



INSECTICIDE

For Use by Individuals/Firms licensed by the State to apply insecticide products.

For use to control insect pests on lawns, ornamental trees and shrubs and around buildings for perimeter insect control including landscaped areas around residential, institutional, public, commercial and industrial buildings, parks, recreational areas and athletic fields.

EPA Reg. No. 279-3141

EPA Est. 39578-TX-1

Active Ingredient:	By Wt.
Permethrin**	36.8%
Other Ingredients***	63.2%
	100.0%

**cis/trans ratio: Max. 55% (±) cis and min. 45% (±) trans

***Contains petroleum distillates.

Contains 3.2 pounds permethrin per gallon

KEEP OUT OF REACH OF CHILDREN

CAUTION

See other panels for additional precautionary information.

FMC Corporation
Agricultural Products Group
1735 Market Street
Philadelphia PA 19103

Net Contents: 1 Gallon

FIRST AID	
If swallowed	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give any liquid to the person. • Do not give anything by mouth to an unconscious person.
If inhaled	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes	<ul style="list-style-type: none"> • 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.
HOTLINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-(800)-331-3148 for Emergency Assistance.	
NOTE TO PHYSICIAN	
This product contains aromatic hydrocarbons which can produce a severe pneumonitis if aspirated, consideration should be given to gastric lavage with an endotracheal tube in place. Treatment is controlled removal of exposure followed by symptomatic and supportive care.	
For Information Regarding the Use of this Product Call 1-800-321-1FMC (1362).	

PRECAUTIONARY STATEMENTS

Hazards to Humans (and Domestic Animals)

CAUTION

Harmful if swallowed, inhaled or absorbed through the skin. Avoid contact with skin, eyes or clothing. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Personal Protective Equipment

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

Applicators and other handlers who handle this pesticide for any use covered by Worker Protection Standard (CFR Part 170) -- in general, only agricultural-plant uses are covered --must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- 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.

Engineering Controls Statement

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

User Safety Recommendations

Users Should:

Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Environmental Hazards

This pesticide is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply this product or allow it to drift to crops or weeds on which bees are actively foraging. Additional information may be obtained from your Cooperative Extension Service.

This product is extremely toxic to fish and aquatic invertebrates. Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

Physical and Chemical Hazards

Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Shake well before using.

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

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry to treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water, is:

- Coveralls
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standards for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries and greenhouses.

Do not allow people or pets on treated surfaces until the spray has dried.

Do not touch treated surface until dry.

Storage and Disposal

Prohibitions: Do not contaminate water, food or feed by storage or disposal.

Storage: Store at temperatures above 40°F (5°C)

If separation occurs during storage, and less than entire contents of container are to be used, remix by inverting and shaking the container several times until contents are homogeneous. For the 5 gallon U-Turn® container, grasp handle and rock container forward and backward vigorously until contents are homogeneous. For 10 gallon U-Turn container, remix with mechanical agitator by attaching a power drill with ¼ inch chuck to agitator shaft and agitating by spinning shaft for 1 minute prior to dispensing.

If crystals have formed, warm to room temperature (70°F) (21°C) by room heating for 24–48 hours and shake occasionally until crystals dissolve and product appears uniform. Do not use external source of heat for warming container.

Keep out of reach of children and animals. Store in original containers only. Store in a cool, dry place and avoid excess heat. Carefully open containers. After partial use, replace lids and close tightly. Do not put concentrate or dilute material into food or drink containers. Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.

In case of spill, avoid contact, isolate area and keep out animals and unprotected persons. Confine spills. Call FMC: (800) 331-3148.

To confine spill: If liquid, dike surrounding area or absorb with sand, cat litter, or commercial clay or gel absorbents. If dry material, cover to prevent dispersal. Place damaged package in a holding container. Identify contents.

Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. 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.

Container Disposal:

Metal or Plastic Container: Non-refillable container. Do not reuse or refill this container. Triple rinse as follows: Empty the contents into application equipment or a mix tank and drain for 10 seconds after flow begins to drip. Fill container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or 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. Then offer for recycling, if available or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill.

Returnable/Refillable Sealed Container: Refill this container with pesticide only. Do not reuse this container for any other purpose. Do not rinse container. Do not empty remaining formulated product. Do not break seals. Return intact to point of purchase. 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.

Ornamental and Lawn Use (Greenhouses, Interiorscapes and Plantscapes, Lawns, Trees and Shrubs)

General Application Instructions

Astro may be used to control insect pests on ornamentals and lawns in landscaped areas around residential, institutional, public, commercial and industrial buildings, parks, recreational areas and athletic fields.

Astro is a 3.2 pounds per gallon formulation of the insecticide permethrin. Apply Astro when insects appear or feeding is noticed. The higher rate should be used as pest populations increase. Retreatment may be necessary to achieve and/or maintain control during periods of high pest pressure. Repeat application is necessary only if there are signs of renewed insect activity. Repeat application should be limited to no more than once per seven days.

Astro may be applied by ground equipment. Use sufficient water to obtain full coverage.

To prepare a 0.5% emulsion, mix 1.6 oz. (50 ml) of Astro Insecticide in 1 gallon of water.

Do not apply more than 2.0 lb. a.i./A/year.

Astro has demonstrated excellent plant safety; however, not all cultivars have been tested. Before treating large numbers of plants of a particular cultivar, treat a few plants and observe prior to full scale application.

Spray Drift Precautions:

All ground application equipment must be properly maintained and calibrated using appropriate carriers.

Do not make ground applications during temperature inversions.

Do not apply by air.

Make ground applications when the wind velocity favors on target product disposition (approximately 3 to 10 mph). Do not apply when wind velocity exceeds 15 mph.

Do not apply by ground equipment within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries, and commercial fish farm ponds.

Resistance: Some insects are known to develop resistance to products used repeatedly for control. Because the development of resistance cannot be predicted, the use of this product should conform to resistance management strategies established for the use area. Consult your local or state pest management authorities for details.

If resistance to this product develops in your area, this product, or other products with a similar mode of action, may not provide adequate control. If poor performance cannot be attributed to improper application or extreme weather conditions, a resistant strain of insect may be present. If you experience difficulty with control and suspect that resistance is a reasonable cause, immediately consult your local company representative or pest management advisor for the best alternative method of control for your area.

Recommended Application Rates

CROP	PEST	RECOMMENDED RATE	SPECIFIC INSTRUCTIONS	
Ornamentals in greenhouses and interiorscapes, in residential landscaped areas and landscaped areas around institutional, public, commercial and industrial buildings, parks, recreational areas and athletic fields.	Ants Aphids Bagworm Beet Armyworm Birch Leafminer Cabbage Looper Cankerworms Citrus Thrips Fungus Gnat Gypsy Moth Caterpillars Heliothis spp Japanese Beetles Lace Bug Leaf Feeding Caterpillars Leafminers Leafhoppers Leafrollers Lygus Bugs Mealybugs Pine Sawflies Plant Bugs Root Weevils (Adult) Tent Caterpillars Webworms Whiteflies Zimmerman Pine Moths	Broadcast 4 to 8 Fl. Oz. per 100 Gals.	Apply sufficient volume of water to adequately cover foliage. Use higher rate for moderate to high infestations. Direct application to blooms may cause browning of petals. Marginal leaf burn may occur on Salvia, Dieffenbachia and Pteris Fern.	
	Ornamental Trees	Clearwing Moth Borers Ash Borer, Banded ash Clearwing, Dogwood borer, Lesser peachtree borer, Lilac borer, Oak borer, Peachtree borer, Rhododendron borer	1 to 2 qts. per 100 Gals.	Apply to the lower branches and trunks prior to adult emergence. Adult emergence varies according to pest species, host tree, environmental conditions and geographic location.
		Bark Beetles Dendroctonus spp., Ips spp., Elm bark beetles, Mountain pine beetle, Pine engravers, Turpentine beetles, Western pine beetle	2 to 5 qts. per 100 Gals.	Thorough coverage of bark is required for control.
		Coleopteran borers Bronze birch borer, Flatheaded apple-tree borer	2 to 5 qts. per 100 Gals.	
		For maximum residual control of the above listed pests	5.35 qts. per 100 Gals.	
	Nantucket Pine Tip Moth Coneworms* Seed Bugs*	4 to 8 Fl. Oz. per 100 Gals.	Begin application when adults appear. Repeat applications may be made on 5–7 day intervals as needed.	
Lawns (around residential, institutional, public, commercial and industrial buildings, parks, recreational areas and athletic fields)	Chinchbugs Pill Bugs Sod Webworm (See also list of pests under Pest control on outside surfaces and around buildings)	0.4 to 0.8 fl. oz. per 1000 sq. ft.	Apply using sufficient water to provide adequate coverage.	

*To control Coneworm, Seed Bugs—Use Astro® Insecticide at the following rates:
For high volume sprayers: Use 8 ounces in 100 gallons of water. Apply 5 to 10 gallons of finished spray per tree.
For low volume sprayers: Use 42 ounces in 100 gallons of water.
To control Webbing Coneworm—make first application within 1 week of female flower closure or peak pollen flight.
To control other coneworms and seed bugs—make first application within 30 days following flower closure.

Recommended Application Rates for Fruit and Nut Trees Around Residential Sites Only

Apply the appropriate amount of Astro insecticide (see table below) in 1 gallon of water per 436 sq. ft. Astro insecticide may be diluted and applied in greater volumes of water providing that the maximum application rates listed below are not exceeded on a per acre basis. For example: when attempting to control Navel Orangeworm on almonds using an application volume of 2 gallons per 436 sq. ft, the maximum dilution of Astro Insecticide is ½ teaspoon per 1 gallon.

TREE	PEST	RECOMMENDED RATE	CROP
Almond	Navel Orangeworm Peach Twig Borer	½ to 1 tsp. per 1 gal/436 sq. ft.	Do not harvest nuts within 7 days after application. Do not apply more than 2 tsp. per 436 sq. ft. during hull split. Do not apply more than 5 tsp. per 436 sq. ft. per year.
Apples	Green Fruitworm Oblique Banded Leafroller Plum Curculio Redbanded Leafroller Rosy Apple Aphid Spotted Tentiform Leafminer Tarnished Plant Bug White Apple Leafhopper	¼ to ½ tsp per 1 gal/436 sq. ft.	Do not apply more than 1½ tsp. per 436 sq. ft. per year.
Cherries	Green Fruitworm Lesser Peachtree Borer Plum Curculio Redbanded Leafroller Rose Chafer Tarnished Plant Bug	¼ to ½ tsp per 1 gal/436 sq. ft.	Do not harvest fruit within 3 days after application. Do not make more than 4 applications per year. Do not make more than 3 applications after petal fall.
Filberts	Filbertworm Oblique Banded Leafroller	½ to 1 tsp. per 1 gal/436 sq. ft.	Do not harvest nuts within 14 days after application. Do not apply more than 4 tsp. per 436 sq. ft. per year.
Peaches	Green Fruitworm Lesser Peachtree Borer Oriental Fruit Moth Peach Twig Borer Plum Curculio Rose Chafer Tarnished Plant Bug	¼ to ¾ tsp per 1 gal/436 sq. ft.	Do not harvest fruit within 14 days after application. Do not apply more than 3½ tsp. per 436 sq. ft. per year
Pears	Pear Psylla	½ to 1 tsp. per 1 gal/436 sq. ft.	Apply only during dormant through delayed dormant growth periods. Do not apply more than 2 tsp. per 436 sq. ft. per year.
Pistachios	Leaftooted Bugs Navel Orangeworm Peach Twig Borer Plant Bugs Stinkbugs	½ to 1 tsp. per 1 gal/436 sq. ft.	Nuts may be harvested on the day of application. Do not apply more than 2 tsp. per 436 sq. ft. per year. Do not apply after 10 percent hull split.

1fl. oz. = 2 tablespoons = 6 teaspoons.
Do not use household utensils to measure Astro Insecticide.

Astro insecticide is not for use on commercial fruit and nut trees.

Pest Control on Outside Surfaces and Buildings

Apply Astro® insecticide using a 0.5% emulsion as a residual spray to outside surfaces of buildings including, but not limited to, exterior siding, foundations, porches, window frames, eaves, patios, garages, refuse dumps, lawn areas adjacent or around private homes, duplexes, townhouses, condominiums, house trailers, apartment complexes, carports, garages, fence lines, storage sheds, barns, other residential structures, commercial, industrial and institutional buildings, soil, trunks of woody ornamentals and other areas where pests congregate or have been seen. Retreatment may be necessary to achieve and/or maintain control during periods of high pest pressure. Repeat application is necessary only if there are signs of renewed insect activity. Repeat application should be limited to no more than once per seven days.

Vinyl and Aluminum Siding: The application of Astro Insecticide to vinyl and aluminum siding (particularly lightly colored, aged, weathered or otherwise damaged) may result in staining, bleaching or discoloration. Factors such as extreme heat and direct sunlight can promote damage when using emulsifiable concentrates. Before applying Astro Insecticide to vinyl or aluminum siding, treat a small area and evaluate 30 minutes later to allow any potential staining to occur. Regardless of the test results, do not apply to vinyl or aluminum siding while exposed to direct sunlight or during the heat of the day.

Perimeter Treatment: Apply to a band of soil and vegetation 6 to 10 feet wide around and adjacent to the structure. Also, treat the foundation of the structure to a height of 2 to 3 feet. Use a spray volume of 2 to 10 gallons of emulsion per 1000 square feet. Higher volumes of water may be needed if mulch or leaf litter is present or foliage is dense. House siding may be treated if pests such as Gypsy moth adults and caterpillars, boxelder bugs, elm leaf beetles, earwigs or silverfish are present.

Applications to Outside Surfaces

Pest	Specific Instructions
Ants	Apply as a pinstream, as a fine/coarse, low pressure spray (20 psi or less), as a spot treatment or with a paintbrush. Treat where pests are found or entry points of the structure such as window and door frames and along the foundation.
Ant Mounds ¹	
Armyworm	
Fire Ants	
Bees	
Carpenter Bees	
Bark Beetles ³	
Borers ³	
Boxelder Bugs ²	
Centipedes	
Cockroaches	1 Drench Method: Apply 1-2 gallons of emulsion to each mound area by sprinkling the mound until it is wet and treat a 4 foot diameter circle around the mound. Use the higher volume for mounds larger than 12". For best results, apply in cool weather, such as in early morning or late evening hours, but not in the heat of the day.
Asian	
Cockroaches	
Crickets	
Mole Crickets	
Earwigs	
Elm Leaf	
Beetles ²	
Firebrats	
Fleas ⁴	
Ground Beetles	2 Boxelder Bugs, Elm Leaf Beetles, Gypsy Moth Caterpillars: Spray tree trunks, building siding or wherever pests congregate, thoroughly but not to the point of runoff.
Gypsy Moths (adults & Caterpillars) ²	
Millipedes	
Scorpions	
Silverfish	
Sowbugs	
Spiders	
Wasps	
Ticks ⁴	
Flies	
Carpenter Ants	3 Borers and Bark Beetles: To prevent infestation of trees and woody ornaments, spray the bark thoroughly but not to the point of runoff.
Chinchbugs ⁴	
Pill Bugs	
Sod Webworm	
	4 Fleas: Mix 1.6-3.2 oz. of Astro in 16 to 100 gallons of water and apply to 4000 square feet of lawn. Use the lower rate to knock down existing fleas and the higher rate where faster knockdown or greater residual is desired. For example:

Subsurface Injection of Astro to Flush Mole Crickets: **(In New York State, this product may NOT be used for subsurface injection).** To increase flushing of mole crickets with subsurface insecticide applications, use Astro with a companion mole cricket control product (such as Talstar PL Granular) and apply at the rate of 0.2 to 0.8 fluid ounces of Astro per 1,000 square feet. Applications must be made in accordance with the more restrictive of label limitations and precautions. No label application rates may be exceeded. This product cannot be used with any product with label prohibitions against such mixing.

Conditions of Sale and Limitation of Warranty and Liability:

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions beyond the control of FMC or Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold FMC and Seller harmless for any claims relating to such factors.

Seller warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the Directions for Use when used in accordance with the directions under normal conditions of use. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, FMC MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE SELECTION, PURCHASE, OR USE OF THIS PRODUCT. Any warranties, express or implied, having been made are inapplicable if this product has been used contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to (or beyond the control of) seller or FMC, and buyer assumes the risk of any such use.

To the extent consistent with applicable law, FMC or seller shall not be liable for any incidental, consequential or special damages resulting from the use or handling of this product. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF FMC AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF FMC OR SELLER, THE REPLACEMENT OF THE PRODUCT.

This Conditions of Sale and Limitation of Warranty and Liability may not be amended by any oral or written agreement.

