Landscape, Integrated Pest Management Plan

County of Ventura
General Services Agency, Grounds Department
Integrated Pest Management Plan
Revised 2/07/2011
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Part 1 Overview

1.1 Introduction

Pest management and pests vary considerably depending on their purpose and use. The agricultural industry, recreational businesses such as golf courses and parks, residential, commercial complexes and government facilities all have variant threshold levels and categories of pests. The vegetation is protected for various reasons.

The County of Ventura GSA Landscape Department does not maintain its grounds to a level of agriculture for food consumption nor does it consider it from the perspective of recreation and human contact. Our grounds primary purpose is climate control and aesthetics. These pest control management plans and threshold levels are established based on this premise. From an ecological sense, there are no pests except humans because all organisms are part of the ecosystem. However, for the purpose of this report pests are defined as anything that degrades human health due to migration, exposure or damages the landscape to a level of noticeable degradation to its appearance as identified in the Federal Insecticide Fungicide and Rodenticide Act (FIFRA). Pests include all of the following categories of organisms:

- Pathogens (including fungi, bacteria, mollicutes and viruses)
- Weeds (all classes of vascular plants)
- Nematodes (roundworms)
- Mollusks (slugs and sails)
- Arthropods (including insects, mites, crustaceans, and other joint-legged invertebrates)
- Vertebrates (including amphibians, reptiles, birds, mammals)

Ideally, man can coexist with the birds and the bees. However, some of them are harmful to humans and our preferred landscape. Pests must be managed. This plan provides a responsible manner in which to control them with minimal impact to the ecosystem and the environment. Chemicals are used at a minimum while biological, natural, cultural and mechanical means are utilized to the fullest extent possible.

1.2 Policy Statement

The County of Ventura is committed to providing a safe and healthy environment for its employees and visitors. Whereas fertilizing plants, controlling weeds and other pests within the grounds is important for the enjoyment and sustainability of the environment, this policy limits chemical use within the grounds maintenance program. All forms of chemicals applied to the County grounds will follow the principles of Integrated Pest Management (IPM). As such, a variety of preventive and non-chemical management strategies shall be used or considered before using the least toxic approved chemicals. Approved herbicide, pesticide and fertilizer applications will be used in circumstances where alternative practices or products have failed to manage the pest or support healthy growth of desirable vegetation. Standards of practice for pesticide application on County property will continue to meet or exceed federal, state and local requirements.

1.3 The Purpose:

The purpose of this policy is to minimize the use of chemicals on County maintained grounds but where required, use them responsibly by ensuring that:

- Integrated Pest Management (IPM) principles (which include Cultural Mechanical/Manual, Biological and Chemical methods) are adhered to by all County Agencies/Departments.
- Sound pest prevention planning in the acquisition of new property is applied, not excluding the consideration of future plan health and care.
- Relevant staffing receives training and leadership in IPM.
- Management reviews the IPM program annually and makes recommendations for improvement.

1.4 Procedure:

All County Agencies/Departments that purchase, design, and maintain County owned grounds shall have an Integrated Pest Management Plan that considers:

- Pest Control
- Weed Control
- Plant Enhancement

1.5 The Plan:

The plan shall specifically:

- Prior to purchasing new property for the purpose of supporting the low chemical use approach:

- Consider neighboring landscape and future developments prior to purchasing new property.

- Obtain specialized review of proposed property and evaluate local compatibility.

- Make changes to the purchase and adjust design and maintenance plans as necessary, including adjusting the design to minimize soil erosion and provide for compliance with County NPDES Storm Water Permit.

- Seek to avoid the need for use of chemicals through proactive landscape design.

    - Design new structures to minimize the intrusion and colonization by rodents and insects. Use pest resistant structural materials to avoid termite infestations, minimize exterior penetrations, and build in safe food storage/preparation facilities.

    - Design new landscaped areas that will minimize the need for fertilizers insecticides and herbicides. In particular:

        - Choose plant material that is more resistant or tolerant of pests and disease that can coexist naturally.

        - Select plants that will not highly depend on frequent or excessive chemical use (or watering) for fertilization.

        - Use soil and drainage designs specific to microclimate and to planting the design objectives, aforementioned.

        - Use plant assessable hard scape in support of mechanical weed removal.

        - Minimize the use of chemicals in landscaping areas through refined maintenance and the use of the least toxic alternatives whenever possible. Control methods should include Cultural, Mechanical/Manual, Biological and Chemical. Specifically:

            - Use mulch and/or topping to cover bare soil areas.

            - Do not use broadcast herbicides on lawn areas (e.g. do not apply broadleaf killers to entire lawn areas) unless absolutely necessary.

            - Use the least toxic herbicide appropriate to the task (recognizing that herbicide choice will be dictated by the circumstance).

            - Continually evaluate and test new “least toxic” products as they become available.

- Use application techniques to reduce off-target application to the minimum extent possible.

- Use mowers, machine trimming and hand removal whenever possible.

- Replant native or noninvasive naturalized plant species that will not require fertilizing and that are naturally resistant to local pests and diseases.

- Whenever possible and affordable, use natural biologically derived (naturally occurring), organic fertilizers, pesticides and herbicides.

- Keep eating and food preparation areas clean, eliminate nesting/breeding areas around building exteriors, avoid garbage accumulation, and encourage employees to use proper food storage and waste disposal practices to discourage pests.

Note: Water and energy conservation should always be considered to the fullest extent possible.

- ***PART 2***

2.1 Landscape Management Context

In compliance with aforementioned policy the following plan has been developed. It applies to Grounds maintained by GSA County of Ventura Maintained Property.

2.2 Description of Facility

The County of Ventura, General Services Landscape Department maintains sites throughout the County. The majority of the sites are maintained through contractor support. However, the Government Center Campus, which is 82 acres, 855 Partridge, 646 County Square Drive, 669 County Square Drive and 4651 Telephone Rd, are maintained using in-house resources. Nonetheless, the vendors are held to the same standards set forth in this plan. The locations are listed below:

AGENCY	LOCATION	ACRES
	VENTURA	
GSA	669 County Sq. Bldg Multi Svc	2.00
GSA	Telephone Rd. Bldg. Multi Svc	2.50
GSA	Clifton Tatum Center	0.25
GSA	Colston Youth Center	2.00
GSA	577 N. Ventura Rd. Haz. Waste	
GSA	Intake (384 Hillmont)	0.08
GSA	Saticoy Ops. Yard	20.00
	SANTA PAULA	
GSA	Agriculture Dept	0.75
	CAMARILLO	
GSA	Animal Control	2.00
GSA	ITSD, Control Center	0.25
GSA	Las Posas Sheriff/Police Station	2.50
GSA	Rain Project	2.00
	OXNARD	
GSA	2220 Gonzales Rd Multi Svc	6.01
GSA	1400 Vanguard Multi Svc	2.50
GSA	Juvenile Justice Center Courts	2.50
GSA	Juvenile Justice Center Juvenile Facility	10.00
	SIMI VALLEY	
GSA	East Valley Sheriff Station	8.00
GSA	East Valley Court House	4.00

GSA	Royal Ave. Multi Svc	1.00
GSA	Simi/DA	0.20
	MOORPARK	
GSA	Moorpark PD	1.50
	PIRU	
GSA	Piru Train Station	3.00

The plan will focus primarily on the Government Center because of its vast plant variety and size. However, the concepts presented within this plan are utilized throughout our programs.

2.3 Goals:

The General Services Agency (GSA) pest management mission is to prevent pests and diseases from adversely affecting the county's property by establishing and maintaining a safe, effective, and environmentally sound Integrated Pest Management Program (IPM). The primary goal is to reduce the amount of pesticide actual ingredient used on the Government Center Campus by 20% using the base year 2005, and still maintain excellent plant conditions.

To accomplish this goal, many IPM techniques were used to maintain the same quality conditions and meet the 20% goal. These control techniques include physical, mechanical, cultural, biological, educational, and at last resort, chemical control using the least toxic products available.

The secondary goal for GSA landscape is to provide the best maintained grounds in the County given the conditions that must be worked with. We want to be the example others follow. The landscape maintenance operation is continually pursuing new techniques and methods to achieve this goal by attending local and state seminars our staff maintains pesticide and herbicide applicator and arborist licenses.

2.4 IPM program execution includes six steps that are routine procedures used to obtain the goals for each pest problem.

2.4.1 Identification of the Pest:

A crucial step in any IPM program is to identify the pest. The effectiveness of both proactive and reactive pest management measures depends on correct identification.

2.4.2 Development of a Control Plan/Strategy:

Strategies and prescriptions are the "bottom-line" of any pest management program. They provide the required product: adequate pest management. While conventional pest control programs have generally relied upon a single tool (pesticides) to achieve this objective, IPM programs utilize an array of tools that are *integrated* in strategies and prescriptions designed not only to control pests, but to *manage* them, focusing largely on options to *prevent or mitigate the occurrence* of pest problems.

2.4.3 Monitor the Pest Populations:

Monitoring involves systematically checking our grounds for pests and beneficial organisms, at regular intervals and at critical times, to gather information about the turf, pests, and natural enemies.

2.4.4 Control the Pest:

Pesticides are the option of last resort within the IPM programs because of their potential negative impacts on the environment, which result from the manufacturing process as well as from their application. Pesticides should be used only when other measures, such as biological or cultural controls, have failed to keep pest populations from approaching economically damaging levels.

2.4.5 Document the Results:

Documentation for the IPM program is maintenance of records and recording of decisions as required by the plan. An IPM program that is well-developed, implemented, and documented will minimize the need for and use of pesticides, maintain or improve the quality of our grounds, utilize fiscal resources efficiently, and promote political, administrative, and public approval and support.

2.4.6 Evaluation and/or Redesign the Plan:

Evaluation of individual program activities, system components, and the overall pest management program are an integral part of an IPM system. They are used to analyze the effectiveness, costs, and benefits of the program and its components, to highlight opportunities to adjust the program to better serve its intended implementation goals and objectives.

PART 3 PEST MANAGEMENT PRACTICES

3.1 Pest Management Practices at In-house Maintained Grounds

3.2 Scouting & Monitoring

During their daily inspection rounds, maintenance workers have identified certain hot spots to check for both disease and watering problems. If a crewmember finds something they cannot identify or are uncertain of, they will go to the landscape supervisor for verification. (The spray technician is also trained in pest identification). A decision will then be made for control measures. When the technician is out on a non-spray duty, he will monitor the areas he is working in. Scott Bucy, Landscape Supervisor, has a State of California Pest Control Advisors license. He has trained all technicians (GSA landscape employees). This includes scouting, monitoring and identification. The Landscape Supervisor also has a BS in Soil Sciences, which provides the basics for all management applications.

3.3 Hot Spots

The landscape scouts have identified hot spot areas that include rodent, weed and irrigation problems. Maps are used to identify these hot spots on a yearly basis for possible identification of future pressure areas.

3.4 Types of Pest

All pests will be monitored and treated appropriately.

3.4.1 Diseases:

The following diseases have been noted:

- Pink bud rot on king palms
- Powdery mildew rust on roses
- Root rot on shrubs and trees
- Oak Root Fungus

3.4.2 Insects:

The following insect pests have been identified:

- Bees
- Cockroaches
- Aphids
- Sod web worms (in grass)
- Snails and slugs
- Scale
- Mites

3.4.3 Weeds:

Weeds present a number of unique challenges that need to be recognized when developing management strategies. The intensity of weed problems during a growing season will be influenced by weed population levels in previous years. The axiom "one year's seeding equals seven years' weeding" is apt. There are various annual and perennial weeds growing on campus. They are:

- **Perennial** – field bindweed, common bermuda, dandelion, and clover.

- **Annual** – sow thistle, purslane, spotted spurge, and oxalis (both perennial and annual type).

Clovers and other broadleaf weeds are a real nuisance. The method of keeping these weeds in check is to spot treat bad areas. A few broadleaf weeds here and there are tolerable. On the grass, where weeds have not been a problem, applying broadleaf control product can be used to spot out the weeds if they develop. This is an "as needed" application.

The grounds department has come to live with the conclusion that a certain population of kikiyu grass is tolerable in the grass populations. The treatment eradication would be too costly to the environment. Over 60 % of the open soil has been covered with mulch. This has added greatly in the reduction of chemical use.

3.4.4 Rodents:

Landscape Department chemical and bait control program is executed by our vendors of record. They are Hydrex, Inc. and Kastle Kare Rodent management. They apply dry and liquid anticoagulants to the grounds in order to exterminate rodents. See the attached MSDS (Material Safety Data Sheet(s) for further information regarding substances used.

Acknowledging that these chemicals may become harmful to the life cycle of the County of Ventura's wild life and in response to Board of Supervisors' letter of March 22, 2005 , which supports AB 1548 (PAVLEY) Field Rodents by recommending the avoidance of the use of anticoagulants to the extent possible, the following has been accomplished. Specifically, we are complying with the request by taking a comprehensive program overview to seek opportunities to reduce anticoagulants where applicable and use alternative methods. Details are provided below:

3.4.4.1 Method:

The landscape department has examined physical conditions and practices that might invite rodent infestation and prescribed corrective measures, i.e. we will integrate starving them, keeping them off the premises and finally, extermination. Tenant and food services vendor practices will also be reviewed and recommendations made.

The landscape department routinely reviews the pest control vendors' understanding of the biology of rodents, their needs and habits and employ a variety of alternate chemicals or bait to the program wherever feasible.

Specifically, the Integrated Pest Management (IPM) plan will reduce to the maximum extent possible, reliance on the chemical pesticides named brodifacoum, bromadialone, diphacione, or difethialone. While these anticoagulants offer short-term suppression of the rodent population, the goal of the IPM is to develop long-term pest control alternatives.

Currently, gophers are being controlled mostly with fumitoxin (Aluminum Phosphide); however, groundskeepers have had relatively good success with trapping gophers. Trapping is done whenever operations permit.

Please note: Pesticides, which include anticoagulants, will be utilized to control pests when other means prove inadequate.

3.4.4.2 Existing protocols:

Existing protocols for approval of any chemical application will be documented. Decisions are first based on the need for control, next on the failure of non-pesticidal control methods, and last on an evaluation of the various chemical options available, their toxicity, their potential for unwanted exposure and adverse impacts, and their demonstrated efficacy for the proposed application. Anticoagulants will be placed at the bottom of the list for desired chemicals to be used.

3.4.4.3 Preventive Measures:

Rodents on campus include gophers, mice, opossums and squirrels. In an effort to prevent and eliminate rodent populations, it is important that conditions favorable to their survival be reduced as much as possible or eliminated, thereby reducing the chemicals needed to treat these pests. Prevention begins with sanitation. Additionally, exclusion measures shall be taken that will make structures less hospitable or accessible. The following measures shall be taken:

- Trash containers are regularly cleaned and all waste, especially food and paper debris are routinely removed.
- Cracks in pavement and sidewalks are repaired as soon as possible.

- The facility is made rodent-proof by plugging holes in the foundation and walls. Steel wool is used as a temporary patch while waiting for permanent repairs to be done. (Attention should be given to areas where sewers and drains enter a building.)

- Water runoff is kept away from the building. Drains are screened with 2" hardware cloth to prevent rodent access and kept free of debris to reduce standing water.

- Loading dock areas are kept clean, free of debris, and doors should remain closed as much as possible.

- Trees, shrubs, vines, and brush are be trimmed away from the building at least 12"-18" to allow access for the pest control technician to monitor and place traps and bait stations if necessary. Grass should be mowed and trimmed.

- Dumpsters are kept in good condition with all doors closed and drain holes capped. They are located away from the building on a paved surface. Trash is contained and lids secured.

- Outdoor storage areas are managed using a first in, first out program. Inventory has been elevated on pallets or shelving that is 12" or more away from any wall.

- Areas where rodent feces are found are identified in the pest-sighting log and reported to our vendor of record for treatment.

3.5 Special Projects

Special projects conducted include:

3.5.1 Plant reduction:

The Landscape Department has removed approximately ½ of the prevailing border shrubs (Xylosmas) throughout the property, along with various plants on the "Victoria Avenue Hill" side of the property. This action reduced the habitat for rodents, reduced the amount of insect control agents needed because of a reduction in their food source and saved in labor expended on pruning and irrigation.

3.5.2 Use of Low Irrigation Plants/Groundcover

The Landscape Department continues to utilize plantings requiring less water along with natural ground cover (tree bark and red rock). These areas allow for reduction in

the use of water, pesticides and herbicides along with eliminating the need for more labor intensive mowing, (placing these plantings in narrow grass areas reduces the need for hand-mowing).

Access Ramp, East Side

Planter Adjacent to PTDF

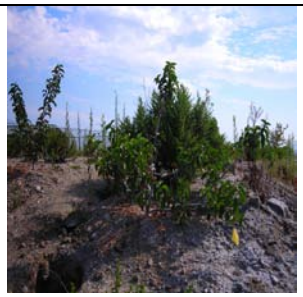
Additional plans include the use of Native California Plants. Native plants will provide us with a hearty variety that will do well with limited irrigation and local environmental conditions, further reducing the need for water, fertilizer and control management.

Among species Identified for inclusion are:

COYOTE BUSH

ELDERBERRY BUSH

SAGE



LEMONADE BERRY

CALIF. RYE GRASS

CEANOTHIS

3.5.3 Evapotranspiration

Evapotranspiration is the process by which trees and plants draw water from the ground and release the moisture into the atmosphere via their leaves. This movement of water is necessary for plant health and is the vehicle for plant metabolism. This water evaporates, drawing heat and cooling the air. Evapotranspiration is often referred to as "ET", ET information is retrieved (Via the Internet) from local CIMIS weather stations that measure local weather conditions. Universities have developed crop coefficients for landscape plants and numerous agricultural crops. ET is multiplied by the crop coefficient to determine crop specific ET. Evapotranspiration is measured using a variety of information such as: temperature, day length, solar energy, humidity and wind velocity. This information is important to landscaping and is used as a tool to assure that plants, trees and turf are getting the right amount of water at the right time. Our goal is to give the plants what they need –not too much and not too little. It takes the guess work out of irrigation scheduling.

Weather Station: In December 2008, GSA Grounds installed a weather station at the GSA Service Building located on the Government Center Campus with satellite locations at County Square Drive and the Telephone Road Building. The wireless system sends valuable information to the Central Irrigation Computer. The weather station provides weather data that can be used for irrigation scheduling. The weather station takes weather information such as solar energy, temperature, humidity and wind velocity and converts this information into (ET) or Evapotranspiration. This is a measure of the amount of water that is used by turf, plants, and trees on a daily basis. ET is expressed in inches of water per acre. Soil moisture is depleted by plants twenty-four hours a day – ET tells us the amount of water that is depleted in the soil on a daily basis so we can replenish the soil water reservoir. The weather station also provides us with some weather forecasting based on changes in barometric pressure.

The benefits of the weather station are many; (1) water is conserved because the station shuts down automatically during rain events, (2) the weather station makes daily changes in the amount of applied water thus minimizing the potential for human error, (3) ET assures that the plants are getting the right amount of water at the right time – this makes for healthier plants that can resist pests and diseases thus minimizing the need for pesticide applications, (4) healthier plants make for a better looking campus.

GSA Grounds has realized a significant water savings and efficiency over the last several years using ET information collected from the Oxnard CIMIS weather station. We are currently tracking water use from the Government

Center well and water meters located at several other County properties that are managed by GSA Grounds. Additional improvements in water conservation and irrigation efficiency are expected in the coming years using the onsite weather station.

In managing the existing landscape and planning new projects, this information is one of the tools utilized by the GSA Landscape Department. We have found that by using ET data to make educated decisions and adjustments in our irrigation scheduling that we are observing healthier plants that can better resist insects and diseases.

3.5.4 Tree Attrition Plan

An evaluation of every tree on the Government Center Campus has been completed, identifying sick, aged trees along with those that present safety issues. Removal and restoration of identified trees is in progress, along with the plan to install younger healthier native trees to replace those being removed. (See part 5 for more specifics).

PART 4. Written Records

Monitoring goes hand-in-hand with recordkeeping. Records should not only provide information about when and where pest problems have occurred, but should also incorporate information about cultural practices (irrigation, cultivation, fertilization, mowing, etc.) and their effect on pest and beneficial populations. The effects of non-biotic factors, especially weather, on pest and beneficial populations should also be noted. Recordkeeping is simply a systematic approach to learning from experience. The State of California mandates record keeping as a mandatory job requirement. Pesticide application records are kept for every application; (see attachment (1) for a sample form). Information from previous year's applications are used to give an intelligent idea of possible upcoming pest problems. This information is also reported to the agricultural department for the monitoring of yearly hot spots of different pests and mapping these areas, creating a guide to follow for next season's treatments. Each year a schedule is developed, to keep programs on track and keep members informed of upcoming work. This keeps the "surprises" down to a minimum. Records are kept on quarterly inventories of:

- Pesticide and other hazardous products
- Irrigation and ground water usage
- A complete label and MSDS file of all products being used (See Attachment (2))
- Equipment maintenance
- Training records
- Operating instructions.

Key Performance Indicators (KPI) – Pesticide use and Irrigation Water use is posted on the General Services Agency intranet web site. Water use is updated and posted monthly. Irrigation water use is tracked via the Toro Sentinel II irrigation control system. The County has flow sensors and tracks flow at the Government Center (800 So. Victoria Ave), 646 County Square Drive, 669 County Square Drive and 4651 Telephone Road. Others sites and installations are being considered at this time. Pesticide Use is updated and posted on a quarterly basis.**PART 5 Pest Control**

5.1 Pest Control

Much research is done on the new products being developed. By going to the trade shows, seminars, field days, and brainstorming with other landscape departments, information on the effectiveness of these products is gained. Test plots are first developed to try a product if there is still uncertainty about its effectiveness. But experience is the best advantage on what products work or do not work on our grounds. Due to the goal of a 20% reduction in chemical usage, a closer look at the toxicity level of a product is done. Fortunately the newer products being developed have very low active ingredients. Switching from using the organic-phosphates and carbamates to using the newer natural organic insecticides for all surface feeding and foliar feeding insects is now standard practice. They do just as good a job for control, and have a much lower AI rate. It's the research that is done on products and gained knowledge that ensures that the least toxic control method is used only after all other non-pesticide methods have been tried.

5.2 Pesticide Application Techniques

Granular products or soil-applied products are the preferred product as opposed to overhead spraying.

