

# PlantShield<sup>®</sup> HC

## Biological Fungicide

### ACTIVE INGREDIENT

*Trichoderma harzianum* Rifai strain KRL-AG2\* 1.15%

OTHER INGREDIENTS 98.85%

TOTAL 100.00%

\*Contains at least 1.0 x 10<sup>7</sup> colony forming units per gram dry weight.

EPA Reg.No. 68539-4

Net Contents: 3.0 lbs.

EPA Est. No. 068539-NY-001

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

### First Aid

If in eyes

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

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

### PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

**CAUTION:** Avoid contact with skin or eyes. Avoid breathing dust.

#### PERSONAL PROTECTIVE EQUIPMENT

Applicators and other handlers must wear: a) long sleeved shirt and long pants; b) shoes plus socks; c) when dumping or opening bags, or other operations where dusts may be created, wear a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C) or a NIOSH approved respirator with any N-95, R-95, P-95 or HE filter for biological products. Follow manufacturer's directions 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

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 equipment wash water.

#### GENERAL INFORMATION

PlantShield HC Biological Fungicide is a preventative biological fungicide for control of plant diseases. The active ingredient is a microbe, *Trichoderma harzianum* strain T-22 (KRL-AG2) which when applied to seeds, transplants, or other propagative material, grows onto plant roots as they develop and provides protection against plant root pathogens such as *Pythium*, *Rhizoctonia*, *Fusarium*, *Cylindrocladium* and *Thielaviopsis*. In the greenhouse, PlantShield HC Biological Fungicide is a preventative that suppresses foliar\* pathogens such as *Botrytis* and mildews on flowers, bedding plants and ornamentals. This product can be used alone or in conjunction with certain chemical fungicides, consult the tank mix compatibility charts below or the company for more information. This product should not be tank mixed with chemicals that contain the following active ingredients: benomyl, imazalil, propiconazole, tebuconazole, and triflumizole. Do not apply this product immediately before these pesticides are used. Where early season seed rot and seedling diseases are expected, use chemically treated seed or other appropriate measures for stand establishment and PlantShield HC Biological Fungicide for root disease control.

**NOTE:** PlantShield HC Biological Fungicide contains live spores of a microbe that must be used prior to disease onset. It becomes active in soil or on plants when temperatures are above 50° F and is not effective while temperatures remain cold. PlantShield HC Biological Fungicide can be applied to sterilized or fumigated soil but **MUST BE APPLIED AFTER STERILIZATION OR FUMIGATION.**

\*This product is not intended for foliar application in California.

#### 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 workers may be in the area during application. For any requirement 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, 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.

##### For enclosed environments:

There is a restricted entry of one (1) hour for this product when applied as a foliar application via spraying to growing plants in enclosed environments such as glasshouses and greenhouses. PPE requirement 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 over long sleeved shirt and long pants, and shoes plus socks.

There is a restricted entry of zero (0) hours for this product when applied as a soil application via soil drench, in-furrow spray, transplant starter solution, dip, soak, chemigation or other non-spraying or non-dusting foliar application methods when used in enclosed environments such as glasshouses and greenhouses.

**For field applications:** Keep unprotected persons out of treated areas until sprays have dried or dusts have settled.

Biological fungicide for use in soil applications (drench, in soil furrow, potting soil, broadcast) in or on all raw agricultural commodities, food and fiber crops. PlantShield HC Biological Fungicide is for use in soil applications (drench, in soil furrow, and potting soil) and greenhouse foliar applications on ornamentals, landscape plants and ornamental trees, including tree seedlings for transplanting into the forest.