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Material Safety Data Sheet

ASTRO® INSECTICIDE

MSDS #: 1547-A
Revision Date: 2013-09-30
Version 0.02



This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200
And Canadian Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	ASTRO® INSECTICIDE
Formula code	1547-A
Active Ingredient(s)	Permethrin
Synonyms	FMC 33297; 3-phenoxybenzyl (1RS,3RS;1RS,3SR)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate; (3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate
Chemical Family	Pyrethroid Pesticide
Recommended use:	Insecticide
<u>Manufacturer</u>	<u>Emergency telephone number</u>
FMC Corporation Agricultural Products Group 1735 Market Street Philadelphia, PA 19103 General Information: Phone: (215) 299-6000 E-Mail: msdsinfo@fmc.com	Medical Emergencies: 1 800 / 331-3148 (PROSAR - U.S.A. & Canada) 1 651 / 632-6793 (PROSAR - All Other Countries - Collect) For leak, fire, spill or accident emergencies, call: 1 800 / 424 9300 (CHEMTREC - U.S.A.) 1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

<u>Appearance</u>	amber liquid
<u>Physical state</u>	Liquid
<u>Odor</u>	Faint hydrocarbon
<u>Physical or Chemical Hazards</u>	
Flammable properties	Combustible liquid
<u>Potential health effects</u>	
Acute effects	
Eyes	May cause slight irritation.
Skin	Irritating to skin.

Inhalation	Inhalation of vapors in high concentration may cause irritation of respiratory system. May cause drowsiness and dizziness.
Ingestion	Harmful if swallowed. Potential for aspiration if swallowed. May cause drowsiness and dizziness. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Chronic effects	May cause adverse kidney effects. May cause adverse liver effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients

Chemical Name	CAS-No	Weight %
Permethrin	52645-53-1	36.8
1,1'-Biphenyl, bis(1-methylethyl)-	69009-90-1	20-30
Petroleum distillates, hydrotreated light	64742-47-8	10-20

4. FIRST AID MEASURES

Eye contact	Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
Skin contact	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.
Inhalation	Move person to fresh air. If person is not breathing, call 911 (within the U.S. and Canada) 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.
Ingestion	Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not induce vomiting or give anything by mouth to an unconscious person.
Notes to physician	Contains petroleum distillate. Vomiting may cause aspiration pneumonia. This product is a pyrethroid. If large amounts have been ingested, the stomach and intestines should be evacuated. Treatment is symptomatic and supportive. Digestible fats, oils, or alcohol may increase absorption and so should be avoided.

5. FIRE-FIGHTING MEASURES

<u>Flammable properties</u>	Combustible liquid
Flash Point	66-68 °C / 151-154 °F
Method	Tag Closed Cup
Sensitivity to Mechanical Impact	Not applicable
Sensitivity to Static Discharge	Not applicable
Suitable extinguishing media	Foam. Carbon dioxide (CO ₂). Dry chemical. Water spray or fog.
Protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus and full protective gear. Isolate fire area. Evaluate downwind.

NFPA

Health Hazard	0
Flammability	1

Stability 0
Special Hazards -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Isolate and post spill area. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see section 8.
Environmental precautions	Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.
Methods for cleaning up	Sweep up and shovel into suitable containers for disposal. Clean and neutralize spill area, tools and equipment by washing with bleach water and soap. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.
Other	For further clean-up instructions call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

7. HANDLING AND STORAGE

Handling	Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.
Storage	Keep in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep out of reach of children and animals. Store in original container only.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure guidelines

Chemical Name	British Columbia	Quebec	Ontario TWAEV	Alberta
Petroleum distillates, hydrotreated light 64742-47-8	TWA: 200 mg/m ³ Skin			

Occupational exposure controls

Engineering measures	Apply technical measures to comply with the occupational exposure limits. Ensure adequate ventilation, especially in confined areas. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.
Personal Protective Equipment	
General Information	If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.
Respiratory protection	For dust, splash, mist or spray exposures wear full-face elastomeric half mask respirator with appropriate cartridges and/or filters, which is approved for pesticides (U.S. NIOSH/MSHA, EU CEN or comparable certification organization).
Eye/face protection	For dust, splash, mist or spray exposure, wear chemical protective goggles or a face-shield
Skin and body protection	Wear long-sleeved shirt, long pants, socks, shoes, and gloves.
Hand protection	Protective gloves

Hygiene measures

Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum or using tobacco. Shower or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	amber liquid
Color	amber
Physical state	Liquid
Odor	Faint hydrocarbon
pH	4 @ 25 °C (5% solution)
Melting Point/Range	No information available.
Freezing point	No information available.
Boiling Point/Range	Not applicable
Flash Point	66-68 - 68 °C / 151-154 154 °F Tag Closed Cup
Evaporation rate	Not applicable
Flammable properties	Combustible liquid
Vapor pressure	No information available.
Vapor density	No information available.
Density	8.61 lb/gal
Specific Gravity	1.033 @ 201 °C
Water solubility	Emulsifies
Percent volatile	No information available.
Partition coefficient:	Not applicable
Viscosity	No information available.

10. STABILITY AND REACTIVITY

Stability	Stable.
Conditions to avoid	Excessive heat, Extreme risk of explosion by shock, friction, fire or other sources of ignition
Hazardous decomposition products	Chlorine, Hydrogen chloride, Carbon oxides, Aldehydes.
Hazardous polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute effects

Eye contact	May cause slight irritation
Skin contact	Irritating to skin
Ingestion	Large toxic doses of the formulated product, administered to laboratory animals, have produced central nervous system effects with symptoms that include hypersensitivity to touch and sound, tremors, and clonic convulsions. Vomiting after ingestion of this product may cause aspiration of aromatic hydrocarbons into the lungs, which may result in fatal pulmonary edema.
Inhalation	In animals overexposure has produced symptoms such as squinting eyes, irregular and rattling breathing, and ataxia. Inhalation of hydrocarbon vapors may cause headaches, dizziness, disturbances in vision, drowsiness, respiratory irritation, anesthesia, unconsciousness, and other central nervous system effects.
LD50 Dermal	> 2,000 mg/kg (rabbit)
LD50 Oral	998 mg/kg (Rat)
LC50 Inhalation:	> 4.3 mg/L 4 hr (Rat)
Sensitization	May cause sensitization of susceptible persons.

Chronic effects

Chronic Toxicity	May cause adverse kidney effects. May cause adverse liver effects.
Carcinogenicity	Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).
Mutagenicity	Permethrin: Did not show mutagenic effects in animal experiments.
Reproductive toxicity	Permethrin: No toxicity to reproduction.
Neurological Effects	Permethrin: Clinical signs of neurotoxicity include altered motor activity and FOB effects, with no signs of histopathology
Developmental Toxicity	Permethrin: Not teratogenic in animal studies
Target Organ Effects	Permethrin: Long-term feeding studies in animals resulted in increased liver and kidney weights, induction of the liver microsomal drug metabolizing enzyme system and histopathological changes in the lungs and liver.
<u>Chronic Toxicity - Other Ingredient(s)</u>	Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Permethrin (52645-53-1)				
Active Ingredient(s)	Duration	Species	Value	Units:
Permethrin	LC50	aquatic arthropods	0.02 - 7.6	µg/L
	LC50	Fish	0.05 - 315	µg/L
	LD50 Oral	Bobwhite quail	>5200	mg/kg
	LD50 Oral	Mallard duck	>5200	mg/kg
	LD50	Bee	0.026 - 0.17	µg/bee

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Permethrin		LC50 0.008 - 0.03 mg/L Pimephales promelas 96 h LC50 0.001 - 0.009 mg/L Pimephales promelas 96 h LC50= 0.015 mg/L Cyprinus carpio 96 h LC50 0.0052 - 0.0077 mg/L Cyprinus carpio 96 h LC50= 0.00079 mg/L Lepomis macrochirus 96 h LC50= 0.0108 mg/L Lepomis macrochirus 96 h LC50 0.00188 - 0.00336 mg/L Lepomis macrochirus 96 h LC50 0.00049 - 0.00097 mg/L Oncorhynchus mykiss 96 h LC50 0.0017 - 0.0048 mg/L Oncorhynchus mykiss 96 h		
Petroleum distillates, hydrotreated light		LC50= 45 mg/L Pimephales promelas 96 h LC50= 2.2 mg/L Lepomis macrochirus 96 h LC50= 2.4 mg/L Oncorhynchus mykiss 96 h		LC50 = 4720 mg/L 96 h

Environmental Fate

Permethrin (52645-53-1)		
Active Ingredient(s)	Type of Test	Result
Permethrin	Bioconcentration factor (BCF) Bluefill sunfish (Lepomis macrochirus)	535
	Half-life in soil	~30 days
	log Pow	6.1
	Mobility in soil	Not expected to reach groundwater
	Stability in water	Stable to hydrolysis over a wide range of pH values.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.

Contaminated packaging Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions.

14. TRANSPORT INFORMATION

DOT Not regulated for transportation if shipped in Non Bulk packaging. The classification below pertains to the shipment in Bulk packaging.

Packaging Type Bulk
Proper shipping name Combustible liquid, n.o.s.
UN/ID No NA1993
Hazard Class Combustible
Packing group III
Description NA1993, Combustible liquid, n.o.s. (Aromatic hydrocarbons), III

TDG The "Marine Pollutant" marking is only applicable when shipped by vessel or air, and is not applicable when shipped only by road or rail in Canada.

UN/ID No UN3082
Proper shipping name Environmentally hazardous substance, liquid, n.o.s.
Hazard Class 9
Packing group III
Marine pollutant Permethrin.
Description UN3082, Environmentally hazardous substance liquid n.o.s. (Permethrin), 9, III

ICAO/IATA

UN/ID No UN3082
Proper shipping name Environmentally hazardous substance, liquid, n.o.s.
Hazard Class 9
Packing group III
Marine pollutant Permethrin
Description UN3082, Environmentally hazardous substance liquid n.o.s. (Permethrin), 9, III
Limited quantity 914 / 450 L

IMDG/IMO

UN/ID No UN3082
Proper shipping name Environmentally hazardous substance, liquid, n.o.s.
Hazard Class 9
Packing group III

Marine pollutant Permethrin
Description UN3082, Environmentally hazardous substance liquid n.o.s. (Permethrin), 9, III

15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values %
Permethrin	52645-53-1	38.85	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard yes
Chronic Health Hazard yes
Fire Hazard yes
Sudden Release of Pressure Hazard no
Reactive Hazard no

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Chemical Name	U.S. - TSCA (Toxic Substances Control Act) - Section 8(d) - 716.120(a) - Health and Safety Reporting - List of Substances
1,1'-Biphenyl, bis(1-methylethyl)-	06/28/1984

International Regulations

Mexico - Grade
Canada

No information available.

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

WHMIS Hazard Class

D2B Toxic materials



16. OTHER INFORMATION

Revision Date: 2013-09-30
Reason for revision: No information available.

Disclaimer

FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. **NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN.** The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Use of this product is regulated by the U.S. Environmental Protection Agency (EPA). It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Further, since the conditions and methods of use are beyond the control of FMC Corporation, FMC corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

Prepared By

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End of Material Safety Data Sheet

Specimen Label



Conserve[®] SC

Turf and
Ornamental

Insect Control

®Trademark of Dow AgroSciences LLC

For control of listed pests such as thrips, lepidopterous larvae, foliage feeding worms, fire ants and other listed pests infesting apple and other pome fruits, artichoke, asparagus, banana, *Brassica* (cole) leafy vegetables, bulb vegetables, bushberries, caneberries, citrus, commercial aquatic plants, cucurbits, dates, fruiting vegetables, grape, herbs, leafy vegetables, leaves of legume vegetables, leaves of root and tuber vegetables, okra, ornamentals (herbaceous and woody) growing outdoors, in nurseries or in greenhouses, peppermint, pistachio, plantain, pomegranate, popcorn, root and tuber vegetables, spearmint, spices, stone fruits, strawberry, sweet corn, tree nuts, tropical tree fruits, tree farms or plantations and turfgrass

Active Ingredient:

spinosad (including Spinosyn A and Spinosyn D).....	11.6%
Other Ingredients.....	88.4%
Total.....	100.0%

Contains 1 lb of active ingredient per gallon.

EPA Reg. No. 62719-291

Precautionary Statements

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks

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

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

Environmental Hazards

This product is toxic to bees exposed to treatment during the 3 hours following treatment. Do not apply this pesticide to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period. This product is toxic to aquatic invertebrates. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or when disposing of equipment washwaters. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Apply this product only as specified on the label.

Directions for Use

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

Read all Directions for Use carefully before applying.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants in nurseries, greenhouses, and on sod and seed farms.

- Adults, children, and pets should not contact treated surfaces until the spray has dried.

Storage and Disposal

Do not contaminate water, food or feed by storage and disposal.

Pesticide Storage: Store in original container only. Avoid freezing. In case of leak or spill, contain material with absorbent materials and dispose as waste.

Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Nonrefillable containers 5 gallons or less:

Container Handling: Nonrefillable container. Do not reuse or refill this container.

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. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable containers 5 gallons or larger:

Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. 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% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Nonrefillable containers 5 gallons or larger:

Container Handling: Nonrefillable container. Do not reuse or refill this container.

Storage and Disposal (Cont.)

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. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

- Base insecticide use on comprehensive IPM programs.
- Contact your local extension specialist and/or manufacturer for insecticide resistance management and/or IPM recommendations for the specific site and resistant pest problem.
- For further information or to report suspected resistance, contact your local Dow AgroSciences representative by calling 800-253-3033.

Requirements for Use of Conserve SC in Greenhouses¹ and for Commercial Production of Herbaceous (Non-Woody) Ornamentals in Nurseries¹

¹A greenhouse is defined as a structure or space enclosed with a nonporous covering inside which plants are produced. A nursery is defined as a facility engaged in the outdoor production of plants.

- Regardless of the crop or pest being treated (excluding thrips, leafminers, spider mites and/or diamondback moths), do not apply Conserve SC more than 10 times in a 12-month period inside a greenhouse or a structure that can be altered to be closed or open. If Conserve SC is used for thrips, leafminer, spider mite and/or diamondback moth control, do not apply Conserve SC more than 6 times in a 12-month period inside a greenhouse or a structure that can be altered to be closed or open regardless if other insect pests are also being treated. It is a violation of federal law to use this product in a manner inconsistent with its labeling.
- For areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds), do not apply Conserve SC more than 10 times in a 12-month period per crop regardless of the pest being treated (excluding thrips, leafminers, spider mites and/or diamondback moths). If Conserve SC is used in areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds) for leafminer, spider mite and/or diamondback moth control, do not apply Conserve SC more than 6 times in a 12-month period per crop regardless if other insect pests are also being treated.
- Because generations of a specific pest may overlap, rotate insecticides and miticides and never apply more than 3 consecutive applications of Conserve SC or products containing the same active ingredient or with the same mode of action (same insecticide group). Use only specified label rates.
- Make localized area treatments of ornamental plants where pest problems are anticipated or occur rather than general area-wide broadcast treatments.
- Do not apply to seedlings of edible crops for transplanting or to any other stage of edible crops growing in greenhouses.

General Information

Use Conserve[®] SC Turf and Ornamental insect control, a fermentation-derived insect control agent, for control of listed pests such as thrips, lepidopterous larvae, foliage feeding worms, and fire ants and other listed pests.

General Use Precautions

- Do not treat pets.
- Do not graze livestock in treated areas.
- Do not feed treated grass cuttings (hay) or seed screenings to livestock or use hay for livestock bedding.
- Do not apply directly to fish pools and other bodies of water that may contain fish.
- **Chemigation:** Conserve SC may be applied through properly equipped sprinkler irrigation systems in the following crops: field grown gladiolus produced for cut flowers, field grown roses, field grown Dutch iris, and field grown delphinium. Do not apply this product by chemigation to any other crop except as specified on Dow AgroSciences supplemental labeling. Do not apply to the above listed crop(s) through any other type of irrigation system.
- Conserve SC may be aerially applied to commercially grown ornamentals only. Do not aerially apply this product to any other crop except as specified on Dow AgroSciences approved supplemental labeling.
- Do not apply to seedlings of edible crops for transplanting or to any other stage of edible crops growing in greenhouses.

Integrated Pest Management (IPM) Programs

Conserve SC is recommended for IPM programs in labeled crops. Other than reducing the target pest species as a food source, Conserve SC does not have a significant impact on certain parasitic insects or the natural predaceous arthropod complex in treated crops including ladybird beetles, lacewings, minute pirate bugs, and predatory mites. The feeding activities of these beneficials will aid in natural control of other insects and reduce the likelihood of secondary pest outbreaks. If Conserve SC is tank mixed with any insecticide that reduces its selectivity in preserving beneficial insects, the full benefit of Conserve SC in an IPM program may be reduced.

Insecticide Resistance Management (IRM)

Conserve SC contains spinosad, a Group 5 insecticide. Insect/mite biotypes with acquired resistance to Group 5 insecticides may eventually dominate the insect/mite population if Group 5 insecticides are used repeatedly in the same area, or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by Conserve SC or other Group 5 insecticides. Currently, only spinetoram and spinosad active ingredients are classified as Group 5 insecticides. These two insecticide active ingredients share a common mode of action and must not be rotated with each other for control of pests listed on this label. Spinetoram and spinosad may be rotated with all other labeled insecticide active ingredients.

To delay development of insecticide resistance, the following practices are recommended:

- Carefully follow the specific label guidelines within the Use Direction sections of this label, especially in regard to IRM recommendations.
- Avoid use of the same active ingredient or mode of action (same insecticide group) on consecutive generations of insects. However, multiple applications to reduce a single generation are acceptable. Treat the next generation with a different active ingredient that has a different mode of action or use no treatment for the next generation.
- Avoid using less than labeled rates of any insecticide when applied alone or in tank mixtures.
- Applications should be targeted against early developmental stages of the pest whenever possible.

Mixing Directions

Shake Well Before Use – Avoid Freezing

Conserve SC - Alone: Fill the spray tank with water to about 1/2 of the required spray volume. Start agitation and add the required amount of Conserve SC. Continue agitation while mixing and filling the spray tank to the required spray volume. Maintain sufficient agitation during application to ensure uniformity of the spray mix. Do not allow water or spray mixture to back-siphon into the water source.

Conserve SC - Tank Mix: When tank mixing Conserve SC with other materials, conduct a compatibility test (jar test) using relative proportions of tank mix ingredients prior to mixing ingredients in the spray tank. Vigorous, continuous agitation during mixing, filling, and throughout application is required for all tank mixes. Sparger pipe or mechanical agitators generally provide the most effective agitation in spray tanks. To prevent foaming in the spray tank, avoid stirring or splashing air into the spray mixture.

Mixing Order for Tank Mixes: Fill the spray tank with water to 1/4 to 1/3 of the required spray volume. Start agitation. Add different formulation types in the order indicated below, allowing time for complete dispersion and mixing after addition of each product. Allow extra dispersion and mixing time for dry flowable products.

Add different formulation types in the following order:

1. Water dispersible granules and dry flowables
2. Wettable powders
3. Conserve SC and other suspension concentrates

Maintain agitation and fill spray tank to 3/4 of total spray volume. Then add:

4. Emulsifiable concentrates and water-based solutions
5. Spray adjuvants

Finish filling the spray tank. Maintain continuous agitation during mixing, final filling, and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be resuspended before spraying is resumed. A sparger pipe agitator is particularly useful for this purpose.

Premixing: Dry and flowable formulations may be premixed with water (slurried) and added to the spray tank through a 20 to 35 mesh screen. This procedure assures good initial dispersion of these formulation types.

Spray Tank pH: A spray tank pH between 6.0 and 9.0 is suggested to achieve maximum performance of Conserve SC. If the water source is outside of this pH range, or tank mixing other pesticides, adjuvants, or foliar nutrients cause the pH to fall outside this range, consider adjusting the spray tank pH to be between 6.0 and 9.0 before adding Conserve SC. To do this, add all other tank mix components first, then check the spray tank pH, adjust if desired, and then add Conserve SC. If you require additional information on how to adjust spray tank pH, contact your Dow AgroSciences representative.

Application Directions

Aerial Application

Conserve SC may be aerially applied to commercially grown ornamentals only. Aerial or ground applications in production agriculture or directed ground applications to individual plants are permitted. Do not make aerial applications in immediate proximity of residential, commercial, government, institutional or other structures where people may be present including homes, apartments, offices, churches, schools, and businesses. Aerial applicators should evaluate conditions existing at the time of application and make appropriate adjustments to reduce drift. In urban areas, however, use is limited to directed ground applications. Do not aerially apply this product to any other crop except as specified on Dow AgroSciences approved supplemental labeling.

Apply in spray volume of 5 gallons or more per acre (10 gallons or more per acre for trees, vines or orchard crops). Nozzle configuration should provide a medium to fine droplet size per ASABE S-572 standard (see USDA-ARS or NAAA handbook). Guidance for ASABE S-572 nozzle configuration can be found at the following web site: www.cppproductsinc.com. Boom length must be less than 75% of wing or 85% of rotor span and swath adjustment (offset) to compensate for crosswinds. Observe minimum safe application height (maximum 12 feet for ag canopies). Use GPS equipment, swath markers or flagging to ensure proper application to the target area. Configure the boom nozzle used (e.g., at NAAA Fly-In) for both crosswind and near parallel winds. If application is made parallel to the wind direction, adjust swath width downward. Use swath adjustment (offset) to compensate for crosswinds. Do not apply under completely calm wind conditions. It is best to apply when wind speed is between 2 to 10 mph. Under conditions of low humidity and high temperatures, adjust spray volume and droplet size upward to compensate for evaporation of spray droplets. Insect control by aerial application may be less than control by ground application because of reduced coverage.

Chemigation Application

Conserve SC may be applied through properly equipped sprinkler irrigation systems in the following crops: field grown gladiolus produced for cut flowers, field grown roses, field grown Dutch iris, and field grown delphinium. Do not apply this product by chemigation to other labeled crops except as specified in Dow AgroSciences supplemental labeling. Do not apply to the above listed crop(s) through any other type of irrigation system.

Directions for Sprinkler Chemigation: Apply Conserve SC only through overhead sprinkler irrigation systems including center pivot, lateral move, end tow, side (wheel) roll, traveler, solid set, micro sprinkler, or hand move. Do not apply this product through any other type of irrigation system. Sprinkler systems that deliver a low coefficient of uniformity such as certain water drive units are not recommended.

For continuously moving systems, the mixture containing Conserve SC must be injected continuously and uniformly into the irrigation water line as the sprinkler is moving. If continuously moving irrigation equipment is used, apply in no more than 0.25 inch of water. For irrigation systems that do not move during operation, apply in no more than 0.25 inch of irrigation immediately before the end of the irrigation cycle.

Chemigation Equipment Preparation: Follow these use directions when this product is applied through sprinkler irrigation systems. Thoroughly clean the chemigation system and tank of any fertilizer or chemical residues, and dispose of the residues according to state and federal laws. Flush the injection system with soap or a cleaning agent and water. Determine the amount of Conserve SC needed to cover the desired acreage. Mix according to instructions in the Mixing Directions section above. Continually agitate the mixture during mixing and application.

Chemigation Equipment Calibration: In order to calibrate the irrigation system and injector to apply the mixture containing Conserve SC, determine the following: 1) Calculate the number of acres irrigated by the system; 2) Calculate the amount of product required and premix; 3) Determine the irrigation rate and determine the number of minutes for the system to cover the intended treatment area; 4) Calculate the total gallons of insecticide mixture needed to cover the desired acreage. Divide the total gallons of insecticide mixture needed by the number of minutes (minus time to flush out) to cover the treatment area. This value equals the gallons per minute output that the injector or eductor must deliver. Convert the gallons per minute to milliliters or ounces per minute, if needed. Calibrate the injector system with the system in operation at

the desired irrigation rate. It is suggested that the injection pump/system be calibrated at least twice before operation, and the system should be monitored during operation.

Chemigation Equipment Requirements:

- The system must contain an air gap, or approved backflow prevention device, a functional check valve, vacuum relief valve (including inspection port), and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow. Refer to the American Society of Agricultural Engineer's Engineering Practice 409 for more information or state specific regulations.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- The pesticide injection pipeline must also contain a functional normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection when the water pump motor stops.
- The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- To insure uniform mixing of the insecticide in the water line, inject the mixture in the center of the pipe diameter or just ahead of an elbow or tee in the irrigation line so that the turbulence created at those points will assist in mixing. The injection point must be located after all back flow prevention devices on the water line.
- The tank holding the insecticide mixture should be free of rust, fertilizer, sediment, and foreign material and equipped with an in-line strainer situated between the tank and the injection point.

Chemigation Operation: Start the water pump and irrigation system and let the system achieve the desired pressure and speed before starting the injector. Check for leaks and uniformity and make repairs before any chemigation takes place. Start the injection system and calibrate according to manufacturer's specifications. This procedure is necessary to deliver the desired rate per acre in a uniform manner. When the application is finished, allow the entire irrigation and injector system to be thoroughly flushed clean before stopping the system.

Chemigation Precautions:

- Crop injury, lack of effectiveness or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.
- If you have questions about calibration, contact state extension service specialists, equipment manufacturers or other experts.
- Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
- A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall operate the system and make necessary adjustments should the need arise and continuously monitor the injection.

Chemigation Restrictions:

- Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, back flow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the flow outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection.
- The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and

constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

- Do not connect an irrigation system used for pesticide application (including greenhouse systems) to a public water system unless the pesticide label prescribed safety devices for public water systems are in place with current certification. Specific local regulations may apply and must be followed.
- Do not apply when wind speed favors drift beyond the area intended for treatment. End guns must be turned off during the application if they irrigate nontarget areas.
- Do not allow irrigation water to collect or run off and pose a hazard to livestock, wells, or adjoining crops.
- Do not enter treated area during the reentry interval specified in the Agricultural Use Requirements section of this label unless required PPE is worn.
- Do not apply through sprinkler systems that deliver a low coefficient of uniformity such as certain water drive units.

Uses

Commercial Aquatic Plant Production

Use Conserve SC in commercial aquatic plant production for control of lepidopterous pests such as China mark moth (*Nymphuliea daeckalis*) and light brown apple moth. This use is restricted to commercial facilities that utilize fully contained above or in-ground pools or containers for the purpose of commercial production of aquatic ornamental plants.

Application Timing: Apply when lepidopterous larvae are present. Applications at 2-week intervals, two to three times per year, have been shown to be effective when larvae are present.

Application Rate: Prepare a spray mixture containing 0.12 fl oz (3.5 mL) of Conserve SC per gallon of water. Apply the spray mixture to aquatic foliage at a rate not to exceed 1 gallon of spray mixture per 100 sq ft of water surface area using suitable hand or power-operated application spray equipment.

Phytotoxicity: Conserve SC has been tested alone on a wide variety of herbaceous and woody ornamental plants without phytotoxic symptoms. However, because it is not possible to test all possible tank mix combinations (including adjuvants) and ornamental plant species, varieties, and cultivars, and because environmental factors and varietal and plant stage of growth may affect phytotoxic expression, it is recommended that a small group of test plants be treated at the anticipated use rate of Conserve SC either alone or in tank mix combinations and observed for at least 5 to 7 days to determine phytotoxicity before treating large numbers of those plants. **Note:** The user assumes responsibility for determining if Conserve SC is safe to treated plants when applied either alone or in tank mixtures under commercial growing conditions.

Specific Use Restrictions:

- Do not apply this product to aquatic environments (such as ponds; landscape pools or containers or ponds; lakes, rivers or streams) other than fully contained commercial production pools or containers.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.

- If water treated with Conserve SC needs to be discharged due to cleaning, repairing, or other reasons, discharge is allowed only onto land. Do not discharge water treated with Conserve SC from commercial production pools or containers into surface water.

Fire Ants – Mound Application in Turfgrass and Ornamentals, in Greenhouses, and in Other Outdoor Areas

Dilution Rate (fl oz)	
Conserve SC per 1 gallon	Conserve SC per 10 gallons
0.1 (2.96 mL)	1 (29.6 mL)

Apply diluted Conserve SC to individual fire ant mounds as a drench application. Use 1 to 2 gallons per mound depending upon the mound size. For mounds less than 8 inches in diameter, use 1 gallon of dilution per mound. Use a higher volume, up to 2 gallons, on mounds 8 inches or larger in diameter. Apply approximately 10% of the dilution volume around the perimeter of the mound out to about 12 inches and pour the remaining volume directly on the mound. Do not disturb mounds prior to application. If possible, apply following a recent rainfall. For best results, apply in cool weather, 65 to 85°F, or in early morning or late evening hours. Treat new mounds as they appear. Do not use pressurized sprays as they may disturb the ants and cause migration, reducing control.

Home Gardens

Add the required amount of Conserve SC to the specified amount of water, mix thoroughly, and apply uniformly to plant foliage to point of runoff, but do not exceed 3 gallons of spray per 1000 sq ft. Uniform coverage of both upper and lower leaf surfaces is essential for effective insect control. Mix only as much spray as needed for a single treatment. Do not use kitchen utensils for measuring. Keep measuring utensils with product and away from children.

Unit of Measure	Amount of Conserve SC to Use per 100 Gallons of Spray
Fluid Ounces (fl oz)	8 fl oz
Milliliters (mL)	236.6 mL
Tablespoons (Tbs)	16 Tbs
Teaspoons (tsp)	48 tsp

Apply when listed pests are present. Target applications against early insect developmental stages whenever possible. Repeat applications may be made as indicated in the table below, but follow resistance management guidelines.

In the state of Georgia, do not apply Conserve SC to: broccoli raab, Chinese cabbage (bok choy), collards, kale, mizuna, mustard greens, mustard spinach, rape greens.

Crops	Pests Controlled	Maximum Number of Applications per Season	Minimum Reapplication Interval (Days)	Preharvest Interval (Days)
apple and other pome fruits (crop group 11) including crabapples, loquat, mayhaw, pears, and quince	codling moth European grapevine moth leafminers leafrollers light brown apple moth oriental fruit moth thrips tufted apple budmoth	5	10	7
asparagus (post-harvest to protect ferns)	asparagus beetles	3	7	60
banana and plantain	banana rust thrips caterpillars Hawaiian flower thrips	4	7	56
Brassica (cole) leafy vegetables (crop group 5) including broccoli, broccoli raab, Brussels sprouts, cabbage, cauliflower, cavalo, Chinese broccoli, Chinese cabbage (bok choy), Chinese cabbage (napa), Chinese mustard cabbage (gai choy), collards, kale, kohlrabi, mizuna, mustard greens, mustard spinach, and rape greens	armyworms cabbage looper diamondback moth flea beetle (suppression) imported cabbage worm leafminers thrips worms (caterpillars)	5	4	1
bulb vegetables (crop group 3) including dry bulb onion, garlic, great-headed (elephant) garlic, green onion, leek, shallot, and welch onion	armyworms dipteran leafminers European corn borer flea beetle loopers thrips (suppression)	5	4	1
bushberries (subgroup 13B) including blueberry, currant, elderberry, gooseberry, huckleberry, juneberry, lingonberry, and salal	armyworms European grapevine moth fireworms fruitfly (suppression) fruitworms leafrollers light brown apple moth loopers thrips	5	6	3
caneberries (subgroup 13A) including blackberry, black raspberry, loganberry, red raspberry, and cultivars and/or hybrids of these	armyworms European grapevine moth fireworms fruitworms leafrollers light brown apple moth loopers sawfly	5	5	1
citrus (crop group 10) including grapefruit, lemons, limes, oranges, and tangerines	katydids leafminers thrips worms (caterpillars)	5	6	1
cucurbits (crop group 9) including cucumber, edible gourds, muskmelons (cantaloupe, honeydew, etc.), pumpkin, summer and winter squash, and watermelon	armyworm leafminers loopers thrips worms (caterpillars)	5	5	all except cucumber, 3 cucumber, 1
dates	carob moth	3	7	7
fruiting vegetables (crop group 8) and okra including eggplant, ground cherry, pepino, pepper, tomatillo, and tomato	Colorado potato beetle European corn borer flea beetle leafminers loopers thrips worms (caterpillars)	5	4	1
grape	European grapevine moth leafrollers light brown apple moth thrips worms (berry moth)	5	5	7

Crops (Cont.)	Pests Controlled	Maximum Number of Applications per Season	Minimum Reapplication Interval (Days)	Preharvest Interval (Days)
herbs (subgroup 19A) including angelica, balm, basil, borage, burnet, camomile, catnip, chervil (dried), chive, chive (Chinese), cilantro, cilantro (leaf), clary, coriander (leaf), costmary, curry (leaf), dillweed, horehound, hyssop, lavender, lemongrass, lovage (leaf), marigold, marjoram, nasturtium, parsley (dried) pennyroyal, rosemary, rue, sage, savory (summer and winter), sweet bay, tansy, tarragon, thyme, wintergreen, woodruff, and wormwood	leafminers loopers thrips worms (caterpillars)	5	5	1
leafy vegetables (crop group 4) and watercress including amaranth, arugula, cardoon, celery, celtuce, chervil, Chinese celery, Chinese spinach, corn salad, dandelion, dock, edible chrysanthemum, endive (escarole), Florence fennel, garden cress, garden purslane, garland chrysanthemum, head lettuce, leaf lettuce, leafy amaranth, New Zealand spinach, orach, parsley, radicchio (red chicory), rhubarb, spinach, Swiss chard, tampala, upland cress, vine spinach, watercress, winter cress, winter purslane, and yellow rocket	diamondback moth leafminers loopers thrips worms (caterpillars)	5	4	1
leaves of legume vegetables (subgroup 7A) and turnip greens including any cultivar of bean and field pea (except soybean)	diamondback moth leafminers loopers thrips worms (caterpillars)	5	4	3
leaves of root and tuber vegetables (crop group 2) including bitter cassava, black salsify, carrot, celeriac (celery root), chicory, dasheen (taro), edible burdock, garden beet, oriental radish (daikon), parsnip, radish, rutabaga, sugar beet, sweet cassava, sweet potato, tanier, true yam, turnip, turnip greens, and turnip-rooted chervil	diamondback moth leafminers loopers thrips worms (caterpillars)	5	4	3
legume vegetables (succulent and dried beans and peas) (crop group 6) including blackeyed pea, chickpea, cowpea, crowder pea, edible-pod pea, English pea, fava bean, field bean, field pea, garbanzo bean, garden pea, green pea, kidney bean, lentil, lima bean, lupins, mungbean, navy bean, pigeon pea, pinto bean, runner bean, snap bean, snow pea, sugar snap pea, tepary bean, wax bean, and yardlong bean	borers leafminers loopers thrips worms (caterpillars)	5	5	succulent, 3 dried, 28
peppermint and spearmint	armyworms cutworms leafminers loopers thrips (suppression)	4	4	7
pomegranate	fruit fly leafrollers moths naval orangeworm peach twig borer thrips	3	10 - 14	7
root and tuber vegetables (crop group 1) and artichoke including garden beet and sugar beet,	armyworms European corn borer flea beetle leafminers loopers thrips	4	7	3
black salsify, carrot, chicory, ginseng, horseradish, parsnip, salsify, skirret, Spanish salsify, turnip-rooted chervil, and turnip-rooted parsley		4	5	3
celeriac, edible burdock, oriental radish, radish, rutabaga, turnip and other root vegetables not specifically listed		3	5	3
arracacha, arrowroot, bitter cassava, chayote root, Chinese artichoke, chufa, dasheen, edible canna, ginger, Jerusalem artichoke, leren, potato, sweet cassava, sweet potato, tanier, true yam, tumeric, and yam bean	artichoke plume moth Colorado potato beetle corn borers leafminers light brown apple moth loopers thrips worms (caterpillars)	4	7	7
artichoke		4	7	2

Crops (Cont.)	Pests Controlled	Maximum Number of Applications per Season	Minimum Reapplication Interval (Days)	Preharvest Interval (Days)
spices (subgroup 19B) including allspice, anise (seed), annatto (seed), black caraway, caper (buds), caraway, cardamom, cassia (buds), celery (seed), cinnamon, clove (buds), common fennel, coriander (seed), culantro (seed), cumin, dill (seed), Florence fennel (seed), fenugreek, grains of paradise, juniper (berry), lovage (seed), mace, mustard (seed), nutmeg, poppy (seed), saffron, star anise, vanilla, and white pepper	flea beetle leafminers thrips	5	10	14
stone fruits (crop group 12) including apricot, cherries, nectarine, peach, plum, and prune	borers European grapevine moth fruit flies fruitworm leafminers leafrollers light brown apple moth oriental fruit moth thrips worms (caterpillars)	5	7	apricot, all except cherry, peach, plum, prune, nectarine, 14 cherry, plum, prune, 7 nectarine, peach 1
strawberry	armyworms European grapevine moth leafrollers light brown apple moth thrips	5	5	1
sweet corn and popcorn (for earworms, treat silk frequently as it grows)	corn borers earworm worms (caterpillars)	5	3	1
tree nuts (crop group 14) and pistachio including almonds, cashew, chestnut, filbert (hazelnut), macadamia, pecans, and walnuts	codling moth filbert worm husk fly (suppression) leafrollers light brown apple moth navel orangeworms peach twig borer pecan nut casebearer redhumped caterpillar shuckworms webworms	3	7	1
tropical tree fruits including, acerola, atemoya, avocado, biriba, black sapote, canistel, cherimoya, custard apple, feijoa, guava, ilama, jaboticaba, longan, lychee, mamey sapote, mango, papaya, passionfruit, pulasan, rambutan, sapodilla, soursop, Spanish lime, star apple, starfruit, sugar apple, ti leaves, wax jambu (wax apple), and white sapote	suppression of European grapevine moth katydid leafrollers light brown apple moth thrips worms (caterpillars)	2	7	1

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides. If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For **thrips**, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Consult your local Dow AgroSciences representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Ornamentals (Herbaceous and Woody) Growing Outdoors, in Nurseries (Including Conifer Seed Orchards), or in Greenhouses

Pests	Conserve SC fl oz/gallon	Conserve SC fl oz/100 gallons	Conserve SC fl oz/acre
chrysomelid leaf feeding beetles, such as: elm leaf (1) viburnum leaf (larvae) willow leaf (1) European grapevine moth lepidopterous larvae, such as: azalea caterpillar bagworm beet armyworm cabbage looper California oakworm cankerworm diamondback moth eastern tent caterpillar fall webworm Florida fern caterpillar geranium budworm gypsy moth light brown apple moth oblique banded leafroller oleander caterpillar orange striped oakworm spruce budworm tussock moths (hickory, whitemarked) western tent caterpillar winter moth yellownecked caterpillar (2) sawfly larvae, such as: European pine pear redheaded pine shore fly thrips (exposed) in greenhouse settings, such as: (3) chilli Cuban laurel western flower	0.06 (1.77 mL)	6 (177 mL)	24 (709.8 mL)
dipterous gall midges pinyon spindlegall thrips (exposed) in outdoor settings, such as: (3) chilli Cuban laurel western flower	0.1 (2.96 mL)	11 (325.3 mL)	44 (1301 mL)
dipterous leafminers, such as: serpentine (4) emerald ash borer (5) lewis mites Nantucket pine tip moth spider mites, such as: spruce two-spotted (6) (see 6 below for mite suppression/control expectations)	0.2 (5.92 mL)	22 (650.6 mL)	88 (2602 mL)

Numbers in parentheses (-) refer to Pest-Specific Use Directions.

Pest-Specific Use Directions (for pest control in the greenhouse or nursery, also refer to Insecticide Resistance Management for Greenhouses):

- Elm leaf beetle** and **willow leaf beetle** (adults and larvae): For effective control, apply in the spring or early summer when feeding is observed.
- For effective control of the following lepidopterous larvae:
 - Bagworms:** Apply when bags are small and larvae are actively feeding.
 - Beet armyworms:** Apply when larvae are small.
 - Diamondback moth:** If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications.
 - Gypsy moth larvae:** Apply when larvae are small and all eggs have hatched.
 - Spruce budworms:** Apply when larvae are exposed and actively feeding.
 - Tent caterpillars and fall webworms:** Apply early when webs are first observed and direct the spray into the web and surrounding foliage within at least 3 feet of the nest.
- Exposed thrips (chilli, Cuban laurel and western flower):** For effective control, apply early at first signs of infestation and repeat until infestation is controlled, but follow resistance management guidelines. For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications.
- Serpentine leafminers:** For effective control, apply early when stippling or mining of leaves is first observed and repeat until infestation is controlled, but follow resistance management guidelines. Three sequential applications at 7-day intervals can maximize control. Addition of a nonionic spray adjuvant such as DYNE-AMIC spray adjuvant at 0.1% v/v in greenhouse settings (see Phytotoxicity) has been shown to enhance control of leafminers (follow surfactant manufacturer's label directions).
- Apply to foliage and bark of tree when adult **emerald ash borer** are first observed emerging from the bark or when adult emerald ash borer are first noticed feeding on the leaves of the tree. Reapply every 7 to 10 days until no additional adult emerald ash borer activity is observed. Application to trees already heavily infested may not prevent the eventual loss of the tree due to existing pest damage and tree stress.

6. **Spruce spider mites and two-spotted spider mites:** Apply when spider mites are first observed prior to webbing and before mite populations have become severe. Reapply after 7 to 10 days (3 to 5 days in greenhouses and structures that can be altered to be closed or open) to contact newly hatched nymphs and repeat until infestation is managed. **Uniform coverage of both upper and lower leaf surfaces is critical.**

Note: Control of spider mites with Conserve SC in certain research trials has been variable. The variability between these evaluations is not well understood but may be due to late application timing when mite populations and webbing were severe, poor spray coverage of both the upper and lower leaf surfaces, or interaction of the leaf surface with residues of Conserve SC. Addition of a nonionic spray adjuvant such as Activate Plus, DYNE-AMIC, Joint Venture, Phase, and Thoroughbred at 0.1% v/v in greenhouse settings and at label rates in outdoor settings (see Phytotoxicity) has been shown to improve spray coverage and enhance control of spider mites (follow surfactant manufacturer's label directions).

Application Method: Dilute Conserve SC in water and apply using suitable hand or power-operated application equipment (such as portable pump-up, backpack, hydraulic, boom) in a manner to provide complete and uniform plant coverage. Use of Conserve SC in lath and shadehouses is permitted.

Application Rate: Conserve SC may be used up to a maximum labeled rate of 0.2 fl oz per gallon (22 fl oz per 100 gallons, 88 fl oz per acre) per application on trees and ornamentals as a general treatment regardless of the target insect pest. Use pest specific rates when a single insect pest or group of insect pests within a rate category is the only intended target.

Spray Volume: Attempt to penetrate dense foliage, but avoid over-spraying to the point of excessive runoff. Uniform coverage of both upper and lower leaf surfaces is critical for effective insect control.

Tank Mix: Conserve SC may be tank mixed with other insect control products if broader spectrum insect control is required. When using tank mixtures, also follow all label directions of the mixing partner(s).

Phytotoxicity: Conserve SC has been tested alone on a wide variety of herbaceous and woody ornamental plants without phytotoxic symptoms. However, because it is not possible to test all possible tank mix combinations (including adjuvants) and ornamental plant species, varieties, and cultivars, and because environmental factors and varietal and plant stage of growth may affect phytotoxic expression, it is recommended that a small group of test plants be treated at the specified use rate of Conserve SC either alone or in tank mix combinations and observed for at least 5 to 7 days to determine phytotoxicity before treating large numbers of those plants. **Note:** The user assumes responsibility for determining if Conserve SC is safe to treated plants when applied either alone or in tank mixtures under commercial growing conditions. Research has demonstrated that some spotting of African violet (*Saintpaulia*) flowers may occur.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides. If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For **thrips** and **diamondback moth**, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Consult your local Dow AgroSciences representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Specific Use Restrictions:

- **Minimum Treatment Interval:** Except for greenhouses and structures that can be altered to be closed or open, do not make applications less than 7 days apart.

Tree Farms or Plantations

Conifers, including Christmas trees, and deciduous trees

Pests	Conserve SC (fl oz/acre)
lepidopterous larvae, such as: bagworm cone moth coneworm fall webworm gypsy moth hemlock looper jackpine budworm pine tip moth redhumped caterpillar spruce budworm tent caterpillar tussock moths light brown apple moth sawfly larvae, such as: European pine pear redheaded pine	4 – 16 (118.3 – 473.2 mL)

Application Timing: Time applications to reach larvae when small or just hatching. A 7-day re-treatment schedule may be necessary to maintain control. Consult with your Dow AgroSciences representative, state agricultural experiment station, certified pest control advisor, or extension specialist for information on application timing for specific pests in your area.

Application Rate: The rate of Conserve SC applied per acre will depend upon tree size and severity of infestation. Use a higher rate in the rate range for large trees or heavy infestations. Apply in sufficient volume to ensure thorough coverage.

Specific Use Restrictions:

- Do not apply more than a total of 58 fl oz of Conserve SC (0.45 lb ai spinosad) per acre per year.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.

Turfgrass

Pests	Conserve SC fl oz/1000 sq ft	Conserve SC fl oz/acre
armyworms-small larvae such as: fall armyworm (1) sod webworms (including tropical) (2)	0.25 (7.4 mL)	10 (296 mL)
cutworms-small larvae such as: black cutworm variegated cutworm (1,2)	0.8 (23.7 mL)	35 (1035 mL)
annual bluegrass weevil armyworms-large larvae such as: fall armyworm (1) black turfgrass ataenius (adults) cutworms-large larvae such as: black cutworm variegated cutworm (1,2) fleas, such as: cat flea (3)	1.2 (35.5 mL)	52 (1538 mL)

Numbers in parentheses (-) refer to Pest-Specific Use Directions.

Pest-Specific Use Directions:

1. **Fall armyworm** and **black cutworm** larvae: Use the lower rate for control of light infestations of small larvae (less than 3/4 of an inch for armyworms, an inch or less for cutworms); use the higher rate for control of heavy infestations and large larvae (3/4 of an inch or larger for armyworms, larger than an inch for cutworms). Applications for **fall armyworms** during the early morning or late afternoon can maximize control. For best results, delay watering or mowing of the treated area for 12 to 24 hours after treatment.
2. **Black cutworm**, **sod webworm**, and **tropical sod webworm** larvae: Applications during the late afternoon or early evening can maximize control. For best results, delay watering or mowing of the treated area for 12 to 24 hours after treatment.
3. Control of **cat fleas**: Apply early or late in the day since effective control requires direct contact of adults and larvae with the dilute spray prior to drying. For best results, make a second application at 7 to 14 days to control adults that have emerged from pupae that may have been present during the initial treatment. Thorough spray coverage is necessary for outside areas frequented by pets. **Do not treat pets with Conserve SC.**

Application Method: Dilute Conserve SC in water and apply using suitable hand or power-operated application equipment (such as portable pump-up, backpack, hydraulic, boom, turf spray gun).

Application Rate: Conserve SC may be used up to a maximum labeled rate of 1.2 fl oz per 1000 sq ft (52 fl oz per acre) per application on turfgrass as a general treatment regardless of the target insect pest. Use pest specific rates when a single insect pest or group of insect pests within a rate category is the only intended target.

Tank Mix: Conserve SC may be tank mixed with other insect control products if broader spectrum insect control is required. When using tank mixtures, also follow all label directions of the mixing partner(s).

Resistance Management: Do not apply more than three times in any 21-day period. Whenever Conserve SC is applied up to three times in succession, this should be followed by no use of Conserve SC for a 21-day period or rotation to another insecticide class. Do not make more than six applications per season.

Specific Use Restrictions:

- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT PERMITTED BY LAW, Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

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To the extent permitted by law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used.

To the extent permitted by law, Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. In no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or Limitation of Remedies in any manner.

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Label Code: D02-090-013
Replaces Label: D02-090-012
LOES Number: 010-00073

EPA accepted 01/27/11

Revisions:

1. Added all pome fruits, asparagus, banana and plantain, bulb vegetables, bushberries, caneberries, dates, grape, herbs, leaves of legume vegetables, leaves of root and tuber vegetables, okra, peppermint, pistachio, pomegranate, popcorn, root vegetables, spearmint, spices, strawberry, tree nuts, tropical tree fruits, turnip greens, and watercress.
2. Added codling moth, European grapevine moth, oriental fruit moth, thrips, and tufted apple budmoth to apple and other pome fruits.
3. Added armyworms, cabbage looper, diamondback moth, flea beetle, imported cabbage worm, and thrips to Brassica.
4. Added armyworm and loopers to cucurbits.
5. Added European corn borer, flea beetle, and loopers to fruiting vegetables and okra.
6. Added diamondback moth, loopers, and thrips to leafy vegetables.
7. Added loopers to legume vegetables.
8. Added armyworms, artichoke plume moth, European corn borer, flea beetle, leafminers, light brown apple moth, loopers, and thrips to root and tuber vegetables.
9. Added European grapevine moth, fruitworm, oriental fruit moth, and thrips to stone fruits.
10. Changed PHI for peach to 1 day.
11. Added European grapevine moth and winter moth to ornamentals.



Material Safety Data Sheet

Dow AgroSciences LLC

Product Name: CONSERVE* SC Turf and Ornamental insect control

Issue Date: 10/07/2010

Print Date: 07 Oct 2010

Dow AgroSciences LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

CONSERVE* SC Turf and Ornamental insect control

COMPANY IDENTIFICATION

Dow AgroSciences LLC
A Subsidiary of The Dow Chemical Company
9330 Zionsville Road
Indianapolis, IN 46268-1189
USA

Customer Information Number: 800-992-5994

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994
Local Emergency Contact: 800-992-5994

2. Hazards Identification

Emergency Overview

Color: Off-white

Physical State: Liquid.

Odor: Sharp

Hazards of product:

No significant immediate hazards for emergency response are known.

OSHA Hazard Communication Standard

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

Potential Health Effects

Eye Contact: May cause pain disproportionate to the level of irritation to eye tissues. May cause slight temporary eye irritation. Corneal injury is unlikely.

Skin Contact: Brief contact is essentially nonirritating to skin.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation: No adverse effects are anticipated from single exposure to mist.

Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

Effects of Repeated Exposure: For the active ingredient(s): In animals, Spinosad has been shown to cause vacuolization of cells in various tissues. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

Reproductive Effects: For the active ingredient(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

3. Composition Information

Component	CAS #	Amount
Spinosad	168316-95-8	11.6 %
Propylene glycol	57-55-6	4.5 %
Balance		83.9 %

Spinosad is comprised of Spinosyn A (CAS # 131929-60-7) and Spinosyn D (CAS # 131929-63-0)

4. First-aid measures

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

Skin Contact: 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.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

Ingestion: No emergency medical treatment necessary.

Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

Emergency Personnel Protection: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

5. Fire Fighting Measures

Extinguishing Media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes.

Hazardous Combustion Products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance.
Personal Precautions: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Storage

Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Propylene glycol	WEEL	TWA Aerosol.	10 mg/m ³
Spinosad	Dow IHG	TWA	0.3 mg/m ³

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most

conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Off-white
Odor	Sharp
Odor Threshold	No test data available
Flash Point - Closed Cup	Not applicable
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	> 400 °C (> 752 °F) <i>EC Method A15</i>
Vapor Pressure	Not applicable
Boiling Point (760 mmHg)	100 °C (212 °F) (water).
Vapor Density (air = 1)	No test data available
Specific Gravity (H₂O = 1)	1.034 <i>Digital Density Meter (Oscillating Coil)</i>
Liquid Density	1.04 g/cm ³ @ 20 °C <i>Digital density meter</i>
Freezing Point	No test data available
Melting Point	Not applicable
Solubility in water (by weight)	Dispersible
pH	8.2 (@ 100 %) <i>CIPAC MT 75.1</i> (neat)
Molecular Weight	No test data available
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Evaporation Rate (Butyl Acetate = 1)	No test data available
Dynamic Viscosity	85.7 cPs @ 24.3 °C
Kinematic Viscosity	No test data available
Explosive	No <i>EEC A14</i>
Oxidizer	No

10. Stability and Reactivity

Stability/Instability

Thermally stable at recommended temperatures and pressures.

Conditions to Avoid: Active ingredient decomposes at elevated temperatures.

Incompatible Materials: None known.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Nitrogen oxides.

11. Toxicological Information

Acute Toxicity

Ingestion

As product: LD50, Rat, male and female > 5,000 mg/kg

Dermal

As product: LD50, Rabbit > 5,000 mg/kg

Inhalation

As product: LC50, 4 h, Aerosol, Rat, male and female > 17.02 mg/l

Eye damage/eye irritation

May cause pain disproportionate to the level of irritation to eye tissues. May cause slight temporary eye irritation. Corneal injury is unlikely.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.

Sensitization

Skin

Did not cause allergic skin reactions when tested in guinea pigs.

Respiratory

No relevant information found.

Repeated Dose Toxicity

For the active ingredient(s): In animals, Spinosad has been shown to cause vacuolization of cells in various tissues. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

Chronic Toxicity and Carcinogenicity

For the active ingredient(s): Did not cause cancer in laboratory animals.

Developmental Toxicity

For the active ingredient(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive Toxicity

For the active ingredient(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Genetic Toxicology

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Data for Component: **Spinosad**

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient, soil organic carbon/water (Koc): 701 Measured

Bioconcentration Factor (BCF): 33; fish; Measured

Persistence and Degradability

Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Stability in Water (1/2-life):

200 - 259 d; pH 9
0.84 - 0.96 d; pH 7

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
1 %	28 d	OECD 301B Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
66.000 %	68.000 %	76.000 %	77.000 %

Data for Component: Propylene glycol

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry's Law Constant (H): 1.2E-08 atm*m3/mole Measured

Partition coefficient, n-octanol/water (log Pow): -0.92 Measured

Partition coefficient, soil organic carbon/water (Koc): < 1 Estimated.

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.28E-11 cm3/s	10 h	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
81 %	28 d	OECD 301F Test
96 %	64 d	OECD 306 Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
69.000 %	70.000 %	86.000 %	

Chemical Oxygen Demand: 1.53 mg/mg

Theoretical Oxygen Demand: 1.68 mg/mg

ECOTOXICITY

Data for Component: Spinosad

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested). Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Fish Acute & Prolonged Toxicity

LC50, common carp (Cyprinus carpio), 96 h: 3.49 - 4.99 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, 48 h, immobilization: 14 mg/l

EC50, eastern oyster (Crassostrea virginica), shell growth inhibition: 0.295 mg/l

Aquatic Plant Toxicity

EbC50, diatom Navicula sp., biomass growth inhibition, 5 d: 0.107 mg/l

Toxicity to Above Ground Organisms

oral LD50, bobwhite (Colinus virginianus): > 2,000 mg/kg: > 2000 mg/kg bodyweight.

oral LD50, Honey bee (Apis mellifera): 0.06 micrograms/bee

contact LD50, Honey bee (Apis mellifera): 0.05 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, Earthworm Eisenia foetida, adult, 14 d: > 970 mg/kg

Data for Component: Propylene glycol

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (*Oncorhynchus mykiss*), static, 96 h: 44,000 - 51,600 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, 48 h, immobilization: 4,850 - 34,000 mg/l

Aquatic Plant Toxicity

EbC50, green alga *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*), biomass growth inhibition, 96 h: 19,000 mg/l

Toxicity to Micro-organisms

EC50; bacteria, 16 h: 26,000 mg/l

EC50, OECD 209 Test; activated sludge, 3 h: > 1,000 mg/l

13. Disposal Considerations

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. Transport Information

DOT Non-Bulk

NOT REGULATED

DOT Bulk

NOT REGULATED

IMDG

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Spinosad

Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

EMS Number: F-A,S-F

Marine pollutant.: Yes

ICAO/IATA

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Spinosad

Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

Cargo Packing Instruction: 914

Passenger Packing Instruction: 914

Additional Information

MARINE POLLUTANT

Spinosad

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

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

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Propylene glycol	57-55-6	4.5%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Toxic Substances Control Act (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	0	0

Revision

Identification Number: 57403 / 1016 / Issue Date 10/07/2010 / Version: 7.0

DAS Code: NAF-313

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

Dow AgroSciences LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided 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 between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

COMPANY ADDRESS:

RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS
2239 Edgewood Ave. S.
St. Louis Park, MN 55426

EMERGENCY TELEPHONE NUMBERS:

(800) 424-9300 (CHEMTREC, transportation and spills)

PRODUCT NAME : Lepitect Systemic Tree & Ornamental Insecticide
CHEMICAL NAME : [O,S-DIMETHYL ACETYLPHOS-PHORAMIDOTHIOATE
CHEMICAL FAMILY : Insecticide
EPA REG NO : 74779 - 6

SECTION 2 - COMPOSITION, INFORMATION OF INGREDIENTS

COMPONENT	PERCENTAGE	CAS NUMBER	OSHA PEL	ACIGH TLV
Acephate (O,S-Dimethyl acetylphosphoramidothioate)	94.5 – 99.1	30560-19-1		
Other Ingredients	0.9 – 4.5			

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

SECTION 3 - HAZARDS IDENTIFICATION SUMMARY

(As defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200)

HEALTH HAZARDS: Causes eye irritation. Harmful if swallowed. Avoid breathing dust or spray mist. Avoid contact with eyes, skin, or clothing. Wash hands thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. **Keep out of reach of children.**

ACUTE TOXICITY (Primary Routes of Exposure)

Signs and Symptoms of Systemic Effects: This product contains a cholinesterase inhibitor. Signs and symptoms that may be seen, usually within several hours of exposure, include but are not limited to, headaches, dizziness, weakness, constriction of the pupil, blurred or dark vision, excessive salivation or nasal discharge, profuse sweating, abdominal cramps, nausea, diarrhea, and vomiting. Severe poisonings may result in incontinence, unconsciousness, convulsions and death.

Eye: This product is expected to cause minimal or no eye irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness and possibly some minor swelling.

Skin: This product is expected to cause brief and /or minor irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting with an exposure may include redness and possibly some minor swelling.

This product is not expected to cause allergic skin reactions.

This product has been shown to be slightly toxic when absorbed through the skin. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Ingestion: This product has been shown to be slightly toxic when ingested. The degree of injury will depend on the amount of material ingested and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Inhalation: Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when inhaled. The degree of injury will depend on the amount of material inhaled and the speed and

thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Exposure to high concentrations of dust may result in respiratory irritation. Signs and symptoms may include, but not be limited to, nasal discharge, sore throat, coughing and difficulty in breathing.

PHYSICAL HAZARDS: Stable at normal ambient temperatures. Acephate can degrade on prolonged exposure to elevated temperatures or at alkaline pH. Contact with alkaline materials, including hypochlorite oxidants may produce noxious gas.

ENVIRONMENTAL HAZARDS: Extremely toxic to bees. Moderately toxic to birds. Practically non-toxic to freshwater fish. Keep out of waterways. Do not contaminate water when cleaning equipment or disposing of equipment wash water.

SECTION 4 - FIRST AID MEASURES

IF SWALLOWED: Call physician or Poison Control Center immediately. Drink 1 or 2 glasses of water (or milk) and induce vomiting by touching back of throat with finger. If possible, contact a physician or Poison Control Center before inducing vomiting. Do not induce vomiting or give anything by mouth to an unconscious person. Take person and product container to the nearest emergency treatment center.

IF IN EYES: Immediately flush eyes with water for at least 15 minutes while holding eyelids open. Remove contact lenses if worn. Get medical attention if irritation persists.

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

IF ON SKIN: Remove contaminated clothing and wash separately. Wash skin with plenty of soap and water. Get medical attention if irritation persists.

NOTE TO PHYSICIAN: This material contains a cholinesterase inhibitor. Measurement of blood cholinesterase activity may be useful in monitoring exposure but decisions regarding treatment will usually need to be made before test results are available. If signs of cholinesterase inhibition appear, atropine sulfate is antidotal. 2-PAM (PROTOPAM) is also antidotal and may be used in conjunction with atropine but should not be used alone.

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

SECTION 5 - FIRE FIGHTING MEASURES

FLASHPOINT (method): NA

FLAMMABLE LIMITS (LFL-UFL): NA

NFPA RATINGS: Health 1; Flammability 1; Reactivity 1; Special None

(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using professional judgement.

Values were not available in the guidelines or published evaluations prepared by the National Fire Protection Association, NFPA.

EXTINGUISHING MEDIA: Use CO₂, dry chemical, foam, or water fog when fighting fires involving this material.

FIRE FIGHTING INSTRUCTIONS: Products of combustion from fires involving this product may be toxic. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. Do not enter any enclosed area without full protective equipment, including self contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and fire fighting equipment before reuse. Read the entire document.

FIRE FIGHTING EQUIPMENT: Full protective equipment with self-contained breathing apparatus with full facepiece.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustions forms carbon dioxide, water vapor and may produce oxides of sulfur, nitrogen and phosphorous. Incomplete combustion can produce carbon monoxide.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Clean up spills immediately, observing precautions in Section 8 of this document. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

LAND SPILLS: Reduce airborne dust. Avoid runoff into storm sewers or other bodies of water. Clean up spill immediately. Vacuum or sweep up material and place in a container for reuse or disposal. Wash area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container.

WATER SPILLS: This material will disperse or dissolve in water. Stop the source of the release. Contain and isolate to prevent further release into soil, surface water and ground water. Clean up spill immediately. Absorb spill with inert material. Remove contaminated water for treatment and disposal.

SECTION 7 - HANDLING AND STORAGE

KEEP OUT OF REACH OF CHILDREN!

HANDLING: Use only in a well-ventilated area. Minimize dust generation and accumulation.

STORAGE: Keep insecticide in original container when not in use. Do not store or transport near food or feed. Do not contaminate food or feed. Do not put concentrate into food or drink containers. Do not dilute concentrate in food or drink containers. Store in a cool, dry place, out of direct sunlight.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS (8 HOUR TWA): (Refer to Section 3)

ENGINEERING CONTROLS: Proper ventilation is required when handling or using this product to keep exposure to airborne contaminants below the exposure limit. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION – Do not get this material in your eyes. Eye contact can be avoided by wearing protective eyewear.

CLOTHING – Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves. Long-sleeved shirt and long pants, Chemical-resistant footwear plus socks

GLOVES - Chemical-resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyvinyl chloride (PVC), viton

RESPIRATOR – Use this material only in well ventilated areas. Unless ventilation is adequate to keep airborne concentrations below recommended exposure standards, approved respiratory protection should be worn. When handling in enclosed areas with inadequate ventilation, use a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C)

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

USER SAFETY RECOMMENDATIONS:

1. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
2. Remove clothing immediately if insecticide gets inside. Then wash thoroughly and put on clean clothing.
3. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION: White pellets

ODOR: Strong cabbage-like odor

MELTING POINT: NDA

BULK DENSITY: 27 lbs/cu ft

pH: NA

VAPOR PRESSURE: 1.7×10^{-6} mmHg @ 24° C (acephate)

WATER SOLUBILITY: Soluble in water

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable at normal ambient temperatures. Acephate can degrade on prolonged exposure to elevated temperatures or at alkaline pH.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid contact with alkaline materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Contact with alkaline materials including hypochlorite may produce noxious

gases.

SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

Oral LD ₅₀ (male rat)	- > 688 mg/Kg (Toxicity Category III)
Oral LD ₅₀ (female rat)	- > 1127 mg/Kg (Toxicity Category III)
Oral LD ₅₀ (female/male rat)	- > 846 mg/Kg (Toxicity Category III)
Dermal LD ₅₀ (rabbit)	- > 2 g/Kg (Toxicity Category III)
Inhalation LC ₅₀ (rat)	- > 61.7 mg/L (Toxicity Category IV)
Eye Irritation (rabbit)	- Minimal effects clearing within 24 hours. (Toxicity Category IV)
Skin Irritation (rabbit)	- Slight and transient irritation was present at 72 hours after exposure. (Toxicity Category IV)
Sensitization (guinea pig)	- Acephate technical did not induce a positive skin sensitization reaction in the guinea pig using the modified Buehler or the Maximization techniques.

This product contains acephate, a cholinesterase inhibitor. Acute overexposures by oral, dermal or inhalation routes may produce signs and symptoms of toxicity, usually within several hours of exposure, including but are not limited to, headaches, dizziness, weakness, constriction of the pupil, blurred or dark vision, excessive salivation or nasal discharge, profuse sweating, abdominal cramps, nausea, diarrhea and vomiting. Severe poisoning may result in incontinence, unconsciousness, convulsions and death.

SUBCHRONIC TOXICITY: The dermal administration of Acephate Technical to rats, five days per week for three weeks, at doses up to 300 mg/kg/day produced statistically significant inhibition of cholinesterase activity in the brain of males and females treated with the highest dose (300mg/kg/day) and in females at the mid-dose (60 mg/kg/day). The degree of inhibition was less than 15% in all cases and no clinical signs of toxicity were observed. The NOEL was 60 mg/kg/day for males and 12 mg/kg/day for females.

CHRONIC/CARCINOGENICITY: When mice were fed diets containing Acephate Technical throughout their entire lifetime, a compound-related increase in liver weight, together with liver carcinoma (a commonly occurring cancer in mice) and adenoma occurred in high-dose females. These changes were not observed in males at any dose level or in low- or mid-dose females. When rats were fed diets containing Acephate Technical throughout their entire lifetime, there was no treatment-related increase in tumors at any site. The most significant treatment-related effect was a decrease in cholinesterase activity of plasma, RBC, and brain.

Based on the increased incidence of liver carcinoma and adenoma in female mice, EPA has classified acephate as a Group C (possible) human carcinogen.

This product is not listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

TERATOLOGY/DEVELOPMENTAL TOXICITY: In a developmental toxicity study in rats, Acephate Technical produced maternal toxicity (tremors, decreased motor activity and/or decreased body weight gain) at dosages of 20 mg/kg/day or higher. Developmental toxicity (decreased fetal body weight and delayed skeletal ossification) was observed in the 75 mg/kg/day dose group. The maternal NOEL was 5 mg/kg/day, the highest dose tested. The developmental NOEL was 20 mg/kg/day.

REPRODUCTION: Male and female rates were fed 25, 50 or 500 ppm Acephate Technical in the diet continuously for two generations through weaning of the third generation. Reproductive performance and toxicity was monitored for each generation. Based on decreased body weights and/or body weight gains for adult males (each generation), and for adult females and pups (some generations), decreased food consumption during gestation and lactation periods, and decreased in litter size (some generations), the parental LOEL and NOEL are 500 ppm (25 mg/kg/day) and 50 ppm (2.5 mg/kg/day), respectively. Based on decreases in viability index (two generations) and in mating performance (one generation), the reproductive LOEL and NOEL are also 500 ppm and 50 ppm, respectively.

MUTAGENIC DATA: Acephate Technical has been shown to have a weak potential to cause mutations when tested at high doses in microbes or cultured cells. However, the results of most *in vivo* assays indicate that Acephate Technical does not cause mutations in whole animals. Overall, acephate is not considered to be a mutagenic hazard.

ADDITIONAL DATA: For a summary of the potential for adverse health effects from exposure to this product, refer to

Section 3. For information regarding regulations pertaining to this product, refer to Section 15.

SECTION 12 - ECOLOGICAL INFORMATION

ENVIRONMENTAL SUMMARY: This product is highly toxic to aquatic invertebrates. Keep out of water bodies. Extremely toxic to bees by direct exposure or residues on treated crop. Do not apply to or allow drift on blooming crops that bees may visit.