If the monitoring program indicates that the pest outbreak is isolated to a particular location, *spot treatment* of only the infested area will not only save time and money, but will conserve the natural beneficial organisms located in other parts of the grounds. The landscape supervisor times treatments to be least disruptive of other organisms and campus visitors & employees. This is yet another example where knowledge about the ecosystem is important.

5.3 Application Equipment

The following is a list of the most commonly used application equipment on the Government Center campus.

- Powered pump sprayer
- Broadcast spreaders
- Backpack and/or hand pump sprayers

PART 6 Control Techniques

6.1 Physical and/or Mechanical Control Practices

Methods included in this category utilize some physical component of the environment, such as temperature, humidity, light or soil to plant disturbance, to the detriment of the pest. Common practices used are tillage, soil solarization, hand weeding (performed by work release crews), weed barriers, decorative rocks, synthetic bark, mulches to kill weeds or to prevent weed seed germination. The mulch comes from recycled wood chips provided by the Public Works Agency and private tree companies at no cost. Sixty percent of the bare soil and weedy areas have been covered. Although generally used in small or localized situations, some methods of mechanical/physical control are finding wider acceptance because they are generally friendlier to the environment.

6.2 Cultural Control Practices

Cultural controls are manipulations of the ecosystem that make the shrubs and beds system less friendly to the establishment and proliferation of pest populations. Although they are designed to have positive effects on the grounds ecology and pest management, negative impacts may also result, due to variations in weather or changes in management.

Techniques of this practice involve planting resistant grass cultivars, planting different plant varieties including native plants, developing healthy biologically active soils, sanitation, efficient irrigation practices, modifying mowing heights, and monitoring *degree* or *growing days*, removing planting areas that are habitats for various pests. Recent projects include removal of 50% Xylosmos shrubs, removal of Victoria bank ground cover composite and replanting of it with the fescue grass.

Factors influencing the health and biodiversity of soils include the amount of organic matter, soil pH, nutrient balance, moisture, and parent material.. Healthy soils with a diverse community of organisms support plant health and nutrition better than soils deficient in organic matter and low in species diversity.

6.2.1 Fertilization:

Our philosophy is to use minimal commercial fertilizers due to consideration of low watering. Currently the lawns are fertilized once a year, while our beds are fertilized less than once a year. The beds and shrubs are fertilized with mulching except for the courtyard, and entryways which contain red brick. It contains synthetic bark.

Both slow release and organic fertilizers are used on the premises. 95% of the fertilizer products we use on the grounds are slow release with the remaining products being organic (mulch, grass clippings).

6.2.2 Soil Tests:

As a steward of the environment, soil tests are done once a year to determine the true nutritional needs of our grass. Composite soil samples are collected which are more representative of the total landscaped area. The fertilization programs are based on the test results.

6.2.3 Irrigation:

The most important function of irrigation is cultural control. The irrigation system was installed in 2006 As part of this program. It is a Torro Sentinel control operated system. It is state of the art. With the information obtained from its data base on GPM and spacing, schedules are written to match plant and soil conditions. The Landscape Supervisor is responsible for checking the grounds each day for wet or dry areas. With an irrigation system, feedback on conditions can be used to make adjustments. The future plan is hooked into a weather system that sends evapotranspiration (ET) information to the central program. This information can adjust our ET setting for the day automatically, or a responsible person can take the information and set an adjusted ET rate. We also use local weather reports to check for pending weather fronts coming into the area. With this information a decision can be made to override the system so there is no worry about watering while it is raining. Weather reports also help in scheduling spray applications. Spray applications are not to be made within 48 hours of a rain event. If a storm occurs it could potentially wash off a valuable control application, the application can be held off until the rain passes. The goal is to maintain healthy growth and not to have any overly wet or dry hot spots that could eventually cause other problems or even cause the growth to die.

6.3 Biological Control Techniques

Biological control is the use of living organisms, such as parasites, predators, or pathogens, to maintain pest populations below damaging levels. They may be either natural or applied.

Natural biological control results when naturally occurring enemies maintain pests at a lower level than would occur without them. Mammals, birds, bats, insects, fungi, bacteria, and viruses all have a role to play as natural predators and parasites in the landscape system**.**

Biological control techniques will be examined each time a problem occurs.

6.4 Chemical Controls:

Included in this category are both synthetic pesticide and botanical pesticide control. Restricted materials are not to be used.

- Synthetic pesticides comprise a wide range of man-made chemicals used to control insects, mites, weeds, nematodes, plant diseases, and vertebrate and invertebrate pests. These powerful chemicals are fast acting and relatively inexpensive to purchase. Pesticides are the option of last resort in this IPM program because of their potential negative impacts on the environment, which result from the manufacturing process as well as from their application on the grounds. Pesticides should be used only when other measures, such as biological or cultural controls, have failed to keep pest populations from approaching economically damaging levels. If chemical pesticides must be used, it is to eradicate the pest but not harm non-target organisms such as birds, fish, and mammals. Pesticides that are short-lived or act on one or a few specific organisms are in this class. Examples include insecticidal soaps, horticultural oils and boric acid.

- Botanical pesticides are prepared in various ways. They can be as simple as pureed plant leaves, extracts of plant parts, or chemicals purified from plants. Pyrethrum and rotenone are examples of botanicals. Some botanicals are broad-spectrum pesticides. Botanicals are generally less harmful in the environment than synthetic pesticides because they degrade quickly, but they can be just as deadly to beneficial organisms as synthetic pesticides.

Because pest resistance to chemical controls has become so common, the landscape department is increasingly viewing susceptibility to pesticides as an issue of concern. The less a product is applied, the longer a pest population will remain susceptible to that product. Routine use of any pesticide is a problematic strategy. Rotation of the different pesticide classes and modes of action is the answer.

There are instances where pesticides are the only effective tool for controlling unacceptable pest problems. A clear example is fungus diseases. While cultural controls, use of resistant plant varieties, and replacement with other species can contribute to reductions in disease problems; once established these pests often cannot be managed without the use of pesticides.

Monthly Summary Pesticide Use Report											
Mth	**Year**	**Bayer Advance Tree & Shrub**	**Cleary's 3336 WP**	**Gallery 75 DF - Dow Agro Science**	**Gordons Atrimmec**	**Durham Metaldehyde Granules 7.5%**	**Monsanto Roundup**	**Syngente Fusilade II**	**Contrac Blox (Bromadiolone)**	**Fumi-toxin**	**Surflan AS - Dow Agro Science**
Jan	2007										
Feb	2007										
Mar	2007	3 GA					18 OZ				
Apr	2007				45 OZ	80 LB			<5 LB		
May	2007						30 OZ				
Jun	2007										
Jul	2007										
Aug	2007										
Sep	2007										
Oct	2007										
Nov	2007										
Dec	2007										
Jan	2006						45 OZ				
Feb	2006										
Mar	2006						54 OZ				45 OZ
Apr	2006						18 OZ				18 OZ
May	2006						81 OZ		<5 LB		108 OZ
Jun	2006		12 OZ				75 OZ				75 OZ
Jul	2006										
Aug	2006						51 OZ				
Sep	2006										
Oct	2006						45 OZ				45 OZ
Nov	2006										
Dec	2006				45 OZ		24 OZ				150 OZ
Jan	2005						72 OZ				
Feb	2005						6 OZ	19 OZ			
Mar	2005										
Apr	2005										
May	2005			12 OZ			123 OZ	2.25 OZ	<5 LB		240 OZ
Jun	2005										
Jul	2005										
Aug	2005										
Sep	2005										
Oct	2005						90 OZ				
Nov	2005						72 OZ				
Dec	2005						81 OZ				27 OZ

There has been a marked decrease in chemical use. Specifically, a decrease for weed removal from 2005-2006 occurred in the amount of 22%. The two-year objective of 20% was met the first year. Another 20% was gained from 2006-2007. The greatest reduction was in the use of Roundup. In 2005, 444 oz of Roundup was applied. In 2006, 348 oz were applied and we are proud to say that only 93 oz were applied this year. The total projected use is 186 oz for 2007. This reduction can be attributed to the application of mulch, brick, synthetic bark and the use of Work Release crews provided by the Probation Department. GSA was fortunate to obtain large crews at the reasonable price of $540 for a crew of 6-10 individuals. In addition, a concerted effort to reduce the toxicity of the products has also been made as shown in the below chart.

For use in FY 2007.

* For specifics see attachment (2).

Pesticide	Comments	Frequency (if needed)	Pest	Application
* Bayer Advanced Tree & Shrub		One time	Aphids	Tulip Trees
Cleary's 3336 WP		One time	Pink Bud Rot	King Palm Trees
Galley 75 DF - Dow Agro	Pre-emergent with high toxicity	Practice abandoned	Weeds	Plant Beds
* Gordons Atrimmec	Regulatory hormone growth retardant. Reduced trimming 6 to 2 times/yr	Annually	Rapid Growth	Xylosma
* Durham Metaldehyde Granules 7.5%	Non-pellet safe around kids and pets	Annually	Snail	Beds
* Monsanto Roundup	Non selective weed killer but does not harm herbaceous plants	Spring-Summer	Weeds	
Syngenta Fusilade II	Low toxicity	Practice abandoned	Grass	Ground Cover
Contrac Blox (Bromadiolone)	Applied by vendor	Seasonally	Rats/Mice	Bait stations
Surflan AS – Dow Agro Science	Pre-Emergent with low toxicity	Practice Abandoned	Weeds	Plant Beds
Surflan AS - Dow Agro Science	P-emergent with low toxicity	practice abandoned	Weeds	Plant Beds

PART 7 Future Considerations

When installing landscape we change the environment. What was once the natural habitat for plants and animals has been eliminated and the survival and/or return to the environment have caused them to be labeled as pest's. Future consideration will be given by the County of Ventura, Landscape Department to return its grounds to their natural habitat. We will strongly consider and use native planting in future landscape changes and additions. The pests will no longer be pests because they belong. This will reduce the need for weed, disease and insect control because they will have already achieved the ability to coexist.

Currently, the County of Ventura has one building that is LEED Certified. Other properties are being reviewed for certification as well. IPM is one component in LEED certification and sustainability.

Part 8 Tree Integrated Pest Management Plan

The Integrated Pest Management (IPM) Plan for the County of Ventura Grounds Division has a three-pronged approach which includes:

- Inventory of the County's woody and herbaceous plants and identification of pest problems.
- Monitoring of areas and organisms that have been pest problems in the past.
- Remediation using management tactics in the context of the particular pest and plant host.

8.1 Inventory

Our inventory is a database catalog of all the campus landscape trees. Every landscape tree is tagged with a unique identification number. This database identifies specific trees by their species, size, and other inventoried data. There are approximately 1,200 landscape trees. The inventory was prepared by Poly & Associates.

8.2 Monitoring

We use the tree inventory together with our knowledge of the County's landscape to monitor for insect and disease occurrences and environmental stresses (e.g., leaf and bark scorch, girdling roots, nutrient deficiencies, etc.) before these occurrences become problems. In cases where the insect or disease occurrence is a problem, we use monitoring as a technique to measure population size and to determine if and when we need to use remediation measures.

For example, a soil drench application is used whenever possible for aphid control, eliminating the technique commonly used whereby a hole is drilled into the tree (which causes irreparable damage to the tree) and the pesticide applied via a syringe. A soil drench application also eliminates the need for aerial spraying.

We observe and collect weather related data to estimate when certain insects will hatch their eggs and anticipate the outbreak of certain fungal diseases. An example of weather data monitoring occurs in the management of Elm Leaf Beetles using degree/day monitoring. A degree/day is a unit based on accumulated heat to measure physiological time.

8.3 Remediation

Before applying pest management control measures we determine what action is needed and whether that action is likely to be effective. The majority of our landscape pest problems are minor or do not threaten plant health and therefore no action is taken. When action is needed, we use more than one method to provide more effective control. As a part of our Integrated Pest Management Plan we use cultural, mechanical, physical, biological, and chemical control measures.

We base our pest management program on cultural control. Cultural controls begin with selecting healthy specimens of pest resistant species, properly planting them, and maintaining their vigor with the necessary irrigation and fertilization. Providing plants with the proper care is our foremost consideration and the best line of defense against pests. In addition to proper installation and establishment, we give a lot of time and effort to pruning appropriately to minimize pest problems.

Our biological control attempts have been limited to successful use of *Bacillus thuriengensis* for the management of various caterpillars. We are exploring the use of predaceous insects, but have not worked with any species yet.

Annually, we will utilize chemical means for controlling landscape pests such as weeds, insects, and diseases. The use of chemicals on campus is a last resort tactic. We will use the least toxic chemicals available and have had great success using horticultural soaps and oil. All staff that applies pesticides are certified or trained in accordance with the California Department of Agriculture laws and regulations. We follow all occupational and environmental precautions and suggestions in addition to ecological common sense.

Part 9 Storm Water Strategy:

9.1 Storm Water Strategy

The County NPDES Storm Water Permit No. CAS004002, which regulates discharges from the storm sewer systems within the County, requires that the County of Ventura, as co-permittee, implement an Integrated Pest Management Program. The County IPM Program was introduced in XXXand was designed to significantly reduce the use of harmful chemicals. Those chemicals have the potential to enter storm drain systems and contaminant our streams, rivers and ocean. Under the strategy, GSA does not apply pesticides in or near drainage or natural waterways. With respect to water run off, pesticides are not applied 48 before, during or 48 hours after an irrigation or rain event. To ensure compliance, GSA's Grounds Department operates an onsite weather station and a computer operated irrigation system, with daily weather monitoring and forecasting.

9.2 Types of Pesticides

Current Practices:

GSA Grounds does not apply organophosphate pesticides. On one occasion, when other methods had been examined/tested and were not successful, a pyrethroid was used: careful consideration was taken so that it was not used within 48 hours of a rain or irrigation event. This is considered to be a BMP.

9.3 Contractor/Vendor Compliance

Vendors applying pesticides are required to supply copies of reports sent to the Ventura County Agricultural Commissioner's office and to the County Contract Administrator. Types and amounts of pesticides are reported annually on GSA websites. This information is used to monitor pesticide use and to implement the IPM Strategy. The Vendor and County Contract Administrator meet each month to discuss pesticide applications and IPM methods and procedures. These meetings are used to identify potential pest problems and solutions, including alternatives such as biological control, the use of beneficial insects, the application of mulches for weed control, among others. This routine communication with vendors is considered to be a BMP.

GSA will provide storm water permit training for all vendors with activities that may affect storm water systems into its IPM Strategy. The training shall include the following:

- Promote a clear understanding of the potential for activities to pollute storm water.
- Review BMPs so that employees and vendors have a clear understanding of their importance and implementation.
- Review the Integrated Pest Management Program and the potential for pesticide-related surface water toxicity.
- Review proper use, handling and disposal of pesticides.
- Review the possibilities for reduction of pesticide use.
- The identification, investigation, termination, cleanup, reporting and documentation of incidents of discharges, including those that are illegal and/or inconsistent with the IPM program.

- GSA will include reference to the NPDES requirements in RFQs and vendor contracts.
- GSA will provide landscaping contractors with a fact sheet on Best Management Practices related to storm drains.

9.4 Pesticide Storage

GSA Grounds does not use or purchase any banned, unregistered or restricted materials. The Department has an on-site separate indoor facility for storage of pesticides. The room has a cement floor designed for containment in the event of a spill. The room has a DPR approved pesticide storage sign on the door. Should a spill occur, personnel have been trained on proper containment and disposal. This training occurs annually, at a minimum, and each time an employee uses a pesticide that he or she has not used before. Spill containment materials are located in the storage room.

GSA Grounds will include orientation on spill containment during annual Storm water permit training.

9.5 Staff Certification

Current practices:

The GSA Grounds Department Landscape Supervisor has a Pest Control Advisors License and provides Pesticide Safety Training for County employees that apply pesticides. Employees are trained annually for each pesticide material that they use, in accordance with the California Department of Pesticide regulations. The County holds a site ID and permit from the County Agricultural Commissioner's Office, requiring monthly reports. The permit is reviewed and renewed annually. Because the Department does not apply any restricted materials, only applies pesticides on County property and does not apply pesticides for hire, the Department is not required to have a QAL or QAC. This approach to staff certification is considered a storm water BMP, since it ensures that all measures are taken by qualified staff to minimize the discharge of harmful pesticides to the storm drain system.

9.6 Employee Training

Current practices:

As noted above, employees receive regular training, at a minimum annually, on the management of pesticides.

Employee training will be expanded to include a storm water component. Landscaping team leaders will be included in vendor training and will receive storm water factsheets to assist them in communicating with their staff.

9.7 Catch Basin Inspection and Clean-up

A catch basin is a part of a storm drain or sewer system which is designed to trap debris so that it cannot enter the drainage pipes. GSA Grounds is responsible for ensuring that debris from County property does not enter storm drains.

The Grounds Department employs three grounds keepers to police the Government Center and to collect paper trash on grounds and Center roads as observed. At the remaining 23 properties for which GSA is responsible, trash is collected two to three times a week (depending upon size of facility) and/or upon special request. These practices reduce the amount of debris that enters catch basins. This preventive action is considered a BMP.

GSA's Facilities Department is responsible for maintenance and clean-up of the basins.

9.8 Bioswales and Drainage Basins

County of Ventura properties with bioswales or drainage basins for which GSA Grounds is responsible include:

- 855 Partridge Avenue, Ventura (bioswale)
- 815 Spring Street, Moorpark (bioswale)
- 11251 Riverbank Drive, Saticoy Yard, Ventura (drainage basin)
- 4333 Vineyard Avenue, Juvenile Justice Center, Oxnard (drainage basin)

Bioswales and drainage basins are currently managed using landscape maintenance procedures adopted by GSA Grounds. This includes removal of organic and inorganic debris and regular mowing of bioswales.

The Grounds Supervisor conducts periodic (once every 4-6 weeks) inspection for erosion, damage to vegetation, and sediment and debris accumulation. The areas are checked for pools of standing water, debris and sediment accumulation.

Under a maintenance permit for the Juvenile Justice Center, the drainage basin is cleaned twice a year, under the supervision of GSA Grounds.

The Saticoy Drainage Basin is cleaned once a year.

For both facilities with drainage basins, any unusual build up of debris that is identified during period inspections is removed to ensure proper operation of the basins.

Bioswales themselves are considered to be a BMP because they reduce the need for irrigation and pesticides and filter water before it reaches the storm sewer system.

These practices are considered to be consistent with BMPs for bioswales and drainage basins.

References

1. University of Michigan Grounds & Waste Management Department sample plan
2. U.S Air Force sample Plan
3. Integrated Pest Management Plan, New York
4. Robert F. Norris, Edward P. Caswell-Chen, Marcose Kogan,, 2003. *Concepts in Integrated Pest Management*. Prentice Hall, New Jersey
5. Federal Insecticide, Fungicide, and Rodenticide Act, 1996

National Pollution Discharge Elimination System (NPDES) Permit No. CAS004002, Ventura County, 2009.

PESTICIDE APPLICATION RECORD

Location:_____

Applicator_____Date_____Day_____Time_____AM_____PM

PESTICIDE INFORMATION
(*CIRCLE)* **FUNGICIDE INSECTICIDE HERBICIDE GROWTH REG.**

(Trade Name) (Chemical Name)
Pesticide Name: _____ _____

C. E.P.A. REG.# _____
Formulation (% Active Ingredient)
Soluble_____ Flowable_____ Wetable Powder_____ EC_____
Granular_____ WDG_____ Aerosol_____
(CIRCLE) CAUTION WARNING DANGER
APPLICATION INFORMATION
Identify Target Pest_____
Type of Area Treated_____
Location of Treated Area_____
Total Area Treated (Acres)_____
Total Actual Pesticide Used_____
Application Rate of Formulated Product: _____Per Acre _____Per 1000 sq. ft.
Total Amount of Formulated Product_____
Application Equipment_____
Amount of Carrier Used: Dry_____ Liquid_____
Weather Conditions at Time of Application: Air Temp._____ Wind Dir._____ (*Get From Weather Station or Forecast)* Humidity _____ Wind Velocity_____
Time of Application_____
Total Hours (include mixing & cleanup) _____
Special Label Instructions _____
Comments/Results _____
Tank Mixture (if any) _____
AMOUNT OF MATERIAL USED per LOAD _____
FOLLOW ALL LABEL INSTRUCTIONS

Signature_____

License Number _____

Attachment (1)

VENTURA COUNTY AGRICULTURAL COMMISSIONER
P.O. BOX 889
SANTA PAULA, CA 93061-0889

Office: (805)933-2926 Fax: (805)525-8922 Recorder (NOI's): (805)525-8922

OPERATOR IDENTIFICATION NUMBER

VENTURA CO. GROUNDS & MAINT
800 S. VICTORIA AVE.
VENTURA, CA 93009-

SCOTT BUCY
800 S. VICTORIA AVE.
VENTURA, CA 93009-

Permittee Type: Non-Certified

Operator Identification #: 56-11-56X0042
County District #: SP
Expiration Date: December 31, 2011
Effective Date: January 10, 2011

Home Phone: (805) 659-4895
Shop Phone: (805)654-3821
Mobile Phone: (805) 207-6687
Fax: (805) 477-7178

SCOTT BUCY PCA #71951 EXPIRES 12/31/2012

Conditions: 1E,1J

See end of permit for code descriptions.

I understand that this permit does not relieve me from liability for any damages to any persons or property caused by the use of these pesticides. I waive any claims of liability for damages against the County Department of Agriculture based on the issuance of this permit. I further understand that this permit may be revoked when pesticides are used in conflict with the manufacturer's labeling or in violation of applicable laws, regulations and specific conditions of this permit. I authorize inspection at all reasonable times and whenever an emergency exists by the Department of Pesticide Regulation or the County Department of Agriculture of all areas treated or to be treated, storage facilities for pesticides or emptied containers and equipment used or to be used in the treatment. I have considered alternatives and mitigation measures pursuant to Title 3, California Code of Regulations, section 6426. Taking into account economic, environmental, social, and technological factors, I have adopted those that are feasible and would substantially lessen any significant adverse impact on the environment.
[Form PR-ENF-125 (Rev. 11/06) Pesticide Enforcement Branch]

Permit Applicant: Scott Bucy (Please Print) Signed: Scott Bucy

Title: Landscape Supervisor (Please Print) Issue Date: 1/10/11

Issuing Officer: [signature] Issue Date: JANUARY 10, 2011

Page 1

Employees handle pesticides.

Contact Name	License#	Exp. Date	Phone Number	Contact Type
CROP PRODUCTION SERVICES	37365	12/31/2010	(805) 487-4961	Pest Control Business Branch
KASTLE KARE	30437	12/31/2010	(805) 484-8181	Pest Control Business
QUALITY LANDSCAPE CARE	30855	12/31/2010	(805) 649-1030	Pest Control Business
VENTURA CO. GROUNDS & MAINT.	56X0042		(805) 659-4895	Grower-Permittee

PERMIT PESTICIDES

Number	Pesticide	Pests	Forms	Methods	Applicators
99900	NON-RESTRICTED USE	ALL PESTS	All Reg.	Ground	PG

PERMIT SITES

Site	Location/Site Narrative / Crop		District	Section	Town	Range	Meridian
				Quantity	Units		
27	800 S. VICTORIA AVE., VTA GOVERNMENT CENTER		SP	2	02N	23W	S
	LANDSCAPE MAIN	**30**	**0**	30.00	A		
	99900 (NON-RESTRICTED USE),						
28	855 PARTRIDGE ST. VENTURA HUMAN SERVICES		SP	8	02N	22W	S
	LANDSCAPE MAIN	**30**	**0**	0.50	A		
	99900 (NON-RESTRICTED USE),						
29	669 COUNTY SQUARE DRIVE - VENTURA WEST COUNTY ANNEX		SP	7	02N	22W	S
	LANDSCAPE MAIN	**30**	**0**	0.75	A		
	99900 (NON-RESTRICTED USE),						
30	646 COUNTY SQUARE DRIVE - VENTURA MULTI-SERVICE BUILDING		SP	8	02N	22W	S
	LANDSCAPE MAIN	**30**	**0**	0.25	A		
	99900 (NON-RESTRICTED USE),						
31	4651 TELEPHONE ROAD - VENTURA MULTI-SERVICE BUILDING		SP	12	02N	23W	S
	LANDSCAPE MAIN	**30**	**0**	0.75	A		
	99900 (NON-RESTRICTED USE),						

EMPLOYEE PESTICIDE SAFETY TRAINING RECORD

EMPLOYEE NAME:	EMPLOYEE'S SIGNATURE:	DATE:
EMPLOYER NAME:	EMPLOYER'S SIGNATURE:	
TRAINER NAME:	TRAINER'S SIGNATURE:	

☐ APPLICATOR ☐ FLAGGER

☐ MIXER/LOADER ☐ OTHER (SPECIFY) _____

IMPORTANT:

1. Training must be given before employees are allowed to handle any pesticide, continually updated to cover any new pesticides that will be handed and repeated and documented at least annually thereafter.

	PESTICIDE NAME						
1	IMMEDIATE AND LONG TERM HAZARDS Involved, Including hazards associated with exposure to pesticides know or suspected of chronic effects such as, tumors, cancer, birth defects, etc.						
2	SAFETY PROCEDURES to be followed while mixing, loading, applying pesticides, or servicing contaminated equipment.						
3	ENGINEERING CONTROLS: When and how to use enclosed cabs, closed mining/loading systems.						
4	PROTECTIVE CLOTHING AND EQUIPMENT: Proper use and care of coveralls,gloves,goggles,boots,apron,rainsuit,respiratory equipment.						
5	EMERGENCY PROCEDURES to be followed for handling non-routine tasks or emergency situations						
6	WAYS POISONING OR INJURY CAN OCCUR Through ingestion, inhalation, or dermal routes.						
7	IMPORTANCE OF IMMEDIATE DECONTAMINATION OF SKIN AND EYES when exposure occurs.						
8	COMMON SYMPTOMS OF PESTICIDE POISONING: Pinpoint pupils, nausea,blurred vision,shortness of breath,dizziness,headache.						
9	WHERE TO OBTAIN EMERGENCY MEDICAL TREATMENT: Name, address and telephone number of medical facility where emergency medical care is available						
10	PURPOSE AND REQUIREMENTS OF MEDICAL SUPERVISION: Required when handling pesticides with "Danger" or "Warning" signal word that contains an organophosphate or carbonate.						
11	APPLICABLE LAWS AND REGULATIONS: MSDSs;PSISs; AND LABEL REQUIREMENTS: Importance of complying with the laws and regulations and label requirements.						
12	EMPLOYEE RIGHTS: To personally receive information on pesticides they may be exposed to; to have physician or their representative receive this information; protected against discharge or discrimination.						
13	LOCATION OF DOCUMENTS/RECORDS: Location of written hazard Communication Program, use records, PSISs, MSDSs,exposure and monitoring records.						

*ENTER DATE TRAINING GIVEN FOR EACH PESTICIDE

ESRI ArcExplorer 2.0

CNTY OF VTA - GRNDS MAINTENCE - 56X0042 - SITE 01 GOV'T CENTER

- Schools
- Schoolbuffersquartermile
- Myagarcels
- Cropsnow
- Venco
- Roads & Streets

N

Wednesday, June 28 2007

MATERIAL

SAFETY

DATA

SHEETS

(MSDS)

MATERIAL SAFETY DATA SHEET

SLUGGO®

Issue Date: 07/09

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Chemical Product
SLUGGO®
EPA Reg. No. 67702-3-54705
Common Name: Granular snail and slug bait.
Chemical Description: 1% Iron phosphate, granular.
TSCA/CAS No.: This product is a mixture — there is no specific CAS number.

Manufactured For
Lawn & Garden Products, Inc.
P. O. Box 35000
Fresno, CA 93745-5000

Emergency Phone Numbers
Emergency Telephone: DAYS: (559) 499-2100 EVES.: (559) 994-9144
CHEMTREC (24-Hour Emergency Number): (800) 424-9300
EPA National Response Center: (800) 424-8802

SECTION 2. HAZARDOUS INGREDIENTS

CHEMICAL	CAS NO.	%	TLV OR PEL	RQ (lbs)
None.				

* N.A. - Not Available.

SECTION 3. EMERGENCY/HAZARDS OVERVIEW

Light tan granules, odorless. Causes moderate eye irritation. Not D.O.T. regulated.

HEALTH: 1 REACTIVITY: 0 FLAMMABILITY: 0 ENVIRONMENT: 0
(0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme)

SECTION 4. FIRST AID

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

Skin: 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.

Ingestion: 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.

Inhalation: Move 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 further treatment advice.

SECTION 5. FIRE AND EXPLOSION HAZARDS

Flash Point:	Not available.
Test Method:	Not available.
LEL Flammable Limits:	Not pertinent.
UEL Flammable Limits:	Not pertinent.
Autoignition Temperature:	Not pertinent.
Flammability Classification:	Noncombustible.
Known Hazardous Products of Combustion:	None.
Properties that Initiate/Contribute to Intensity of Fire:	None.
Potential For Dust Explosion:	None.
Reactions that Release Flammable Gases or Vapors:	Not known.
Potential For Release of Flammable Vapors:	None.
Unusual Fire & Explosion Hazards:	None.
Extinguishing Media:	Use extinguishing media appropriate for surrounding fire.
Special Firefighting Procedures:	Wear positive pressure, self-contained breathing apparatus and goggles. Avoid smoke inhalation. Contain any liquid runoff.

SECTION 6. SPILLS AND LEAKS

Containment:	Prevent product spillage from entering drinking water supplies or streams.
Clean Up:	Sweep up spill and place in appropriate container for disposal.
Evacuation:	Not necessary.

SECTION 7. STORAGE AND HANDLING

Storage:	Store in plastic or stainless steel container in a cool, well-ventilated, dry place at temperatures above 40°F. Do not store near food or feeds. Do not stack pallets more than two (2) high.
Transfer Equipment:	Transfer product using chemical-resistant plastic or stainless steel tanks, pumps, valves, etc.
Work/Hygienic Practices:	Keep out of reach of children. Causes moderate eye irritation. Avoid contact with eyes, skin and clothing. Wash thoroughly with soap and water after handling.

SECTION 8. PERSONAL PROTECTIVE EQUIPMENT

Eyes:	None required.
Skin:	Wear impervious gloves.
Respiratory:	Not normally needed. If use generates an aerosol mist or respiratory irritation, use NIOSH-approved dust/mist respirator (such as 3M #8710).
Ventilation:	Recommended but no TLV established.

SECTION 9. PHYSICAL AND CHEMICAL DATA

Appearance:	Light brown granules.
Odor:	Odorless.
pH:	Not applicable.
Vapor Pressure:	Not applicable.
Vapor Density (Air = 1):	Not applicable.
Boiling Point:	Not applicable.
Freezing Point:	Not applicable.
Water Solubility:	Mainly insoluble.
Density:	0.79 g/ml.
Evaporation Rate:	Not applicable.
Viscosity:	Not applicable.
% Volatile:	Not applicable.
Octanol/Water Partition Coefficient:	Not applicable.
Saturated Vapor Concentration:	Not applicable.

SECTION 10. STABILITY AND REACTIVITY

Stability:	Stable.
Conditions To Avoid:	None identified.
Incompatibility:	None identified.
Hazardous Decomposition Products:	Carbon monoxide, carbon dioxide, oxides of nitrogen.
Hazardous Polymerization:	Will not occur.

SECTION 11. POTENTIAL HEALTH EFFECTS

Acute Effects:

Eyes:	May cause irritation.
Skin:	None identified. LD_{50} (Dermal): > 5000 mg/kg.
Ingestion:	None identified. LD_{50} (Oral): > 5000 mg/kg.
Inhalation:	Granular; does not pose an inhalation hazard.
Subchronic Effects:	None known.
Chronic Effects:	None known.

SECTION 12. ECOLOGICAL INFORMATION

Algal/Lemna Growth Inhibition:	Not known.
Toxicity to Fish and Invertebrates:	Not known.
Toxicity to Plants:	Not known.
Toxicity in Birds:	Not known.

SECTION 13. DISPOSAL

Do not contaminate lakes, streams, ponds, estuaries, oceans or other waters by discharge of waste effluents or equipment washwaters. Dispose of waste effluents according to state and local regulations. Also, chemical additions or other alterations of this product may invalidate any disposal information in this MSDS. Therefore, consult local waste regulators for proper disposal. Do not discharge.

SECTION 14. TRANSPORTATION

D.O.T.: Not D.O.T. Regulated.

Other Shipping Description: Insecticides and Fungicides, Dry.
NMFC Item 102120, LTL Class 60

SECTION 15. REGULATORY INFORMATION

CERCLA: None.

SARA TITLE III, Section 313 Toxic Chemicals: None.

Proposition 65: None.

SECTION 16. OTHER

All information appearing in this document was based on data provided by third party sources and was compiled to comply with the Federal Hazard Communication Standard and the California Hazardous Substances Information and Training Act. The information is believed to be accurate as of the preparation date, but is not warranted as being the final authority in the use of this product. This information does not purport to be legal or medical advice.

TALPIRID® Mole Bait MSDS

MANUFACTURER'S ADDRESS:	PREPARED BY:	TELEPHONE NO:	EMERGENCY PHONE NOS:
BELL LABORATORIES, INC. 3699 KINSMAN BLVD. MADISON, WI 53704	PSM/CAR	(608) 241-0202	**Medical** (877) 854-2494 **Transportation (Spills)** (800) 424-9300 CHEMTREC
PRODUCT NAME: TALPIRID Mole Bait			
USE: Acute Mole Bait	**BAIT FORM:** Formulated Bait		**EPA REGISTRATION NO.** 12455-101

SECTION I. HAZARDOUS INGREDIENTS

INGREDIENT NAME	% BY WEIGHT	CURRENT TLV
Bromethalin [N-Methyl-2,4-dinitro-N-(2,4,6-tribromophenyl)-6-(trifluoromethyl)benzenamine] CAS No. 63333-35-7	0.025 %	N/A

This product contains no components subject to the reporting requirements of Section 313 of the Superfund Amendment and Reauthorization Act (SARA) of 1986

SECTION II. PHYSICAL DATA

APPEARANCE: Worm-like cylinder	**COLOR:** Amber	**ODOR:** Pungent	**SPECIFIC GRAVITY:** 1.13g/ml
VAPOR DENSITY: N/A	**MELTING POINT:** N/A	**WATER REACTIVITY:** N/A	**EVAPORATION RATE:** N/A
VAPOR PRESSURE: N/A	**BOILING POINT:** N/A	**SOLUBILITY:** Not soluble in water	**BULK DENSITY:** N/A

SECTION III. FIRE AND EXPLOSION DATA

FLASH POINT (Method Used):	FLAMMABLE LIMIT:	AUTOIGNITION TEMP:
N/A	Upper Limit: N/A Lower Limit: N/A	N/A

EXTINGUISHING MEDIA:
Extinguish with water, foam or inert gas

SPECIAL FIREFIGHTING PROCEDURES:
Firefighters should be equipped with protective clothing and self-contained breathing apparatus.

UNUSUAL FIRE OR EXPLOSION HAZARDS:
None

SECTION IV. REACTIVITY HAZARD DATA

STABILITY: Stable	**CONDITIONS TO AVOID:** None
POLYMERIZATION: Will not occur	**CONDITIONS TO AVOID:** None
INCOMPATIBILITY (MATERIALS TO AVOID): Strongly alkaline materials	**HAZARDOUS DECOMPOSITION PRODUCTS:** Oxides of carbon and nitrogen, hydrobromic acid

SECTION V. TOXICITY DATA

LD50, ORAL (INGESTION): 2000 mg/kg (rats)	**LD50, DERMAL (SKIN CONTACT):** >5001 mg/kg (rats)	**LC50, INHALATION:** N/A
EYE IRRITATION: Minimally Irritating (rabbits)	**SKIN IRRITATION:** Non-Irritating (rabbits)	**DERMAL SENSITIZATION:** Mild Sensitizer

TALPIRID Mole Bait MSDS

SECTION VI. HEALTH HAZARDS

PRIMARY ROUTE OF ENTRY:	SIGNS & SYMPTOMS OF EXPOSURE:
Ingestion	Headache, confusion, personality change, tremors, convulsive seizures, respiratory distress

EMERGENCY FIRST AID PROCEDURES:
Eyes: Flush with cool water for at least 15 minutes. If irritation develops, obtain medical assistance.
Skin: Wash with soap and water. If irritation develops, obtain medical assistance.
Ingestion: Call physician or emergency phone number immediately. Do not give anything by mouth or induce vomiting unless instructed by physician.
Inhalation: None.

NOTE TO PHYSICIAN: If ingested, limit absorption by either emesis or gastric lavage. Sublethal symptoms, if present, would be the result of cerebral edema and should be treated accordingly through administrations of an osmotic diuretic and corticosteroid.

SECTION VII. CONTROL AND PROTECTIVE MEASURES

RESPIRATOR TYPE:
Not required

EYE PROTECTION:	GLOVES (Recommended):	VENTILATION:
Not required	Rubber Gloves	Not required

OTHER PROTECTIVE MEASURES:
Not required

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:
HEALTH: 2 (Moderate) **FIRE**: 0 (Will not burn) **REACTIVITY**: 0 (Stable) **SPECIFIC HAZARD**: None

HAZARDOUS MATERIAL INFORMATION (HMIS) RATINGS:
HEALTH: 2 (Moderate) **FLAMMABILITY**: 0 (Minimal) **REACTIVITY**: 0 (Minimal) **PROTECTIVE EQUIPMENT:** B

SECTION VIII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN THE EVENT MATERIAL IS RELEASED OR SPILLED:
Sweep up spilled material, place in properly labeled container for disposal or re-use.

WASTE DISPOSAL METHOD:
Wastes resulting from use may be disposed of on-site or at an approved waste disposal facility. Dispose of all wastes in accordance with all Federal, state and local regulations.

SECTION IX. SPECIAL PRECAUTIONS AND STORAGE DATA

STORAGE TEMPERATURE:	AVERAGE SHELF LIFE:
Room temperature	Bait is stable for a minimum of 1 year when stored at room temperature

SPECIAL SENSITIVITY (HEAT, LIGHT, MOISTURE):
Avoid exposure to light and extreme humidity

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Store in a cool, dry place inaccessible to children, pets and wildlife. Keep container tightly closed when not in use. Avoid contamination of lakes, streams and ponds by use, storage or disposal. Wash thoroughly with soap and water after handling.

SECTION X. SHIPPING DATA

DOT SHIPPING NAME:	DOT HAZARD CLASSIFICATION:
None required	Non-hazardous
DOT LABELS REQUIRED:	**FREIGHT CLASSIFICATION:**
None required	LTL Class 60

WARRANTY: The information provided in this Material Safety Data Sheet has been obtained from sources believed to be reliable. Bell Laboratories, Inc. provides no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein. This information is offered for your consideration and investigation. The user is responsible to ensure that they have all current data relevant to their particular use.

PETRO-CANADA

Material Safety Data Sheet

NFPA	HMIS (U.S.A.)	Rating	Protective Clothing	DOT (pictograms)
Health 1, Fire Hazard 1, Reactivity 0, Specific hazard	Health Hazard 1 Fire Hazard 1 Reactivity 0 Personal Protection B	0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme		

Section I. Chemical Product and Company Identification

Product Name	**PURESPRAY GREEN**	**Code**	PSGREEN, 440-198-0
Synonym	Not available.	**DSL**	See Section 15
		TSCA	See Section 15
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	PureSpray Green is a Spray Oil that is registered as "Organic" with USEPS and OMRI and used in Organic farming operations. EPA registration number: 69526-9		

Section II. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
Mixture of severely hydrotreated and hydrocracked base oil (petroleum).	8042-47-5	-	5 mg/m³ (oil mist)	10 mg/m³ (oil mist)	Not established
Other proprietary, non-hazardous additives.	Mixture	-	Not applicable	Not applicable	Not applicable

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section III. Hazards Identification.

Potential Health Effects	Prolonged or repeated contact may cause skin irritation, defatting, drying and dermatitis. Not expected to cause more than slight skin or eye irritation. With its relatively low vapour pressure, this product is not expected be inhaled in any appreciable quantity at ambient conditions. If heated to high temperatures or subjected to mechanical actions which produce vapours or mists, inhalation may cause respiratory tract irritation. Ingestion may produce a laxative effect. For more information refer to Section 11 of this MSDS.

Section IV. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section V. Fire-fighting Measures

Flammability	May be combustible at high temperature.	**Flammable Limits**	Not available.
Flash Points	OPEN CUP: 174°C (345.2°F) (Cleveland)	**Auto-Ignition Temperature**	Not available.
Fire Hazards in Presence of Various Substances	Low fire hazard. This material must be heated before ignition will occur.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO2), smoke and irritating vapours as products of incomplete combustion.		

Continued on Next Page

Fire Fighting Media and Instructions	NAERG96, GUIDE 171, Substances (low to moderate hazard). If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (0.5 mile) in all directions; also, consider initial evacuation for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: use DRY chemicals, foam, water spray or CO2. LARGE FIRE: use water spray, fog or foam. For small outdoor fires, portable fire extinguishers may be used, and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.

Section VI. Accidental Release Measures

Material Release or Spill	Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Extinguish all ignition sources. Stop leak if safe to do so. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Avoid contact with spilled material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Notify appropriate authorities immediately.

Section VII. Handling and Storage

Handling	Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid eye contact. Avoid skin contact. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated.
Storage	Store away from incompatible and reactive materials (See section 5 and 10). Keep container tightly closed. Store in dry, cool, well-ventilated area.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	- ***The selection of personal protective equipment varies, depending upon conditions of use.***
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section IX. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid.	**Viscosity**	13.6 cSt @ 40°C (104°F), 3.18 cSt @ 100°C (212°F)
Colour	Colourless to light yellow.	**Pour Point**	Not applicable.
Odour	No odour or slight petroleum oil like.	**Softening Point**	Not applicable.
Odour Threshold	Not available.	**Dropping Point**	Not applicable.
Boiling Point	Not available.	**Penetration**	Not available
Density	0.8550 kg/L @ 15°C (59°F)	**Oil / Water Dist. Coeff.**	Not available.
Vapour Density	Not available.	**Ionicity (in water)**	Not available
Vapour Pressure	Negligible at ambient temperature and pressure.	**Dispersion Properties**	Easily dispersed in water.
Volatility	Non-volatile.	**Solubility**	Insoluble in water.

Continued on Next Page

Section X. Stability and Reactivity

Corrosivity	Not available.		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents.	**Decomposition Products**	May release COx, organic compounds, smoke and irritating vapours when heated to decomposition.

Section XI. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.
Acute Lethality	Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below: (Base oil CAS# 8042-47-5): Acute Oral toxicity (LD50): >5000 mg/kg (rat) Acute Dermal toxicity (LD50): >2000 mg/kg (rabbit) Acute Inhalation toxicity (LC50): >2500 mg/m³/4h (rat)
Chronic or Other Toxic Effects	
Dermal Route:	Prolonged or repeated contact may defat and dry skin, and cause dermatitis. Short-term exposure is expected to cause only slight irritation, if any.
Inhalation Route:	With its relatively low vapour pressure, this product is not expected be inhaled in any appreciable quantity at ambient conditions. If heated to high temperatures or subjected to mechanical actions which produce vapours or mists, inhalation may cause respiratory tract irritation.
Oral Route:	Ingestion of this product may lead to aspiration of the liquid, especially if vomiting occurs. This may result in chemical pneumonitis (inflammation of the lungs) and/or pulmonary edema (an accumulation of fluid in the lungs). May produce a laxative effect.
Eye Irritation/Inflammation:	Short-term exposure is expected to cause only slight irritation, if any.
Immunotoxicity:	Not available.
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	This product is not known to contain any chemicals at reportable quantities that are listed as Group A1 or A2 carcinogens by ACGIH.
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as Group 1, 2A, or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	No additional remark.

Section XII. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available.	**Products of Biodegradation**	Not available.
Additional Remarks	No additional remark.		

Section XIII. Disposal Considerations

Waste Disposal Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section XIV. Transport Information

DOT Classification	Not a DOT controlled material (United States).	**Special Provisions for Transport**	Not applicable.

Section XV. Regulatory Information

Other Regulations This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substance List)

All components of this formulation are listed on the US EPA-TSCA Inventory.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Please contact Product Safety for more information.

DSD/DPD (EEC)	Not evaluated.	**WHMIS (Canada)**	Not controlled
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.	**TDG (Canada) (Pictograms)**	

Section XVI. Other Information

References Available upon request.
* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazard Communication Standard
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS

The Canadian Controlled Products Regulations (CPR) (Under the Hazardous Products Act, part of the WHMIS legislation) only apply to WHMIS Controlled (i.e., hazardous) products. Therefore, the CPR and the 3-year update rule specified therein do not apply to WHMIS Non-Controlled products. Although this is true, customarily Petro-Canada reviews and updates Non-Controlled product MSDS if a customer requests such an update. These Non-Controlled product updates are given a lower priority than Controlled products but are handled as soon as practicable. If you would like to verify if the MSDS you have is the most current, or you require any further information, please contact:

Prepared by Product Safety - TLM on 8/26/2004.

Data entry by Product Safety - RS.

Internet: www.petro-canada.ca/msds

Lubricants:
Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564
Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285
Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285

For Product Safety Information: (905) 804-4752

March 29, 2010

Material Safety Data Sheet

Product Name: SPEED ZONE Broadleaf Herbicide for Turf

MSDS No.: 654-6 **Version No.:** 002 **EPA Registration No.:** 2217-833

1. Basic Information:

Manufacturer: PBI/Gordon Corporation
Address: 1217 West 12th Street
City, State Zip: Kansas City, MO 64101-1407
Information Contact: Environmental, Health, & Safety Dept.
Information Telephone Number: (816)421-4070
Emergency Contact: Chemtrec
Emergency Telephone Number: (800)424-9300

Last Update: 3/29/2010

2	Health
1	Flammability
0	Reactivity
B	Pers. Protection

Chemical State: [X] Liquid [ ] Gas [ ] Solid
Chemical Type: [ ] Pure [X] Mixture

2. Ingredients:

[ ] Trade Secret *(ND = Not Disclosed)*

CAS No.	Chemical Name	% Range	EHS	NTP	IARC	SUB Z	SARA 313	OSHA PEL	ACGIH TLV	Other Limits
1928434	2,4-Dichlorophenoxyacetic acid, isooctyl (2-ethylhexyl) ester (2,4-D 2-EHE)	28.57%	N	N	Y	N	Y	NI	NI	NI
1918009	3,6-Dichloro-o-anisic acid (Dicamba)	1.71%	N	N	N	N	Y	NI	NI	NI
128639021	Carfentrazone-ethyl	0.62%	N	N	N	N	N	NI	NI	NI
16484778	R(+)2(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	5.88%	N	N	Y	N	N	NI	NI	NI

3. Hazardous Identification:

Hazard Catagory:
[X] Acute [X] Chronic [ ] Fire [ ] Pressure [ ] Reactive

Hazardous Identification Information:
The International Agency for Research on Cancer (IARC) lists chlorophenoxy herbicides in its Group 2B (limited evidence for carcinogenicity in humans.) The US EPA has given the chlorophenoxy herbicides 2,4-D, 2,4-DP, MCPP, and MCPA a Class D classification (not classifiable as to human carcinogenicity.) More current 2,4-D lifetime feeding studies in rats and mice did not show carcinogenic effects and a recent World Health Organization (WHO) review of 2,4-D toxicology has concluded that 2,4-D is not a carcinogen.

4. First Aid Measures:

Route(s) of Entry:
Skin contact, Inhalation, Ingestion.

Health Hazards (Acute and Chronic):
EYES: Moderately irritating to eyes.

SKIN: Moderately irritating to the skin.

INHALATION: Moderately irritating to the mucous membranes. Inhalation of sprays may cause burning sensations in the respiratory tract, resulting in coughing.

INGESTION: May cause vomiting, with pain in the chest and abdomen, and diarrhea.

Signs and Symptoms:
Inhalation may cause burning in the chest, with coughing. Prolonged inhalation sometimes causes dizziness. Ingestion usually leads to vomiting. Pain in the chest and abdomen, and diarrhea may follow. Headache, mental confusion, and bizarre behavior are early

First Aid Measures (Continued)

manifestations of severe poisoning, which may progress to unconsciousness.

Medical Conditions Generally Aggravated by Exposure:
Individuals with chronic skin disease or known sensitivity to chlorophenoxy compounds should either avoid using them or take strict precautions to avoid contact. (respirator, gloves, etc.)

Emergency First Aid Procedure:
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 any liquid to the person.
· Do not give anything by mouth to an unconscious person.

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:
· 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 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.

Other Health Warnings:
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-877-800-5556 for emergency medical information

Material Safety Data Sheet

March 29, 2010

Product Name: SPEED ZONE Broadleaf Herbicide for Turf

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First Aid Measures (Continued)

NOTE TO PHYSICIAN: Contains petroleum distillate - vomiting may cause aspiration pneumonia.

5. Fire Fighting Measures:

Flash Point: >200°F **F.P. Method:** Pensky Martens C

Lower Explosive Limit: NI

Upper Explosive Limit: NI

Fire Extinguishing Media:
Foam, CO2, dry chemical.

Special Fire Fighting Procedures:
Wear positive-pressure breathing apparatus and full protective clothing. Fight fire from maximum distance. Stay up-wind and out of low areas.

Unusual Fire and Explosion:
Fire fighting precautions would be the same as those used for any petroleum based oil product. Runoff from fire control area or dilution water may cause pollution. If surface water is contaminated, contact local authorities.

6. Accidental Release Measures:

Steps to be Taken in Case Material is Released or Spilled:
Do not touch spilled material. See Section 8 for Personal Protective Equipment. Contain and absorb spilled material on Dri-Rite, sand or other inert absorbent. Collect into drums; cover and label for disposal. Flush area with water if possible.

7. Handling and Storage:

Precautions to be Taken:
Do not contaminate water, food, or feed by storage or disposal.

STORAGE: Store in original container in a locked storage area inaccessible to children or pets. Keep from freezing.

Other Precautions:
Engineering Control Statements
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 170.240 (d)(4-6), the handler PPE requirements may be reduced or modified as specified in the WPS.

8. Exposure Controls/Personal Protection:

Ventilation Requirements:
Good local ventilation is recommended; mechanical ventilation may be used if exposure limits may be exceeded.

Personal Protective Equipment:
Clothing Requirement Statement:
When mixing, loading, or applying this product, wear long-sleeved shirt, long pants, socks, shoes, chemical-resistant gloves and eye protection. It is recommended that safety glasses include front, brow, and temple protection.

Personal Hygiene Statement:
After using this product, rinse gloves before removing, remove clothing and launder separately before reuse, and promptly and thoroughly wash hands and exposed skin with soap and water. Remove saturated clothing as soon as possible and shower.
PROTECTIVE CLOTHING: Wear long sleeves and pants; chemical-resistant gloves and shoes with socks.

EYE PROTECTION: Safety glasses with side shields or safety goggles.

RESPIRATORY PROTECTION: If exposure limits may be exceeded,

Exposure Controls/Personal Protection (Continued)

wear a respirator with an organic-vapor removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a NIOSH approved respirator with any R, P or HE filter.

9. Physical and Chemical Properties:

Boiling Point: >200 °F **Melting Point:** NI

Evaporation Rate (Butyl Acetate = 1) : <1

Vapor Pressure (mm Hg.): NI

Vapor Density (Air = 1): NI

Specific Gravity (H20 = 1): 0.96650

Solubility in Water: Emulsifiable

Appearance and Odor: Amber liquid, ester odor

Other Information:
pH = 2.92 for a 1% aqueous solution
Density = 8.05 pounds/gallon
Freezing point <35°F
Viscosity: 8.11 cps @ 23.8°C

10. Stability and Reactivity:

Stability:
Stable.

Incompatibility (Materials to Avoid):
None known

Decomposition/By-Products:
May produce gases such as HCl, organo chlorides, nitrogen oxides, and carbon monoxide when burning.

Hazardous Polymerization:
Will not occur.

11. Toxicological Information:

EYES: Moderately irritatiing to the eye.

SKIN: Moderately irritating to the skin. Acute demal LD50 is greater than 2,000 mg/kg for males, and between 1,000 and 2,000 for females. This product is considered to be a contact sensitizer.

INHALATION: Acute inhalation LC50 is greater than 2.06 mg/L in male and female rats.

INGESTION: Acute oral LD50 is greater than 2,000 mg/kg for male and female rats.

12. Ecological Information:

Environmental Hazards
This pesticide is toxic to fish and aquatic invertebrates and may adversely affect non-target plants. 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 aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment wash waters or rinsate.

This chemical has 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,

Material Safety Data Sheet

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Product Name: SPEED ZONE Broadleaf Herbicide for Turf

MSDS No.: 654-6 **Version No.:** 002 **EPA Registration No.:** 2217-833

Ecological Information (Continued)

may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

13. Disposal Considerations:

Disposal Considerations (Continued)

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

[For Plastic Containers - Nonrefillable with capacities equal to or less than 5 gallons:]
CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning If burned, stay out of smoke.

Triple rinse [or pressure rinse] container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

[Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.]

[For Plastic Containers - Nonrefillable with capacities greater than 5 gallons:]
CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning If burned, stay out of smoke.

Triple rinse [or pressure rinse] container (or equivalent) promptly after emptying.
Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

[Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.]

[For Refillable Containers:]
CONTAINER HANDLING: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose.

Container cleaning: Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing

March 29, 2010

Material Safety Data Sheet

Product Name: SPEED ZONE Broadleaf Herbicide for Turf

MSDS No.: 654-6 **Version No.:** 002 **EPA Registration No.:** 2217-833

Disposal Considerations (Continued)

procedure two more times.

14. Transport Information:

The following guidelines apply for domestic ground transport. If shipping by air or ocean, please contact our Transportation Dept.

Freight Class: PESTICIDES, NOI - NMFC #155050-6

In our current available sizes, this product does not qualify as a Hazardous Material.

15. Regulatory Information:

OSHA STATUS: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS: This product is exempt from TSCA Regulation under FIFRA Section 3(2)(B)(ii) when used as a pesticide.

CERCLA REPORTABLE QUANTITY: 339 pounds of the formulation which contains 100 pounds of 2,4-D 2-ethylhexyl ester

SARA TITLE III:
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES: None
SECTION 311/312 HAZARD CATEGORIES: Immediate Health Hazard, Delayed Health Hazard
SECTION 313 TOXIC CHEMICALS: Dicamba CAS# 1918-00-9, 2,4-D 2-ethylhexyl ester CAS# 1928-43-4

RCRA STATUS: When discarded in its purchased form, this product is a listed RCRA hazardous waste and should be managed as a hazardous waste. (40 CFR 261.20-24)

16. Other Information:

REASON FOR ISSUE: New MSDS in the ANSI Z400.1-1998 format

Note: NI means not Indicated.

The information and statements in this Material Safety Data Sheet are believed to accurately reflect the scientific evidence used in making the hazard determination, but is not to be construed as a warranty or representation for which we assume legal responsibility. Additional information may be necessary or desirable depending on particular, exceptional or variable conditions or circumstances of use or storage or because of locally applicable laws or government regulations. Therefore, you should use this information only as a supplement to other information available to you and must make independent determinations of the suitability of the information for your particular circumstances or conditions and of the completeness of the information available from all sources to assure both the proper use of the material described herein and the safety and health of employees.

Ronstar G Herbicide MSDS

The following MSDS information is for **RONSTAR G HERBICIDE**. Keep in mind that MSDS sheets do change and we are not able to keep the most up to date posted all the time. For most uses, this will not be critical but if it is, contact the manufacturer or if you need more help, give us a call at 1-800-877-7290 and we'll try to further assist.

Here is a link for this product's LABEL.

RONSTAR 2G SECTION

1. CHEMICAL PRODUCT AND COMPANY INFORMATION
Product Name RONSTAR 2G
MSDS Number: 000000000311 MSDS Version 1.1
Chemical Name Synonym MSDS Number Chemical Family Chemical Formulation EPA Registration No. Canadian Registrat. No.
311 C1 5H 1 8Cl2N2O3 (Oxadiazon)
23600
Bayer CropScience Inc #100 – 3131 – 114th Avenue SE
Calgary, AB T2Z 3X2 Canada
Emergency Number (24 Hours/Day): 1-800-334-7577 Product Information: 1-888-283-6847 Product Use Description HERBICIDE
SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS Component Name CAS No. Concentration % by Weight
OXADIAZON 19666-30-9
SECTION 3. HAZARDS IDENTIFICATION
NOTE: Please refer to Section 11 for detailed toxicological information.
Minimum
>= 1.0000
Maximum
<= 5.0000
Emergency Overview
Physical State
Odor
Routes of Exposure
Immediate Effects Eye
Skin Ingestion
Causes moderate eye irritation. Causes moderate skin irritation. solid SLIGHT Dermal – skin. Inhalation. Oral.
Causes moderate eye irritation. Causes moderate skin irritation. Harmful if swallowed. This product contains petroleum distillates as a part of the

Inhalation
Chronic or Delayed Long-Term
Medical Conditions Aggravated by Exposure

granule. It does not constitute a petroleum disti llate inhalation hazard if the product is swallowed and then vomited.
Harmful if inhaled. May irritate mouth, nose, and throat. May irritate the lungs.
Oxadiazon has been shown to cause liver tumors at doses that are hepatotoxic.
CARCINOGENIC: This product or one of its ingredients present 0.1% or more is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or O SHA.
None known.
SECTION 4. FIRST AID MEASURES
Eye
Skin
Ingestion Inhalation
For eye contact, immediately flush eyes for at least 15 minutes with running water. Hold eyelids apart to ensure rinsing of the enti re eye surface and lids with water. Get immediate medical attention.
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove cont aminated clothing and launder before reuse.
Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.
Note to Physician SECTION 5. FIRE FIGHTING MEASURES
Flash Point
Auto Ignition Temperature
Upper Flammable Limit
Suitable Extinguishing Media
Fire Fighting Instructions
Flash Point: No flash point. Flammable: No
NA
NA Use media proper to primary cause of fire.
Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.
No specific antidote. Treatment based on sound judgment of physician and individual reactions of patient.

Dust Explosion Class SENSITIVITY TO MECHANICAL IMPACT (Y/N):..NO
SENSITIVITY TO STATIC DISCHARGE:
Sensitivity to static discharge is not expected.
SECTION 6. ACCIDENTAL RELEASE MEASURES Land Spill or Leaks Sweep or gather up material and place in proper container for disposal or recovery. Avoid runoff to natural waters.
SECTION 7. HANDLING AND STORAGE
Handling Procedures Store in a cool, dry location away from incompatible materials. Keep away from food and feed products. Avoid contact with skin and eyes. Do
not reuse this container.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Engineering Controls Eye/Face Protection Body Protection
Respiratory Protection Exposure Limits
Use in a well ventilated area.
Monogoggles.
All cleanable impervious glove types are acceptable. Wear shirt with long sleeves.
Use an approved pesticide respirator if ventilation is not adequate or exposure to sprays, mists vapours, or dusts is likely.
ACGIH TLV Oxadiazon TWA: N/E
STEL: N/E
SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES Physical State solid

Odor Odor Threshold
pH Vapor Pressure
Vapor Density (air = 1) Specific Gravity Density
Boiling Point Melting/Freezing Point
Solubility (in water) Other Information
SLIGHT (PPM): NA
at NA
7.8×10-7 mmHg at 25 °C
NA
NA
37 lbs/ft3 at 25 °C
NA
FREEZING POINT: NA MELTING POINT: NA
55% at 20 °C
COLOUR: GRAY_WHITE
EVAP. RATE (BUTYL ACETATE=1): NA
SECTION 10. STABILITY AND REACTIVITY
Chemical Stability Conditions to Avoid
Incompatibility
Hazardous Products of Decomposition
STABLE None known.
Avoid contact with acidic, basic or oxidizing agents.
Hydrogen chloride. Aldehydes. Carbon dioxide. Carbon monoxide. Oxides of nitrogen.

Hazardous WILL NOT OCCUR Polymerization
(Conditions to avoid) SECTION 11. TOXICOLOGICAL INFORMATION
Acute Oral Toxicity LD50(mg/kg): >8,000 (RAT) Acute Dermal Toxicity
LD50(mg/kg): >2,000 (RBT) Acute Inhalation Toxicity LC50(mg/l): >200 mg/l /4H /RAT
Eye and skin irritant.
Assessment Carcinogenicity ACGIH
None
NTP

None
IARC
SECTION 12. ECOLOGICAL INFORMATION
Ecological Information Aquatic toxicity: 96 hour LC50 for Rainbow Trout >9.0 ppm (Oxadiazon technical)
None OSHA None
48-hour LC50 for Daphnia magna:2.1 8ppm (Oxadiazon technical). Environmental Fate No data at this time
SECTION 13. DISPOSAL CONSIDERATIONS
General Disposal Disposal should be made in accordance with federal, provincial and local Guidance regulations.
RCRA Classification

SECTION 14. TRANSPORT INFORMATION
CANADIAN TDG DESCRIPTION (ROAD & RAIL) Not dangerous for transport by road/rail in Canada. UN/NA NUMBER: NONE PLACARDS: NONE
IATA: NONE IMO IMDG-code: NONE
SECTION 15. REGULATORY INFORMATION
This product is registered under the Pest Control Act. PCP # 23600.
WHMIS HAZARD CLASS: D2B TOXIC MATERIALS WHMIS TRADE SECRET: Exempt
CANADIAN INVENTORY: This product is currently exempt from CEPA. HAZARD RATING SYSTEMS H MIS: FLAMMABILITY 1 , REACTIVITY 1 , HEALTH 2 NFPA: FLAMMABILITY 1 , REACTIVITY 1 , HEALTH 2
US Federal EPA Registration No. TSCA list
None
TSCA 12b export notification
None
SARA Title III – section 302 – notification and information
None
SARA Title III – section 313 – toxic chemical release reporting
None
US States Regulatory CA Prop65
MSDS Version 1.1
This product does not contain any substances known to the State of California to cause cancer.
This product does not contain any substances known to the State of California to cause reproductive harm.
US State right-to-know ingredients
None
Canadian Regulations Canadian Registrat. No.
23600

Canadian Domestic Substance List
None
Environmental CERCLA
None

Clean Water Section 307 Priority Pollutants
None
Safe Drinking Water Act Maximum Contaminant Levels
None
International Regulations EU Classification
None
European Inventory of Existing Commercial Substances (EINECS)
OXADIAZON 19666-30-9
SECTION 16. OTHER INFORMATION
Prepared by: The HSE Department of Bayer CropScience Inc. Phone: (306) 721-0310
Print Date: 17.03.2003 Supersedes MSDS, which is older than: 13.12.2007
MSDS Version 1.1
This information is provided in good faith but without express or implied warranty. Buyer assumes all responsibility for safety and use not in accordance with label instructions. The product names are regist ered trademarks of Bayer AG. Bayer CropScience Inc

Bayer CropScience

MATERIAL SAFETY DATA SHEET

BAYER CROP SCIENCE

P.O. Box 4913 Hawthorn Road
Kansas City, MO 64120-0013

TRANSPORTATION EMERGENCY
CALL CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

NON-TRANSPORTATION
BAYER EMERGENCY PHONE...: (800) 414-0244
BAYER INFORMATION PHONE.: (800) 842-8020

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: BAYER ADVANCED GARDEN Tree & Shrub Insect Control Conc.
PRODUCT CODE.....: 41723
CHEMICAL FAMILY.....: Chloronicotinyl
CHEMICAL NAME.....: 1-((6-chloro-3-pyridinyl)methyl)-N-nitro
-2-imidazolidinimine
SYNONYMS.....: Imidacloprid
FORMULA.....: C9 H10 Cl N5 O2
PRODUCT USE.....: Consumer Insecticide

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
***** HAZARDOUS INGREDIENTS *****		
Imidacloprid 138261-41-3	OSHA : Not Established ACGIH: Not Established	1.47 %
Ingredient 1979 Specific chemical identity is withheld as a trade secret.	OSHA : Not Established ACGIH: Not Established	1-3 %
Ingredient 1614 Specific chemical identity is withheld as a trade secret.	OSHA : Not Established ACGIH: Not Established	1-3 %

Ingredient 1619 may be used as an alternate to Ingredient 1614.

3. HAZARDS IDENTIFICATION:

****
* EMERGENCY OVERVIEW *
*
* CAUTION! Color: Tan; Form: Liquid; Opaque aqueous *
* suspension; Odor: Similar to white glue; Causes eye *
* irritation. *
****

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: Inhalation; Skin Contact; Eye Contact; Ingestion

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE EFFECTS OF EXPOSURE.....: Exposure during the labeled use of this product is expected to be minimal. Consumers should refer to the packaging label for proper handling procedures. No specific symptoms of acute overexposure are known to occur in humans. Based on EPA Toxicity Category criteria, this product is mildly toxic by the oral and dermal routes of exposure. In addition, animal studies have shown that it is minimally irritating to the conjunctiva of the eye but the irritation is reversible within 72 hours.

CHRONIC EFFECTS OF EXPOSURE...: Based on animal studies, no adverse effects are expected from chronic exposure to this product.

CARCINOGENICITY.....: This product is not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: No specific medical conditions are known which may be aggravated by exposure to this product.

4. FIRST AID MEASURES:

FIRST AID FOR 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.

FIRST AID FOR SKIN.....: 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.

4. FIRST AID MEASURES (Continued)

FIRST AID FOR INHALATION: 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 information.

FIRST AID FOR INGESTION.: 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 physician or poison control center. Do not give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN.....: Treat symptomatically.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Greater than 200 F (93 C)

EXTINGUISHING MEDIA.....: Water; Carbon Dioxide; Dry Chemical; Foam

SPECIAL FIRE FIGHTING PROCEDURES: Keep out of smoke, cool exposed containers with water spray. Fight fire from upwind position. Use self-contained breathing equipment. Contain run-off by diking to prevent entry into sewers or waterways. Equipment or materials involved in pesticide fires may become contaminated.

6. ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES.....: Isolate area and keep unauthorized people away. Do not walk through spilled material. Avoid breathing vapors and skin contact. Remove sources of ignition if combustible or flammable vapors may be present and ventilate area. Wear proper protective equipment. Dike contaminated area with absorbent granules, soil, sand, etc. If large spill, material should be recovered. Small spills can be absorbed with absorbent granules, spill control pads, or any absorbent material. Carefully sweep up absorbed spilled material. Place in covered container for reuse or disposal. Scrub contaminated area with soap and water. Use dry absorbent material such as clay granules to absorb and collect wash solution for proper disposal. Contaminated soil may have to be removed and disposed. Do not allow material to enter streams, sewers, or other waterways or contact vegetation.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE(MIN/MAX): 32 F/30 day avg. not to exceed 100 F (38 C)

SHELF LIFE.....: Time/temperature dependent. Contact Bayer for additional information.

SPECIAL SENSITIVITY.....: Not established

7. HANDLING AND STORAGE (Continued)

HANDLING/STORAGE PRECAUTIONS: Do not allow product to contaminate material which is intended for use or consumption by humans or animals.

