tr>
</tbody>
</table>
How can I find out what the inert ingredient(s) is in a pesticide product?

- Pesticide manufacturers sometimes release the identity of the inert ingredient(s) not listed on a product. Most manufacturers have product information telephone numbers. An inert ingredient(s) is sometimes listed on material safety data sheets (MSDS) published by the manufacturer.
- Citizens can submit Freedom of Information Act (FOIA) requests to ask for information about inert ingredients from the EPA. A fees for search, review and copy services may be assessed. Visit the web site "Freedom of Information Act" (FOIA) home page at http://www.epa.gov/pesticides/foia to learn how to submit a FOIA request. (7)
- Confidential Business Information (CBI) requests may initially be denied due to confidentiality considerations. EPA will contact the affected business in writing to ascertain the validity of the CBI claims. This initial denial of the request is procedural in nature and does not constitute final action on the request (7).
- Pesticide companies will often disclose the inert ingredient(s) in their product to medical professionals for treatment related to pesticide poisonings. The medical staff may be asked to sign a statement that they will keep the information secret.

How can I find out the toxicity of the inert ingredient?

- EPA requires manufacturers to identify an inert ingredient of highest concern (List 1) on the label (7).
- The overall toxicity of the pesticide product, which takes into account the toxicity of the inert ingredients and the active ingredient combined, is listed on the label in the form of a SIGNAL WORD. For example, pesticide products that are low in overall toxicity would display a signal word of CAUTION on the label. Pesticide products that are moderately or highly toxic would display WARNING or DANGER signal words, respectively. See Pesticide Label box.
- See Toxicity Category box below for further information (8).

### Toxicity Category (Signal Word)

<table>
<thead>
<tr>
<th>Exposure</th>
<th>High Toxicity (Danger)</th>
<th>Moderate Toxicity (Warning)</th>
<th>Low Toxicity (Caution)</th>
<th>Very Low Toxicity (Caution)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>Less than 50 mg/kg</td>
<td>50 - 500 mg/kg</td>
<td>600 - 6000 mg/kg</td>
<td>Greater than 6000 mg/kg</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>Less than 200 mg/kg</td>
<td>200 - 2000 mg/kg</td>
<td>2000 - 8000 mg/kg</td>
<td>Greater than 5000 mg/kg</td>
</tr>
<tr>
<td>Inhalation LD50</td>
<td>Less than 0.05 mg/l</td>
<td>0.05 - 0.5 mg/l</td>
<td>0.5 - 2 mg/l</td>
<td>Greater than 2 mg/l</td>
</tr>
<tr>
<td>Eye Effects</td>
<td>Corrosive</td>
<td>Irritation persisting for 7 days</td>
<td>Irritation reversible within 7 days</td>
<td>Minimal effects, gone within 24 hrs</td>
</tr>
<tr>
<td>Skin Effects</td>
<td>Corrosive</td>
<td>Severe irritation at 72 hours</td>
<td>Moderate irritation at 72 hours</td>
<td>Mild or slight irritation</td>
</tr>
</tbody>
</table>
What else should I know about inert ingredients?

- Scientists are continually evaluating the potential risks of certain inert ingredients in pesticide products.
- The FIFRA encourages pesticide manufacturers to use less toxic inert ingredients in their products (2).
- The EPA does not allow the use of several chemicals as inert ingredients in pesticide products (9).
- The EPA is encouraging pesticide manufacturers to use the term "other" instead of "inert" ingredients. They believe that this term is less confusing to the consumer and does not imply that these chemicals are risk free (10).

Date reviewed: December 2000

For more information contact: NPTN
Oregon State University, 333 Weniger Hall, Corvallis, Oregon 97331-6502.
Phone: 1-800-858-7378 Fax: 1-541-737-0761 Email: nptn@ews.orst.edu
NPTN at http://nptn.orst.edu/ EXTOXNET at http://ace.orst.edu/info/extoxnet/

References

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Pesticides in Drinking Water

What is a pesticide?

- A pesticide is a chemical that is used to control a pest. A pest can be an insect, weed, bacteria, fungus, rodent, fish or any other troublesome organism.
- Pesticides manufacturers develop most pesticides, although some occur naturally in the environment.
- Pesticides control one or more specific pests around homes, in agricultural areas and on public land.

Where does our drinking water come from?

- Drinking water comes from two main sources: surface water and ground water. See Surface water and ground water box. In urban areas, water from these sources is frequently pumped to water treatment plants and then to buildings.
- Drinking water in rural or agricultural areas often comes from individual wells drilled into aquifers. The water from these wells is usually not treated.
- Human activity depletes drinking water sources, which must be restored by rain and snow. See Recharge box.

How can pesticides get into drinking water?