FISH TOXICITY: (Technical)

96 hour LC₅₀, Black Bass – 1,725 ppm
 96 hour LC₅₀, Bluegill – 2,050 ppm
 96 hour LC₅₀, Catfish – 2,230 ppm
 96 hour LC₅₀, Mosquito Fish – 6,000 ppm
 96 hour LC₅₀, Goldfish – 9,550 ppm
 96 hour LC₅₀, Crayfish – 750 ppm

Acephate Technical is practically non-toxic to freshwater fish. The 96-hour LC₅₀, was found to be higher than 1,000 ppm in rainbow trout, bluegill, and channel catfish.

AVIAN TOXICITY: (Technical)

Oral LD₅₀, Pheasant - 140 mg/Kg
 Oral LD₅₀, Mallard duck – 350 mg/kg
 Oral LD₅₀, Chickens – 852 mg/kg

In addition, Acephate Technical in the diet causes adverse effects on reproduction in mallard ducks (no effect level greater than 5 ppm, but less than 20 ppm) and in bobwhite quail (no-effect level greater than 20 ppm, but less than 80 ppm).

BEE TOXICITY:

Oral LD₅₀, Bees – 1.2 ug/bee (Acephate Technical is highly toxic to bees.)

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE: Insecticide wastes are toxic. Dispose of in accordance with applicable Federal, state and local laws and regulations.

CONTAINER: Completely empty container into processing equipment. Then dispose of empty container in sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

SECTION 14 - TRANSPORT INFORMATION

DOT SHIPPING DESCRIPTION:	Insecticide, dry, non-regulated
TECHNICAL SHIPPING NAME:	Acephate 97% Powder
DOT HAZARD CLASS:	N/A
UN NUMBER:	N/A
DOT PACKING GROUP:	N/A
DOT PRIMARY/SECONDARY LABEL:	N/A
DOT PRIMARY/SECONDARY PLACARD:	N/A
DOT EMERGENCY RESPONSE GUIDE #:	N/A

SECTION 15 - REGULATORY INFORMATION

REGULATIONS UNDER FIFRA: All pesticides are governed under FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act). Therefore, the regulations presented below are pertinent only when handled outside of the normal use and applications of pesticides. This includes waste streams resulting from manufacturing/formulation facilities, spills or misuses of products, and storage of large quantities of products containing hazardous or extremely hazardous substance.

CERCLA REPORTABLE QUANTITY:	- NA
OSHA:	- NA
RCRA:	- NA
SARA TITLE III STATUS:	
311/312 Hazard Categories	- Immediate Health Effects: Yes - Chronic Health Effects: Yes - Fire Hazard: No - Sudden Release of Pressure: No - Reactivity Hazard: No
313 Chemicals	- Acephate
Sara Section 302:	- NA

STATE REGULATIONS: Each state may promulgate standards more stringent than the federal government. This section cannot encompass an inclusive list of all state regulations. Therefore, the user should consult state or local authorities.

SECTION 16 - OTHER INFORMATION

DISCLAIMER: The information presented herein is based on available data from reliable sources and is correct to the best of Rainbow Treecare Scientific Advancements knowledge. Rainbow Treecare Scientific Advancements makes no warranty, express or implied, regarding the accuracy of the data or the results obtained from the use of this product. Nothing herein may be construed as recommending any practice or any product in violation of any law or regulations. The user is solely responsible for determining the suitability of any material or product for a specific purpose and for adopting any appropriate safety precautions. We disclaim all liability for injury or damage stemming from any improper use of the material or product described herein.

REVISED DATE: Jan, 2009
REVISED FOR: Initial draft

Lepitect™

Net Contents:
283.5 g (10 oz)

Systemic Tree & Ornamental Insecticide

KEEP OUT OF REACH OF CHILDREN CAUTION

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

See Side/Back Panel for Additional Precautionary Statements, First Aid and Directions for Use

Lepitect™ Systemic Tree & Ornamental Insecticide is absorbed through the plant root system and then moves throughout the plant, protecting it from the damage caused by sucking insects and certain chewing insects as listed.

Active Ingredient	
Acephate (O,S-Dimethyl acetylphosphoramidothioate).....	97.4%
Other Ingredients.....	2.6%
Total	100%

EPA Reg. No. 74779- 6

EPA Est. No. 39578-TX-1

Distributed by:



Rainbow Treecare Scientific Advancements

11571 K-Tel Dr
Minnetonka, MN 55343

1-877-272-6747
www.treecarescience.com

FIRST AID:

Acephate is an organophosphate, cholinesterase inhibitor

IF SWALLOWED	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF IN EYES	<ul style="list-style-type: none"> • 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 poison control center or doctor immediately for treatment advice.
IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call poison control center or doctor immediately for treatment advice.
IF INHALED	<ul style="list-style-type: none"> • 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 poison control center or doctor immediately for treatment advice.

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

HOT LINE NUMBER

For 24 hour medical emergency assistance (human or animal), or chemical emergency assistance (spill, leak or accident).

Call CHEMTREC at 1-800-424-9300.

NOTES TO PHYSICIAN

This material contains a cholinesterase inhibitor. Measurement of blood cholinesterase activity may be useful in monitoring exposure but decisions regarding treatment will usually need to be made before test results are available. If signs of cholinesterase inhibition appear, atropine sulfate is antidotal. 2-PAM (PROTOPAM) is also antidotal and may be used in conjunction with atropine but should not be used alone.

PRECAUTIONARY STATEMENT

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Some materials that are chemical-resistant to this product are those made of any waterproof material. If you want more options, follow the instruction for category A on an EPA chemical-resistant category selection sheet.

Mixers, loaders, applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical resistant gloves
- Shoes plus socks

In addition, all mixers and loaders and all applicators using low pressure hand wand application equipment must wear:

- A NIOSH-approved dust mist filtering respirator with MSHA/NIOSH approval number prefix TC-21C or a NIOSH-approved respirator with any N, R, P, or HE filter

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this products concentrate. Do not reuse them.

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.

USER SAFETY RECOMMENDATIONS:

Users should:

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

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of wastes. Cover or soil-incorporate spills.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

DIRECTIONS FOR USE

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

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

RESTRICTIONS

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation. Do not apply this product through any type of irrigation system.

Do not apply under conditions involving possible drift to food, forage or other plantings that might be damaged or the crops thereof rendered unfit for sale, use or consumption.

Do not apply using low pressure hand wand except when used on ornamental trees, shrubs, and floral plants grown for non-agricultural or non-commercial use.

Not for indoor residential use. For greenhouse use, use is limited to commercial greenhouses for use on ornamental, floral and foliage plants.

Do not apply by air.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, waterproof gloves, shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow others to enter treated areas until sprays have dried.

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator and/or application advisor.

Read and follow the entire label of each product to be used in the tank mix with this product.

SPRAY DRIFT MANAGEMENT

A variety of factors including weather conditions, (e.g., wind direction, wind speed, temperature, relative humidity) and method of application can influence pesticide drift. The applicator and grower must evaluate all factors and make appropriate adjustments when applying this product.

- All application equipment must be properly maintained and calibrated using water as carrier. Do not apply this product as an ultralow (ULV) spray, or in any carrier other than water.
- Use the largest droplet size consistent with good pest control. Small droplets are more prone to spray drift and can be minimized by appropriate nozzle selection, by orienting nozzles away from the air stream as much as possible, and by avoiding excessive spray boom pressure.
- Do not apply at wind speeds greater than 10 mph at the application site.
- Apply as close to target plants as practical to obtain a good spray pattern for adequate coverage.
- For airblast applications, direct spray above foliage and turn off outward pointing nozzles at row ends and outer rows.
- Do not apply at heights greater than 4 feet.

MIXING INSTRUCTIONS

Thoroughly clean all application components prior to mixing. Add approximately 1/2 of the required amount of water to the application tank and begin agitation. Add the required amount of Lepitect™ Systemic Tree & Ornamental Insecticide and mix thoroughly. Then add other additives and the remaining water. Maintain agitation during filling and application to ensure uniform mixture.

For application equipment that has minimal agitation, give proper attention to mixing this product.. With such equipment, premix this product with water to form a slurry prior to putting the product into the applicator. If premixing is not done, then allow adequate time for the product to dissolve in the water prior to beginning applications.

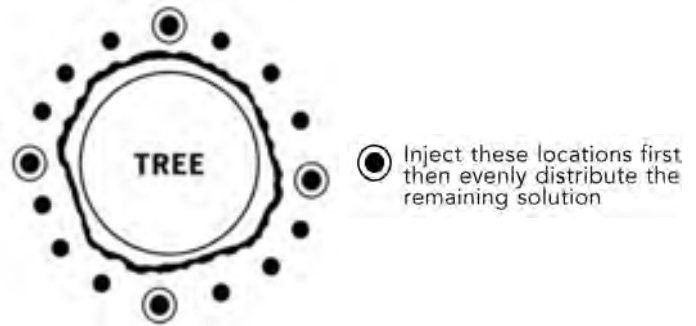
SMALL VOLUME DILUTION CHART		
Amount of product per 100 gallons of water	Amount of product per 25 gallons of water	Amount of product per 1 gallon of water
1/4 lb (113.4 g)	1 oz (28.3 g)	1/3 tsp (1.1 g)
1/2 lb (226.8 g)	2 oz (56.7 g)	2/3 tsp (2.3 g)
3/4 lb (340.2 g)	3 oz (85.0 g)	1 tsp (3.4 g)
1 lb (453.6 g)	4 oz (113.4 g)	1 1/3 tsp (4.5 g)

APPLICATION METHOD

Pull back landscape mulch, landscape fabric and surface organic matter prior to making soil applications to ensure solution is delivered to the mineral soil.

Measure the diameter of the tree at breast height (DBH), 4'6" above the soil line. For multi-stemmed trees and shrubs, use the cumulative diameter of individual stems at soil line instead of DBH.

Basal Soil Injection: Mix required dosage in sufficient water to inject an equal amount of solution in each hole. For trees less than 8 inches DBH, use a minimum of 4 injection sites per tree. Space injection sites evenly around the base of the tree no more than 12 inches out from the base. Maintain a low pressure and inject into the mineral soil to a depth of two (2) to six (6) inches. Dilution rate may vary depending on equipment used and tree size. Refer to the injector equipment instructions for guidance.



ORNAMENTAL TREE AND SHRUBS - SOIL APPLICATION

PLANTS	INSECTS	AMOUNT OF PRODUCT	APPLICATION TIMING	APPLICATION DIRECTIONS	RESTRICTIONS
Ornamental Trees and Shrubs	Aphids	For trees up to 15 inches in trunk diameter (DBH) use 1/5 oz (5.7 g) per DBH inch One 10 oz packet will treat 50 inches of trunk diameter (DBH)	Make applications to actively growing plants just prior to or when insects first appear	For optimal uptake, irrigate the treated area after treatment to promote absorption into the root system. Applications to dry soil may decrease performance. Rainbow Treecare Scientific Advancements does not recommend applications be made to Huckleberry, Balm of Gilead, Cottonwood, Lombardy Poplar, and Viburnum suspensum.	Do not apply more than once per month.
	Bagworm				
	Black Vine Weevil				Do not apply to areas where food crops are grown (i.e., vegetable gardens, fruit trees, berry vines, etc.), children's play areas, or animal runs.
	Budworm				Do not apply more than 5 lbs. of product per acre per application.
	Cankerworm				Do not apply more than 6 lbs of product per acre per year.
	Carpenterworm				
	Cuban Laurel Thrips				
	Gall Forming Insects				
	Gypsy Moth (larvae)				
	Japanese Beetle				
	Lacebugs				
	Leaf Beetles				
	Leafhoppers				
	Leafminers				
	Leafrollers				
	Leaftier (larvae)				
	Lepidoteran (larvae)				
	Loopers				
	Maple Shoot Moth				
	Oakworm				
	Pine Coneworm				
	Pine Tip Moth (larvae)				
	Plantbugs				
	Sawflies				
	Scales				
	Spider Mites				
	Tent Caterpillar				
	Tiger moth (larvae)				
	Tussock Moth (larvae)				
	Webworm				
	Whitefly				
	Winter moth (larvae)				
		Dilute 1 packet (10 oz) in up to 25 gallons of water.		Caution: Phytotoxicity has occurred on the following crabapple varieties: Hopa, Ichonoski, Malusfloribunda, Pink Perfection, Red Wine, and Snow Cloud.	

ORNAMENTAL TREES AND SHRUBS – FOLIAR SPRAY – Maximum single application rate is 1.0 lb active ingredient per acre.

PLANTS	INSECTS	AMOUNT OF PRODUCT PER 100 GALLONS	APPLICATION TIMING	APPLICATION DIRECTIONS	RESTRICTIONS
Ornamental Trees and Shrubs (Except Flowering Crabapple)	Aphids Bagworms Birch Leafminer Lace Bugs Leafrollers Tent Caterpillars	¼ lb (4 oz) (113.4 g)	Begin treatments when insects first appear. Repeat applications every 2 weeks as needed.	Apply as a full coverage spray using a hydraulic sprayer. Rainbow Treecare does not recommend applications be made to Huckleberry, Balm of Gilead, Cottonwood, Lombardy Poplar, and Viburnum suspensum. For nursery crops, spray only a few plants and observe for 2 weeks and evaluate for phytotoxicity before treating the entire crop. The use of a sticker improves control of gypsy moth larvae. *Mist blower application: Adjust rates to 1 lb per 100 gallons of water for Gypsy Moth control. Adjust rate to 3/4lb per 100 gallons of water for tent caterpillar control.	
	Douglas Fir Tussock Moth Larvae Gypsy Moth Larvae* Webworms	½ lb (8 oz) (226.8 g)			
	Scale (Crawlers)	½ lb (8oz) (226.8g)	Begin treatments when crawlers first appear. Repeat applications every 2 weeks as needed to achieve control.		
	Ponderosa Pine Needle Miner	½ lb (8oz) (226.8g)	Time of application is important. Consult your County Extension Agent for proper timing. Repeat applications every 2 weeks as needed.		
	California Oakworm Cankerworms (Spring and Fall)	¼ lb to ½ lb (4 to 8 oz) (113.4 to 226.8g)	Begin treatments when insects first appear. Use the higher rate when larger larvae are present. Repeat applications every 2 weeks as needed.		
	Nantucket Pine Tip Moth Larvae	¾ lb (12 oz) (340.2 g)	Time of application is important. Consult your County Extension Agent for proper timing. Repeat applications will be necessary for subsequent generations. Repeat applications every 2 weeks as needed.		

ORNAMENTAL TREES AND SHRUBS – FOLIAR SPRAY – Maximum single application rate is 1.0 lb active ingredient per acre. (continued)

PLANTS	INSECTS	AMOUNT OF PRODUCT PER 100 GALLONS	APPLICATION TIMING	APPLICATION DIRECTIONS	RESTRICTIONS
Ornamental Trees and Shrubs (Except Flowering Crabapple)	Root Weevil Adults	¾ lb (12 oz) (340.2 g)	Begin treatments when feeding damage first appears. Repeat applications every four weeks until the first heavy frost may be necessary for complete foliage protection.	Apply as a full coverage spray using a hydraulic sprayer.	
	Box Elder Bugs Budworms Leafhoppers Sawflies	¾ lb (12 oz) (340.2 g)	Begin treatments when insects first appear. Repeat applications every 2 weeks as needed.	Apply as a full coverage spray using a hydraulic sprayer.	
	Japanese Beetles Elm Leaf Beetles	1 lb (16 oz) (453.6 g)	Begin treatments when insects first appear. Repeat applications every 2 weeks as needed.		
Douglas Fir (Christmas Trees)	Douglas Fir Needle Midge	½ lb (8 oz) (226.8 g)	Application should be made no more than 2 weeks prior to bud burst. For additional pest management information, consult your County Extension Agent. The minimum spray intervals for repeat applications is 3 days for rates up to and including 0.5 lb ai/acre and 7 days for rates exceeding 0.5 lb.ai/acre.	Apply by ground as a full coverage spray in 100 gallons of water using a hydraulic sprayer.	
Flowering Crabapples	Aphids Leafrollers Tent Caterpillars	¼ lb (4 oz) (113.4 g)	Begin treatments as the insects begin to appear. Repeat applications every 4 weeks as needed.	Apply as a full coverage spray using a hydraulic sprayer. Caution: Phytotoxicity has occurred on the following crabapple varieties: Hopa, Ichonoski, Malus floribunda, Pink Perfection, Red Wine, and Snow Cloud	Do not apply more often than 3 times in a growing season at a four (4) week interval Do not apply by low pressure hand wand.
Crape Myrtle	Aphids	2 – 3 level tablespoons (0.6 to 0.9 oz) (17 to 25.5 g) per 1 tablespoon of water	Begin treatments as aphids begin to appear. The minimum spray intervals for repeat applications is 3 days for rates up to and including 0.5 lb ai/acre and 7 days for rates exceeding 0.5 lb.ai/acre	Make a paint-on slurry by mixing. Remove the loose bark from the trunk areas to be treated. Completely paint a band around each trunk to a width twice its diameter. Make applications to trunks 6 to 8 inches above the ground and below the point where branching begins. For multi-trunk plants, make treatments as low as possible within the 6 to 12 inches of the ground.	