8. PERSONAL PROTECTION:

REQUIRED WORK/HYGIENE PROCEDURES...: Exposure during the labeled use of this product is expected to be minimal. Consumers should refer to the packaging label for proper handling procedures. However, if exposure to this product is possible while handling large quantities such as in subsequent manufacturing, transportation spills or other emergencies, the following personal protection is recommended.

EYE PROTECTION REQUIREMENTS.....: Splash-proof goggles

SKIN PROTECTION REQUIREMENTS.....: Long sleeves and trousers

HAND PROTECTION REQUIREMENTS.....: Chemical-resistant gloves such as latex or nitrile

VENTILATION REQUIREMENTS.....: Control exposure levels through the use of general and local exhaust ventilation where needed.

RESPIRATOR REQUIREMENTS.....: If needed, based on the conditions of use, wear a NIOSH-approved particulate respirator.

ADDITIONAL PROTECTIVE MEASURES.....: Clean water should be available for washing in case of eye or skin contamination. Educate and train employees in safe use of the product. Follow all label instructions. Launder clothing after use. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Liquid

APPEARANCE.....: Opaque aqueous suspension

COLOR.....: Tan

ODOR.....: Similar to white glue

MOLECULAR WEIGHT.....: 255.7 (for imidacloprid)

pH .....: 7.3-8.3

BOILING POINT.....: Not established

MELTING/FREEZING POINT....: Freezing: 32 F (0 C)

VISCOSITY.....: approx. 300 cps @ 20 C

SOLUBILITY IN WATER .....: 0.51 g/L @ 20 C (for imidacloprid)

SPECIFIC GRAVITY .....: 1.06 @ 20 C/20 C

BULK DENSITY.....: Not applicable

VAPOR PRESSURE .....: 1.5 x 10-9 mm @ 20 C (for imidacloprid)

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10. STABILITY AND REACTIVITY:

STABILITY.....: This is a stable material.
HAZARDOUS POLYMERIZATION...: Will not occur.
INCOMPATIBILITIES.....: None known
INSTABILITY CONDITIONS.....: Strong exothermal reaction above 200 C (imidacloprid)
DECOMPOSITION PRODUCTS.....: Proposed under extreme conditions such as fire: HCl, HCN, CO, NO(x) (for imidacloprid)

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11. TOXICOLOGICAL INFORMATION:

Acute toxicology studies have not been performed on this product as formulated. The acute toxicology information provided are from a similar formulation containing a higher percentage of the active ingredient, imidacloprid. The non-acute information pertains to imidacloprid technical.

ACUTE TOXICITY
ORAL LD50.....: Male Rat: >4870 mg/kg; Female rat: 4143 mg/kg
DERMAL LD50.....: Male and Female Rabbit: >2000 mg/kg
INHALATION LC50....: 4 Hr Exposure to Liquid Aerosol: Male and Female Rat: >5.33 mg/L (analytical); 1 Hr Exposure to Liquid Aerosol (extrapolated from 4 Hr LC50): Male and Female Rat: >20 mg/L (analytical)
EYE EFFECTS.....: Rabbit: Only minimal irritation to the conjunctiva was observed with all irritation resolving within 72 hours.
SKIN EFFECTS.....: Rabbit: Not a dermal irritant.
SENSITIZATION.....: Guinea Pig: Not a dermal sensitizer.
SUBCHRONIC TOXICITY...: In a 3 week dermal toxicity study, rabbits were treated with the active ingredient, imidacloprid, at the limit dose level of 1000 mg/kg for 6 hours/day, 5 days/week. There were no local or systemic effects observed at any of the levels tested. The no-observed-effect-level (NOEL) was 1000 mg/kg. In a 4 week inhalation study, rats were exposed to dust concentrations of imidacloprid at 5.5, 30.5 and 191.2 mg/cubic meter for 6 hours/day, 5 days/week. Effects observed at the high concentration included decreased body weight gains, decreased heart and thymus weights, increased liver weights, and induction of the hepatic mixed-function oxidases. Histopathological examinations did not reveal any organ damage or local injury to the respiratory tract. The NOEL was 5.5 mg/cubic meter based on induction of the hepatic mixed-functioned oxidases.
CHRONIC TOXICITY.....: Dogs were administered imidacloprid for 1 year at dietary concentrations of 200, 500 or 1250 ppm. Due to the lack of significant effects, the high dose was increased to 2500 ppm at 17 weeks for the remainder of the study. Effects observed at the high dose included decreased food consumption, increased liver weights and elevated serum chemistries. The NOEL was 500 ppm. In chronic studies using rats, imidacloprid was administered for 2 years at dietary concentrations of 100,

300, 900 or 1800 ppm. Histopathology examinations revealed an increased incidence of mineralization in the colloid of the thyroid follicles at concentrations of 300 ppm and greater. At 1800 ppm, there were changes in the serum chemistries and a slight increase in the incidence of parafollicular hyperplasia seen in the thyroids. Body weight gains were reduced at 900 and 1800 ppm. The overall NOEL was 100 ppm.

CARCINOGENICITY.....: Imidacloprid was investigated for carcinogenicity in chronic feeding studies using mice and rats at maximum levels of 2000 and 1800 ppm, respectively. There was no evidence of a carcinogenic potential observed in either species.

MUTAGENICITY.....: The imidacloprid mutagenicity studies, taken collectively, demonstrate that the active ingredient is not genotoxic or mutagenic.

DEVELOPMENTAL TOXICITY: In a developmental toxicity study using rats, imidacloprid was administered by oral gavage during gestation at doses of 10, 30 or 100 mg/kg. At the maternally toxic dose of 100 mg/kg, skeletal examinations of the fetuses revealed a slight increase in the incidence of wavy ribs. The NOELs for maternal and developmental toxicity were 10 and 30 mg/kg, respectively. Teratogenic effects were not observed at any of the doses tested. Rabbits were administered imidacloprid during gestation at oral doses of 8, 24 or 72 mg/kg. At the maternally toxic dose of 72 mg/kg, reduced body weights and delayed skeletal ossification were observed in the fetuses. The NOELs for maternal and developmental toxicity were 8 and 24 mg/kg, respectively. Teratogenic effects were not observed at any of the doses tested.

REPRODUCTION.....: In a reproduction study, imidacloprid was administered to rats for 2 generations at dietary concentrations of 100, 250 or 700 ppm. Offspring at 700 ppm, exhibited reduced mean body weights and body weights gains. No other reproductive effects were observed. The maternal and reproductive NOELs were 100 and 250 ppm, respectively.

NEUROTOXICITY .....: In an acute neurotoxicity screening study using rats, imidacloprid was administered as a single oral dose at levels of 42, 151, or 307 mg/kg. Clinical observations and neurotoxicity evaluations were performed over a period of 15 days followed by a neurohistopathological examination. Deaths attributed to imidacloprid were observed at the high dose within a day of treatment. The NOEL for motor and locomotor activity was 42 mg/kg for males. Females at the low dose exhibited minimal decrease in activity in the figure-eight maze. In a subsequent study, the NOEL for motor and locomotor activity in females was 20 mg/kg. All clinical signs and neurobehavioral effects were ascribed to acute cholinergic toxicity, with complete recovery at sub-lethal doses within 7 days following treatment. The NOEL for neurotoxicity was 307 mg/kg based on the absence of treatment-related microscopic lesions in skeletal muscle or neural tissue. In a 13 week neurotoxicity screening study, imidacloprid was administered to rats at dietary concentrations of 140, 963 or 3027 ppm. At the mid- and high-dose, effects observed included reductions in body weight and feed consumption, and clinical chemistry findings. Neurobehavioral changes were observed only in males at the high dose. There were no correlative micropathologic findings in muscle or neural tissues in any animals at any treatment level. The NOEL for neurotoxicity was 3027 ppm. The overall NOEL was 140 ppm.

Continued on next page

12. ECOLOGICAL INFORMATION:

This product is toxic to aquatic invertebrates. Bayer will provide a summary of specific ecological effects data upon written request. As with any pesticide, this product should be used according to label directions and should be kept out of streams, lakes and other aquatic habitats of concern.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Follow container label instructions for disposal of wastes generated during use in compliance with the product label. In other situations, bury in an EPA-approved landfill or burn in an incinerator approved for pesticide destruction. Do not reuse container.

14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Imidacloprid
FREIGHT CLASS PACKAGE.....: Insecticides, NOI-NMFC 102120
PRODUCT LABEL.....: Not Noted

DOT (DOMESTIC SURFACE)

HAZARD CLASS OR DIVISION .....: Non-Regulated

IMO / IMDG CODE (OCEAN)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

ICAO / IATA (AIR)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
TSCA STATUS.....: This product is exempt from TSCA Regulation under FIFRA Section 3 (2)(B)(ii) when used as a

15. REGULATORY INFORMATION (Continued)

pesticide.

CERCLA REPORTABLE QUANTITY..: No components listed

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES..: None

SECTION 311/312 HAZARD CATEGORIES.....: Immediate Health Hazard

SECTION 313 TOXIC CHEMICALS.....: None

RCRA STATUS.....: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

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16. OTHER INFORMATION:

NFPA 704M RATINGS:	Health	Flammability	Reactivity	Other
	1	1	1	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

Bayer's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. NFPA ratings are provided by Bayer as a customer service.

REASON FOR ISSUE.....: Create new MSDS
PREPARED BY.....: V. C. Standart
APPROVED BY.....: D. C. Eberhart
TITLE.....: Director Product Safety & Stewardship
APPROVAL DATE.....: 06/12/2000
SUPERSEDES DATE.....: None
MSDS NUMBER.....: 39898

CLEARY

3336 WP

CLEARY MATERIAL SAFETY DATA SHEET

Please read the entire document. This Material Safety Data Sheet contains important environmental, health and toxicology information for your employees, and anyone who will use, transport, store, dispose of or handle this product. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information contained herein must be incorporated in your MSDS.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3336 WP
EPA REGISTRATION NUMBER(S): 1001-63
CHEMICAL NAME: Dimethyl-4-4´-o-phenylenebis-3-thioallophanate
SYNONYM: Thiophanate methyl
GENERAL USE: Turf and ornamental fungicide
FRAC GROUP CODE: 1

COMPANY

Cleary Chemical Corporation
178 Ridge Road, Suite A
Dayton, New Jersey 08810

EMERGENCY TELEPHONE NUMBERS

CLEARY CHEMICAL CORP.
M-F 9-5 EST
(800) 524-1662 OR
(732) 329-8399

PROSAR:
(800) 324-7598
CHEMTREC 24 HOUR:
(800) 424-9300

SECTION 2: INFORMATION ON INGREDIENTS

Active Ingredient(s)/ Hazardous Inert Ingredient(s)	% by Wt.	CAS#	ACGIH TLV	OSHA PEL
Dimethyl-4-4´-o-phenylenebis-3-thioallophanate	50%	23564-05-8	NDA	NDA

SECTION 3: HEALTH HAZARD INFORMATION

Caution - Harmful if swallowed, absorbed through skin or inhaled. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing dust or spray mist. Wash thoroughly with soap and water after handling.

SECTION 4: FIRST AID MEASURES

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 further 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 further treatment advice.

continued on page 2

SECTION 4: FIRST AID MEASURES (continued from page 1)

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.

Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. For 24-Hour Emergency Assistance Call Chemtrec 1-800-424-9300.

SECTION 5: FIRE AND EXPLOSION INFORMATION

Flash Point (Method): NA
Flammable Limits (vol % in air): NA
Autoignition Temperature: NA
Extinguishing Media: Carbon dioxide, foam, water, earth, dry chemical.
Special Fire Fighting Procedures: Self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: None

SECTION 6: ACCIDENTAL RELEASE MEASURES

Steps to be Taken in Case Material is Released or Spilled: Sweep up and dispose of in compliance with all federal, state and local laws.

SECTION 7: HANDLING AND STORAGE

Precautions to be Taken in Handling and Storing: Store in original sealed containers in a cool dry area not accessible to children or unauthorized persons.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Clothing: Long sleeve shirt, long pants or coveralls, shoes plus socks.
Eye Protection: Where there is potential for eye contact, chemical goggles or safety glasses with side shields are recommended.
Ventilation: Use product outdoors or in a well ventilated area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	fine, light tan powder
Boiling Point:	NA
Vapor Pressure (@25° C):	NA
pH:	6.5-8.0
Melting Point:	181.5° - 182.5° F
Freezing Point:	NA
Bulk Density (25° C):	16 - 19 lb./cu.ft.
Vapor Density:	NA
Evaporation Rate:	NA
Solubility in Water:	Insoluble (dispersible)
% VOC:	0

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable
Incompatible Materials: Highly alkaline materials, oxidizing agents, lime sulfur, bordeux mixture, copper compounds.
Conditions to Avoid: NA
Hazardous Decomposition: Thermal decomposition generates oxides of nitrogen, sulfur, and carbon.
Hazardous Polymerization: NA

SECTION 11: TOXICOLOGICAL INFORMATION

Oral (Acute) LD50: > 7500 mg/kg (male rat); > 6400 mg/kg (female rat)
Dermal (Acute) LD50: > 10,000 mg/kg (rabbit)
Inhalation (acute): > 20.8 mg/L (LC50 rat 4 hour)
Chronic (oral): No oncogenicity, no observed effect level, 160 ppm in diet for two years (rat) and 50 mg/kg/day in single dose for two years (dog).
NOEL:
Subchronic (oral): No observable effect level, 1,600 ppm in diet for 180 days (rats and mice).
Neurotoxicity: No delayed neurotoxicity or cholinesterase inhibition.
Oncogenicity: No oncogenicity to mice consuming diets containing levels as high as 640 ppm over a two year period.
Teratogenicity: No teratology to rats or mice dosed throughout pregnancy with levels as high as 1,000 mg/kg/day.
Reproductive Toxicity: No effect on spermatogenesis, testosterone assimilation. Three generation study showed no evidence of effects on fertility, fecundity or offspring.
Mutagenicity: Ames, Mammalian Somatic, Cytogenicity, Dominant Lethal, DNA Damage/Repair, all test negative.

SECTION 12: ECOLOGICAL INFORMATION

This pesticide is toxic to fish. 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 by disposal of equipment washwaters. Do not apply, allow to drift, or drain or flush equipment onto non-target areas.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Improper disposal of excess pesticide, spray mixture or rinsate is a violation of federal law. If these wastes cannot be disposed of by intended use according to label instructions, contact the appropriate agency in your state or the nearest EPA Regional Office for guidance.

SECTION 14: TRANSPORTATION INFORMATION

DOT Shipping Description: Fungicide, Agricultural, Solid NOI
DOT Hazard Classification: Not DOT regulated
UN Identification Number: NA
OSHA Hazard Classification: NA
Reportable Quantity: NA
Hazardous Substance: NA
DOT Label Requirements: NA

SECTION 15: REGULATORY INFORMATION

EPA SARA Title III Data: Positive rating for acute hazard
Section 302 Substances: NA
RCRA Waste Number: U409
Section 311/312 Hazardous Categories: NA
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)
Immediate Health: Yes
Delayed Health: Yes
Fire: No
Reactive: No
Sudden Pressure: No
Section 313 Toxic Chemicals: This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Thiophanate Methyl
CERCLA RQ: 1 lb.
California Prop 65: Developmental Toxins
This product does contain the following chemical as indicated below, currently on the California list of Developmental Toxins.
Thiophanate methyl
NFPA Ratings: Flamability: 0 Reactivity: 0 Health: 1

SECTION 16: OTHER INFORMATION

Please note: Cleary Chemical Corp. believes that the information and recommendations contained herein are accurate as of the date hereof. The information provided herein applies only to the specific product designated and may not be valid where said product is used in combination with any other material or in any process. It is the users responsibility to determine the suitability of the information for their purposes. No warranty of fitness for any particular purpose, warranty of merchantability, or any other warranty, expressed or implied, is made concerning the information provided.

Reason for issue:	update
Prepared by:	Rick Fletcher
Effective date:	6.02.05
Replaces:	3/00


Dow AgroSciences
Gallery*
75 Dry Flowable

MATERIAL SAFETY DATA SHEET

Dow AgroSciences

Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

GALLERY* 75 DRY FLOWABLE HERBICIDE

Effective Date: 8/5/03
Product Code: 20116
MSDS: 003994

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Gallery* 75 Dry Flowable Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Isoxaben: N-(3-(1-ethyl-1-methylpropyl)-5-isoxazolyl)-2,6-dimethoxybenzamide and isomers (Isoxaben)	CAS# 082558-50-7	75%
Other ingredients, total, including:		25%
Kaolin	CAS# 001332-58-7	
Crystalline silica (in Kaolin)	CAS# 014808-60-7	

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Light tan water dispersible granule with a mild aromatic odor. May cause eye irritation with corneal injury. LD_{50} for skin absorption is >5000 mg/kg. Oral LD_{50} is >5000 mg/kg.
EMERGENCY PHONE NUMBER: 800-992-5994

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause moderate eye irritation, which may be slow to heal. May cause slight transient (temporary) corneal injury.

SKIN: Prolonged or repeated exposure may cause slight skin irritation. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD_{50} for skin absorption in rabbits is >5000 mg/kg.

INGESTION: Very low toxicity if swallowed. The oral LD_{50} for rats is >5000 mg/kg. Harmful effects not anticipated from swallowing small amounts.

INHALATION: No adverse effects are anticipated from single exposure to dust.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Contains component(s), which, in animals, have been shown to cause liver and kidney effects. Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs. Some evidence suggests that kidney effects may result from excessive exposure also.

CANCER INFORMATION: This mixture contains a component which, is listed as a carcinogen for hazard communication purposes under OSHA Standard 29 CFR 1910.1200. Component listed by IARC and NTP is crystalline silica. An increase in non-malignant liver tumors was observed with isoxaben in one of two species tested.

TERATOLOGY (BIRTH DEFECTS): Isoxaben caused birth defects in laboratory animals only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Isoxaben has been shown to interfere with reproduction in animal studies.

4. FIRST AID:

EYES: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

SKIN: Wash skin with plenty of water.

INGESTION: No emergency medical treatment necessary.

INHALATION: Move person to fresh air; if effects occur, consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Not applicable
METHOD USED: Not applicable

FLAMMABLE LIMITS
LFL: 0.665 oz/cu ft
UFL: Not applicable

AUTO-IGNITION TEMPERATURE: 778°F to 788°F, (415°C to 420°C)

EXTINGUISHING MEDIA: Use water, CO_2 or dry chemicals.

FIRE AND EXPLOSION HAZARDS: Will emit toxic vapors as it burns.

FIRE-FIGHTING EQUIPMENT: Wear full protective clothing and use positive-pressure, self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS: Contain and sweep up material of small spills and dispose as waste. Report large spills to Dow AgroSciences at 800-992-5994. Prevent runoff.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Causes eye irritation. Harmful if inhaled. Avoid ingestion, breathing dust or spray mist, and contact with skin, eyes, or clothing. Store in original container. Do not store in direct sunlight. Do not store at temperatures above 120°F. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):
Kaolinite: ACGIH TLV is 2 mg/M^3 respirable, A4, for Kaolin. OSHA PEL is 15 mg/M^3 total dust, 5 mg/M^3 respirable for Kaolin.

Silica, crystalline: ACGIH TLV is 0.1 mg/M^3 (respirable) for tripoli and fused silica; 0.05 mg/M^3 (respirable) for cristobalite, tridymite, and quartz. Quartz has an A2 designation. OSHA PEL is (30 mg/M^3)/(%SiO2+2) total dust, (250 mppcf)/(%SiO2+5) or (10 mg/M^3)/(%SiO2+2) respirable for quartz, tripoli, and fused silica; the value for cristobalite and tridymite is 1/2 the value calculated for the respirable dust formula for quartz.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. When respiratory protection is required for certain operations, use a NIOSH approved air-purifying respirator. In dusty atmospheres, use a NIOSH approved particulate respirator.

SKIN PROTECTION: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur.

EYE PROTECTION: Use chemical goggles.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: Not applicable
VAPOR PRESSURE: Not applicable
VAPOR DENSITY: Not applicable
SOLUBILITY IN WATER: Disperses in water
SPECIFIC GRAVITY: Not applicable
APPEARANCE: Light tan water dispersible granule
ODOR: Mild aromatic odor
pH: (aqueous 50/50) 8.5 to 10.0

MATERIAL SAFETY DATA SHEET

Dow AgroSciences

Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

GALLERY* 75 DRY FLOWABLE HERBICIDE

Effective Date: 8/5/03
Product Code: 20116
MSDS: 003994

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Do not store near heat or flame. Do not store in direct sunlight. Do not store at temperatures above 120°F.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) None known.

HAZARDOUS DECOMPOSITION PRODUCTS: Will emit toxic vapors as it burns.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY: In-vitro and animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:
Based largely or completely on information for isoxaben. Bioconcentration potential is low (BCF is <100 or Log Pow <3).

DEGRADATION & PERSISTENCE:
Based largely or completely on information for isoxaben.
The photolysis half-life in water is 6 days.
The photolysis half-life in soil is 248 days.
Under aerobic soil conditions the half-life is 4.3-10.6 months.

ECOTOXICOLOGY:
Based largely or completely on information for isoxaben.
Not expected to be acutely toxic to aquatic organisms.
EC_{50} is above the water solubility.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Wastes are toxic. Improper disposal is a violation of federal law. If wastes resulting from the use of this product cannot be disposed of according to label instructions, dispose of these wastes at an approved facility. Contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORATION (DOT) INFORMATION:

This material is not regulated for transportation.

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health effect

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
Kaolin	001332-58-7	PA1
Silica - crystalline, quartz	014808-60-7	NJ3 PA1

NJ3=New Jersey Workplace Hazardous Substance (present at > or = to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at > or = to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

CATEGORY	RATING
Health	2
Flammability	0
Reactivity	0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

16. OTHER INFORMATION:

MSDS STATUS: Revised Section: 3, 4, 8, 11, 12, 14 & 15
Reference: DR-0324-6740
Replaces MSDS Dated: 8/25/00
Document Code: D03-081-003
Replaces Document Code: D03-081-002

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult Dow AgroSciences for Further Information.