- Pesticides that are applied correctly may wash away from the application site. Rain falling on a treated area before the pesticide binds or degrades may carry the pesticide to surface water sources.
- Pesticides can seep into and through the soil during recharge of groundwater and get into aquifers.
- Pesticides are sometimes applied directly to lakes or wetlands for control of aquatic weeds, insects, or fish. However, these products are labeled to avoid use near drinking water systems.
- Some pesticides can move in air from the application site to surface waters used in a drinking water system.
When a pesticide is spilled, dumped, or misused, the chance of it reaching drinking water is greater than with labeled uses.

- Pesticides can get into drinking water when homeowners illegally dump unused pesticides down the drain. For instructions on proper disposal of pesticides contact your County Cooperative Extension Office or State Environmental Department.

- In water treatment plants, disinfectant pesticides are intentionally put in drinking water to help protect humans from disease-causing organisms such as bacteria and viruses. See Antimicrobials box.

**Antimicrobials.** The Safe Drinking Water Act requires that public water supplies be disinfected. Antimicrobial pesticides are added during the process of drinking water treatment to prevent waterborne disease. Chlorine is the most common and cost-effective antimicrobial used. However, this process can produce chemical by-products, some of which may have toxic effects. The EPA is responsible for setting drinking water treatment standards to ensure that human health is protected. They must balance the risks from microbial contaminants against risks from disinfectants and disinfection by-products.

**Which pesticides are commonly found in drinking water?**

- Pesticides used in the recharge zone might be found in drinking water. For example, drinking water in an agricultural area may contain pesticides that were sprayed on agricultural crops.

- Pesticides with certain chemical characteristics, such as high water solubility, are more likely to be found in drinking water.

- If pesticides are spilled or misused near a well, they can get into drinking water.

- Certain antimicrobial pesticides are common in drinking water that has come from a public source (municipal water).

**How do I know if pesticides are in my drinking water?**

- Officials regularly test the public water supplies (municipal water) for certain pesticides. Information on these tests is available from your local water company.

- If you get water from a well, you can contact your County Health Department or State Environmental Department to inquire if pesticides have been found in wells in your area.

- The only way to know if a pesticide is present in your drinking water is to have your water tested. Unfortunately, testing can be costly.

**Can pesticides in drinking water cause health effects?**

- Pesticides found in drinking water may be harmful to your health. The toxicity of pesticides and the amount detected determines if any health effects are likely. See Dose Response box.

- Individual pesticides have different effects on humans. Variation exists in the toxicity of pesticides and the sensitivity of people to chemicals. In large amounts, some pesticides can cause long-term health effects, such as cancer or organ damage, in laboratory animals. Some pesticides at high doses can cause reproductive effects in laboratory animals.

- Most pesticides will have toxic effects on animals at high levels. Some pesticides are toxic at medium or low levels. Pesticides in drinking water are usually found at very low levels.

**Dose-Response.** Pesticides can affect human health and the environment depending on how much chemical is present, the length and frequency of exposure, and the toxicity of the pesticide. Effects also depend on the health of a person and the condition of the environment when exposure occurs. Laboratories can detect extremely low levels of pesticides in drinking water that are unlikely to be harmful to humans.
For many pesticides, scientists have determined levels that are not likely to pose health risks. See Maximum Contaminant Level box.

- When pesticides in drinking water are above acceptable levels, you should take measures to avoid drinking it.

What do I do if pesticides are found in my drinking water?

- If a pesticide is found in your drinking water above acceptable levels, you should report this to your State Department of Agriculture. If you are having health effects you suspect are linked to pesticide exposure, consult a physician or contact the National Pesticide Telecommunications Network (NPTN).

- Drinking water contaminated with pesticides can be treated by a local water treatment facility to remove most of the pesticides. Activated carbon or reverse osmosis filters can be effective at removing pesticides from water. Consult your EPA Regional Office for the most effective treatment method for the pesticide(s) of concern.

- Contaminated wells can sometimes be dug deeper to avoid pesticides. Note: This may not always solve the problem. Consult a professional engineer.

- Using bottled water can be an alternative if your water is contaminated until you can take measures to correct the problem. Note: Bottled water is not always regulated for pesticides.

What is being done about pesticides in drinking water?

- Several government agencies including the U.S. EPA Office of Water, U.S. Geological Survey (USGS), and State Environmental Departments, and local city and county agencies monitor drinking water. Note: Drinking water is not tested in all areas. Contact these agencies for further information.

- Pesticide levels detected in water samples are compared to acceptable levels. If pesticides are found at higher than the acceptable levels, then agencies take action to correct the problem or notify affected citizens.

- The Safe Drinking Water Act is in place to reduce exposure to contaminants including pesticides in drinking water.

- Scientists are conducting research to better understand the long term effects of certain pesticides in drinking water.

Further reading: