

# BotaniGard® Optima ES

**EMULSIFIABLE SUSPENSION MYCOINSECTICIDE**

For Control of Whiteflies, Aphids, Thrips, Psyllids, Mealybugs, Leafhoppers, Weevils, Plant Bugs, Borers and Leaf-feeding Insects on Listed Food and Nonfood Crops Grown Outdoors, in Indoor/Outdoor Nurseries, Greenhouses, Shadehouses, Commercial Landscapes, and Interiorscapes, and on Turf



FOR ORGANIC PRODUCTION

## ACTIVE INGREDIENT:

*Beauveria bassiana* strain GHA<sup>†</sup> ..... 2.0%

**OTHER INGREDIENTS<sup>‡</sup>**..... 98.0%

**Total:**..... 100.0%

<sup>†</sup>Contains a minimum of 1 x 10<sup>9</sup> viable spores per mL of product

<sup>‡</sup>Contains petroleum distillates.

## KEEP OUT OF REACH OF CHILDREN

Refer to inside of label booklet for additional precautionary information and Directions for Use including First Aid and Storage and Disposal

Store between 40°F and 85°F

Shake Well

## MANUFACTURED BY:

Certis USA LLC  
9145 Guilford Road, Suite 175  
Columbia, MD 21046



**EPA Reg. No.:** 82074-17

**EPA Est. No.:**

**Lot Number:** \_\_\_\_\_

**Net Contents:** \_\_\_\_\_

**Not for sale or use after:**

ESL20241126

Ver20250116

This is a Specimen Label. It may not reflect the most-recent approved label for use in your state. Always refer to the label on the product packaging for approved use instructions. Please contact your Certis sales representative for more information.

FIRST AID	
<b>If swallowed:</b>	<ul style="list-style-type: none"> <li>• Immediately call a poison control center or doctor.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Do not give <b>any</b> liquid to the person.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
<p align="center"><b>HOTLINE NUMBER</b></p> <p>Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For medical emergencies, call the Poison Control Center at 1-800-222-1222. For non-emergency information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-858-7378, Monday through Friday, 8:00 am to 12:00 pm Pacific Time (NPIC Website: <a href="http://www.npic.orst.edu">www.npic.orst.edu</a>).</p>	
<p align="center"><b>NOTE TO PHYSICIAN</b></p> <p align="center">Contains petroleum distillate. Vomiting may cause aspiration pneumonia.</p>	

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Harmful if swallowed. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves (barrier laminate, nitrile rubber  $\geq$  14 mils, or neoprene rubber  $\geq$  14 mils)

Mixers/loaders and applicators must wear a minimum of a NIOSH-approved particulate filtering facepiece respirator with any R or P filter; OR a NIOSH-approved elastomeric particulate respirator with any R or P filter; OR a NIOSH-approved powered air-purifying respirator with an HE filter. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

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

USER SAFETY RECOMMENDATIONS
<p><b>Users should:</b></p> <ul style="list-style-type: none"> <li>• Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.</li> <li>• Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.</li> </ul>

### ENGINEERING CONTROLS

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 §170.607 (d), (e), (f)), the handler PPE requirements may be reduced or modified as specified in the WPS.

## ENVIRONMENTAL HAZARDS

This product is potentially pathogenic to honey bees. Avoid applying to areas where honey bees are actively foraging or around bee hives. This product may be toxic to fish. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

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 washwater or rinsate.

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## 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 State or Tribal agency responsible for pesticide regulation.

### 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 apply only to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours. PPE required for 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 (barrier laminate, nitrile rubber  $\geq$  14 mils, or neoprene rubber  $\geq$  14 mils)

### 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.

Keep unprotected persons out of treated areas until sprays have dried.

## PRODUCT INFORMATION

BotaniGard® Optima ES contains live spores of the ubiquitous soilborne fungus, *Beauveria bassiana* strain GHA. This ubiquitous soilborne fungus is a disease organism of corn borers and other insects. Spores are alive and may be harmed by storage at high temperatures. Spores will be harmed if left overnight or longer in water. See STORAGE AND DISPOSAL instructions on the container label.

May be applied by air. Suitable for use with ultra low-volume application equipment.

## MODE OF ACTION AND APPLICATION TIMING

This product acts by contact. Fungal spores attach to the insect pest, germinate, and penetrate through the insect cuticle. The fungus then grows rapidly with the insect pest, causing mortality.

Begin treatment of crops at the first appearance of the insect pest. Typically, it takes 7-10 days after the first spray to see control. Application rates, frequency, spray coverage and insect numbers impact the speed at which acceptable control is achieved. This product is most effective when used early, before high insect populations develop. Reapply as indicated on the label under a pest management program that includes close scouting. Intense pest outbreaks may require combination of this product with a compatible insecticide.

*Beauveria bassiana* occurs naturally in close association with corn plants where it infects corn borers. When applied to corn early in the season, the fungus persists in association with corn plants providing season long reduction in corn borer damage.

Contact Certis USA LLC or your distributor for specific information on compatible insecticides.

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### PRE-HARVEST INTERVAL (PHI)

This product can be applied up to the day of harvest (0-day PHI).

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### MIXING AND APPLICATION

**SHAKE WELL BEFORE USING.** Apply this product using hand-held, ground and/or aerial spray equipment; low-volume application equipment and chemigation (**follow specific directions for chemigation in this booklet**). This product contains emulsifiers and mixes readily in water. Mix well by external mixing, in-tank mixing, or pump circulation to form an emulsion. To mix, fill spray tank with half the desired amount of water and start agitation. Shake product to suspend spores; then, with agitator running, slowly add desired quantity of product to spray tank. Add remainder of desired amount of water. Continue agitation throughout loading and spraying. Triple rinse empty container with water and add rinse water to spray tank. Do not mix more product than needed for that day. Do not mix product the day before application. Spores will be harmed if left overnight or longer in the spray tank.

Contact your dealer or Certis USA LLC for instructions about specific crops, insects, and spray equipment.

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### APPLICATION FREQUENCY

In most situations, apply at 5- to 10-day intervals; however, with high insect populations, especially whiteflies and aphids, applications may need to be done at 2- to 5-day intervals. Repeat applications for as long as pest pressure persists. There is no limit on the number of applications or total amount of product that can be applied in one season.

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### PHYTOTOXICITY

This product has demonstrated plant safety but has not been tested on all plant varieties or in all tank mixes. Use caution when making applications to open blooms, especially on varieties known to be sensitive. Test product on a small number of plants to check for potential damage before applying to larger number of plants. **Do not apply on poinsettias after bract formation.**

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### TANK MIX COMPATIBILITY

This product is physically and biologically compatible with a wide range of insecticides and spray adjuvants. It is compatible with some fungicides in tank mixtures. Fungicides may kill the spores. Do not exceed label dosage rates. Observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

**Adjuvants:** This product is designed for application without additional wetting agents and spreaders. If adjuvants are needed for some other reason, contact your dealer or Certis USA LLC for specific instructions. Some wetting agents and spreaders kill the spores (*i.e.*, the active ingredient in this product) or contribute to poor mixing and spray problems.

**Compatibility with Chemical Insecticides:** This product is compatible with most chemical insecticides. However, some insecticide formulations can kill the fungal spores, the active ingredient in this product. If you are going to use this product in combination with other pesticides, contact your dealer or Certis USA LLC for specific information. In all cases, pesticides must be used in accordance with their labels.

**Compatibility with Fungicides:** This product is compatible in tank mix with some fungicides. Contact Certis USA LLC or your dealer for specific instructions on using this product with fungicides.

## FOOD CROPS

### CROP GROUP 1: ROOT AND TUBER VEGETABLES

Arracacha; arrowroot; artichoke, Chinese; artichoke, Jerusalem; beet, garden; beet, sugar; burdock, edible; canna, edible; carrot; cassava, bitter and sweet; celeriac (celery root); chayote (root); chervil, turnip-rooted; chicory; chufa; dasheen (taro); ginger; ginseng; horseradish; leren; parsley, turnip-rooted; parsnip; potato; radish; radish, oriental (daikon); rutabaga; salsify (oyster plant); salsify, black; salsify, Spanish; skirret; sweet potato; tanier (cocoyam); turmeric; turnip; yam bean (jicama, manioc pea); yam, true

### CROP GROUP 3-07: BULB VEGETABLES

Chive, fresh leaves; chive, Chinese, fresh leaves; daylily, bulb; elegans hosta; fritillaria, bulb; fritillaria, leaves; garlic, bulb; garlic, great-headed, bulb; garlic, serpent, bulb; kurrat; lady's leek; leek; leek, wild; lily, bulb; onion, Beltsville bunching; onion, bulb; onion, Chinese, bulb; onion, fresh; onion, green; onion, macrostem; onion, pearl; onion, potato, bulb; onion, tree, tops; onion, Welsh, tops; shallot, bulb; shallot, fresh leaves; cultivars, varieties, and/or hybrids of these

### CROP GROUP 4-16: LEAFY VEGETABLES

Amaranth, Chinese; amaranth, leafy; arugula; aster, Indian; blackjack; broccoli, Chinese; broccoli raab; cabbage, abyssinian; cabbage, Chinese, bok choy; cabbage, seakale; cat's whiskers; cham-chwi; cham-na-mul; chervil, fresh leaves; chipilin; chrysanthemum, garland; cilantro, fresh leaves; collards; corn salad; cosmos; cress, garden; cress, upland; dandelion, leaves; dang-gwi, leaves; dillweed; dock; dol-nam-mul; ebolo; endive; escarole; fameflower; feather cockscomb; good king henry; hanover salad; huauzontle; jute, leaves; kale; lettuce, bitter; lettuce, head; lettuce, leaf; maca, leaves; mizuna; mustard greens; orach; parsley, fresh leaves; plantain, buckhorn; primrose, English; purslane, garden; purslane, winter; radicchio; radish, leaves; rape greens; rocket, wild; shepherd's purse; spinach; spinach, Malabar; spinach, New Zealand; spinach, tanier; Swiss chard; turnip greens; violet, Chinese, leaves; watercress; cultivars, varieties, and hybrids of these commodities

### CROP GROUP 5-16: BRASSICA HEAD AND STEM VEGETABLES

Broccoli; Brussels sprouts; cabbage; cabbage, Chinese, napa; cauliflower; cultivars, varieties, and hybrids of these commodities

### CROP GROUP 6: LEGUME VEGETABLES (SUCCULENT OR DRIED)

Bean, *Lupinus* spp. (including grain lupin, sweet lupin, white lupin, and white sweet lupin); bean, *Phaseolus* spp. (including field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean); bean, *Vigna* spp. (including adzuki bean, asparagus bean, blackeyed pea, catjang, Chinese longbean, cowpea, Crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlong bean); broad bean (fava bean); chickpea (garbanzo bean); guar; jackbean; lablab bean (hyacinth bean); lentil; pea (including dwarf pea, edible-pod pea, English pea, field pea, garden pea, green pea, snow pea, sugar snap pea); pigeon pea; soybean; soybean (immature seed); sword bean

### CROP GROUP 8-10: FRUITING VEGETABLES

African eggplant; bush tomato; cocona; currant tomato; eggplant; garden huckleberry; goji berry; groundcherry; martynia; naranjilla; okra; pea eggplant; pepino; pepper, bell; pepper, nonbell; roselle; scarlet eggplant; sunberry; tomatillo; tomato; tree tomato; cultivars, varieties and/or hybrids of these

#### CROP GROUP 9: CUCURBIT VEGETABLES

Chayote (fruit); Chinese waxgourd (Chinese preserving melon); citron melon; cucumber; gherkin; gourd, edible (includes hyotan, cucuzza, hechima, Chinese okra); *Momordica* spp. (includes balsam apple, balsam pear, bittermelon, Chinese cucumber); muskmelon (includes cantaloupe); pumpkin; squash, summer; squash, winter (includes butternut squash, calabaza, hubbard squash, acorn squash, spaghetti squash); watermelon

#### CROP GROUP 10-10: CITRUS FRUIT

Australian desert lime; Australian finger lime; Australian round lime; Brown River finger lime; calamondin; citron; citrus hybrids; grapefruit; Japanese summer grapefruit; kumquat; lemon; lime; Mediterranean mandarin; mount white lime; New Guinea wild lime; orange, sour; orange, sweet; pummelo; Russell River lime; satsuma mandarin; sweet lime; tachibana orange; Tahiti lime; tangelo; tangerine (mandarin); tangor; trifoliate orange; uniq fruit; cultivars, varieties, and/or hybrids of these

#### CROP GROUP 11-10: POME FRUIT

Apple; azarole; crabapple; loquat; mayhaw; medlar; pear; pear, Asian; quince; quince, Chinese; quince, Japanese; tejocote; cultivars, varieties, and/or hybrids of these

#### CROP GROUP 12-12: STONE FRUIT

Apricot; apricot, Japanese; capulin; cherry, black; cherry, Nanking; cherry, sweet; cherry, tart; Jujube, Chinese; nectarine; peach; plum; plum, American; plum, beach; plum, Canada; plum, cherry; plum, Chickasaw; plum, Damson; plum, Japanese; plum, Klamath; plum, prune; plumcot; sloe; cultivars, varieties, and/or hybrids of these

#### CROP GROUP 13-07: BERRY AND SMALL FRUIT

Amur river grape; aronia berry; bayberry; bearberry; bilberry; blackberry (including Andean blackberry, arctic blackberry, bingleberry, black satin berry, boysenberry, brombeere, California blackberry, Chesterberry, Cherokee blackberry, Cheyenne blackberry, common blackberry, coryberry, darrowberry, dewberry, Dirksen thornless berry, evergreen blackberry, Himalayaberry, hullberry, lavacaberry, loganberry, lowberry, Lucretiaberry, mammoth blackberry, marionberry, mora, mures deronce, nectarberry, Northern dewberry, olallieberry, Orgeon evergreen berry, phenomenalberry, rangeberry, ravenberry, rossberry, Shawnee blackberry, Southern dewberry, tayberry, youngberry, zarzamora, and cultivars, varieties and/or hybrids of these); blueberry, highbush; blueberry, lowbush; buffalo currant; buffaloberry; che; Chilean guava; chokecherry; cloudberry; cranberry; cranberry, highbush; currant, black; currant, red; elderberry; European barberry; gooseberry; grape; honeysuckle, edible; huckleberry; jostaberry; Juneberry (Saskatoon berry); kiwifruit, fuzzy; kiwifruit, hardy; lingonberry; maypop; mountain pepper berries; mulberry; muntries; native currant; partridgeberry; phalsa; pincherry; raspberry, black and red; riberry; salal; schisandra berry; sea buckthorn; serviceberry; strawberry; wild raspberry; cultivars, varieties, and/or hybrids of these

#### CROP GROUP 14-12: TREE NUTS

African nut-tree; almond; beechnut; Brazil nut; Brazilian pine; bunya; bur oak; butternut; Cajou nut; candlenut; cashew; chestnut; chinquapin; coconut; coquito nut; dika nut; ginkgo; Guiana chestnut; hazelnut (filbert); heartnut; hickory nut; Japanese horse-chestnut; macadamia nut; mongongo nut; monkey-pot; monkey puzzle nut; Okari nut; Pachira nut; peach palm nut; pecan; pequi; Pili nut; pine nut; pistachio; Sapucaia nut; tropical almond; walnut, black; walnut, English; yellowhorn; cultivars, varieties, and/or hybrids of these

#### CROP GROUP 15: CEREAL GRAINS

Barley; buckwheat; corn (all including field, seed, and sweet; fresh market and grain); millet, pearl; millet, proso; oats; popcorn; rice; rye; sorghum (milo); teosinte; triticale; wheat; wild rice

#### CROP GROUP 16: FORAGE, FODDER, AND STRAW OF CEREAL GRAINS

Forage, fodder, stover and straw of: barley; buckwheat; corn; millet, pearl; millet, proso; oats; popcorn; rice; rye; sorghum (milo); teosinte; triticale; wheat; wild rice

#### CROP GROUP 17: GRASS FORAGE, FODDER, AND HAY

Forage, fodder, stover, and hay of any grass, *Gramineae/Poaceae* family (either green or cured) except sugarcane and those included in the cereal grains group, that will be fed to or grazed by livestock, all pasture and range grasses and grasses grown for hay or silage

#### CROP GROUP 18: NONGRASS ANIMAL FEEDS (FORAGE, FODDER, STRAW, AND HAY)

Alfalfa; bean, velvet; clover; kudzu; lespedeza; lupin; sainfoin; trefoil; vetch; vetch, crown; vetch, milk

#### CROP GROUP 19: HERB AND SPICES

Allspice; angelica; anise (seed); anise, star; annatto (seed); balm (lemon balm); basil; borage; burnet; camomile; caper buds; caraway; caraway, black; cardamom; cassia bark; cassia buds; catnip; celery seed; chervil (dried); chive; chive, Chinese; cinnamon; clary; clove buds; coriander leaf (cilantro or Chinese parsley); coriander seed (cilantro); costmary; culantro (leaf); culantro (seed); cumin; curry (leaf); dill (dillweed); dill (seed); fennel (common); fennel, Florence (seed); fenugreek; grains of paradise; horehound; hyssop; juniper berry; lavender; lemongrass; lovage (leaf); lovage (seed); mace; marigold; marjoram (includes sweet or annual marjoram, wild marjoram or oregano, and pot marjoram); mustard (seed); nasturtium; nutmeg; parsley (dried); pennyroyal; pepper, black; pepper, white; poppy (seed); rosemary; rue; saffron; sage; savory, summer and winter; sweet bay; tansy; tarragon; thyme; vanilla; wintergreen; woodruff; wormwood

#### CROP GROUP 20: OILSEED

Borage; calendula; castor oil plant; Chinese tallowtree; cottonseed; crambe; cuphea; echium; euphorbia; evening primrose; flax seed; gold of pleasure; hare's ear mustard; jojoba; lesquerella; lunaria; meadowfoam; milkweed; mustard seed; niger seed; oil radish; poppy seed; rapeseed; rose hip; safflower; sesame; stokes aster; sunflower; sweet rocket; tallowwood; tea oil plant; vernonia; cultivars, varieties, and/or hybrids of these

#### CROP GROUP 22: STALK, STEM AND LEAF PETIOLE VEGETABLES

Agave; aloe vera; asparagus; bamboo, shoots; cardoon; celery; celery, Chinese; celtuce; fennel, Florence, fresh leaves and stalk; fern, edible, fiddlehead; fuki; kale, sea; kohlrabi; palm hearts; prickly pear, pads; prickly pear, Texas, pads; rhubarb; udo; zuiki; cultivars, varieties, and hybrids of these commodities

#### CROP GROUP 23: TROPICAL AND SUBTROPICAL FRUIT, EDIBLE PEEL

Açaí; acerola; achachairú; African plum; agritos; almondetta; ambarella; apak palm; appleberry; arazá; arbutus berry; babaco; bacaba palm; bacaba-de-leque; bayberry, red; bignay; bilimbi; borojó; breadnut; cabeluda; cajou, fruit; cambucá; carandas-plum; carob; cashew apple; Ceylon iron wood; Ceylon olive; cherry-of-the-Rio-Grande; Chinese olive, black; Chinese olive, white; chirauli-nut; ciruela verde; cocoplum; date; Davidson's plum; desert-date; doum palm coconut; false sandalwood; feijoa; fig; fragrant manjack; gooseberry, Abyssinian; gooseberry, Ceylon; gooseberry, Indian; gooseberry, otaheite; governor's plum; grumichama; guabiroba; guava; guava berry; guava, Brazilian; guava, cattley; guava, Costa Rican; guava, Para; guava, purple strawberry; guava, yellow strawberry; guayabillo; illawarra plum; imbé; imbu; Indian-plum; jaboticaba; Jamaica-cherry; jambolan; jelly palm; jujube, Indian; kaffir-plum; kakadu plum; kapundung; karanda; kwai muk; lemon aspen; mangaba; marian plum; mombin, Malayan; mombin, purple; mombin, yellow; monkeyfruit; monos plum; mountain cherry; nance; natal plum; noni; olive; papaya, mountain; patauá; peach palm, fruit; persimmon, black; persimmon, Japanese; pitomba; plum-of-Martinique; pomeac; rambai; rose apple; rukam; rumberry; sea grape; sentul; sete-capotes; silver aspen; starfruit; Surinam cherry; tamarind; uvalha; water apple; water pear; water berry; wax jambu; cultivars, varieties, and hybrids of these commodities



#### CROP GROUP 24: TROPICAL AND SUBTROPICAL FRUIT, INEDIBLE PEEL

Abiu; aisen; akee apple; atemoya; avocado; avocado, Guatemalan; avocado, Mexican; avocado, West Indian; bacury; bael fruit; banana; banana, dwarf; binjai; biriba; breadfruit; Burmese grape; canistel; cat's-eyes; champedak; cherimoya; cupuacu; custard apple; dragon fruit; durian; elephant-apple; etambe; granadilla; granadilla, giant; ilama; inga; jackfruit; jatoba; karuka; kei apple; langsai; lanjut; longan; lucuma; lychee; mabolo; madras-thorn; mammy-apple; manduro; mango; mango, horse; mango, Saipan; mangosteen; marang; marmaladebox; matisia; mesquite; mongongo, fruit; monkey-bread-tree; monstera; nicobar-breadfruit; paho; pandanus; papaya; passionflower, winged-stem; passionfruit; passionfruit, banana; passionfruit, purple; passionfruit, yellow; pawpaw, common; pawpaw, small-flower; pelipisan; pequi; pequia; persimmon, American; pineapple; pitahaya; pitaya; pitaya, amarillo; pitaya, roja; pitaya, yellow; plantain; pomegranate; poshte; prickly pear, fruit; prickly pear, Texas, fruit; pulasan; quandong; rambutan; saguaro; sapodilla; sapote, black; sapote, green; sapote, mamey; sapote, white; sataw; satinleaf; screw-pine; Sierra Leone-tamarind; soncoya; soursoy; Spanish lime; star apple; sugar apple; sun sapote; tamarind-of-the-Indies; velvet tamarind; wampi; white star apple; wild loquat; cultivars, varieties, and hybrids of these commodities

#### MISCELLANEOUS CROPS (NO CROP GROUP)

Artichoke, globe; coffee; cotton; hemp; hops; peanut; tobacco; water chestnut

#### NON-FOOD CROPS, INCLUDING ORNAMENTAL PLANTS AND SHRUBS, AND TURF

##### FORESTRY

Trees and conifers; tree and forest seedlings; woody ornamentals

##### ORNAMENTAL PLANTS (INCLUDING FLOWERS, FLOWERING AND FOLIAGE PLANTS, BEDDING PLANTS, GROUNDCOVERS, SHRUBS, VINES, EVERGREENS, AND TREES)

African lily; African violet; ageratum; alyssum; anthurium; arborvitae; ash; asparagus sprengeri; aster; atlas cedar; azalea; bald cypress; balsam fir; bamboo; barberry; beech; begonia; birch; Boston fern; bougainvillea; boxwood; bridal veil; cacti; caladium; calceolaria; calendula; calla lily; camella; camellias; carissa; carnation; ceanothus; celosia; chenille plant; cherro; Christmas cactus; chrysanthemum; cineraria; cleome; coleus; cordyline; corylus avellana; cotoneaster; cottonwood; crabapple; crepe myrtle; crossandra; croton; cyclamen; cypress; daffodil; dahlia; daisy; delphinium; deodar cedar; dichondra; dieffenbachia; dogwood; Douglas fir; dracaena; dumb cane; dusty miller; elm; eucalyptus; ferns; ficus; fig (nonfruiting); firethorn; fittonia; floss flower; foliage plants; forsythia; freesia; fuchsia; gardenia; geranium; gerbera; gerber daisy; gladiolus; gloxinia; grape (ornamental); gynura; gypsophila; hackberry; hawthorn; hederia; hemlock; hibiscus; hickory; holly; honeysuckle; hop bush; horse chestnut; hyacinth; hydrangea; iceplant; imitari; impatiens; India hawthorn; iris; ivy; Japanese aucuba; Japanese barberry; Japanese boxwood; Japanese spindle tree; Japanese yew; juniper; kalanchoe; lantana; larch; larkspur; laurel; leucanthus; leatherleaf fern; linden; lilac; lily; lithodora; lobelia; loquat; magnolia; mandevilla; maple; marigold; Mediterranean fan palm; mesembryanthemum; mimosa; monster; mother-in-law plant; mountain laurel; myrtle; nandina; narcissus; oak; oleander; olive (ornamental); orchid; ornamental kale; pachysandra; palms; pansy; parasol pine; pelargonium; peony; petunia; philodendron; phlox; photinia; piggyback plant; pine; pink; pittosporum; planetree; podocarpus; poinsettia; poplar; pothos ivy; prayer plant; primrose; privet; pteris fern; pyracantha; rhododendron; rose; rubber plant; salvia; scabiosa; schefflera; schubertiana; sedum; shrub verbena; shrubby cinquefoil; smoke tree; snapdragon; spathiphyllum; spruce; stock; sweet gum; sweet pea; sweet William; sycamore; syngonium; taxus; Texas sage; tulip; tulip tree; verbena; viburnum; vinca; Virginia creeper; walnut; wandering Jew; willow; yew; yucca; zinnia