GORDON'S
PROFESSIONAL
TURF & ORNAMENTAL PRODUCTS

ATRIMMEC®

PLANT GROWTH REGULATOR

For Consistent Growth Regulation of
Landscape Plants & Trees

May 1, 2001

Material Safety Data Sheet

Product Name: Gordon's Professional Turf & Ornamental Products ATRIMMEC Plant Growth Regulator

MSDS No.: 662-6 **Version No.:** 017 **EPA Registration No.:** 2217-776

1. Basic Information:

Manufacturer: PBI/Gordon Corporation
Address: 1217 West 12th Street
City, State Zip: Kansas City, MO 64101-1407
Information Contact: Environmental, Health, & Safety Dept.
Information Telephone Number: (816)421-4070
Emergency Contact: Chemtrec
Emergency Telephone Number: (800)424-9300

Last Update: 10/2/00

1	Health
1	Flammability
0	Reactivity
B	Pers. Protection

Chemical State: [X] Liquid [ ] Gas [ ] Solid
Chemical Type: [ ] Pure [X] Mixture

2. Ingredients:

[ ] Trade Secret *(ND = Not Disclosed)*

CAS No.	Chemical Name	% Range	EHS	NTP	IARC	SUB Z	SARA 313	OSHA PEL	ACGIH TLV	Other Limits
52508357	2,3:4,6-Bis-O-(1-methylethylidene)-alpha -L-xylo-2-hexulofuranosonic acid, sodium salt (Dikegulac sodium)	18.5	N	N	N	N	N	NI	NI	NI

3. Hazardous Identification:

Hazard Catagory:
[X] Acute [ ] Chronic [ ] Fire [ ] Pressure [ ] Reactive

Hazardous Identification Information:
Light blue liquid; no distinguishable odor.

Irritant.

4. First Aid Measures:

Route(s) of Entry:
Contact, inhalation.

Health Hazards (Acute and Chronic):
EYES: Contact may cause irritation and/or burning.

SKIN: Contact may cause irritation. Dermal LD50: >1,000 mg/kg.

INHALATION: May irritate respiratory system. LC50 (4H): 25.24 mg/L, male rats; 27.92 mg/L, female rats.

INGESTION: May irritate gastrointestinal system. Oral LD50: >5000 mg/kg.

Signs and Symptoms:
NI

Medical Conditions Generally Aggravated by Exposure:
NI

Emergency First Aid Procedure:
EYES: Flush eyes with clean water for 10-15 minutes, holding lids open. If irritation persists, seek medical attention.

SKIN: Bathe and shampoo with soap and water to remove chemicals from skin and hair. Launder contaminated clothes separately, prior to reuse. If irritation persists, seek medical attention.

INHALATION: Remove victim to fresh air. Apply artificial respiration if needed. If irritation persists, seek medical attention.

First Aid Measures (Continued)

INGESTION: Call a physician or Poison Control Center.

Other Health Warnings:
NI

5. Fire Fighting Measures:

Flash Point: 111°F **F.P. Method:**
Lower Explosive Limit: NI
Upper Explosive Limit: NI

Fire Extinguishing Media:
Foam, CO_2, dry chemical, water, as appropriate for fire in surrounding materials. The low flash point of this product is due to a minor component in the mixture. Based on independent laboratory testing of similar products, this product would not sustain combustion as specified in DOT Regulation 49 CFR 173 Appendix H, and, therefore, would not be classified as a combustible liquid.

Special Fire Fighting Procedures:
Wear self-contained breathing apparatus.

Unusual Fire and Explosion:
Runoff from fire control may pollute surface water. If pollution occurs, call local authorities.

6. Accidental Release Measures:

Steps to be Taken in Case Material is Released or Spilled:
See Section 8 for Personal Protective Equipment. Do not touch spilled product. Contain and collect spilled material with inert absorbent; place in drums for disposal. Cover and label the drums. Wash area with water, if possible.

7. Handling and Storage:

Precautions to be Taken:
Do not contaminate water, food, or feed by storage or disposal.

Material Safety Data Sheet

Product Name: Gordon's Professional Turf & Ornamental Products ATRIMMEC Plant Growth Regulator

MSDS No.: 662-6 **Version No.:** 017 **EPA Registration No.:** 2217-776

Handling and Storage (Continued)

STORAGE: Store in original container in a locked storage area. Keep from freezing. To prevent cross contamination, do not store near other pesticides, fertilizers, seeds, food or feed.

Other Precautions:
NI

8. Exposure Controls/Personal Protection:

Ventilation Requirements:
Mechanical ventilation is recommended if product is applied in an enclosed area. Good local ventilation is required.

Personal Protective Equipment:
CAUTION: May be harmful if inhaled. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing. In case of contact immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists. Do not use on food or fodder crops.

Personal Protective Equipment (PPE):
Applicators and other handlers must wear long-sleeved shirt and long pants, waterproof gloves, and shoes plus socks. Follow 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.

PROTECTIVE CLOTHING: Wear long sleeve shirt, long pants, shoes with socks, and chemical-resistant gloves.

EYE PROTECTION: Safety glasses with side shields or safety goggles.

RESPIRATORY PROTECTION: If exposure limits may be exceeded, wear a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C), or a NIOSH approved respirator with any N, R, P or HE filter.

9. Physical and Chemical Properties:

Boiling Point: 212°F **Melting Point:** NI

Evaporation Rate (Butyl Acetate = 1) : >1

Vapor Pressure (mm Hg.): <17@20°C

Vapor Density (Air = 1): <1

Specific Gravity (H20 = 1): 1.09510

Solubility in Water: Soluble

Appearance and Odor: Light blue liquid; no odor

Other Information:
pH: 9.5
Density: 9.12 pounds/gallon @20°C
Viscosity: 5 cp @ 25°C

10. Stability and Reactivity:

Stability:
Stable.

Incompatibility (Materials to Avoid):
None known.

Decomposition/By-Products:
None known.

Hazardous Polymerization:
Will not occur.

11. Toxicological Information:

Dermal LD50: >1000 mg/kg body weight.

Toxicological Information (Continued)

Inhalation LC50 (4H): 25.24 mg/L (male rats); 27.92 mg/L (female rats)

Oral LD50: >5000 mg/kg body weight.

12. Ecological Information:

For terrestrial uses, 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.

13. Disposal Considerations:

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or incineration, or if allowed by state and local authorities by burning. If burned stay out of smoke.

14. Transport Information:

The following guidelines apply for domestic ground transport. If shipping by air or ocean, please contact our Transportation Dept.

Freight Class: Inhibitors, Modifiers, or Regulators, Plant Growth - NMFC #101685

In our current available sizes, this product does not qualify as a Hazardous Material.

15. Regulatory Information:

OSHA STATUS: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS: This product is exempt from TSCA Regulation under FIFRA Section 3(2)(B)(ii) when used as a pesticide.

CERCLA REPORTABLE QUANTITY: None

SARA TITLE III:
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES: None
SECTION 311/312 HAZARD CATEGORIES: Immediate Health Hazard
SECTION 313 TOXIC CHEMICALS: None

RCRA STATUS: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

16. Other Information:

REASON FOR ISSUE: To revise MSDS to the ANSI Z400.1-1998 format

NOTE: NI means not indicated.

The information and statements in this Material Safety Data Sheet are believed to accurately reflect the scientific evidence used in making the hazard determination, but is not to be construed as a warranty or representation for which we assume legal responsibility. Additional information may be necessary or desirable depending on particular, exceptional or variable conditions or circumstances of use or storage or

Material Safety Data Sheet

Product Name: Gordon's Professional Turf & Ornamental Products ATRIMMEC Plant Growth Regulator

MSDS No.: 662-6 **Version No.:** 017 **EPA Registration No.:** 2217-776

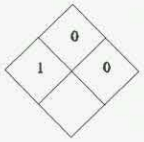
Other Information (Continued)

because of locally applicable laws or government regulations. Therefore, you should use this information only as a supplement to other information available to you and must make independent determinations of the suitability of the information for your particular circumstances or conditions and of the completeness of the information available from all sources to assure both the proper use of the material described herein and the safety and health of employees.


DURHAM®
METALDEHYDE GRANULES 7.5

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION



PRODUCT NAME: DURHAM® METALDEHYDE GRANULES 7.5; TRAILS END™ 7.5
GENERAL USE: Molluscicide
PRODUCT DESCRIPTION: Gray to brown or blue granule with an aldehyde odor
EPA Registration Number: 5481-103
MSDS No.: 138_12
Revision Date: 13 February, 2001

MANUFACTURER:
AMVAC CHEMICAL CORPORATION
4100 E. Washington Blvd.
Los Angeles, CA 90023-4406
Ph: 323-264-3910
FAX: 323-268-1028

EMERGENCY TELEPHONE NUMBERS:
MANUFACTURER: 323-264-3910
TRANSPORTATION (24 HOURS)
CHEMTREC: 800-424-9300
OTHER (24 HOURS)
AMVAC: 323-264-3910

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	WT %	CAS No.
Metaldehyde [2,4,6,8-Tetramethyl-1,3,5,7-tetroxocane or 2,4,6,8-Tetramethyl-1,3,5,7-tetraoxacyclooctane]	7.5%	108-62-3
Other ingredients	92.5%	
(includes trace of Crystalline silica, quartz)	trace	14808-60-7

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)

COMPONENT	HAZARD	OSHA PEL*	ACGIH TLV*
Crystalline silica (quartz respirable particles)	Silicosis	0.1 mg/m^3	0.05 mg/m^3

* Exposure Limits 8 hrs. TWA

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! May be harmful if swallowed, inhaled, or absorbed through the skin. Do not breathe dust, get in eyes, on skin or clothing.

Keep granules away from children, dogs and other pets. Bait may be attractive to dogs.

Do not contaminate water supplies.

POTENTIAL HEALTH EFFECTS

ROUTE(S) OF ENTRY: Typical routes of entry are skin or eye contact, ingestion of granules, and inhalation of dusts.

SIGNS OF ACUTE OVEREXPOSURE: Based on animal toxicity information for metaldehyde, it is anticipated that this material would be harmful upon ingestion and that direct contact may elicit mild eye and skin irritation. Overexposure to metaldehyde may cause excessive salivation, vomiting, nausea, acetonuria (odor of acetone on breath), convulsions, increased body temperature, depression of medullary respiratory and vasomotor control centers. Coma. May be fatal. [Note: Because of the low amounts of metaldehyde in the product, it is unlikely the victim can be exposed to sufficient quantities of metaldehyde to have coma or death induced.]

SIGNS OF CHRONIC OVEREXPOSURE: Same as for acute overexposure.

OTHER POTENTIAL EFFECTS: Acetaldehyde, a decomposition product of Metaldehyde, has been listed as carcinogenic in the IARC monographs and by the NTP. Respirable crystalline silica is listed as being carcinogenic by both IARC and NTP. Both are present at less than 0.01% in the product. None of the components found in appreciable quantities has been found to be carcinogenic by IARC, NTP, or OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Overexposure to metaldehyde may aggravate preexisting conditions associated with the kidney, liver, and brain.

4. FIRST AID MEASURES

EYES: Immediately flush the eyes with copious amounts of clear, cool running water for a minimum of 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eyes and lids with water. Contact a physician immediately if irritation develops or persists.

4. FIRST AID MEASURES, cont'd

INHALATION: Remove victim to fresh air. If breathing has ceased, clear the victim's airway and start mouth-to-mouth artificial respiration. If breathing is difficult, give oxygen. Contact a physician immediately.

INGESTION: If swallowed, immediately give 3-4 glasses of water. DO NOT induce vomiting. If vomiting occurs, give fluids again. Get immediate medical attention. Have physician determine if patient's condition allows induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

SKIN: Immediately wash contaminated area with soap and warm water. Remove contaminated clothing. Wash clothing before reuse. If skin irritation develops, contact a physician immediately.

NOTE TO PHYSICIANS: According to Hazardous Substance Database (HSDB), gastric lavage should be considered if potentially life-threatening levels of Metaldehyde have been ingested, if the procedure can be performed within one hour of ingestion. Administration of Diazepam or Clonidine 20 minutes after ingestion of 1000 mg/kg of Metaldehyde by mice delayed the onset of symptoms and reduced mortality. This is equivalent to 0.6 lb of product ingested for a 10 kg child. Therefore, Diazepam and Clonidine may be appropriate antidotes to reduce the symptomatology of Metaldehyde ingestion.
For acute inhalation overexposure, the patient should be monitored as respiratory failure may occur 24 to 48 hours after exposure.
Contact your local or state Poison Control Center for more information.

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5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point: Pure active ingredient has a reported flash point of 97°F (TCC)
Autoignition Temperature: Not applicable
Flammable Limits:
Lower flammable limit: Not applicable
Upper flammable limit: Not applicable

EXPLOSIVITY:

Mechanical Impact:	Not available. Not expected to be sensitive to mechanical impact.
Static Discharge:	Not available
Rate of Burning:	Not available

Explosive Power: Not available

HAZARDOUS COMBUSTION PRODUCTS: Carbon oxides, paraldehyde, acetaldehyde, and other unknown compounds can be formed during the combustion of Metaldehyde.

EXTINGUISHING MEDIA: Alcohol foam, water, and dry chemical.

5. FIRE FIGHTING MEASURES, cont'd

FIRE FIGHTING INSTRUCTIONS: Wear full protective gear, including self-contained breathing apparatus. Stay upwind of fire.

6. ACCIDENTAL RELEASE MEASURES

GENERAL: Use adequate ventilation and air-supplied respirators, as well as impervious clothing and safety goggles. Keep bystanders upwind and away from the spill.

LARGE OR SMALL SPILL: Sweep or vacuum the spilled product into a closed container for reuse according to the label or for disposal as a hazardous waste.

7. HANDLING AND STORAGE

HANDLING: Wear personal protective equipment listed below (Section 8). Keep away from pets, children, and unauthorized users. Avoid contact with dust.

STORAGE: Store product in original labeled container in a cool, dry, locked place out of the reach of children. Keep container tightly closed when not in use. Do not store in direct sunlight. Do not contaminate water, food, or feed by storage or application.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: No engineering controls are necessary under normal use conditions. For manufacturing, sufficient ventilation should be used to ensure keeping the exposures to dust below the TLV's.

RESPIRATORY PROTECTION: In processes where dusts or airborne particulates may be generated, a Dust/Mist filtering respirator (MSHA/NIOSH approval number prefix N95 or greater) or MSHA/NIOSH approved respirator with dust cartridges or equivalent is required in the absence of effective environmental controls.

SKIN PROTECTION: Applicators and other handlers must wear long-sleeved shirt and long pants; waterproof gloves; shoes plus socks.

EYE PROTECTION: Safety glasses or goggles are required when working with chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Appearance:	Gray to brown or blue granule
Odor:	Aldehyde odor
Boiling Point:	Not applicable
Freezing/Melting Point:	Not applicable
Vapor Pressure (mm/Hg):	1.9 @ 24°C (active ingredient)
Vapor Density:	6.06 (air = 1)
Specific Gravity:	1.3 to 1.5
Density:	74.9 - 93.6 lb/ft^3
Evaporation Rate:	Not available
Percent Volatile by Vol:	5%
Solubility in Water:	0.2 g/l @ 17°C for active ingredient
pH:	Not available
Partition Coefficient:	Not available

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY (Conditions to avoid): Stable under normal storage and use conditions. Moisture can cause very slow hydrolysis of active ingredient.

INCOMPATIBILITY: Avoid oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Acetaldehyde can be formed by decomposition of Metaldehyde. Decomposition by burning may result in carbon monoxide and other toxic fumes and vapors of unknown composition.

HAZARDOUS POLYMERIZATION: Metaldehyde is already a polymer. Further polymerization is unlikely.

11. TOXICOLOGICAL INFORMATION

No data is available for this product. Information on the active ingredient, Metaldehyde, is given below to help you to determine the potential toxicity of this product.

INGESTION:	Oral LD_{50} (rat):	283 mg/kg
INHALATION:	Inhalation LC_{50} (rat):	> 15 mg/L (4 hr, aerosol)
DERMAL:	Skin LD_{50} (rabbit):	> 5000 mg/kg
IRRITATION:	Eye irritation:	Essentially not an irritant. All transient minor inflammation cleared by day 2, post dose.
	Skin irritation:	Not an irritant
SENSITIZATION:	Skin sensitization: (guinea pig)	Not a sensitizer

11. TOXICOLOGICAL INFORMATION, cont'd

TERATOGENICITY: No evidence of teratogenicity in laboratory testing.
MUTAGENICITY: No evidence of mutagenicity with *in vitro* testing.
CARCINOGENICITY: None of the components found in appreciable quantities has been found to be carcinogenic by IARC, NTP, or OSHA. Acetaldehyde, a decomposition product of Metaldehyde, has been listed as carcinogenic in the IARC monographs. Respirable crystalline silica is listed as being carcinogenic by both IARC and NTP. Both are present at less than 0.01% in the product.
REPRODUCTIVE TOXICITY: No evidence of reproductive toxicity has been observed in laboratory studies.
TOXICOLOGICAL SYNERGISTIC PRODUCTS: No information is available.

12. ECOLOGICAL INFORMATION

This product may be fatal to dogs, other pests, and wild animals if eaten. May be toxic to water inhabitants. Do not contaminate water bodies.

13. DISPOSAL CONSIDERATIONS

Wastes resulting from the use of this product may be disposed on site by use according to the label or at an approved waste disposal facility. State and local authorities should be contacted to determine the current regulations.

The container may be disposed in a sanitary landfill or by incineration after completely emptying the bag into the application equipment. State and local authorities should be contacted to determine the current regulations.

14. TRANSPORTATION INFORMATION

DOT Class	: Not regulated
UN Number	: Not regulated
IMDG Class (sea)	: Not regulated
IATA Class (air)	: Not regulated
Marine Pollutant	: No
Packing Group	: Not regulated
Hazard label(s)	: Not regulated
ADR Class (road)	: Not regulated
Proper shipping name(s)	:Not regulated
Reportable Quantity	: None

14. TRANSPORTATION INFORMATION, cont'd

PACKAGING

General description : 25 lb and 50 lb lined Kraft bags

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

This product is registered under EPA/FIFRA Regulations. It is a violation of Federal Law to use this product in any manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.

CANADIAN REGULATIONS: This product is not registered in Canada.

EUROPEAN UNION REGULATIONS: This product is not registered in the European Union.

SARA TITLE III DATA

Section 311 & 312 Hazard Categories:

Immediate Health Hazard:	Yes
Delayed Health Hazard:	Yes
Fire Hazard:	No
Reactive Hazard:	No
Sudden Pressure Release Hazard:	No

Section 302 Extremely Hazardous Substances: None

Section 313 Toxic Chemicals: This product contains trace amounts (less than 0.01% each) of Acetaldehyde (CAS # 75-07-0) and Paraldehyde (CAS # 123-63-7).

CERCLA Reportable Quantities (RQ): Acetaldehyde (CAS # 75-07-0) - 1000 lbs
Paraldehyde (CAS # 123-63-7) - 1000 lbs

STATE REGULATIONS:

CALIFORNIA (Proposition 65): This product may contain respirable crystalline silica and acetaldehyde, known to the State of California to cause cancer.

16. OTHER INFORMATION

MSDS Status:

Date This Revision: 2/13/01
Date Previous Revision: 2/04/00
Person Responsible for Preparation: Gary A. Braden

Reasons for Revision: New information has been incorporated in sections 1, 2, 3, 4, 8, 9, 11, and 15.

16. OTHER INFORMATION, cont'd

DISCLAIMER:

This information is provided for the limited guidance to the user. While Amvac believes that the information is, as of the date hereof, reliable, it is the user's responsibility to determine the suitability of the information for its purposes. The user is advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional, or variable conditions or circumstances exist (like combinations with other materials), or because of applicable regulations. No express or implied warranty of merchantability or fitness for a particular purpose or otherwise is made hereunder with respect to the information or the product to which the information relates.

ABBREVIATIONS:

ACGIH	-	American Conference of Governmental Industrial Hygienists
ADR	-	European Agreement Concerning the International Carriage of Dangerous Goods by Road
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	-	Environmental Protection Agency
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
IARC	-	International Agency for Research on Cancer
NTP	-	National Toxicology Program
SARA	-	Superfund Amendments and Reauthorization Act
TSCA	-	Toxic Substances Control Act

This is the last page of this MSDS. There should be 8 pages.


Roundup

Roundup Concentrate Weed & Grass Killer1 MSDS #7017

MATERIAL SAFETY DATA SHEET

DATE PREPARED: 04/07/1999

MSDS No: 7017

Roundup Concentrate Weed & Grass Killer1

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Roundup Concentrate Weed & Grass Killer1
PRODUCT DESCRIPTION: Herbicide

MANUFACTURER

Monsanto Company
Lawn & Garden Products
41 South High Street
Columbus, OH 43215

24 HR. EMERGENCY TELEPHONE NUMBERS

Emergency Phone 1-800-225-2883

EPA REG. NO.: 71995-17 **PN:** 6052A

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Wt.%	CAS#
Glyphosate, isopropylamine salt	18	38641-94-0

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Light amber liquid

IMMEDIATE CONCERNS: CAUSES EYE IRRITATION
AVOID CONTACT WITH EYES OR CLOTHING
WASH THOROUGHLY WITH SOAP AND WATER AFTER HANDLING
KEEP OUT OF REACH OF CHILDREN

POTENTIAL HEALTH EFFECTS

EYES: Eye contact may include discomfort, tearing, swelling, redness, and blurred

vision. See Toxicology Information, section 11.

SKIN: This substance is not expected to cause prolonged or significant skin irritation. If absorbed through the skin, this substance is considered practically non-toxic to internal organs. This product is not expected to cause allergic skin reaction. See Toxicology Information, section 11.

INGESTION: Ingestion may produce irritation of the digestive tract as demonstrated by signs and symptoms of mouth membrane irritation, nausea, vomiting and diarrhea. See Toxicology Information, section 11.

INHALATION: Overexposure to spray mist may result in minor irritation of the upper respiratory tract. See Toxicology Information, section 11.

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4. FIRST AID MEASURES

EYES: If in eyes, immediately flush with plenty of water. Get medical attention if irritation persists.

SKIN: No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.

INGESTION: If swallowed, immediately telephone a poison control center, emergency treatment center or a physician for advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then immediately take person and product container, with label, to an emergency treatment center.

INHALATION: If respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues.

ADDITIONAL INFORMATION: Medical Information: Call day or night, 1-800-225-2883

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5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: >200°F TAG CC

EXTINGUISHING MEDIA: Water spray, foam, CO2, dry chemical or any class B extinguishing agent.

HAZARDOUS COMBUSTION PRODUCTS: This material will not burn.

FIRE FIGHTING PROCEDURES: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire document.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Soak up spilled material with paper towels and discard in trash.

