

SPEAR[®] → LEP

For Control of Lepidopterans

OPEN

GROUP 32 INSECTICIDE**Biological Insecticide**

For control of lepidopteran pests and Colorado potato beetle in a tank mix with a *Bacillus thuringiensis* (Bt) product or other gut disruptor.

Active Ingredient:

GS-omega/kappa-Hctx-Hv1a 2.0%

Other Ingredients: 98.0%**Total:** 100.0%

Contains 0.17 lb of active ingredient per gallon.

KEEP OUT OF REACH OF CHILDREN CAUTION/PRECAUTION

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 inside booklet for additional Precautionary Statements and Storage and Disposal.

FIRST AID

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.
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.

HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. You may also contact 1-800-535-5053 (and +1-352-323-3500 for International) for emergency medical treatment information and chemical emergency assistance.

Produced for:

Vestaron Corporation
600 Park Offices Drive, Suite 117
Research Triangle Park, NC 27709

EPA Reg. No.: 88847-6

EPA Est. No.: Printed on Container

Made in USA

NET CONTENTS: 1 GALLON

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PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals - CAUTION. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Wear protective eyewear and waterproof gloves. 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.

Personal Protective Equipment (PPE):

Applicators and other handlers must wear:

- long-sleeved shirt and long pants
- waterproof gloves
- shoes plus socks
- protective eyewear

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

USER SAFETY RECOMMENDATIONS

Users should:

- 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: 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 wash water or rinsate.

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 State or Tribal agency responsible for pesticide regulation. 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 into treated areas during the Restricted Entry Interval (REI) of 4 hours unless wearing the appropriate personal protective equipment.

Do not enter or allow workers to enter the treated greenhouse or enclosed space until the ventilation requirements in 40 CFR 170.405(b)(3) have been met and the Restricted Entry Interval (REI) of 4 hours has expired. Until then, only handlers wearing the appropriate personal protective equipment can enter the greenhouse or enclosed space.

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
- protective eyewear

PRODUCT INFORMATION

Spear®-Lep is a biological insecticide that contains the peptide active ingredient GS-omega/kappa-Htxx-Hv1a. It is for use on ornamental plants and edible crops. To be effective against the labelled lepidopteran and coleopteran pests, Spear®-Lep must be tank mixed with *Bacillus thuringiensis* (Bt) products or another product that assists in moving the active ingredient to the site of activity. When ingested at labelled rates along with Bt, Spear®-Lep functions as a central nervous system inhibitor. Spear®-Lep is mixed with water and applied as a foliar spray with ground or aerial equipment equipped for conventional insecticide spraying.

Spear®-Lep tank mixes with Bt products can be used in either the field or greenhouse.

USE INSTRUCTIONS

In combination with Bt, the active ingredient in Spear®-Lep largely acts through ingestion. Spear®-Lep has no systemic activity, therefore thorough coverage of infested plant parts is necessary for best performance. For some crops, directed drop nozzles by ground machine are required. Spear®-Lep in combination with Bt is only effective on the immature stages of the listed lepidopteran pests. Younger life stages or earlier instars should be considered more susceptible.

The application rate for all listed crops and targets is 1-2 pints per acre. Repeat applications at 3-10-day intervals (or at intervals necessary to maintain control) depending upon plant growth rate, pest activity and other factors. Under heavy pest pressure conditions, shorten the spray interval,

use a higher rate, and/or increase spray volume to improve spray coverage. Do not spray to run off.

Spear®-Lep may be applied up to and including the day of harvest (Pre-harvest interval = 0 days).

Adjuvants may be used to achieve uniform plant coverage on plants that are difficult to wet, closed canopy or dense foliage. Use a spreader/sticker or an adjuvant that has been approved for the targeted crop use to enhance the adhesion of Spear®-Lep to the crop.

Spear®-Lep has been evaluated for phytotoxicity on a variety of edible and non-edible crops under various normal growing conditions. It is not feasible, however, to test all crop varieties in all mixtures and combinations. Therefore, prior to treating the entire crop, test a small portion of the crop for sensitivity.