**NOTE: DO NOT APPLY** to sugarcane, pechay, rice, mushrooms, kiwi, tobacco, barley, oats, lemon, apple and chickpea. **Not for use on aquatic crops. Greenhouse foliar applications are for non-food crops only. This product is not intended for foliar application in California.**

#### APPLY VIA GROUND APPLICATION ONLY.

CROPS	USE	RATE
<b>Cucurbit Vegetables:</b> Cucumbers, melons, gourds, pumpkins, squash	Greenhouse Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre
	Greenhouse Chemigation	3.0 - 5.0 oz/100 gal
<b>Flowers, Bedding Plants, and Ornamentals.</b>	Cuttings or Bare roots	0.5 – 2.5 lbs/5 gal or dip into dry powder
	Greenhouse & Nursery Soil Drench	3.0 - 5.0 oz/100 gal
	Greenhouse Foliar Spray*	0.25 - 1.0 oz/gal every 7-14 days
<b>Fruiting Vegetables:</b> Eggplant, sweet and hot peppers, and tomatoes.	Greenhouse Chemigation	3.0 - 5.0 oz/100 gal
	Greenhouse Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre
<b>Leafy Vegetables and Cole Crops:</b> Broccoli, Brussels sprouts, cabbage, cauliflower, celery, collards, endive, kale, kohlrabi, lettuce (head and leaf), mustard greens, parsley, and spinach.	Greenhouse Chemigation	3.0 - 5.0 oz/100 gal
	Greenhouse Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre
<b>Herbs, Spices, and Mints.</b>	Greenhouse Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre
	Greenhouse Chemigation	3.0 - 5.0 oz/100 gal
<b>Hydroponic Crops:</b> Cucumbers, tomatoes, lettuce, herbs and spices.	Greenhouse Soil Drench	3.0 - 5.0 oz/100 gal
	Greenhouse Chemigation	3.0 - 5.0 oz/100 gal
<b>Pome Fruit:</b> Pear.	Greenhouse & Nursery Soil Drench	3.0 - 5.0 oz/100 gal
<b>Shadehouse and Outdoor Nursery Crops:</b> Deciduous trees (maple, oak, etc.), ornamentals, grapes, citrus, and pine.	Greenhouse & Nursery Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre
<b>Stone Fruit:</b> Apricots, cherries, nectarines, peaches, plums, and prunes.	Cuttings or Bare roots	0.5 – 2.5 lbs/5 gal or dip into dry powder
	Greenhouse & Nursery Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre
<b>Tree Nuts:</b> Almonds, pecans, pistachios, and walnuts.	Greenhouse & Nursery Soil Drench	3.0 - 5.0 oz/100 gal
	In Furrow Spray or Transplant Starter Solution	3.0 – 5.0 oz/acre

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**GREENHOUSE SOIL DRENCH:** Suspend 3.0 – 5.0 ounces PlantShield HC Biological Fungicide in 100 gallons of water with agitation and apply as a soil drench to greenhouse planting mixes. For seeding flats or shallow (up to 4-inch depth) beds or pots, apply at a rate of 50-100 gallons per 800 square feet. For deeper beds or pots, apply at a rate of 100 gallons per 400 square feet, or at the rate of ½ - 1 cup (4 – 8 fl. oz) per pot. This product can be applied through low pressure watering nozzles such as fan nozzles or other drench watering systems applied directly to the soil. Constant agitation is required to maintain this product in suspension. PlantShield HC Biological Fungicide can be tank-mixed and is compatible with many commonly used fungicides, liquid fertilizers, herbicides, insecticides and biological control products registered for use on greenhouse/ornamental plants. If tank mixes are desired, observe all directions, precautions and limitations on labeling of all products used. Consult the tank mix compatibility chart below or the company for more information.

**NURSERY SOIL DRENCH:** Suspend 3.0 – 5.0 ounces of product in 100 gallons of water with agitation and apply as a soil drench to container nursery crops. PlantShield HC Biological Fungicide may be applied through handheld or backpack sprayers. Maintain constant agitation. For shallow pots (up to 4-inch depth), apply at a rate of 50-100 gallons per 800 square feet. For deeper pots, apply at a rate of 100 gallons per 400 square feet, or at the rate of ½ - 1 cup (4 – 8 fl. oz) per pot.

**IN-FURROW SPRAY OR TRANSPLANT STARTER SOLUTION:** Apply as an in-furrow spray or transplant starter solution at a rate of 3.0 – 5.0 ounces/acre in sufficient water to achieve uniform application. Maintain constant agitation. PlantShield HC Biological Fungicide can be tank mixed with certain fertilizers and pesticides; consult tank mix compatibility chart below for detailed information.