LARGE SPILL: Liquid spills on floor or other impervious surfaces should be contained or diked, and should be absorbed with attapulgite, bentonite or other absorbent clays. Collect contaminated absorbent, place in plastic-lined metal drum and dispose of in accordance with instructions provided under Section 13. "DISPOSAL". Thoroughly scrub floor or other impervious surface with a strong industrial type detergent solution and rinse with water.

For liquid spills that soak into the ground, contact the applicable Federal, State and or County Health Dept. for disposal recommendations. If disposal is required then refer to Section 13 "DISPOSAL" for instructions.

Leaking containers should be separated from non-leakers and either the container or its contents transferred to a drum or other non-leaking container and disposed of in accordance with instructions provided under Section 13 "Disposal". Any recovered spilled liquid should be similarly collected and disposed of.

Do not contaminate water, foodstuffs or feed by storage or disposal.

GENERAL PROCEDURES: Observe all protection and safety precautions when cleaning up spills -- see Section 8. "EXPOSURE CONTROLS/PERSONAL PROTECTION". For help with any spill, leak, fire or exposure involving this material, call day or night (800) 225-2883.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Keep pesticide in original container. Store in a secure, preferably locked, storage area. Protect container from freezing.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: No special ventilation is necessary.

PERSONAL PROTECTION

EYES AND FACE: Workers handling the concentrate should wear chemical goggles to prevent eye contact during mixing/transfer operations or other activities where there is potential for eye contact with the concentrated product. The wearing of goggles is not required during use of this product in accordance with label instruction.

SKIN: Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wearing protective gloves is recommended. Wash hands and contaminated skin throughly after handling.

RESPIRATORY: For Handling the Concentrated Product: Avoid breathing vapor or mist. This product concentrate is not likely to pose an airborne exposure concern during manufacture or packaging. In the event of abnormal exposure conditions, use NIOSH/MSHA approved equipment. In work situations where an air purifying respirator is appropriate to be used, use of a full face respirator equipped with purifying elements for protection against organic vapor and dust/mist approved for pesticides is recommended. Use Cartridges with NIOSH/MSHA approval number TC-23C or canister with NIOSH/MSHA approval number TC-14G. Full facepiece replaces the need for chemical goggles. Observe respirator use limitations specified by the manufacturers. Respiratory protection programs must comply with 29 CFR 1910.134.

For Use of Product in accordance with label instructions: Respirators are not required for use of this product in accordance with label instructions.

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9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

ODOR: Practically odorless to slight amine-like odor

COLOR: Amber to yellow liquid

pH: ~4.6 to 5.0

SOLUBILITY IN WATER: Soluble

DENSITY: 8.93 Lbs./gal

VISCOSITY: No Data Available

COMMENTS:

pH: 1% solution in water @ 25 C

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10. STABILITY AND REACTIVITY

STABLE: YES

HAZARDOUS POLYMERIZATION: NO

STABILITY: Product is stable for at least 5 years under normal conditions of warehouse storage.

INCOMPATIBLE MATERIALS: Do not apply with a galvanized or unlined steel sprayer, or through any irrigation system.

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11. TOXICOLOGICAL INFORMATION

ACUTE

EYES: rabbit - moderately irritating, irritation cleared by test day 7.
EPA FIFRA toxicity category - III.

DERMAL LD_{50}: Rat = > 5.0 g/kg. EPA FIFRA toxicity category - IV.
SKIN IRRITATION: Rabbit - slightly irritating. EPA FIFRA toxicity category - IV.

ORAL LD_{50}: Rat = >5.0 g/kg.
EPA FIFRA toxicity category - IV.

INHALATION LC_{50}: Found to be practically nontoxic to rats following a 4-hour inhalation exposure; the inhalation LC50 is >5.7 mg/L (EPA FIFRA Toxicity Category - IV).

SENSITIZATION: Guinea pig - no evidence of allergic skin reactions.

SUBCHRONIC: Data from glyphosate laboratory toxicology studies were

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: Do not apply directly to water. Do not contaminate water when disposing of equipment washwaters.

ECOTOXICOLOGICAL INFORMATION: Studies performed with a concentrated solution of the isopropylamine salt of glyphosate indicate the following:

MON 0139 Technical (62%)
48-hr LC50 Daphnia: 930 mg/L, Practically Nontoxic
96-hr LC50 Bluegill: >1,000 mg/L, Practically Nontoxic
96-hr LC50 Trout: >1,000 mg/L, Practically Nontoxic
96-hr LC50 Carp: >10,000 ppm, Practically Nontoxic

13. DISPOSAL CONSIDERATIONS

FOR LARGE SPILLS: Material collected that cannot be reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, State or local procedures.

PRODUCT DISPOSAL: Securely wrap partially filled or empty container in several layers of newspaper and discard in trash.

EMPTY CONTAINER: Do not reuse container. Rinse throughly before discarding in trash.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Not Regulated

PRIMARY HAZARD CLASS/DIVISION: None

UN/NA NUMBER: None

PACKING GROUP: No

U.S. SURFACE FREIGHT CLASS: Tree or weed killing compounds, NOI, Density of

20 lbs. or greater per cu. ft.

AIR (ICAO/IATA)

PROPER SHIPPING NAME: Not Regulated

SPECIAL SHIPPING NOTES: The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

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15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA				
ACUTE: YES	**CHRONIC:** NO	**FIRE:** NO	**REACTIVITY:** NO	**PRESSURE GENERATING:** NO

311/312 HAZARD CATEGORIES: Immediate

313 REPORTABLE INGREDIENTS: None

TITLE III NOTES: Immediate (acute) health hazard: Product is moderately irritating to the eyes.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA REGULATORY: All non FIFRA regulated components are on the US EPA's TSCA Inventory List.

STATE REGULATIONS

PROPOSITION 65 STATEMENT: No ingredients on list.

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16. OTHER INFORMATION

HMIS CODES

FIRE: 0 **HEALTH:** 1 **REACTIVITY:** 0 **PROTECTION:** -

NFPA CODES

FIRE: 0 **HEALTH:** 1 **REACTIVITY:** 0 **SPECIAL:** -

APPROVAL DATE: 04/13/1999

REVISION SUMMARY New MSDSIn Section 10
Incompatible Materials (text)

In Section 11
Chronic (text) Subchronic (text)

In Section 13
Product Disposal (text)

In Section 16
Manufacturer Disclaimer (text) Section 16 Footnotes

MANUFACTURER SUPPLEMENTAL NOTES: EPA FIFRA (Federal Insecticide, Fungicide and Rodenticide Act) Toxicity Categories: The EPA toxicity categories are based on the results of the acute toxicology studies. The toxicology findings are compared to the FIFRA criteria to determine the product label signal word, precautionary and first aid statements. The EPA FIFRA toxicity category summary:

EPA FIFRA Product Label Toxicity Rating
Toxicity Category Signal Word

I DANGER Most toxic and irritating
II WARNING
III CAUTION
IV CAUTION Least toxic and irritating

COMMENTS: For additional information concerning this product, call the Helpline at 800-225-2883.

MANUFACTURER DISCLAIMER: This Material Safety Data Sheet (MSDS) contains health, safety and environmental information for you and your employees. It does not replace the precautionary language, use directions, or the storage and disposal information found on the product label. Information contained in this MSDS will help you to prepare for emergency response and to meet community right-to-know, emergency response and reporting requirements under SARA Title III and many other laws. Emergency response agencies and

health care providers will also find this additional information useful.

Use of this product is regulated by the U.S. Environmental Protection Agency (EPA) through the approved label copy. It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Although the information and recommendations set forth herein (herinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determinations as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

http://www.roundup.com/product_info/msds/7017.htm

FUSILADE® II

MATERIAL SAFETY DATA SHEET

Syngenta Crop Protection, Inc.
Post Office Box 18300
Greensboro, NC 27419

In Case of Emergency, Call
1-800-888-8372

1. PRODUCT IDENTIFICATION

Product Name: **FUSILADE II TURF & ORNAMENTAL** Product No.: A12460A

EPA Signal Word: Caution

Active Ingredient(%): Fluazifop-P-Butyl Technical (24.5%) CAS No.: 79241-46-6

Chemical Name: Butyl(RS)-2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoate

Chemical Class: A post emergence herbicide

EPA Registration Number(s): 100-1084 **Section(s) Revised: 11**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen
Naphthalene (<= 3.9%)	10 ppm TWA	10 ppm TWA (skin)	10 ppm TWA**	See "Toxicity", Sec. 11
Petroleum distillates, light paraffinic	Not Established	Not Established	Not Established	No
Petroleum Solvent	Not Established	Not Established	100 mg/m³ (15 ppm) TWA *	No
Fluazifop-P-Butyl Technical (24.5%)	Not Established	Not Established	0.5 mg/m³ TWA***	No

* recommended by manufacturer

** recommended by NIOSH

*** Syngenta Occupational Exposure Limit (OEL)

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.
Syngenta Hazard Category: C, S

3. HAZARDS IDENTIFICATION

Symptoms of Acute Exposure

Can cause eye, skin and respiratory passage irritation. May cause sensitization by skin contact. Harmful if inhaled or swallowed.

Exposure to high vapor levels may cause headache, dizziness, numbness, nausea, incoordination, or other central nervous system effects.

Hazardous Decomposition Products

Can decompose at high temperatures forming toxic gases.

Physical Properties

Appearance: Dark brown liquid, free of sediment

Odor: Aromatic

Unusual Fire, Explosion and Reactivity Hazards

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

4. FIRST AID MEASURES

Have the product container, label or Material Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison contol center or doctor, or going for treatment.

Ingestion: If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Eye Contact: If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

Skin Contact: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

Inhalation: 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 Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

Notes to Physician

There is no specific antidote if this product is ingested.

Treat symptomatically.

Persons suffering a temporary allergic reaction may respond to treatment with antihistamines or steroid creams and/or systemic steroids.

Contains petroleum distillate - vomiting may cause aspiration pneumonia.

Medical Condition Likely to be Aggravated by Exposure

None known.

5. FIRE FIGHTING MEASURES

Fire and Explosion

Flash Point (Test Method):	> 212°F (TCC)	
Flammable Limits (% in Air):	Lower: % Not Applicable	Upper: % Not Applicable
Autoignition Temperature:	Not Available	
Flammability:	Not Applicable	

Unusual Fire, Explosion and Reactivity Hazards

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

In Case of Fire

Use dry chemical, foam or CO2 extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

6. ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions in Protective Equipment Section. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

7. HANDLING AND STORAGE

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.

FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

Ingestion:	Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.
Eye Contact:	Where eye contact is likely, use chemical splash goggles.
Skin Contact:	Where contact is likely, wear chemical-resistant (such as nitrile or butyl) gloves, coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.
Inhalation:	A combination particulate/ organic vapor respirator may be necessary until effective engineering controls are installed to comply with occupational exposure limits. Use a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with an HE prefilter. Use a self-contained breathing apparatus in cases of emergency spills, when exposure levels are unknown, or under any circumstances where air-purifying respirators may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Dark brown liquid, free of sediment
Odor:	Aromatic
Melting Point:	Not Applicable
Boiling Point:	Not Available
Specific Gravity/Density:	0.98 g/ml @ 68°F (20°C)
pH:	6.2 (1% w/w dilution in deionized water)

Solubility in H2O

Fluazifop-P-Butyl Technical:	Almost insoluble in water (1 mg/l @ pH 5 - 6.5)

Vapor Pressure

Fluazifop-P-Butyl Technical:	4.5 x 10(-7) mmHg @ 68°F (20°C)

10. STABILITY AND REACTIVITY

Stability:	Stable under normal use and storage conditions.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	None known.
Materials to Avoid:	Oxidizing agents.
Hazardous Decomposition Products:	Can decompose at high temperatures forming toxic gases.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity/Irritation Studies (Finished Product)

Ingestion:	Practically Non-Toxic	
	Oral (LD50 Rat) :	> 5,000 mg/kg body weight
Dermal:	Practically Non-Toxic	
	Dermal (LD50 Rat) :	> 2,000 mg/kg body weight
Inhalation:	Slightly Toxic	
	Inhalation (LC50 Animal Not Available) :	0.54 mg/l air - 4 hours
Eye Contact:	Slightly Irritating (Rabbit)	
Skin Contact:	Moderately Irritating (Rabbit)	
Skin Sensitization:	See "Other Toxicity Information", Sec. 11	

Reproductive/Developmental Effects

Fluazifop-P-Butyl	Embryo/foetoxic effects have been reported in rats. Did not show teratogenic effects in animal

Technical:	experiments.

Chronic/Subchronic Toxicity Studies

Fluazifop-P-Butyl Technical:	Effects on red cells, bone marrow, liver and spleen observed in long-term high dose feeding tests in dogs. No adverse health effects are expected in humans at airborne levels below the occupational exposure limit.

Carcinogenicity

Fluazifop-P-Butyl Technical:	Did not show mutagenic effects in animal experiments. Did not show carcinogenic effects in animal experiments.

Other Toxicity Information

Repeated and/or prolonged contact may cause skin sensitization.

Toxicity of Other Components

Naphthalene (<= 3.9%)

Exposure to naphthalene can cause cataracts, liver damage, kidney failure, respiratory failure, hematuria, anemia, damage to red blood cells, leukocytosis, or coma.
Carcinogen Status:
NTP: Anticipated Carcinogen
IARC: Group 2B Possible Human Carcinogen

Petroleum Solvent

Inhalation of vapors at high concentrations can cause central nervous system effects (dizziness, headache), irritation to eyes or respiratory tract.

Petroleum distillates, light paraffinic

May cause respiratory tract irritation. Harmful if swallowed. Pulmonary aspiration hazard.

Target Organs

Active Ingredients

Fluazifop-P-Butyl Technical:	Blood, bone marrow, liver, spleen

Inert Ingredients

Naphthalene:	Eye, liver, kidney, respiratory tract, blood, CNS
Petroleum Solvent:	Respiratory tract, stomach, liver, thyroid, urinary bladder, CNS, skin
Petroleum distillates, light paraffinic:	Respiratory tract

12. ECOLOGICAL INFORMATION

Summary of Effects

Fluazifop-P-Butyl Technical:

Toxic to fish and invertebrates. Slightly toxic to birds. Practically non-toxic to bees.

Eco-Acute Toxicity

Fluazifop-P-Butyl Technical:	Bees LC50/EC50 > 200 ug/bee
	Invertebrates (Water Flea) LC50/EC50 1.0 ppm
	Fish (Trout) LC50/EC50 1.4 ppm
	Fish (Bluegill) LC50/EC50 0.53 ppm
	Birds (8-day dietary - Bobwhite Quail) LC50/EC50 > 4,659 ppm
	Birds (8-day dietary - Mallard Duck) LC50/EC50 4,321 ppm

Eco-Chronic Toxicity

Fluazifop-P-Butyl Technical:	Not Available

Environmental Fate

Fluazifop-P-Butyl Technical:

The information presented here is for the active ingredient, fluazifop-p-butyl.

Not persistent in soil or water. Immobile in soil. Sinks in water (after 24 h).

13. DISPOSAL CONSIDERATIONS

Disposal

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

14. TRANSPORT INFORMATION

DOT Classification

Ground Transport - NAFTA
Not regulated.

B/L Freight Classification

Herbicides, NOI (NMC Class 60)

Comments

Water Transport - International
Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Fluazifop), Marine Pollutant
Hazard Class or Division: Class 9
Identification Number: UN 3082
Packing Group: PG III

Air Transport - International
Not regulated.

15. REGULATORY INFORMATION

EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard
Chronic Health Hazard

Section 313 Toxic Chemicals: Naphthalene (<= 3.9%) (CAS No. 91-20-3)

California Proposition 65

Not Applicable

CERCLA/SARA 302 Reportable Quantity (RQ)

Report product spills > 305 gal. (based on naphthalene [RQ = 100 lbs.] content in the formulation)

RCRA Hazardous Waste Classification (40 CFR 261)

Not Applicable

TSCA Status

Exempt from TSCA, subject to FIFRA

16. OTHER INFORMATION

NFPA Hazard Ratings		HMIS Hazard Ratings	
Health:	2	Health:	2
Flammability:	1	Flammability:	1
Instability:	0	Reactivity:	0

0	Minimal
1	Slight
2	Moderate
3	Serious
4	Extreme

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 11/25/1998
Revision Date: 10/31/2005 Replaces: 07/29/2005

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

RSVP# : SCP-955-00333D

End of MSDS

Contrac Blox (Bromadiolone)

CONTRAC® All-Weather Blox

MSDS
Date of Issue:
August 01

MANUFACTURER'S ADDRESS:	PREPARED BY:	TELEPHONE NO:	EMERGENCY PHONE NOS:
BELL LABORATORIES, INC. 3699 KINSMAN BLVD. MADISON, WI 53704	PSM/CAR	(608) 241-0202	**Medical** (877) 854-2494 **Transportation (Spills)** (800) 424-9300 CHEMTREC
PRODUCT NAME: **CONTRAC® All-Weather Blox**			
USE: Anticoagulant Rodenticide	**BAIT FORM:** Formulated Dry Bait		**EPA REGISTRATION NO:** 12455-79

SECTION I. HAZARDOUS INGREDIENTS

INGREDIENT NAME	% BY WEIGHT	CURRENT TLV
Bromadiolone [3-[3-(4'-Bromo-[1,1'-biphenyl]-4-yl)-3-hydroxy-1-phenylpropyl]-4-hydroxy-2H-1-benzopyran-2-one] CAS No. 28772-56-7	0.005 %	N/A

This product contains no components subject to the reporting requirements of Section 313 of the Superfund Amendment and Reauthorization Act (SARA) of 1986

SECTION II. PHYSICAL DATA

APPEARANCE: Polygonal Block	**COLOR:** Blue	**ODOR:** Sweet, grain-like	**SPECIFIC GRAVITY:** 0.629 gm/cc
VAPOR DENSITY: N/A	**MELTING POINT:** N/A	**WATER REACTIVITY:** N/A	**EVAPORATION RATE:** N/A
VAPOR PRESSURE: N/A	**BOILING POINT:** N/A	**SOLUBILITY:** Not soluble in water	**BULK DENSITY:** N/A

SECTION III. FIRE AND EXPLOSION DATA

FLASH POINT (Method Used): N/A	**FLAMMABLE LIMIT:** **Upper Limit:** N/A **Lower Limit:** N/A	**AUTOIGNITION TEMP:** N/A

EXTINGUISHING MEDIA:
Extinguish with water, foam or inert gas

SPECIAL FIREFIGHTING PROCEDURES:
Firefighters should be equipped with protective clothing and self-contained breathing apparatus.

UNUSUAL FIRE OR EXPLOSION HAZARDS:
None

SECTION IV. REACTIVITY HAZARD DATA

STABILITY: Stable	**CONDITIONS TO AVOID:** None
POLYMERIZATION: Will not occur	**CONDITIONS TO AVOID:** None
INCOMPATIBILITY (MATERIALS TO AVOID): Strongly alkaline materials	**HAZARDOUS DECOMPOSITION PRODUCTS:** Oxides of carbon

SECTION V. TOXICITY DATA

LD50, ORAL (INGESTION): >5000 mg/kg (rats)	**LD50, DERMAL (SKIN CONTACT):** > 2000 mg/kg (rats)	**LC50, INHALATION:** N/A
EYE IRRITATION: None (rabbits)	**SKIN IRRITATION:** None (rabbits)	**DERMAL SENSITIZATION:** Not Considered a Sensitizer

SECTION VI. HEALTH HAZARDS

PRIMARY ROUTE OF ENTRY:
Ingestion

SIGNS & SYMPTOMS OF EXPOSURE:
Nausea, vomiting, loss of appetite, extreme thirst, lethargy, diarrhea, bleeding

EMERGENCY FIRST AID PROCEDURES:
Eyes: Flush with cool water for at least 15 minutes. If irritation develops, obtain medical assistance.
Skin: Wash with soap and water.
Ingestion: Call physician or emergency phone number immediately. Do not give anything by mouth or induce vomiting unless instructed by physician.
Inhalation: None.

NOTE TO PHYSICIAN:
If ingested, administer Vitamin K_1 intramuscularly or orally as indicated by bishydroxycoumarin overdoses. Repeat as necessary as based upon monitoring of prothrombin times.

SECTION VII. CONTROL AND PROTECTIVE MEASURES

RESPIRATOR TYPE:
Not required

EYE PROTECTION:
Not required

GLOVES (Recommended):
Rubber Gloves

VENTILATION:
Not required

OTHER PROTECTIVE MEASURES:
Not required

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:
HEALTH: 1 (Caution) **FIRE:** 0 (Will not burn) **REACTIVITY:** 0 (Stable) **SPECIFIC HAZARD:** None

HAZARDOUS MATERIAL INFORMATION (HMIS) RATINGS:
HEALTH: 2 (Moderate) **FLAMMABILITY:** 0 (Minimal) **REACTIVITY:** 0 (Minimal) **PROTECTIVE EQUIPMENT:** B

SECTION VIII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN THE EVENT MATERIAL IS RELEASED OR SPILLED:
Sweep up spilled material, place in properly labeled container for disposal or re-use.

WASTE DISPOSAL METHOD:
Wastes resulting from use may be disposed of on-site or at an approved waste disposal facility. Dispose of all wastes in accordance with all Federal, state and local regulations.

SECTION IX. SPECIAL PRECAUTIONS AND STORAGE DATA

STORAGE TEMPERATURE:
Room temperature

AVERAGE SHELF LIFE:
Bait is stable for a minimum of 1 year when stored at room temperature

SPECIAL SENSITIVITY (HEAT, LIGHT, MOISTURE):
Avoid exposure to light and extreme humidity

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Store in a cool, dry place inaccessible to children, pets and wildlife. Keep container tightly closed when not in use. Avoid contamination of lakes, streams and ponds by use, storage or disposal. Wash thoroughly with soap and water after handling.

SECTION X. SHIPPING DATA

DOT SHIPPING NAME:
None required

DOT HAZARD CLASSIFICATION:
Non-hazardous

DOT LABELS REQUIRED:
None required

FREIGHT CLASSIFICATION:
LTL Class 60


Fumitoxin®
PELLETS
KEEP OUT OF REACH OF CHILDREN
DANGER/PELIGRO – POISON

PESTCON SYSTEMS, INC.