##### TURF (INCLUDING LAWN AND SOD TURFGRASSES)

Bermuda grass; bluegrass; fescue; St. Augustine grass; zoysia grass

#### APPLICATION INSTRUCTIONS



GREENHOUSE, SHADEHOUSE, NURSERY (INDOOR/OUTDOOR), LANDSCAPE (TURF, SOD, ORNAMENTAL PLANTS), AND INTERIORSCAPES

ALL LISTED CROPS

APPLICATION RATES (PRODUCT PER SPRAY VOLUME):

- All Listed Pests (except as specified below):  $\frac{1}{2}$  – 3 qt/100 gal\*
- Whiteflies, Mealybugs, Aphids: .....  $\frac{1}{2}$  – 1½ qt/100 gal
- Thrips: ..... 1 – 3 qt/100 gal
- High volume sprays: ..... up to 4½ qt/100 gal
- Low volume sprays: .....  $\frac{1}{2}$  – 3 qt/5,000 – 20,000 ft<sup>2</sup>

\* depending on insect population and foliage density

HIGH VOLUME SPRAYS:

Apply at a rate of up to 4½ quarts of product per 100 gallons of spray volume in high volume sprays (2 – 9 tsp. or 0.33 - 1.50 fluid ounces of product per gallon of spray volume). Mix well by external mixing, in-tank mixing, or pump circulation to form emulsion. **SPRAY TO WET, BUT AVOID RUNOFF.**

LOW VOLUME SPRAYS:

Apply at a rate equivalent to area coverage of high volume spray. This would normally be  $\frac{1}{2}$  – 3 qt of product for 5,000 to 20,000 square feet. Follow spray equipment manufacturer's instructions for final spray volume to obtain adequate coverage. **DO NOT APPLY THROUGH A THERMAL PULSE FOGGER.**

Contact your dealer or Certis USA LLC for specific instructions.

CUTTINGS DIP

This product can be used as pre-plant dips for cuttings as noted below. To prepare dip solution, thoroughly mix  $\frac{1}{2}$  – 1½ fl oz product per gallon of water (5 – 15 fl oz per 10 gallons water). Prepare only as much dip solution as can be used in one day. Do not use dip solution for more than one day. Spores will be harmed if left overnight or longer in water. Dip a small number of plants in dip solution and observe for plant damage before using dip treatment. Do not use dips if there is any visible damage to test plants.

UNROOTED CUTTINGS

Dip the unrooted cuttings in the product solution just long enough to wet all surfaces, then remove to a flat area and allow cuttings to dry. For water-sensitive varieties, cover to protect until dry. Then proceed with normal planting and misting.

ROOTED CUTTINGS

Holding by the roots, briefly dip in the product solution just long enough to wet all surfaces, including leaves and stems. Once removed from the dip solution, cuttings can be potted, but allow plants to dry before watering.

FOOD CROPS GROWN OUTDOORS, RANGELAND, IMPROVED PASTURES, AND FORESTRY

LISTED CROPS EXCEPT CORN

APPLICATION RATES (PRODUCT PER ACRE):

- All Listed Pests (except as specified below): .....  $\frac{1}{4}$  – 1½ qt
- Diamondback moth: .....  $\frac{1}{2}$  – 1½ qt
- Imported cabbage worm: .....  $\frac{1}{2}$  – 1½ qt
- Cabbage looper: ..... 1½ qt
- Colorado potato beetle: .....  $\frac{1}{2}$  – 1½ qt

- High insect pressure or dense foliage: ..... up to 4½ qt

#### GROUND APPLICATION

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Apply in sufficient water to thoroughly cover foliage infested with insects, typically 5 to 100 gallons of water per acre. Final spray volume may be up to 400 gallons per acre. Water volume depends on spray equipment, crop canopy and target pest. **SPRAY TO WET, BUT AVOID RUNOFF.**

Apply up to a maximum of 4½ quarts of product per acre for high insect pressure or dense foliage.

#### AERIAL APPLICATION

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Apply in sufficient water to thoroughly cover foliage infested with insects. For best results, apply in 5 – 10 gallons water per acre. Do not apply in less than 2 gallons water per acre.

#### CHEMIGATION

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This product can be applied through drip (trickle and microjet) systems; or overhead sprinkler systems including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move. Do not apply this product through any other type of irrigation system. Apply product undiluted (neat) or diluted for injection flow rate and irrigation volume. For best results, use one part water to one part product. If product is diluted, supply tank must be agitated to thoroughly mix product in water. Add water to supply tank, start agitation, and then add product. Continue supply tank agitation during chemigation cycle to maintain uniform emulsion. Supply tank agitation is not necessary if product is used without dilution. Shake well to suspend spores before adding product to supply tank. Use contents of supply tank within one day. Refer to the section entitled “Chemigation Instructions” for detailed instructions.