Mixing directions:

Do not add Spear®-Lep to the mix tank before introducing the desired amount of water. Add water to the mix tank. Start the mechanical or hydraulic agitation to provide moderate circulation before adding Spear®-Lep. Add the desired volume of Spear®-Lep to the mix tank and continue circulation. **Maintain circulation while loading and spraying.** Do not mix more Spear®-Lep than can be used in 24 hours.

Tank mixing and compatibility:

Do not combine Spear®-Lep in the spray tank with other pesticides, surfactants, adjuvants or fertilizers if there has been no previous experience or use of the combination to show it is physically compatible, effective, and non-injurious under your use conditions. Follow the most restrictive of the labeling limitations and precautions of all products used in mixtures.

To ensure compatibility of tank-mix combinations, evaluate prior to use. Use a jar test to determine the physical compatibility of this product with other products. Add the proportionate amounts of the products to one quart of water with agitation. Add dry formulations first, then flowables, then emulsifiable concentrates. After thoroughly mixing, let this mixture stand for 5 minutes. If the combination remains mixed or can be readily remixed, it is physically compatible. Once compatibility has been proven, use the same procedure for adding required ingredients to the spray tank.

When a surfactant is used, add it to the diluted spray solution last. Use the recommended dosage advised in the respective surfactant label to the diluted Spear®-Lep spray solution and mix thoroughly by agitation to prepare the spray solution for application.

Spray volume:

Apply Spear®-Lep tank mixes in ground and aerial equipment with quantities of water sufficient to provide thorough coverage of infested plant parts. The amount of water needed per acre will depend upon crop development, weather, application equipment and local experience. Use a minimum of 20 gallons per acre for ground applications and a minimum of 5 gallons per acre for aerial application.

Do not spray when wind speed favors drift beyond the area intended for use. Avoiding spray drift is the responsibility of the applicator.

Use Restrictions:

Do not apply this product through any type of irrigation.

For outdoor field use, do not apply more than 10 gallons of Spear®-Lep per acre per year.

Integrated Pest Management (IPM):

Spear®-Lep is an important tool for sound pest management whenever pesticide use is necessary. Because the active ingredient has a novel mode of action, Spear®-Lep provides a new control method for the labelled pests. Based on sound scouting practices, use Spear®-Lep preventively to avoid infestations, as a spot spray to suppress localized infestations, or as a blanket spray to prevent outbreaks. Applying Spear®-Lep in rotation with other insecticides will reduce inputs of conventional insecticides and also delay development of pesticide resistance. Based on a variety of evaluations, Spear®-Lep is not disruptive to the benefits of biological control agents or other non-target species. It is not feasible, however, to test all species of beneficials in all situations. Therefore, consult with a pest control advisor, extension agent or the manufacturer before treating an entire crop where beneficial insects serve as part of an IPM program. Consult local agricultural authorities for IPM strategies that are specific to your crop and location.

Resistance Management:

GROUP	32	INSECTICIDE
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Spear®-Lep contains the biological peptide GS-omega/kappa-Htxh-Hv1a, which has a novel mode of action. It is classified as a Group 32 Insecticide and is not known to be cross-resistant to any other class of insecticide. Repeated use of any mode of action, however, has the potential for pests to develop resistance. To delay development of insecticide resistance, the following practices are recommended:

- Carefully follow the specific guidelines within the use directions.
- Avoid using the same active ingredient or mode of action on consecutive generations of insects. Multiple applications to reduce a single generation, however, are acceptable. Treat the next generation with a different mode of action.
- Avoid using less than labeled rates of any insecticide when applied alone.
- Target the insect in early development to achieve the greatest benefit from the insecticide.
- Consult local agricultural authorities for specific IPM strategies developed for your crop(s) and location.

AERIAL DRIFT REDUCTION ADVISORY INFORMATION**General:**

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. Where states have more stringent regulations, they should be observed. Note: This section is advisory in nature and does not supersede the mandatory label requirements.

