

BIFENAZATE | GROUP 20D | ACARICIDE

Engulf™ GHN

GREENHOUSE AND ORNAMENTAL MITICIDE

For Agricultural Use Only

ACTIVE INGREDIENT:

bifenazate: hydrazine carboxylic acid, 2-(4-methoxy-[1,1'-biphenyl]-3-yl) 1-methylethyl ester 43.2%

OTHER INGREDIENTS: 56.8%

TOTAL: 100.0%

Contains 4 pounds active ingredient bifenazate per gallon

KEEP OUT OF REACH OF CHILDREN **CAUTION**

See inside booklet for additional Precautionary Statements and Directions for Use

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300

For Medical Emergencies Only, Call (877) 325-1840

EPA Reg. No. 228-748

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

Net Contents
16 Fl. Oz.
(473 mL)

 **Nufarm**

Grow a better tomorrow



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FIRST AID

IF SWALLOWED:

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

IF INHALED:

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

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Harmful if swallowed. Harmful if inhaled. Avoid breathing spray mist. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and Other Handlers Must Wear:

- Long-sleeved shirt and long pants,
- Shoes plus socks, and
- For mixing and loading activities when not using a closed system, wear an apron and chemical-resistant gloves made of: barrier laminate, polyethylene, butyl rubber (≥ 14 mils), nitrile rubber (≥ 14 mils), neoprene rubber (≥ 14 mils), natural rubber (≥ 14 mils), polyvinyl chloride (≥ 14 mils), or Viton (≥ 14 mils).

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, 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 change into clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing them. As soon as possible, wash thoroughly and change clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds, estuarine/marine invertebrates and fish. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash waters or rinsate. This product is moderately toxic to bees and other pollinating insects exposed to direct treatment or to residues in/on blooming crops or weeds. Protect pollinating insects by following label directions intended to minimize drift and to reduce pesticide risk to these organisms. Do not apply this product while bees are foraging the treatment area.

PHYSICAL OR CHEMICAL HAZARDS

Do not use or store near heat or open flame. Do not mix or allow to come into contact with oxidizing agents. Hazardous chemical reaction may occur.

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.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard (WPS), 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), notification to workers, and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

AGRICULTURAL USE REQUIREMENTS *(continued)*

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours. Exceptions are listed under the USE INSTRUCTIONS for each crop.

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
- shoes plus socks
- chemical-resistant gloves made of: barrier laminate, polyethylene, butyl rubber (≥ 14 mils), nitrile rubber (≥ 14 mils), neoprene rubber (≥ 14 mils), natural rubber (≥ 14 mils), polyvinyl chloride (≥ 14 mils), or Viton (≥ 14 mils).

USE INFORMATION

This product provides knockdown and residual control of the following mites when applied directly to foliage as directed by this label. This product works most effectively on the following mites that are motile, but also has ovicidal activity against the *Tetranychus* spp. mites (i.e., Spider Mites) and is especially effective against grass mites, red mites and spider mites. Common mite species controlled by this product include:

Avocado Red Spider	Lewis Mite	Spruce Spider Mite
Bamboo Spider Mite	McDaniel	Strawberry Spider Mite
Banks grass	Pacific Spider Mite	Two-Spotted Spider Mite
Brown Almond	Pecan Leaf Scorch	Willamette
Citrus Red Mite	Persea	
Clover Mite	Sixspotted	
European Red Mite*	Southern Red Mite	

*using maximum rate specified for the crop.

NOTE: This product is not effective in controlling rust mites, broad mites and flat mites.

Because this product is not a systemic insecticide, thorough coverage of both the upper and lower surfaces of the leaves, as well as any fruit present, is required. When used as directed, this product is useful in resistance management and IPM programs due to its selective nature that minimizes impacts to beneficial insects.

MIXING INSTRUCTIONS

This product is a flowable suspension concentrate, **users must be sure to stir or shake this product well prior to use.**

- 1) Fill spray tank with 1/2 the specified amount of water.
- 2) Begin agitation and add the required amount of this product.

- 3) Fill the tank with the remaining amount of required water and continue agitation until the product is fully dispersed.

IMPORTANT: The stability of this product can be affected by high pH and high temperature. Keep spray mixtures containing this product within pH 5.5-6.5.

Tank Mixes: To increase the number of insect and/or mite species controlled, this product may be tank-mixed with other insecticides. *It is required that compatibility with other tank-mix partners be confirmed prior to broad-scale applications.* Tank mixtures are only permitted in States where all of the pesticide products used as tank-mix partners are registered. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements and use limitations of each product in the tank mixture.

USE RESTRICTIONS

- DO NOT plant another crop within 30 days after last application of this product. Planting within 30 days of last application increases the likelihood of bifenazate residues appearing in rotational crops.
- DO NOT exceed the maximum amount of bifenazate allowed per crop per calendar year. This applies to all product(s) containing

bifenazate that are applied to the crop in a calendar year.

- DO NOT use adjuvants in tank mixtures that will be applied to greenhouse tomatoes.
- DO NOT apply to greenhouse tomatoes within 3 days of harvest (3-day PHI).

USE RATES AND DIRECTIONS

If mite pressure is not heavy, use the lowest specified rates listed. If mite pressure is significant or to provide extended residual control, use the highest specified rates listed. In order to maximize residual control, apply the product as soon as mites are detected. For specific application rates, application numbers, and Pre-Harvest Intervals (PHI), refer to the appropriate USE INSTRUCTIONS tables below. Apply this product using the following types of equipment: air-blast sprayers, compressed air, or hydraulic ground booms. The USE INSTRUCTIONS tables below indicate the minimum numbers of gallons of spray solution to apply per acre for ground applications.

SPRAY DRIFT

Ground Boom Applications:

- Apply with the nozzle height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.
- Applicators are required to use fine or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

SPRAY DRIFT ADVISORIES

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

IMPORTANCE OF DROPLET SIZE

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

Controlling Droplet Size – Ground Boom

- Volume – Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure – Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle – Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

BOOM HEIGHT – Ground Boom

Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage. For ground equipment, the boom should remain level with the crop and have minimal bounce.

SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

TEMPERATURE AND HUMIDITY

When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.

WIND

Drift potential generally increases with wind speed. **AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.** Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

USE INSTRUCTIONS

If mite pressure is not heavy, use the lowest specified rates listed. If mite pressure is significant or to provide extended residual control, use the highest specified rates listed.

CHRISTMAS TREES / CONIFER PLANTATIONS AND NURSERIES

Application Rate (fl. oz. / Acre)	Minimum Gallons of Water per Acre	Maximum Number of Applications per Calendar Year	Minimum Number of Days Between Applications	Pre-Harvest Interval (PHI) in Days
	Ground			
12 - 16	100	1	-	-

TOMATOES: Grown in Greenhouses ONLY

Application Rate (fl. oz. / Acre)	Minimum Gallons of Water per Acre	Maximum Number of Applications per Calendar Year	Minimum Number of Days Between Applications	Pre-Harvest Interval (PHI) in Days
	Ground			
2 - 4	100*	2	-	3

*Apply 1-4 quarts of mixture per 100 square feet (100-400 gallons per acre) to the foliage using ground spray equipment (including air blast, compressed air, ground boom, hose-end and hydraulic sprayers). The spray volume is dependent on the size of the plants being treated, with larger plants requiring greater spray volumes.

ORNAMENTALS GROWN IN GREENHOUSES AND SHADEHOUSES

This product may be applied to ornamental foliage for knockdown and residual control of mites on ornamental plants (including ornamental bulb crops, bedding plants, ornamental foliage and flowering plants, perennials, shrubs and trees). The plants may be grown in the ground or in pots. This product provides residual control for up to 28 days. Within the range of rates specified in the next paragraph, use the lower listed rates when mite pressure is low or for preventative applications; and use the higher rates when mite pressure is severe or for residual control. Apply as soon as mites appear.

Mix 2-4 fluid ounces of this product per 100 gallons of water (1/8 – 1/4 teaspoon per gallon of water). Apply 1-4 quarts of the mixture per 100 square feet (100-400 gallons per acre) to the foliage using ground spray equipment (including, air blast, compressed air, ground boom, hose-end and hydraulic sprayers). The spray volume used is dependent on the size of the plants being treated, with larger plants requiring greater spray volumes.