#### LEAF-FEEDING LEPIDOPTERA

##### FOR USE AGAINST DIAMONDBACK MOTH, IMPORTED CABBAGE WORM AND CABBAGE LOOPER

This product can be used alone or in a tank mix with *Bacillus thuringiensis* (vars. *kurstaki*, *aizawai*) to control these insects in accordance with the more restrictive of label limitations and precautions. Do not exceed label dosage rates. This product cannot be mixed with any product containing a label prohibition against such mixing. The tank mix provides control of later instars (3<sup>rd</sup> to 4<sup>th</sup>) and aids in the management of resistant populations. For additional information, contact Certis USA LLC.

#### LEAF-FEEDING BEETLES

##### FOR USE AGAINST COLORADO POTATO BEETLE

This product can be used alone or in a tank mix with *Bacillus thuringiensis* (var. *tenebrionis*) to control Colorado potato beetle in accordance with the more restrictive of label limitations and precautions. Do not exceed label dosage rates. This product cannot be mixed with any product containing a label prohibition against such mixing. The tank mix provides control and aids in the management of resistant populations. For additional information, contact Certis USA LLC.

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#### CORN

##### APPLICATION RATE (PRODUCT PER ACRE):

- All Listed Pests: ..... 4-6 fl oz (⅛ - ⅜ qt)

#### GROUND APPLICATION

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Apply with sufficient water to provide thorough coverage. Direct spray over row to obtain optimal coverage in whorl and leaf axils. The amount of water will depend on spray equipment, crop size, and local conditions. Generally, a minimum of 10 gallons spray volume per acre is necessary to obtain adequate coverage.

## AERIAL APPLICATION

Apply with sufficient water to provide thorough coverage. For best results, apply in 5 – 10 gallons water per acre. Do not apply in less than 2 gallons water per acre.

## CHEMIGATION

This product can be applied through overhead sprinkler systems including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move; or drip (trickle and microjet) systems. Do not apply this product through any other type of irrigation system. Apply undiluted (neat) or diluted for injection flow rate and irrigation volume. For best results, use one part water to one part product. If product is diluted, supply tank must be agitated to thoroughly mix product in water. Add water to supply tank, start agitation, and then add product. Continue supply tank agitation during chemigation cycle to maintain uniform emulsion. Supply tank agitation is not necessary if product is used without dilution. Shake well to suspend spores before adding product to supply tank. Use contents of supply tank within one day. Refer to the section entitled “Chemigation Instructions” for detailed instructions.

## APPLICATION TIMING FOR CORN

Apply 2½ - 3¾ gallons of product per 80 acres. Apply to corn when plants are 12-16 inches high (V6-V8 stage). A single application is sufficient to establish *Beauveria bassiana* association with corn plants. A second application prior to second generation corn borer flight may further reduce damage from corn borers.

## TURF, ORCHARDS, AND CONTAINER ORNAMENTALS

### SOIL-DWELLING INSECTS

For most soil applications, apply 2-12 fluid ounces of product per 1,000 square feet. For difficult to control soil pests, especially citrus root weevil (*Diaprepes abbreviatus*), apply product at the upper rate range (8-12 fl oz of product per 1,000 square feet).

Do not apply to water-saturated soil. Apply product in enough water to ensure good coverage of treated area, at least one gallon of water per 1,000 square feet. Irrigate treated area after application to disperse product into soil.

## TARGET INSECTS

### ACARI

Two-spotted spider mite\*

### APHIDS

Bean aphid; Cabbage aphid; Cotton aphid; Cowpea aphid; Green peach aphid; Greenbug; Hop aphid; Melon aphid; Pea aphid; Potato aphid; Rose aphid; Russian wheat aphid; Spotted alfalfa aphid

### FOLIAGE-FEEDING LEPIDOPTERA

Cabbage looper; Diamondback moth; Fall armyworm\*; Imported cabbage worm

### LEAF-FEEDING BEETLES

Bean leaf beetle; Cereal leaf beetle; Colorado potato beetle; Corn rootworm; Cucumber beetles; Elm leaf beetle; Flea beetles

### LEAFHOPPERS AND PLANTHOPPERS

Grape leafhopper; Leafhoppers; Planthoppers; Potato leafhopper; Rice delphacid\*; Spotted lantern fly\*; Variegated grape leafhopper; Virginia creeper leafhopper

### MEALYBUGS

Buffalo grass mealybug; Citrus cocci\*; Citrus mealybug; Grape mealybug; Longtailed mealybug

#### ORTHOPTERA

Grasshoppers; Locusts; Mole crickets; Mormon crickets

#### PLANT BUGS (HETEROPTERA)

Chinch bugs; Fleahoppers; Lace bugs; Lygus bugs; Seed bugs; Stink bugs; Tarnished plant bugs

#### PSYLLIDS

Pear psylla; Potato psylla; Tomato psylla

#### SCARAB BEETLES

Ataenius; Green June beetle; White grubs

#### STEM-BORING LEPIDOPTERA

European corn borer; Lesser cornstalk borer; Rice stem borer; Southwestern corn borer; Sugarcane borer