Boom Width:

For aerial applications, the boom width must not exceed 75% of the wingspan or 90% of the rotary blade. Use upwind swath displacement and apply only when wind speed is 3-10 mph as measured by an anemometer. Use medium or coarser spray according to ASAE 572 definition for standard nozzles or VMD for spinning atomizer nozzles. If application includes a no-spray zone, do not release spray at a height greater than 10 feet above the ground or crop canopy.

Application Height:

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

Swath Adjustment:

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

Wind:

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature Inversions:

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

Sensitive Areas:

The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas). Do not allow spray to drift from the application site and contact people, structures people occupy at any time and the associated property, parks and recreation areas, non-target crops, aquatic and wetland areas, woodlands, pastures, rangelands, or animals.

APPLICATION RATES AND VOLUMES

For all listed crops, apply 1-2 pints of Spear®-Lep per acre for all listed pests. Best performance depends on thorough coverage. Use a minimum of 20 gallons for ground applications and 5 gallons for aerial applications. Do not spray to runoff.

PESTS CONTROLLED BY SPEAR®-LEP IN A TANK MIX WITH Bt

Colorado Potato Beetle*

*Apply in a tank mix with the low labelled rate of a beetle active Bt, such as Bt spp. *tenebrionis*

Lepidopteran Larvae (caterpillars, loopers, "worms")*, such as:

*Apply in a tank mix with the low labelled rate of a lepidopteran active Bt, such as Bt spp. *kurstaki*

Alfalfa Caterpillar	Fruitworms, such as	Peach Twig Borer
Amorbia spp.	Cherry, Cranberry, Green, Tomato	Pickleworm
Armyworms	Grape Berry Moth	Pine Butterfly
Artichoke Plume Moth	Grape Leafroller	Redhumped Caterpillar
Azalea Caterpillar	Grapeleaf Skeletonizer	Rindworms
Bagworms	Green Cloverworm	Saddleback Caterpillar
Banana Moth	Greenstriped Mapleworm	Saddled Prominent
Bollworms	Gypsy Moth	Saltmarsh Caterpillar
Browntail Moth	Headworms	Satin Moth
Buck Moth	<i>Helicoverpa</i> spp.	Skippers, such as
Budworms, such as	<i>Heliothis</i> spp.	Banana, Essex, European
Blackheaded, Jack Pine, Spruce, Tobacco	Hickory Shuckworm	Southwestern Corn Borer
California Oakworm	Hornworms	Soybean Podworm
Cankerworms	Imported Cabbageworm	Spanworms, such as
Chainspotted Geometer	Io Moth	Bruce, Cranberry, Currant, Elm
Codling Moth	Leafrollers, such as	Sunflower Moth
Coneworms	Filbert, Fruittree, Obliquebanded, Omnivorous, Redbanded	<i>Thecla basilides</i>
Cotton Leafperforator	Leek Moth	Tomato Pinworm
Cotton Leafworm	Loopers, such as	Tufted Apple Bud Moth
Cutworms, such as	Alfalfa, Hemlock, Omnivorous, Soybean	Tussock Moths, such as
Citrus, Roughskinned, Spotted, Variegated	Melonworm	Douglas-fir, Hickory, Western Pine, Whitemarked
Diamondback Moth	Navel Orangeworm	Velvetbean Caterpillar
Eastern Tent Caterpillar	Oleander Caterpillar	Walnut Caterpillar
European Corn Borer	Omnivorous Leaf-tier	Webworms, such as
European Grapevine Moth	Orange Tortrix	Cabbage, Fall, Filbert, Mimosa
European Pepper Moth	Orangedog	Winter Moth
Forest Tent Caterpillar	Orangestriped Oakworm	
	Oriental Fruit Moth	

USE SPEAR®-LEP IN A TANK MIX WITH BI ON THE FOLLOWING CROPS

Vegetable and Cole Crops:

Vegetable, Root and Tuber (Group 1), such as:

Beet, Carrot, Horseradish, Potato, Radish, Sugar Beet, Sweet Potato, Turnip, Turnip Greens