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage, disposal or cleaning of equipment.

PESTICIDE STORAGE

Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Store in a cool, dry place. Protect from excessive heat. Do not contaminate food or foodstuffs. Do not store or transport near feed or food. For help with any spill, leak, fire or exposure involving this material, call CHEMTREC at 1-800-424-9300

PESTICIDE DISPOSAL

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Open dumping is prohibited.

CONTAINER DISPOSAL

Non-refillable container. Do not reuse or refill this container. Completely empty bag into application equipment. Then offer for recycling, if available or dispose of empty bag in a sanitary landfill or by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Note: This product is sold by weight. Settling may have occurred during shipment.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

Notice: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Tree injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or tree conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS or seller.

To the extent consistent with applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS and seller harmless for any claims relating to such factors.

RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions. This warranty does not extend to the use of the product contrary to label instructions,, and Buyer and User assume the risk of any such use. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, RAINBOW TREECARE MAKES NO WARRANTIES OR MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

To the fullest extent permitted by law, RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS or Seller shall not be liable for any incidental, consequential or special damages resulting from the use or handling of this product. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF RAINBOW TREECARE OR SELLER, THE REPLACEMENT OF THE PRODUCT.

RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS and Seller offer this product, subject to the foregoing Conditions of Sale and Limitation of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS.



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SECTION 1: Product and Company Identification

1.1. Product identifier

Trade name : XYTECT 2F
Chemical name : Imidacloprid
Product code : EPA Reg. No. 42750-115-74779

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/preparation : Insecticide

1.2.2. Uses advised against

No data available

1.3. Details of the supplier of the safety data sheet

Rainbow Treecare Scientific Advancements
11571 K-Tel Drive
Minnetonka, MN 55343
Phone: 1-(877) 272-6747 (toll free)
www.treecarescience.com

1.4. Emergency telephone number

Emergency number : (800)-424-9300 (CHEMTREC)

SECTION 2: Hazards identification

Hazard Identification Summary

Off-white viscous liquid

GHS Labeling Elements

Hazard pictograms (CLP) :



Signal word : WARNING

Hazard statements : May be harmful if swallowed or absorbed through skin.
Mildly irritating to the eyes and skin.
Can decompose at high temperatures releasing toxic gases.
Highly toxic to bees, birds and aquatic invertebrates.
Keep out of waterways.

SECTION 3: Composition/information on ingredients

Name	Product identifier	%/wt.
Imidacloprid	(CAS No.) 138261-41-3	21.4
Other Ingredients	NA	78.6

SECTION 4: First aid measures

4.1. Description of first aid measures

First Aid responders should use protective equipment in Section 8 if there is a potential for exposure to product.

- IF SWALLOWED** : Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person
- IF 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 poison control center or doctor for treatment advice.
- IF ON SKIN OR CLOTHING** : Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
- IF 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.
- First-aid measures – general : Have a product container or label with you when calling a poison control center or doctor, or going in for treatment.
 NOTE TO PHYSICIAN: There is no specific antidote, treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Use foam, dry chemical, or water spray
- Unsuitable extinguishing media : High volume water jet. (Water contamination risk from runoff)

5.2. Special hazards arising from the substance or mixture

National Fire Protection Rating (NFPA)

HEALTH	1
FLAMMABILITY	0
REACTIVITY	0
4 = Severe 3 = Serious 2 = Moderate 1 = Slight 0 = Minimal	

- FLASHPOINT** : >200°F / >100°C
- FIRE AND EXPLOSION HAZARD** : Can burn in fire, releasing irritating and toxic gases due to thermal decomposition or combustion.

5.3. Advice for firefighters

- Firefighting instructions : Evacuate area and fight fire upwind from a safe distance to avoid hazardous vapors and decomposition products. Dike and collect water used to fight fire to prevent environmental damage due to run off. Foam or dry chemical fire extinguishing systems are preferred to prevent environmental damage from excessive water runoff. Minimize use of water to prevent environmental contamination.
- Firefighting equipment : Self-contained breathing apparatus with full face piece.



XYTECT 2F

Safety Data Sheet

US and GHS

Revision date: October 8, 2014

Version: 1.0

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Control the spill at its source. Contain the spill to prevent it from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. Keep unnecessary and unprotected personnel from entering the affected area.

6.2. Environmental precautions

This material should be prevented from contaminating soil or entering sewage and drainage systems and bodies of water. Minimize use of water for cleaning spills to prevent environmental contamination.

6.3. Methods and material for containment and cleaning up

SMALL SPILL : Absorb small spills on sand, vermiculite or other inert absorbent. Place contaminated material in appropriate container for disposal.

LARGE SPILL : Dike large spills using absorbent or impervious material such as clay or sand. Recover and contain as much free liquid as possible for reuse. Allow the absorbed material to solidify, and scrape up for disposal. After removal, clean the contaminated area thoroughly with water. Pick up wash liquid with additional absorbent and place in a disposable container.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

KEEP OUT OF REACH OF CHILDREN!

Precautions for safe handling : Use only in a well-ventilated area. Minimize dust generation and accumulation.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep away from food, feed, and drinking water. Store in a well-ventilated dry place away from heat. Store above 32 °F.

Wear proper safety equipment specified in Section 8 when mixing, loading or otherwise handling concentrate.

SECTION 8: Exposure controls/personal protection

8.1. Personal protective equipment

EYE PROTECTION—Safety goggles or glasses with side shields.

CLOTHING—Long-sleeved shirt and long pants, chemical-resistant footwear plus socks.

GLOVES—Chemical-resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyvinyl chloride (PVC), Viton

RESPIRATOR—Not required when handled under normal conditions. When handling in enclosed areas with inadequate ventilation, use a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C).

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



XYTECT 2F

Safety Data Sheet

US and GHS

Revision date: October 8, 2014

Version: 1.0

USER SAFETY RECOMMENDATIONS:

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

8.2. Exposure controls

EXPOSURE LIMITS (8 hour TWA, ppm):

COMPONENT	OSHA PEL	ACIGH TLV
Imidacloprid	Not listed	Not listed

Engineering controls : Proper ventilation is required when handling or using this product. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Off-white
Odor	: Weak paint, solvent character
pH (1%)	: 6.0 – 8.0
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: Not applicable
Boiling point	: No data available
Flash point	: >100 °C (>212 °F)
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Non-flammable
Vapor pressure	: 5.2×10^{-6} Pa at 25 °C (Imidacloprid)
Density	: 1.06 – 1.09 g/mL (8.85 – 9.10 lb/gl)*
Solubility	: No data available
Partition Coefficient	: Log Pow = 0.57 at 25 °C (Imidacloprid)
Viscosity	: 104 mPa/s at 20 °C; 134 mPa/s at 40 °C
Explosive properties	: Not explosive
Oxidizing properties	: No oxidizing properties
Explosive limits	: Not applicable

*Listed density is an approximate value and does not necessarily represent that of a specific batch



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SECTION 10: Stability and reactivity

10.1. Reactivity

Non-reactive

10.2. Chemical stability

Stable under normal conditions, however may decompose if heated.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

Protect from heat and avoid exposure to temperatures above 100 °F (38 °C) for prolonged periods of time. A strong exothermic reaction can occur above 390 °F (200 °C).

10.5. Incompatible materials

None known

10.6. Hazardous decomposition products

Hydrogen cyanide, Hydrogen chloride, Carbon monoxide, Nitrogen oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity data for XYTECT 2F are provided below:

XYTECT 2F	
LD50 oral rat	>2500 mg/kg
LD50 dermal rat	>2000 mg/kg
LC50 inhalation rat	>2.27 mg/L
Eye irritation rabbit	Mild
Skin irritation rabbit	Mild
Sensitization guinea pig	Non-sensitizer

Imidacloprid

Carcinogenicity	: Imidacloprid is not listed as a carcinogen by IARC, NTP, OSHA or ACGIH.
Teratogenicity	: No reproductive or teratogenic (birth defect) effects at normal exposure levels.
Mutagenicity	: Little or no evidence of mutagenic effects have been observed from in vivo or in vitro studies.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological Summary

This product is highly toxic to birds and aquatic invertebrates. 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. Cover or incorporate spilled treated seeds.



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This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

Ecotoxicity data

Ecotoxicity data are not available for XYTECT 2F. Active ingredient data are given below:

Imidacloprid	
Fish (Rainbow Trout 96 hr.)	LC50: 211 mg/L
Fish (Bluegill 96 hr.)	LC50: unknown
Acute toxicity to Mallard ducks	Oral LC50: 4700 ppm
Acute toxicity to Bobwhite quail	Oral LC50: 1500 ppm
Acute toxicity to Honey bee	Contact LD50: Highly toxic!

Refer to product label for specific directions on pollinator protection.

12.2. Persistence and degradability

FATE : Imidacloprid has a soil half-life of 29-225 days depending on soil type conditions. It is soluble in water and has the potential to leach in permeable soil types.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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

Waste: Pesticide wastes are toxic. Dispose of in accordance with applicable Federal, state and local laws and regulations.

Container Disposal: Non-refillable containers: Do not reuse or refill this container. Offer for recycling, if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Refillable container: Refill this container with pesticide only. Do not reuse this container for any other purpose. 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.

Refer to the container label to determine if it is refillable and for complete cleaning and disposal instructions.

SECTION 14: Transport information

SHIPPING DESCRIPTION : Not regulated by DOT for ground transport

TRANSPORT HAZARD CLASS : N/A

UN NUMBER : N/A

DOT PACKING GROUP : N/A

SECTION 15: Regulatory information

FIFRA Information:

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and



XYTECT 2F

Safety Data Sheet

US and GHS

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Version: 1.0

hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

Signal word : CAUTION

Hazard statements : Harmful if swallowed or absorbed through skin. Causes mild skin and eye irritation.

Precautionary statements : Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

CERCLA REPORTABLE QUANTITY : Not listed

SARA TITLE III STATUS

311/312 Hazard Categories : Immediate Health Hazard

313 Toxic Chemicals : None known

CALIFORNIA PROP 65 : Not listed

TSCA : This product is exempted from TSCA because it is solely for FIFRA regulated use

SECTION 16: Other information

HMIS HAZARD RATING	HEALTH	1
	FLAMMABILITY	1
	PHYSICAL HAZARD	1
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	

It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

MSDS US

Disclaimer: The information provided by Rainbow Treecare Scientific Advancements, contained herein is given in good faith and correct to the best of our knowledge. However, the information given is designed only as guidance for safe handling, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification.

REVISED: October, 2014

REASON: GHS compliance

Xytect™ 2F

Insecticide

PULL HERE TO OPEN

For foliar and systemic insect control in turfgrass, landscape ornamentals, listed residential fruit and nut trees and interior plantscapes.

KEEP OUT OF REACH OF CHILDREN.

CAUTION

See additional precautionary statements and directions for use inside booklet. **STOP** – Read the label before use.

**SHAKE WELL
BEFORE USING**

ACTIVE INGREDIENT:	
Imidacloprid, 1-[(6-Chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine	21.4%
OTHER INGREDIENTS:	78.6%
TOTAL:	100.0%

Contains 2 pounds of imidacloprid per gallon.

EPA Reg. No. 42750-115-74779
EPA Est. No. 42750-MO-1

PRECAUCION AL USUARIO: Si usted no puede leer o entender ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente. (TO THE USER: If you cannot read or understand English, do not use this product until the label has been fully explained to you.)

©2014 Rainbow Treecare Scientific Advancement

Net Contents:

1 gallon 128 fl oz (3.78 L)



Distributed By:
Rainbow Treecare
Scientific Advancements
11571 K-Tel Drive
Minnetonka, MN 55343
1-877-272-6747
www.treecarescience.com

FIRST AID	
IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
<p>In case of emergency call CHEMTREC toll free at 1-800-424-9300. Have a product container or label with you when calling a poison control center or, doctor, or going for treatment.</p>	
<p>Note to Physician: No specific antidote is available. Treat the patient symptomatically.</p>	

For non-emergency questions for this product call Albaugh, Inc. toll free at 1-800-247-8013

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Keep children or pets off treated area until spray is dry.

Applicators and Other Handlers Must Wear:

1. Long-sleeved shirt and long pants
2. Chemical resistant gloves made of any waterproof material such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinyl chloride (PVC) or viton. If you want more options, follow the instructions for category A on an EPA chemical-resistant category chart.
3. Shoes plus socks

Follow manufacturer's instructions for cleaning/ maintaining personal protective equipment, PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

User should:

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

ENVIRONMENTAL HAZARDS

This product is highly toxic to aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops, plants or weeds. Do not apply this product or allow it to drift to blooming crops, plants or weeds if bees are foraging the treatment area.

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



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APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.



Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.

Bees and other insect pollinators will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- o Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- o Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- o Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- o Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives or off-site to pollinator attractive habitat can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at: <http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx>.

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state, go to: www.aapco.org/officials.html. Pesticide incidents should also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov

DIRECTIONS FOR USE

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

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

See individual sites for specific pollinator protection application restrictions. If none exist under the specific site, for outdoor foliar applications, follow these application directions.

- Do not apply Xytect™ 2F Insecticide while bees are foraging.
- Do not apply Xytect™ 2F Insecticide to plants that are flowering.
- Only apply after all flower petals have fallen off.

RESTRICTION: Do not formulate this product into other end-use products.

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STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area.

Handle and open container in a manner as to prevent spillage. If the container is leaking or material spilled for any reason or cause, care-fully sweep material into a pile. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Dispose of pesticide as directed below. In spill or leak incidents, keep unauthorized people away. You may contact Chemtrec at 800-424-9300 for decontamination procedures or any other assistance that may be necessary.

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

CONTAINER HANDLING: Non-refillable containers (1, 2.5, 30 & 55 gallon): Do not reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Offer for recycling, if available 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.

(non-refillable ≤5 gallons): 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 for 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.

APPLICATION TO TURFGRASS

Xytect™ 2F Insecticide will control the following soil inhabiting pests and larvae found in turfgrass

PEST	SCIENTIFIC NAME
Northern & Southern masked chafers	<i>Cyclocephala borealis</i> , <i>C. immaculata</i> , and/or <i>C. lurida</i>
Asiatic garden beetle	<i>Maladera castanea</i>
European chafer	<i>Rhizotroqus majalis</i>
Green June beetle	<i>Cotinis nitida</i>
May or June beetle	<i>Phyllophaga spp.</i>
Japanese beetle	<i>Popillia japonica</i>
Oriental beetle	<i>Anomala orientalis</i>
Billbugs	<i>Spherophorus spp.</i>
Annual bluegrass weevil	<i>Hyperodes spp.</i>
Black turfgrass atanius	<i>Atanius spretulus and Aphodius spp</i>
European Crane Fly	<i>Tipula paludosa</i>
Mole crickets	<i>scapteriscus spp.</i>

Xytect™ 2F Insecticide will suppress cutworms and chinch bugs.

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Xytect™ 2F Insecticide can be applied on turfgrass in the following sites:

Home lawns	Multi-family residential complexes	Cemeteries	Athletic fields
Business and office complexes	Golf courses	Parks	
Shopping complexes	Airports	Playgrounds	

Xytect™ 2F Insecticide has adequate residual activity that applications can be made preceding the egg laying activity of the target pests. Best control is achieved when applications are made prior to egg hatch of the pests and when rainfall or irrigation after application will penetrate vertically in the soil column carrying the active ingredient into the zone where insects are normally located. In order to move the active ingredient through the thatch, irrigate if rainfall does not occur within 24 hours after application.

Apply 1.25 to 1.6 pints per acre (equivalent to 0.46 to 0.6 fl oz per 1000 sq ft). Make application prior to egg hatch of grubs, billbugs, annual bluegrass weevil, and European Crane Fly to maximize control.

For chinch bugs (suppression) and mole crickets apply 1.6 pints per acre (equivalent to 0.6 fl oz per 1000 sq ft). For suppression of chinchbugs, make application before the hatching of the first instar nymphs.

For control of mole crickets make application before or during the peak egg hatch period. If adults or large nymphs are actively tunneling, combine applications of Xytect™ 2F Insecticide with a remedial insecticide. Follow label instructions for other insecticides when tank-mixing.

Consult your local turf, state Agricultural Experiment Station, or State Extension Service Specialists for more specific Information regarding timing of application.

Application Equipment for Use on Turfgrass

Dilute Xytect™ 2F Insecticide with enough water to provide adequate volume to promote thorough distribution into the pest zone. Use only accurately calibrated equipment for application to turfgrass. Apply a uniform, coarse droplet spray, using a low pressure setting to eliminate off target drift. Perform calibration on a regular basis to ensure that equipment is distributing product properly.