MATERIAL SAFETY DATA SHEET: ALUMINUM PHOSHIDE, FUMITOXIN®

	US EPA REG. NO.	DISTRIBUTOR NO.	CANADA REG. NO.
FUMITOXIN® TABLETS	**72959-1**	**72959-1-5857**	**19227**
FUMITOXIN® PELLETS	**72959-2**	**72959-2-5857**	**19226**
FUMITOXIN® BAGS	**72959-3**	—	—

SECTION I – PRODUCT INFORMATION

Distributor:
Pestcon Systems, Inc.
1808 Firestone Parkway
Wilson, NC 27893
Phone: 252-237-7923 (800-548-2778)
Fax: 252-243-1832 or 252-237-3259
E-mail: info@pestcon.com
Internet address: www.pestcon.com

Manufacturer:
People's Republic of China

EMERGENCY TELEPHONE NOS.:
Emergency: - Chemtrec (800) 424-9300 – International: 202-483-7616
Emergency and Information: Pestcon Systems, Inc. 252-237-7923 / 800-548-2778
Date of Revision: April 2004 — Form msds/phosphine

SECTION II – HAZARDOUS INGREDIENTS INFORMATION

Identity:

Fumitoxin and Aluminum Phosphide (AIP) – react with water to produce phosphine, hydrogen phospide. PH_3 as shown in Equation 1. is formulated with 55% aluminum phosphide and also contains ammonium carbamate (AC) and inert ingredients. Ammonium carbamate releases ammonia and carbon dioxide as shown in Equation 2.

1) $AlP + 3H_2O \longrightarrow Al(OH)_3 + PH_3$

2) $NH_2COONH_4 \longrightarrow 2NH_3 + CO_2$

AIP	CAS No. 20859-73-8	NH_2COONH_4	CAS No. 1111-78-0
PH_3	CAS No. 7803-51-2	NH_3	CAS No. 7664-41-7
$Al(OH)_3$	CAS No. 21645-51-2	CO_2	CAS No. 124-38-9

NFPA Chemical Hazard Ratings:
Flammability Hazard 4
Health Hazard 4
Reactivity Hazard 2
Special Hazard ₩

SARA Physical and Health Hazards:
Fire
Reactivity
Immediate (Acute)

Inhalation Exposure Limits:

Component	OSHA PEL TWA (ppm)	ACGIH TLV TWA (ppm)	ACGIH TLV STEL (ppm)	NIOSH IDLH (ppm)
Hydrogen Phosphide*	0.3	0.3	1.0	50
Ammonia	50	25	35	300
Carbon Dioxide	5,000	5,000	30,000	40,000

SECTION III – PHYSICAL CHARACTERISTICS

Boiling Point:
AIP > 1000°C
PH_3 -87.7°C

Vapor Pressure:
AIP 0mm Hg
PH_3 40mm Hg @-129.4°C
AC 100mm Hg @ 26.7°C

Specific Gravity of Vapors (Air=1):
AIP N/A
PH_3 1.17

Solubility in Water:
AIP Insoluble, reacts
PH_3 26cc in 100 ml water at 17°C
AC Very soluble, reacts

Appearance and Odor:
Fumitoxin and aluminum phosphide have a greenish-gray color and the hydrogen phosphide (phosphine, PH_3) gas produced by these chemicals has an odor described as similar to garlic, carbide or decaying fish.

Specific Gravity:
AlP 2.85

Melting Point:
AlP > 1000°C
PH_3 -133.5°C

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Point:
Aluminum phosphide, and Fumitoxin are not themselves flammable. However, they react readily with water to produce hydrogen phosphide (phosphine, PH_3) gas which may ignite spontaneously in air at concentrations above its LEL of 1.8% v/v. UEL of hydrogen phosphide is not known.

Extinguishing Media:
Suffocate flames with sand, carbon dioxide or dry extinguishing chemicals.

Special Fire Fighting Procedures:
Do not use water on metal phosphide fires.

Respiratory Protection:
Wear NIOSH/MSHA approved SCBA or equivalent respiratory protection.

Protective Clothing:
Wear gloves when handling Fumitoxin tablets, pellets or dust.

Unusual Fire and Explosion Hazards:
Hydrogen phosphide-air mixtures at concentrations above the lower flammable limit of 1.8% v/v, PH_3 may ignite spontaneously. Ignition of high concentrations of hydrogen phosphide can produce a very energetic reaction. Explosions can occur under these conditions and may cause severe personal injury. **Never allow the buildup of hydrogen phosphide to exceed explosive concentrations.** Open containers of metal phosphides in open air only and never in a flammable atmosphere. Do not confine spent or partially spent dust from metal phosphide fumigants as the slow release of hydrogen phosphide from these materials may result in the formation of an explosive atmosphere. Spontaneous ignition may occur if large quantities of aluminum phosphide are piled in contact with liquid water. This is particularly true if quantities of these materials are placed in moist or spoiled grain which can provide partial confinement of the hydrogen phosphide gas liberated by hydrolysis.

Fires containing hydrogen phosphide or metal phosphides will produce phosphoric acid by the following reaction:

$$2PH_3 + 4O_2 \longrightarrow 3H_2O = P_2O_5 \longrightarrow 2H_3PO_4$$

SECTION V – REACTIVITY DATA

Stability:
Fumitoxin and aluminum phosphide are stable to most chemical reactions, except for hydrolysis. They will react with moist air, liquid water, acids and some other liquids to produce toxic and flammable hydrogen phosphide gas. Hydrogen phosphide may react vigorously with oxygen and other oxidizing agents.

Incompatibility:
Avoid contact with water and oxidizing agents.

Corrosion:
Hydrogen phosphide gas may react with certain metals and cause corrosion, especially at higher temperatures and relative humidities. Metals such as copper, brass and other copper alloys, and precious metals such as gold and silver are susceptible to corrosion by phosphine. Small electric motors, smoke detectors, brass sprinkler heads, batteries and battery chargers, fork lifts, temperature monitoring systems, switching gears, communication devices, computers, calculators and other electrical equipment may be damaged by this gas. Hydrogen phosphide will also react with certain metallic salts and, therefore, sensitive items such as photographic film, some inorganic pigments, etc., should not be exposed.

Hazardous Polymerization:
Will not occur.

SECTION VI – HEALTH HAZARD INFORMATION

Routes of Entry:
The dermal toxicity of aluminum phosphide is very low. The LD_{50} via the dermal route is greater than 5,000 mg per kilogram for a 1-hour exposure. Primary routes of exposure are inhalation and ingestion.

Acute and Chronic Health Hazards:
Fumitoxin and aluminum phosphide are highly acute toxic substances. The LC_{50} for hydrogen phosphide gas is about 180 ppm for a 1-hour inhalation exposure. The acute oral toxicity of the Fumitoxin formulations was found to be 11.5 mg/kg of body weight. Aluminum phosphide and phosphine are not known to cause chronic poisoning.

Carcinogenicity:

Aluminum phosphide and phosphine are not carcinogenic and are not listed as such by NTP, IARC or OSHA.

Signs and Symptoms of Exposure:

Aluminum phosphide tablets, pellets and dust react with moisture from the air, acids and many other liquids to release hydrogen phosphide (phosphine, PH_3) gas. Mild exposure by inhalation causes malaise (indefinite feeling of sickness), ringing in the ears, fatigue, nausea and pressure in the chest which is relieved by removal to fresh air. Moderate poisoning causes weakness, vomiting, pain just above the stomach, chest pain, diarrhea and dyspnea (difficulty in breathing). Symptoms of severe poisoning may occur within a few hours to several days resulting in pulmonary edema (fluid in lungs) and may lead to dizziness, cyanosis (blue or purple skin color), unconsciousness, and death.

Emergency and First Aid Procedures:

Symptoms of exposure to this product are headaches, dizziness, nausea, difficult breathing, vomiting, and diarrhea. In all cases of overexposure get medical attention immediately. Take victim to a doctor or emergency treatment facility.

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. Keep warm and make sure person can breathe freely. Call a poison control center or doctor for further treatment advice.

If swallowed: - Call a poison control center or doctor immediately for treatment advice. Have person drink one or two glasses of water and induce vomiting by touching back of throat with finger, or if available administer syrup of ipecac. Do not give anything by mouth to an unconscious person.

If on skin or clothing: - Brush or shake material off clothes and shoes in a well-ventilated area. Allow clothes to aerate in a ventilated area prior to laundering. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc. Wash contaminated skin thoroughly with soap and water.

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 further treatment advice.

SECTION VII – PRECAUTIONS FOR SAFE HANDLING

Spill Cleanup Procedures:

If possible, dispose of spilled Fumitoxin by use according to label instructions. Freshly spilled material which has not been contaminated by water or foreign matter may be replaced into original containers. Punctured flasks or containers may be temporarily repaired using aluminum tape. If the age of the spill is unknown or if the product has been contaminated with soil, debris, water, etc. gather up the spillage in small open buckets having a capacity no larger than about 1 gallon. Do not add more than about 1 to 1.5 kg (2 to 3 lbs.) to a bucket. If on-site wet deactivation is not feasible, transport the uncovered buckets in open vehicles to a suitable area. Wear gloves when handling Fumitoxin tablets and pellets.

Respiratory protection may be required during cleanup of spilled material. If the concentration of hydrogen phosphide is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn.

Small amounts of spillage, from about 4 to 8 kg (9 to 18 lbs.) may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, spilled Fumitoxin may be deactivated by the wet method as described in the following:

Wet Deactivation of Spilled Fumitoxin:

1. Deactivating solution is prepared by adding the appropriate amount of low sudsing detergent to water in a drum or other suitable container. A 2% solution or 4 cups of detergent in 30 gallons is suggested. The container should be filled with deactivating solution to within a few inches of the top.
2. The material is added slowly to the deactivating solution and stirred so as to thoroughly wet all of the product. This should be carried out in open air and respiratory protection may be required. At no time should the deactivation drum be covered.
3. No more than about 45 to 50 lbs. of Fumitoxin should be added to 15 gallons of water-detergent mixture.
4. Allow the mixture to stand, with occasional stirring, for about 36 hours. The resultant slurry of dust will then be safe for disposal.
5. Dispose of the slurry of deactivated material, with or without preliminary decanting, at a sanitary landfill or other suitable site approved by local authorities. Where permissible, this slurry may be poured into a storm sewer or out onto the ground.

For Assistance:

Contact – PESTCON SYSTEMS, INC.
Telephone: 252-237-7923 / 800-548-2778
Fax: 252-243-1832 / 252-237-3259
Internet Address: www.pestcon.com
E-mail: info@pestcon.com
or
Chemtrec: 800-424-9300

Disposal of Spent Fumitoxin:

When being disposed of, spilled or partially reacted Fumitoxin is considered hazardous wastes under existing Federal Regulations. If properly exposed, the grayish-white residual dust after a fumigation will not be a hazardous waste and normally contains only a very small amount of unreacted aluminum phosphide. This waste will be safe for disposal. However, the spent residual dust from incompletely exposed Fumitoxin may require special care.

Triple rinse tablet and pellet flasks and stoppers with water. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. Rinsate may be disposed of in a storm sewer, sanitary landfill or by other approved procedures. Or, it is permissible to remove lids and expose empty flasks to atmospheric conditions until the residue in the flasks is reacted. Then puncture and dispose of in a sanitary landfill or other approved site, or by other procedures approved by state and local authorities.

Some local and state waste disposal regulations may vary from the following recommendations. Disposal procedures should be reviewed with appropriate authorities to ensure compliance with local regulations. Contact your State Pesticide or Environmental Control Agency or Hazardous Waste Specialist at the nearest EPA Regional Office for guidance.

1. Confinement of partially spent residual materials, as in a closed container, or collection and storage of large quantities of dust may result in a fire or explosion hazard. Small amounts of hydrogen phosphide may be given off from unreacted aluminum phosphide, and confinement of the gas may result in a flash.
2. In open areas, small amounts of spent residual dust may be disposed of on site by burial or by spreading over the land surface away from inhabited buildings.
3. Residual dust from Fumitoxin may also be collected and disposed of at a sanitary landfill, or other approved sites or by other procedures approved by Federal, State or Local authorities.
4. From 3 to 5 kg (7 to 10 lbs.) of spent dust from 2 to 3 flasks of Fumitoxin may be collected for disposal in a 1-gallon bucket. Larger amounts, up to about one-half case, may be collected in burlap, cotton or other types of porous cloth bags for transportation in an open vehicle to the disposal site. Do not collect dust from more than 7 flasks of tablets, 10 flasks of pellets (about 11 kg or 25 lbs.) in a single bag. Do not pile cloth bags together. Do not use this method for partially spent or "green" dust. **Caution:** Do not collect dust in large drums, dumpsters, plastic bags or other containers where confinement may occur.

Precautions to be taken in Handling and Storage:

Store Fumitoxin products in a locked, well-ventilated area away from heat. Post as a pesticide storage area. Do not store in buildings inhabited by humans or domestic animals.

Other Precautions:

1. Do not allow water or other liquids to contact Fumitoxin tablets, pellets or their dust.
2. Do not pile up large quantities of Fumitoxin during fumigation or disposal.
3. Once exposed, do not confine Fumitoxin or allow hydrogen phosphide concentrations to exceed the LEL.
4. Open containers of Fumitoxin only in open air. Do not open in a flammable atmosphere. Hydrogen phosphide in the head space of containers may flash upon exposure to atmospheric oxygen.
5. Fumitoxin Tablets and Pellets are restricted use pesticides due to acute inhalation toxicity or highly toxic phosphine gas. For retail sale and use only by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification.
6. See EPA accepted labeling for additional precautions and directions for use.

SECTION VIII – CONTROL MEASURES

Respiratory Protection:

NIOSH/MSHA approved full-mask with approved canister for phosphine (hydrogen phosphide, PH_3) may be worn at concentrations up to 15 ppm. At levels above this or when the hydrogen phosphide concentration is unknown, NIOSH/MSHA approved SCBA or equivalent must be worn.

Protective Clothing:

Wear gloves when handling aluminum phosphide tablets, pellets or dust.

Eye Protection:

None required.

Ventilation:

Local ventilation is generally adequate to reduce hydrogen phosphide levels in fumigated areas to below the TLV/TWA. Exhaust fans may be used to speed the aeration of silos, warehouses, shipholds, containers, etc.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, expressed or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.


Dow AgroSciences
Surflan®
A S
Specialty Herbicide

MATERIAL SAFETY DATA SHEET

SURFLAN® A.S. Herbicide

Rev. 2 Effective Date: 12/2/04

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: Surflan A.S. Herbicide

COMPANY IDENTIFICATION: United Phosphorus, Inc.
423 Riverview Plaza
Trenton, NJ 08611
1-800-247-1557 or www.upi-usa.com

FOR MEDICAL EMERGENCIES, contact the National Pesticide Information Center at 1-800-858-7378
FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC 1-800-424-9300

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

Oryzalin: 3,5-Dinitro-N4,N4-dipropyl-sulfanilamide	CAS# 019044-88-3	40.4%
Inert Ingredients, Total, Including:		59.6%
Propylene Glycol	CAS# 000057-55-6	
Glycerin	CAS# 000056-81-5	

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Hazardous chemical. Opaque bright orange liquid with a slight aromatic odor. May cause eye and skin irritation. LD_{50} for skin absorption is >5000 mg/kg. Oral LD_{50} is >5000 mg/kg. Inhalation LC_{50} is >6.30 mg/L. Toxic to avian and aquatic organisms.

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause slight temporary eye irritation. Corneal injury is unlikely.

SKIN: Prolonged contact may cause skin irritation with local redness. Prolonged or frequently repeated skin contact may cause an allergic skin reaction in some individuals. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD_{50} for skin absorption in rabbits is >5000 mg/kg.

INGESTION: Very low toxicity if swallowed. The oral LD_{50} for rats and mice is 5000 mg/kg. Harmful effects not anticipated from swallowing small amounts.

INHALATION: At room temperature, exposure to vapor is minimal low volatility; vapor from heated material may cause respiratory irritation and other effects. The LC_{50} for rats was >6.30 mg/L in 4 hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Contains component(s) which, in animals, have been shown to cause liver, kidney, bladder, spleen or blood effects. For propylene glycol, in humans, symptoms may include central nervous system depression (headache, dizziness, drowsiness, and incoordination.

CANCER INFORMATION: Thyroid follicular cell tumors observed in rats were considered a secondary response caused by mechanisms not relevant to humans. Benign skin and adnexal tumors observed in rats may also have been secondary to thyroid effects.

TERATOLOGY (BIRTH DEFECTS): Oryzalin did not cause birth defects in animals; other fetal effects occurred only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: For the majority of components, in animal studies, did not interfere with reproduction. Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerin given in the diet. Similar effects have been seen in animals fed synthetic diets.

SECTION 4 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
Wash skin with plenty of water.

IF SWALLOWED
Seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

IF INHALED
Move person to fresh air; if effects occur, consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5 FIRE FIGHTING MEASURES

FLASH POINT: No ignition up to 200°F (93.3°C)
METHOD USED: SCC

FLAMMABLE LIMITS
LFL: Water based product
UFL: Water based product

AUTO-IGNITION TEMPERATURE: Water based product

EXTINGUISHING MEDIA: This product is a water based suspension and will not burn.

FIRE AND EXPLOSION HAZARDS: This material will not burn until a sufficient amount of water has evaporated. At this point, the material will exhibit the flammability characteristics of propylene glycol and oryzalin. The explosive potential of oryzalin as an airborne dust is rated as severe. The minimum ignition temperature for a dust cloud is 714°F (379°C).

FIRE-FIGHTING EQUIPMENT: This product is a water based suspension and will not burn. However, if product is involved in a fire, wear positive-pressure, self-contained breathing apparatus and full protective clothing.

SECTION 6 ACCIDENTAL RELEASE MEASURES

ACTION TO TAKE FOR SPILLS: Use absorbent material to contain and clean up small spills and dispose as waste. For large spills, contact CHEMTREC at 800-424-9300. Prevent runoff.

SECTION 7 HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Harmful if swallowed, inhaled, or absorbed through the skin. Causes eye irritation. May cause skin sensitization reactions in

certain individuals. Avoid contact with skin, eyes, and clothing. Avoid breathing vapor or spray mist. Do not contaminate water, food, or feed by storage or disposal. Store in original container only. Read the product label for personal protective equipment, which may be required by the Worker Protection Standard of 1993.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):
Propylene glycol: AIHA WEEL is 50 ppm total, 10 mg/M^3 aerosol only.
Glycerin: ACGIH TLV is 10 mg/M^3. OSHA PEL is 10 mg/M^3 total, 5 mg/M^3 respirable.
PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use safety glasses.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use a NIOSH approved air-purifying respirator.

SKIN PROTECTION: When prolonged or frequently repeated contact could occur, use chemically protective clothing resistant to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on operation.

APPLICATORS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: (@ 1 atmosphere) 212°F (100°C)
VAPOR DENSITY: 1.178 relative to air @ 25°C
SPECIFIC GRAVITY: 1.138 to 1.239 @ 25°C
ODOR: Slight aromatic odor
VAPOR PRESSURE: Approximately 23 mm Hg @ 25°C
SOLUBILITY IN WATER: Miscible in water
APPEARANCE: Bright orange opaque liquid
pH: (aqueous 50/50) 5.0 to 6.8

SECTION 10 STABILITY AND REACTIVITY

STABILITY: (CONDITIONS TO AVOID) This product is water-based and as such is stable under normal handling conditions. If the water in the mixture evaporates; however, the resultant mixture should be handled with care. The explosive potential of oryzalin as an airborne dust is rated as severe. The minimum ignition temperature for a dust cloud is 714°F (379°C)

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) None known

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides and other toxic gases and fumes may be formed if product is involved in a fire.

HAZARDOUS POLYMERIZATION: Not known to occur.

SECTION 11 TOXICOLOGICAL INFORMATION

MUTAGENICITY: For oryzalin and propylene glycol: in-vitro and animal mutagenicity studies were negative.

SECTION 12 ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:
Based largely or completely on information for oryzalin. Bioconcentration potential is low (BCF is <100 or Log Pow <3).

DEGRADATION & PERSISTENCE:
Based largely or completely on information for oryzalin. Degradation is expected in the soil environment within days to weeks.

ECOTOXICOLOGY:
Based largely or completely on information for oryzalin. Material is highly toxic to aquatic organisms on an acute basis (LC_{50} or EC_{50} is between 0.1 and 1 mg/L in most sensitive species).
Material is slightly toxic to birds on an acute basis (LD_{50} is between 501 and 2000 mg/kg.
Acute oral LD_{50} in bobwhite (Colinus virginianus) is 1046 mg/kg.
Acute contact LD_{50} in honeybee (Apis mellifera) is >100 µg.
Acute oral LD_{50} for honeybee (Apis mellifera) is >110 µg.

SECTION 13 DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Do not contaminate water, food or feed by storage or disposal. Wastes resulting from the use of this product may be used according to label directions or disposed of at an approved waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION INFORMATION:
This material is not regulated for transportation.

SECTION 15 REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
ORYZALIN	019044-88-3	40.4%

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
1,2,3-Propanetriol (Glycerin)	000056-81-5	PA1
1,2-Propanediol (Propylene Glycol)	000057-55-6	PA1

PA1=Pennsylvania Hazardous Substance (present at > or = to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

CATEGORY	RATING
Health	2
Flammability	0
Reactivity	0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

SECTION 16 OTHER INFORMATION

MSDS STATUS: Revision 2 replaces Version 1, 9/10/03.
Reason for revision: formatting throughout; update company and emergency contact information; update Section 4 First Aid.

THIS INFORMATION IN THIS MSDS IS BASED ON DATA AVAILABLE AS OF THE REVISION DATE GIVEN HEREIN, AND BELIEVED TO BE CORRECT. CONTACT UNITED PHOSPHORUS, INC. TO CONFIRM IF YOU HAVE THE MOST CURRENT MSDS. JUDGMENTS AS TO THE SUITABILITY OF THE INFORMATION HEREIN FOR THE INDIVIDUAL'S OWN USE OR PURPOSES IS NECESSARILY THE INDIVIDUAL'S OWN RESPONSIBILITY. ALTHOUGH REASONABLE CARE HAS BEEN TAKEN IN THE PREPARATION OF SUCH INFORMATION, UNITED PHOSPHORUS, INC. EXTENDS NO WARRANTIES, MAKES NO REPRESENTATIONS, AND ASSUMES NO RESPONSIBILITY AS TO THE ACCURACY OR SUITABILITY OF SUCH INFORMATION FOR APPLICATION TO THE INDIVIDUAL'S PURPOSES OR THE CONSEQUENCES OF ITS USE.

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.