**COMPATIBILITY FOR DRENCH,  
IN-FURROW SPRAY OR TRANSPLANT STARTER SOLUTION TANK MIX**

Chemical Name	% A.I. Formulation	Product Name	Product Rate	Dilution
Captan	85%, Wettable Powder	Captan 85 WP	1.88 lb/Acre	0.1 oz/gal
Chlorothalonil	82.5%, Water Dispersible Granules	Daconil Ultrex	3.7 oz/1000 ft <sup>2</sup>	0.56 oz/gal
Iprodione	23.3%, Flowable	Chipco 26019 Flo	4 oz/1000 ft <sup>2</sup>	0.6 oz/gal
Thiophanate methyl	50%, Wettable Powder	Cleary's 3336 in water soluble bags	8 oz/ 1000 ft <sup>2</sup>	1.2 oz/gal
Iprodione	50%, Soluble Granules	Rovral	0.75 lb/Acre	0.04 oz/gal
Metalaxyl	21.3%, Liquid	Subdue Maxx	0.25 oz/800 ft <sup>2</sup>	0.05 oz/gal
Chlorpyrifos	50%, Emulsifiable Liquid	Lorsban 4E	3.2 oz/ gallon	3.2 oz/gal

**GREENHOUSE FOLIAR SPRAYS:** Greenhouse foliar applications are for non-food crops only. For preventative control of *Botrytis*, powdery mildew, and other fungal pathogens on greenhouse-grown flowers, bedding plants and ornamentals, apply to foliage and blossoms every 7 – 14 days depending upon disease pressure. PlantShield HC Biological Fungicide can be applied 7 - 10 days after application of a chemical/biorational fungicide. Consult manufacturer or sales representative for specific product recommendations.

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In general, apply at a rate of 0.25 – 0.5 oz per gallon of water. Use a quantity of spray sufficient to thoroughly cover foliage. Crop size, spray equipment and local practice will determine the volume of water needed. Spray to wet, but avoid run-off. PlantShield HC Biological Fungicide can be applied using hand-held backpack or ground spray equipment. **Do not use with low-volume sprayers.** Prepare the tank mix with the recommended rate of a non-ionic spreader sticker such as Latron B-1956, one of the Triton materials, or another quality, alkyl arylpolyethoxylate-based surfactant. **AGITATION IS REQUIRED TO MAINTAIN SUSPENSION.** Application equipment should be cleaned before use of this product, and prepared sprays should be used within 4 hours of preparation. To prevent nozzle tip clogging the manufacturer recommends using 50 – 100 mesh inlet screens in all spray equipment.

**TANK MIXING:** PlantShield HC Biological Fungicide can be tank mixed and is compatible with many commonly used fungicides, liquid fertilizers, herbicides, insecticides and biological control products registered for use on greenhouse/ornamental plants. If tank mixes are desired, observe all directions, precautions, and limitations on labeling of all products used. Consult the tank mix compatibility chart below or the company for more information. This product **SHOULD NOT** be tank-mixed with chemicals that contain the following active ingredients: benomyl, imazilil, propiconazole, tebuconazole, and triflumizole. Do not apply PlantShield HC Biological and Root Fungicide immediately before these pesticides are used.

This product can be mixed with specific products, their percentages and rates for use in foliar sprays as listed in the table below in accordance with the most restrictive of label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing.

**COMPATIBILITY FOR FOLIAR TANK MIX\***

Chemical Name	% A.I. Formulation	Product Name	Product Rate	Dilution
Captan	85%, Wettable Powder	Captan 85 WP	1.88 lb/Acre	0.1 oz/gal
Chlorothalonil	82.5%, Water Dispersible Granules	Daconil Ultrex	3.7 oz/1000 ft <sup>2</sup>	0.56 oz/gal
Iprodione	23.3%, Flowable	Chipco 26019 Flo	2 oz/1000 ft <sup>2</sup>	0.3 oz/gal
Triadimefon	25%, Soluble Granules	Bayleton 25 Turf & Ornamental Fungicide	0.75 oz/1000ft <sup>2</sup>	0.11 oz/gal
Azoxystrobin	50%, Soluble Granules	Heritage	0.4 oz/1000 ft <sup>2</sup>	0.06 oz/gal
Vinclozolin	50%, Wettable Powder	Ronilin DF	0.75 lb/Acre	0.04 oz/gal
Iprodione	50%, Soluble Granules	Rovral	0.75 lb/Acre	0.04 oz/gal