Coverage of ornamentals with hard-to-wet foliage may be improved by using an adjuvant to the spray mixture. Silwet 77® or Sylgard 309® at a rate of 4 ounces per 100 gallons of water has been found to be effective. As with any tank mixture, test the compatibility and safety of any adjuvants in a small-scale trial prior to widespread use.

USE RESTRICTIONS

- DO NOT apply this product more than two times per calendar year.
- DO NOT apply more than 16 fluid ounces of this product per acre per calendar year.
- DO NOT apply this product by aerial application.

RESISTANCE MANAGEMENT

For resistance management, this product contains a Group 20D acaricide. Any insect/mite population may contain individuals naturally resistant to this product or other Group 20D acaricides. The resistant individuals may dominate the insect/mite population if this group of acaricides are used repeatedly in the same fields. Appropriate resistance-management strategies should be followed. To delay acaricide resistance, take the following steps:

- Rotate the use of this product or other Group 20D acaricides within a growing season, or among growing seasons, with different groups that control the same pests. Avoid application of more than 24 fl. oz./A and consecutive sprays of this product or other insecticides in the same group in a season.
- Use tank mixtures with insecticides/acaricides from a different group that are equally effective on the target pest when such use is permitted. Do not rely on the same mixture repeatedly for the same pest population. Consider any known cross-resistance issues (for the targeted pests)

between the individual components of a mixture. In addition, consider the following recommendations provided by the Insecticide Resistance Action Committee (IRAC):

- o Individual insecticides selected for use in mixtures should be highly effective and be applied at the rates at which they are individually registered for use against the target species.
- o Mixtures with components having the same IRAC mode of action classification are not recommended for insect resistance management.
- o When using mixtures, consider any known cross-resistance issues between the individual components for the targeted pest(s).
- o Mixtures become less effective if resistance is already developing to one or both active ingredients, but they may still provide pest management benefits.
- o The insect resistance management benefits of an insecticide mixture are greatest if the two components have similar periods of residual insecticide activity. Mixtures of insecticides with unequal periods of residual insecticide activity may offer an insect resistance management benefit only for the period where both insecticides are active.
- Because of its selectivity, this product can be used in conjunction with most biological control organisms available for mite control. This product, when used as directed, does not adversely affect populations of beneficial/ predaceous mites and insects including:

Common lacewing
(*Chrysopa carnea*)
Insidious flower bug
(*Orius insidiosus*)
Predatory mite
(*Amblyseius fallacis*)
Predatory mite
(*Typhlodromus pyri*)
Predatory mite
(*Zetzellia mali*)
Predatory mite
(*Phytoseiulus persimilis*)

Seven-spotted lady beetle
(*Coccinella septempunctata*)
Six-spotted thrips
(*Scolothrips sexmaculatus*)
Spider mite destroyer
(*Stethorus punctum*)
Western flower thrips
(*Frankliniella occidentalis*)
Western predatory mite
(*Typhlodromus occidentalis*)

The use of these organisms in conjunction with this product is encouraged as a means of reducing the number of chemical applications.

- Adopt an integrated pest management program for insecticide/acaricides use that includes scouting, uses historical information related to pesticide use, crop rotation, record keeping, and which considers cultural, biological and other chemical control practices.
- Monitor after application for unexpected target pest survival. If the level of survival suggests the presence of resistance, consult with your local university specialist or certified pest control advisor.

- Contact your local extension specialist or certified crop advisors for any additional pest resistance-management and/or IPM recommendations for the specific site and pest problems in your area.
- For further information or to report suspected resistance contact Nufarm Americas Inc. at 919-379-2510.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in a dry location.

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

CONTAINER HANDLING:

Non-refillable container. Do not reuse or refill this container. Triple 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 $\frac{1}{4}$ full with water and recap. Shake container 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. Then offer container for recycling, if available, or puncture and dispose of container in a sanitary landfill, or by incineration.

WARRANTY DISCLAIMER

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