RESTRICTIONS FOR TURFGRASS USE:

- Do not exceed a total of 1.6 pints application (0.4 lb of active ingredient) per acre per year.
- Do not allow this product to contact plants in bloom if bees are foraging in the treatment area.
- Do not mow turf or lawn area, until after adequate irrigation or rainfall has occurred.
- Keep people and pets off treated area until dry.
- Not for use on grasses grown for seed, or on commercial fruit and nut trees.
- Do not graze treated areas or use clippings from treated areas for feed or forage.
- Do not apply through any irrigation system
- Do not apply to areas which are water logged or saturated, which will not allow penetration into the root zone of the plant.

APPLICATION TO ORNAMENTALS

Xytect™ 2F Insecticide can be applied to ornamental plants in commercial and residential landscapes and interior plantscapes. Xytect™ 2F Insecticide is a systemic insecticide that is transported within the plant system from the roots to upper foliage. Xytect™ 2F Insecticide must be applied into a growing area of the plant that allows absorption of the active ingredient. Adding soluble nitrogen type fertilizers to the spray solution when appropriate can promote the uptake of the active ingredient.

Application can be made by foliar application or soil applications; including soil injection, drenches, and broadcast sprays. Foliar applications offer locally systemic activity against insect pests.

The systemic translocation of active ingredient will be slower when applied to woody plants with soil applications. This delay can take 60 days or longer depending on species and size of plant. To offset this, make applications before anticipated pest infestation.

ANT MANAGEMENT PROGRAMS

Use Xytect™ 2F Insecticide to control aphids, scale insects, mealybugs and other sucking pests on ornamentals with ant populations because it removes honeydew as a food source. To enhance control of ants, supplement with residual sprays, bait placements or other ant control tactics.

Xytect™ 2F Insecticide mixes readily with water and may be used in many types of application equipment. Add a commercial spreader/sticker to promote coverage on hard to wet foliage such as holly, pine, or ivy.

Xytect™ 2F Insecticide is compatible with many commonly used fungicides, miticides, liquid fertilizers, and other insecticides. If applicator has no prior experience with a particular tank mix; check physical compatibility by making a small clear jar test using correct proportions of products to be tank mixed.

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FOLIAR APP

TO CONTROL:

- Adelgids
- Aphids
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- Diptera (Including gall midge, Hor gall midge)
- Froghopper
- Galls (Including H

Apply 1.5 fluid oz on needed basis.

To control White t fluid ounces (14 t Make broadcast a per 1000 sq ft. In Refer to use direc

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RESTRICTIONS FOR ALL ORNAMENTALS:

- Keep people and pets off treated area until dry.
- Do not apply more than 1.6 pints (0.4 lb of active ingredient) per acre per year.
- Not for use in commercial greenhouses, nurseries, or on grasses grown for seed, or on commercial fruit and nut trees.
- Do not apply through any irrigation system
- Do not apply to areas which are water logged or saturated, which will not allow penetration into the root zone of the plant.
- Do not apply this product, by any application method, to linden, basswood or other *Tilia* species

FOLIAR APPLICATION TO ORNAMENTAL AND NON-BEARING FRUIT & NUT TREES, SHRUBS, EVERGREENS, FLOWERS, FOLIAGE PLANTS, GROUNDCOVERS AND INTERIOR PLANTSCAPES

(Only for Industrial, Commercial Buildings, Residential and Landscaped Planting Areas)

TO CONTROL:

Adelgids	Japanese beetles	Mealybugs	Spittlebugs
Aphids	Lace bugs	Planthoppers	Thrips (suppression) (Including Flower, Pear and Pine thrips)
Honeylocust Plant Bug	Leaf beetles (Including elm and viburnum leaf beetles)	Psyllids	Treehoppers
Diptera (Including Rhododendron gall midge, Honeylocust pod gall midge)	Leafhoppers (Including glassy-winged sharpshooter)	Sawfly larvae	Weevils (Including white Pine and Black vine)
Froghopper	Leafminers (Including Boxwood leafminer)	Scales (Including Lecanium, Azalea bark, Calico, Cottony Camellia, Cottony maple, Cottony taxus)	Whiteflies

Apply 1.5 fluid ounces (45mL) per 100 gal of water. Make foliar applications before high pest populations become established. Reapply on an as needed basis.

To control White grub larvae, (such as Japanese beetle larvae, Chafers, Phyllophaga spp. Asiatic garden beetle, Oriental beetle) apply 0.46 to 0.6 fluid ounces (14 to 17 mL) per 1000 sq ft.

Make broadcast applications by mixing specified rate in enough water to uniformly cover the treated area. Do not use less than 2 gallons of water per 1000 sq ft. In order to move the active ingredient through the thatch, irrigate if rainfall does not occur within 24 hours after application.

Refer to use directions specific for FLOWERS and GROUND COVERS concerning additional use directions.

RESTRICTION:

- Do not apply more than 1.6 pints application (0.4 lb of active ingredient) per acre per year.
- Do not apply this product in the state of Oregon, by any application method, to linden, basswood or other *Tilia* species



Technical Support
1-877-272-6747
www.treecarescience.com

**SOIL APPLICATION TO ORNAMENTAL AND NON-BEARING
FRUIT & NUT TREES, SHRUBS, FLOWERS AND GROUNDCOVERS**
(Only For Industrial, Commercial Buildings, Residential, Landscaped Planting Areas)
(Including State, National, and Private Wooded and Forested Areas)

TO CONTROL:

Adelgids	Japanese beetles	Pine tip moth larvae	Thrips (suppression)
Aphids	Lace bugs	Plant bugs	White grub larvae
Armored scales (suppression)	Leaf beetles (including elm and viburnum leaf beetles)	Psyllids	Whiteflies
Black vine weevil larvae	Leafhoppers (including glassy-winged sharpshooter)	Roundheaded borers (including Asian longhorned beetles)	
Eucalyptus longhorned borer	Leafminers	Royal Palm Bugs	
Flatheaded borers (including bronze, alder and emerald ash borers)	Mealybugs	Sawfly larvae	
		Soft scales	

For TREES –

Use the following rates as a function of tree diameter at breast height (DBH):

Apply 0.1 - 0.4 fl oz per inch of trunk diameter (DBH). You may use the higher rate (0.3 - 0.4 fl oz) only for trees greater than 15 DBH to control the following pests:

- Asian longhorned beetle
- Emerald Ash Borer
- Eucalyptus longhorned borer
- Bronze birch borer
- Alder borer

RESTRICTION:

- Do not apply more than 25.6 fl oz (0.4 lb of active ingredient) per acre per year.

Diameter at Breast Height (D.B.H.) = is measured at 4.5 feet from the ground.

APPLICATION TECHNIQUE:

SOIL INJECTION:

Mix required dosage in sufficient water to inject an equal amount of solution in each hole. For concentrate injectors mix required dose with up to 1 gallon of water per DBH inch. Maintain a low pressure and use sufficient solution for distribution of the liquid into treatment zone. Dilution rate may vary depending on equipment used, tree size and application rate. Refer to the instructions for injector equipment being used for guidance.

- **GRID SYSTEM:** Make applications in a grid pattern on 2.5 foot centers within the drip line of the tree.
- **CIRCLE SYSTEM:** Make applications in holes evenly spaced approximately 2 – 3 feet apart in a circle within the drip line of the tree. Larger trees may require additional application circles.
- **BASAL SYSTEM:** Make applications into holes evenly spaced around the base of the tree trunk no more than 6 to 12 Inches out from the base.

SOIL DRENCH:

Uniformly apply the dosage in no less than 10 gallons of water per 1000 square feet as a drench around the base of the tree, directed to the root zone. Any plastic or other barrier that may prevent drench solution from reaching the root zone must be removed.

FOR ALL APPLICATION TECHNIQUES:

- Inject an equal amount of water and solution in each hole.
- Use low pressure and sufficient solution for thorough distribution into the treatment zone.
- Maintain soil moisture for 7 to 10 days.
- Application to trees already heavily infested with borers listed may not prevent the eventual loss of the trees.

RESTRICTIONS FOR TREES:

- Do not use less than 4 holes per tree.
- No Soil Injection Applications Allowed In Nassau or Suffolk Counties of New York.
- Do not apply more than 25.6 fl oz (0.4 lb of active ingredient) per acre per year.
- Do not apply this product in the state of Oregon, by any application method, to linden, basswood or other *Tilia* species

For SHRUBS -
Apply 0.1 to 0

APPLICATION

SOIL INJECTI
Apply to indiv

SOIL DRENCH

Uniformly app zone. Remove
• Mix require
• Maintain a l
• Maintain so

RESTRICTION

- Do not use
- No Soil Inje
- Do not appl

For FLOWER:

Apply 0.46 to
Apply as a brc lished plants, i



POB

Includes: Appl

TO CONTROL

Aphids (except aphid)

Apply 1.5 fluc OR

6.0 fluid ounce

- For control o
- For first gen est possible adult flight ; are overlap
- For San Jos
- For late sea
- For optimal

RESTRICTION

- Do not appl
- Do not mak
- Allow 10 or
- Allow at lea
- Not for use
- Do not appl

For SHRUBS –

Apply 0.1 to 0.2 fl oz (3 to 6 mL) per foot of shrub height.

APPLICATION TECHNIQUES:

SOIL INJECTION:

Apply to individual plants using dosage indicated.

SOIL DRENCH:

Uniformly apply the dosage in no less than 10 gallons of water per 1000 square feet as a drench around the base of the tree, directed to the root zone. Remove plastic or any other barrier that will stop solution from reaching the root zone.

- Mix required dosage in sufficient water to inject an equal amount of solution in each hole.
- Maintain a low pressure and use sufficient solution for distribution of the liquid into the treatment zone.
- Maintain soil moisture for 7 to 10 days.

RESTRICTIONS FOR SHRUBS:

- Do not use less than 4 holes per shrub.
- No Soil Injection Applications Allowed In Nassau or Suffolk Counties of New York.
- Do not apply more than 25.6 fl oz (0.4 lb of active ingredient) per acre per year.

For FLOWERS and GROUNDCOVERS –

Apply 0.46 to 0.6 fluid ounces (14 to 17 mL) per 1000 sq ft.

Apply as a broadcast treatment and incorporate into the soil before planting or apply after plants are established. If application is made to established plants, irrigate after application.



POME FRUITS (For Residential Areas Only)

Includes: Apple, Crabapple, Loquat, Mayhaw, Pear, Pear (oriental), Quince

TO CONTROL:

Aphids (except Woolly apple aphid)

Leafhoppers (including glassy-winged sharpshooter)

Leafminer Mealybugs

San Jose Scale

Apply 1.5 fluid ounces (45 mL) per 100 gal
OR

6.0 fluid ounces per acre as foliar spray as needed after petal-fall is complete.

- For control of rosy apple aphid, apply prior to leafrolling caused by the pest.
- For first generation leafminer control, make first application as soon as petal fall is complete. Greatest leafminer control will result from the earliest possible application. For second and succeeding generations of leafminer, optimal control is obtained from applications made early in the adult flight against egg and early instar larvae. A second application may be required 10 days later if severe pressure continues or if generations are overlapping. A single application may result in suppression only. Xytect™ 2F Insecticide will not control late stage larvae.
- For San Jose Scale, time applications to the crawler stage. Treat each generation.
- For late season (preharvest) control of leafhopper species, apply Xytect™ 2F Insecticide while most leafhoppers are in the nymphal stage.
- For optimal control of mealybug, insure good spray coverage of the trunk and scaffolding limbs or other resting sites of the mealybug.

RESTRICTIONS FOR RESIDENTIAL POME FRUITS:

- Do not apply more than 6.0 fluid ounces per acre in a single application.
- Do not make more than 4 applications per year.
- Allow 10 or more days between applications.
- Allow at least 7 days between last application and harvest.
- Not for use in California for control on pears.
- Do not apply pre-bloom or during bloom or when bees are foraging the treatment area.



PECAN

TO CONTROL:

Yellow pecan aphid
Pecan spittlebug

Apply 1.5 fl oz (45 mL)

6.0 fl oz/A¹ as a broadcast
OR
Make a second application at specified rate

RESTRICTIONS

- Do not apply to pecans
- Use on pecans
- Do not make more than 4 applications
- Allow 10 or more days between applications
- Allow at least 7 days between last application and harvest
- Do not apply to pecans

¹The amount of insecticide must meet the standard of 400 lb of active ingredient per acre

TO CONTROL:

Leafhoppers (including glassy-winged sharpshooter)

Apply 1.5 fl oz (45 mL)

OR

3.0 fl oz/A (90 mL)

RESTRICTIONS

- Do not apply to pecans
- Allow at least 7 days between last application and harvest
- Applications must be made before petal fall

The DIRECTION: must be followed other unintended application, all or TO THE EXTENT RAINBOW TREE: description on the THE EXTENT OF DISTRIBUTORS: OR ANY OTHER



PECAN (For Residential Areas Only)

TO CONTROL:

Yellow pecan aphid Black margined aphid Pecan leaf phylloxera
Pecan spittlebug Pecan stem phylloxera

Apply 1.5 fl oz (45 ml) per 100 gal

OR

6.0 fl oz/A¹ as a foliar application as pest pressure begins to increase.

Make a second application 10 to 14 days after first if field scouting reveals continued pest pressure. Use of an organosilicone based spray adjuvant at specified rate can insure thorough coverage of foliage.

RESTRICTIONS FOR RESIDENTIAL PECAN TREES:

- Do not apply more than a total of 18.0 fluid ounces per acre per year.
- Use on pecans not permitted in California unless directed by state 24(c) labeling.
- Do not make more than 3 applications per year.
- Allow 10 or more days between applications.
- Allow at least 7 days between last application and harvest.
- Do not apply pre-bloom or during bloom or when bees are foraging the treatment area.

¹The amount of Xytect™ 2F Insecticide required per acre may vary and depends on tree size or volume of foliage. The rates given are based on a standard of 400 gallons of dilute spray solutions per acre for large trees with full foliage. DO NOT apply more than 18 fluid ounces of Xytect™ 2F Insecticide per acre per year.

GRAPES

(For Use Only For Industrial, Commercial Buildings and Residential Planting Areas)

TO CONTROL:

Leafhoppers (including glassy-winged sharpshooter)
Mealybugs

Apply 1.5 fl oz (45 mL) per 100 gal

OR

3.0 fl oz/A (90 mL/A) as a foliar spray using 200 gallons of water per acre.

RESTRICTIONS FOR GRAPES IN RESIDENTIAL, INDUSTRIAL OR COMMERCIAL BUILDING AREAS:

- Do not apply more than a total of 6.0 ounces of Xytect™ 2F Insecticide per acre per year.
- Allow at least 14 days between applications.
- Applications may be applied up to and including day of harvest.

CONDITIONS OF SALE AND WARRANTY

The DIRECTIONS FOR USE of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS, its Supplemental Distributors, or the Seller. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, All such risks shall be assumed by the Buyer.

RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS, its Supplemental Distributors and the Seller warrant that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use subject to the inherent risks referred to above. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, NEITHER RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS NOR ITS SUPPLEMENTAL DISTRIBUTORS MAKE ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE OR OF MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THIS WARRANTY DOES NOT

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No employee or agent of RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS, its Supplemental Distributor, or the Seller is authorized to vary or exceed the terms of this Warranty in any other manner.



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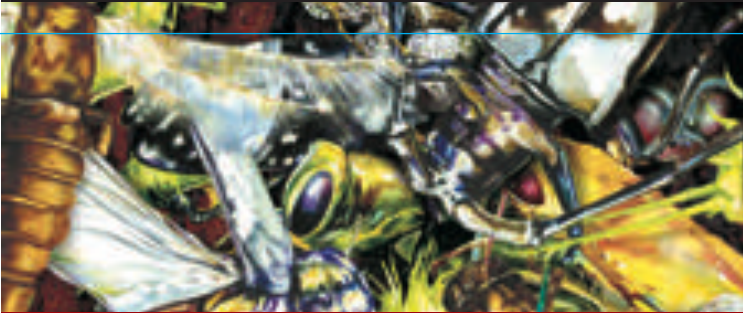


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Net Contents:
1 gallon
128 fl oz (3.78 L)

Xytect™ 2F

Insecticide

For foliar and systemic insect control in turfgrass, landscape ornamentals, listed residential fruit and nut trees and interior plantscapes.

KEEP OUT OF REACH OF CHILDREN.
CAUTION

See additional precautionary statements and directions for use inside booklet. **STOP** – Read the label before use.

**SHAKE WELL
BEFORE USING**

ACTIVE INGREDIENT:	
Imidacloprid, 1-[(6-Chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine	21.4%
OTHER INGREDIENTS:	78.6%
TOTAL:	100.0%

Contains 2 pounds of imidacloprid per gallon.

EPA Reg. No. 42750-115-74779

EPA Est. No. 42750-MO-1

PRECAUCION AL USUARIO: Si usted no puede leer o entender ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

(TO THE USER: If you cannot read or understand English, do not use this product until the label has been fully explained to you.)

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