#### THRIPS

Cuban laurel thrips; Greenhouse thrips; Onion thrips; Pear thrips; Potato thrips; *Thrips palmi*; Western flower thrips

#### WEEVILS

Alfalfa weevil; Apple curculio; Billbugs; Black vine weevil; Citrus root weevil; Coffee berry borer\*; Cotton boll weevil; Fuller rose weevil; Palm weevil\*; Pecan weevil; Pepper weevil; Plantain weevil\*; Plum curculio; Root weevil; Rose curculio; Strawberry root weevil; Sweet potato weevil; Vegetable weevil

#### WHITEFLIES

Banded-winged whitefly; Cassava whitefly\*; Citrus blackfly; Citrus whitefly; Giant whitefly; Greenhouse whitefly; Silverleaf whitefly; Sweet potato whitefly; Tobacco whitefly

**\*Not for use in California.**

#### CHEMIGATION INSTRUCTIONS

##### PRECAUTIONS:

Apply this product only through overhead sprinkler irrigation, including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move; or drip (trickle and microjet) irrigation. Do not apply this product through any other type of irrigation system.

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.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

##### PUBLIC WATER SYSTEM CHEMIGATION:

1. 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.

2. Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow 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 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.
3. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
4. 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.
5. 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.
6. 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.
7. Do not apply when wind speed favors drift beyond the area intended for treatment.
8. Supply tank agitation is necessary if product is diluted in water before injection into irrigation system. Spray tank agitation is not necessary if product is used without dilution provided the product is resuspended before adding to the other spray tank and that content of spray tank are used the same day.
9. For best results in foliar applications by sprinkler, time chemigation with the end of irrigation water application. Time injection duration to apply product in the minimum irrigation volume necessary to achieve uniform coverage immediately prior to shutting off irrigation water. Excessive overhead irrigation during and after chemigation will wash active ingredient (spores) off foliage, reducing effectiveness.
10. For best results in soil applications by drip (trickle and microjet), apply product continuously for the duration of irrigation water application. Apply sufficient volume of water to carry product into proximity of the target pests.

#### DRIP (TRICKLE) AND MICRO-IRRIGATION CHEMIGATION:

1. The system must contain a functional check valve, vacuum relief valve and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. 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.

4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. 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.
7. Use 1½ to 4½ quarts of product per acre for most drip or microjet chemigation. For difficult to control pests, especially citrus root weevil (*Diaprepes abbreviatus*), apply product at up to 8-12 fl oz of product per 1,000 square feet. Apply continuously for the duration of irrigation water application to achieve uniform distribution and penetration of active ingredient (spores) in the soil. Supply tank agitation is necessary if product is diluted in water before injection into irrigation system. Supply tank agitation is not necessary if product is used without dilution provided the product is shaken well to resuspend spores before adding to the supply tank and that contents of supply tank are used the same day.

#### SPRINKLER CHEMIGATION:

1. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. 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.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. 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.
7. Use ½ to 1½ quart product per acre for most sprinkler chemigation applications. Apply up to 4½ quarts of product per acre for high insect pressure or dense foliage. For corn, apply at a rate of 4-6 fluid ounces of product per acre.
8. For best results, time chemigation with the end of the irrigation water application. Time injection duration to apply product in the minimum irrigation volume necessary to achieve uniform coverage

immediately prior to shutting off irrigation water. Excessive irrigation during and after chemigation will wash active ingredient (spores) off foliage, reducing effectiveness.

9. With center pivot or other continuous move equipment, apply product in  $\frac{1}{4}$  to  $\frac{1}{2}$  inches of water per acre. With stationary sets, wheel lines, solid sets or hand move sprinklers, apply product during the last 20-30 minutes of the set.
10. Supply tank agitation is necessary if product is diluted in water before injection into irrigation system. Tank agitation is not necessary if product is used without dilution provided the product is shaken well to resuspend spores before adding the tank and those contents of tank are used the same day.
11. Do not apply when wind speed favors drift beyond the area intended for treatment.



#### **STORAGE AND DISPOSAL**

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

##### **PESTICIDE STORAGE**

Store in a cool, dry place between 40°F and 85°F. This product stability decreases with time at elevated temperatures above 85°F. Tightly reclose the container. Do not contaminate product remaining in container with water.

##### **PESTICIDE DISPOSAL**

To avoid wastes, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

##### **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  $\frac{1}{4}$  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. Do not burn, unless allowed by state and local ordinances. If burned, stay out of smoke.

#### **WARRANTY AND DISCLAIMER**

This product conforms to the description set forth on this label and is reasonably fit for the purposes described herein when used according to the label directions and specified conditions. To the extent consistent with applicable law, manufacturer disclaims any and all other express or implied warranties of merchantability and fitness for particular purpose. To the extent consistent with applicable law, buyers and users shall assume all risk and responsibility for potential loss or damage if this product is used, stored, handled, or applied in a manner inconsistent with this labeling. To the extent consistent with applicable law, manufacturer shall not be liable for more than the purchase price for the quantity involved including incidental, consequential or special damages.