Vegetable, Bulb (Group 3), such as:

Garlic, Leek, Onion, Shallot

Vegetable, Leafy Except Brassica (Group 4), such as:

Celery, Endive, Lettuce, Parsley, Spinach

Vegetable, Brassica Leafy (Group 5), such as:

Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collard, Kohlrabi

Vegetable, Legume (Group 6), such as:

Bean, Lentil, Pea, Soybean

Vegetable, Fruiting (Group 8), such as:

Eggplant, Pepper, Tomato

Vegetable, Cucurbit (Group 9), such as:

Cucumber, Melon, Pumpkin, Squash, Watermelon

Other Vegetables

Artichoke, Asparagus, Malagna, Watercress

Field Crops, such as:

Alfalfa (Hay Seed), Canola, Corn (Field, Sweet, Popcorn), Cotton, Forage Crops, Hay, Hemp, Hops, Jojoba, Peanuts, Rapeseed, Rice, Safflower, Small Grains, Sorghum, Sunflower, Tobacco

Herbs, Mints, Spices, such as:

Basil, Dill, Oregano, Peppermint, Thyme

Fruits, Nuts

Small fruits and berries, such as:

Blackberry, Blueberry, Cranberry, Currant, Grape, Raspberry, Strawberry

Pome and Stone Fruits, such as:

Apple, Apricot, Cherry, Nectarine, Peach, Pear, Plum, Prune, Quince

Nut Trees, such as:

Almond, Chestnut, Filbert, Pecan, Pistachio, Walnut

Avocado, Banana, Citrus, Kiwi, Persimmon, Pineapple, Pomegranate, Tropical Fruits

Bedding Plants, Container Plants, Flowers, Ornamentals

Greenhouse and Outdoor Nursery Crops, such as:

Brassicas, Flowers, Fruiting groups, Hemp, Herbs and Spices, Leafy Vegetables, Ornamental plants, Tobacco, Vegetable Groups

Forest, Ornamentals, Ornamental Fruit, Shade Trees, Shrubs, Sugar Maple Trees, Nut and Citrus Trees

STORAGE AND DISPOSAL

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

Pesticide Storage: Store unopened container at room temperature. Do not allow product to freeze. Do not store product in an open/unsealed container. Discard any remaining product after use.

Pesticide Disposal: Discard any remaining product after use on site, or send to a waste disposal facility or pesticide disposal program.

Container Handling:

Nonrefillable 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 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. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill or by incineration.

TERMS AND CONDITIONS OF USE

If the terms of the following WARRANTY DISCLAIMER, INHERENT RISKS OF USE, and LIMITATION OF REMEDIES are not acceptable, return the unopened package at once to Vestaron Corporation. Otherwise, use of the product will constitute acceptance of the terms under WARRANTY DISCLAIMER, INHERENT RISKS OF USE and LIMITATION OF REMEDIES.

WARRANTY DISCLAIMER

TO THE EXTENT PERMITTED BY APPLICABLE LAW, VESTARON CORPORATION MAKES NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE CONCERNING USE OF THE PRODUCT.

INHERENT RISKS OF USE

It is impossible to eliminate all risks associated with use of the product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use, storage or handling of the product not in accordance with the accompanying label instructions, abnormal conditions, presence of other materials, or other factors, all of which are beyond the control of Vestaron Corporation. All such risks shall be assumed by the user.

LIMITATION OF REMEDIES

To the extent permitted by applicable law, the exclusive remedy for losses or damages resulting from the product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to replacement of the amount of product used. To the extent permitted by applicable law, Vestaron Corporation disclaims any liability for incidental, consequential, exemplary, special or indirect damages resulting from the use, storage or handling of the product.

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 other agent of Vestaron Corporation is authorized to vary or exceed the terms of the WARRANTY DISCLAIMER, INHERENT RISKS OF USE, and LIMITATION OF REMEDIES in any manner. The terms may be varied only by agreement in writing signed by a duly authorized representative of Vestaron Corporation.

Spear® is a registered trademark of Vestaron Corporation.

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