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To reduce potential residue and minimize clogging of spray equipment, the manufacturer recommends the following decanting procedure. Place one gallon of water in a container. Add the desired nonionic spreader-sticker. Mix. Based on the final spray volume, add appropriate amount of PlantShield HC Biological Fungicide. Let the solution sit for 10 minutes. Agitate for 10 minutes. Let the solution sit for less than one minute. Pour off the liquid that now contains Strain T22 into the spray tank. Add a small amount of water to the settled material in the container to remove any remaining Strain T-22 into the tank mix. Briefly mix and let solution sit for less than one minute. Pour off liquid into the spray tank. Bring spray volume to the desired level.

**CUTTINGS, BULBS OR BARE ROOTED TRANSPLANTS:** Dip cuttings, bulbs or transplants in PlantShield HC Biological Fungicide dry powder or in a suspension of 0.5 – 2.5 lbs product in 5 gallons of water. Plant treated cuttings, bulbs or transplants in potting mix or soil in the usual manner.

**PLANT SAFETY:** PlantShield HC Biological Fungicide has been tested on numerous plant varieties with no phytotoxic effects. However, since this product has not been tested on all plant varieties or in combination with all available tank mixes the manufacturer recommends testing on a small number of plants to check for adverse plant effects before applying on a larger number of plants.

**GREENHOUSE CHEMIGATION:** Suspend 3.0 – 5.0 ounces PlantShield HC Biological Fungicide in 100 gallons of water with agitation and apply through the following systems: 1) pressurized drench (flood) or drip (trickle) systems, 2) micro-irrigation such as spaghetti-tube or individual tube irrigation, 3) hand-held calibrated irrigation equipment such as the hand-held wand with injector, 4) ebb and flow systems.

The following precautions must be observed when using this product in any type of irrigation system:

- Do not apply this product through any other type of irrigation equipment.
- Lack of effectiveness or crop injury can result from non-uniform distribution of treated water.
- Do not connect an irrigation system, (including greenhouse system), used for pesticide application to a public water system unless the pesticide safety systems for public water systems are in place.
- If you have questions about calibration, you should contact State Extension specialists, equipment manufacturers or other experts.
- A person knowledgeable of the chemigation system and responsible for its operation, or under supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.
- 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.
- 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 pump when the water pump motor stops.
- 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.
- 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 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.

**STORAGE:** Store in a cool dry place. Do not store near food or feed commodities. Do not store at temperatures above 75° F for prolonged periods. Keep container tightly closed when not in use.

**DISPOSAL:** Do not contaminate food or feed by disposal. Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility. Do not reuse container. Dispose of empty container in a sanitary landfill or by incineration, or by open burning, if allowed by state and local authorities. If burned, keep out of smoke.

**NOTICE TO BUYER AND SELLER:** Seller warrants that this product conforms to the description on the label and is reasonably fit for the purposes stated on the label when used and stored in accordance with directions under normal conditions of use. This warranty does not extend to use of this product contrary to label directions or under conditions not reasonably foreseeable by the Seller, and Buyer and User assume the risk of any such use. Seller disclaims all other warranties express or implied, including any warranty of fitness or merchantability. Seller shall not be liable for consequential, special or indirect damages resulting from use or handling of this product and Seller's sole liability and Buyer's and User's exclusive remedy shall be limited to refund of the purchase price. This product is sold only for uses stated on its label. No express or implied license is granted to use or sell this product under any patent in any country except as specified.

**In Case of Emergency, Call CHEMTREC: (800) 424-9300**

*Manufactured in the USA by:*



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Country: United States of America  
US Patent No. 5,260,213

Lot No. \_\_\_\_\_

Use Before: \_\_\_\_\_

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