



BioWorks®

ROOTSHIELD® Granules

Biological Fungicide



ACTIVE INGREDIENT:

Trichoderma harzianum Rifai strain T-22* 1.15%

OTHER INGREDIENTS: 98.85%

TOTAL: 100.00%

*Contains at least 1.0 x 10⁷ colony forming units per gram of product.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

EPA Reg. No. 68539-3
EPA Est. No. 68539-NY-001

Net Contents: 10 lb, 40 lb, 500 lb, or 1000 lb

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.
HOT LINE NUMBER: Have the product container or label with you when calling a poison control center or doctor or going for treatment. For general information on this product, contact the National Pesticide Information Center (NPIC) at 1-800-858-7378, Monday through Friday 8 a.m. to 12 p.m. Pacific Time, or at http://npic.orst.edu . For medical emergencies, call your poison control center at 1-800-222-1222.	

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing. 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:

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

Mixers/loaders and applicators must wear a NIOSH-approved particulate filter with any N, R, or P filter with NIOSH approval number prefix TC-84A; or a NIOSH-approved powered air purifying respirator with an HE filter with NIOSH approval number prefix TC-21C. 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, use detergent and hot water. 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. 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 washwater or rinsate.

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 (REI). 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.

Exception: If the product is soil injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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:

- Protective eyewear
- Coveralls
- Chemical-resistant gloves (made of any waterproof material)
- Shoes plus socks

PRODUCT INFORMATION

RootShield Granules Biological Fungicide is a preventative biological fungicide for control of soilborne plant pathogens and plant root diseases. The active ingredient is a microbe, *Trichoderma harzianum* Rifai strain T-22, that when applied as an inoculant to soil or planting mixes, grows onto plant roots as they develop and provides protection against plant root pathogens such as *Pythium*, *Rhizoctonia*, *Fusarium*, *Cylindrocladium* and *Thielaviopsis*. RootShield Granules Biological Fungicide can be used in combination with or in rotation with most other fungicides, insecticides, miticides, fertilizers or micronutrients in accordance with the more restrictive of label limitations and precautions. Do not exceed label dosage rates. This product cannot be used with any product containing a label prohibition against such mixing. This product is not compatible with chemicals that contain the following active ingredients: imazalil, propiconazole, tebuconazole, and triflumizole. Do not apply RootShield Granules Biological Fungicide 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 RootShield Granules Biological Fungicide for root disease control.

Note: RootShield Granules Biological Fungicide contains live spores of a microbe that must be used prior to disease onset. RootShield Granules Biological Fungicide becomes active in soil or on plants when temperatures are above 50° F and is not effective while temperatures remain cold. RootShield Granules Biological Fungicide can be applied to sterilized or fumigated soil but must be applied after sterilization or fumigation. This biological fungicide is for use in soil applications (in soil furrow and potting soil) for all listed crops.

USE RESTRICTIONS

Cover applied product with soil, irrigate with at least 1/8" of water, or otherwise incorporate it into the soil. For certain crop groupings or crops, indicated below, this product is not for use in California.

**** ATTENTION: DO NOT APPLY to sugarcane, pechay (bok choy), rice, mushrooms, kiwi, barley, oats, lemon, apple, and chickpea. Not for use on aquatic crops.**

APPLICATION INSTRUCTIONS

APPLY VIA GROUND APPLICATION ONLY.

CROPS ON WHICH ROOTSHIELD GRANULES BIOLOGICAL FUNGICIDE MAY BE USED:

CROP	USE	APPLICATION RATE OF ROOTSHIELD GRANULES BIOLOGICAL FUNGICIDE
Asparagus	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery bed application	0.5 – 7.5 lb/1000 sq ft bed, incorporate with rake or tiller
Berries and Small Fruits, including: Blackberries, Blueberries, Currants,	In-furrow	2.5 – 6.0 lb/1/2 acre
	Container topdress	Use Container Topdress Rates chart below

Elderberries, Gooseberries, Huckleberries, Loganberries, Raspberries, Strawberries, Grapes ** Refer to excluded crops above table		
Bulb Vegetables, including: Garlic, Leeks, Onions, Shallots, Ornamental Bulbs	In-furrow	2.5 – 6.0 lb/1/2 acre
Cereal Grains, including: Buckwheat, Corn (grain, sweet corn, popcorn, high oil) ** Refer to excluded crops above table	In-furrow	2.5 – 6.0 lb/1/2 acre
Citrus Fruits, including: Citrus Hybrids, Grapefruit, Kumquat, Limes, Oranges, Pummelos **Refer to excluded crops above table	In-furrow	2.5 – 6.0 lb/1/2 acre
Cucurbit Vegetables, including: Cucumbers, Melons (e.g., Chinese Waxgourd, Citron Melon, Muskmelons, or Watermelon), Gourds, Pumpkins, Squash	In-furrow	2.5 – 6.0 lb/1/2 acre
Flowers, Bedding Plants, and Ornamentals	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery bed application	0.5 – 7.5 lb/1000 sq ft bed, incorporate with rake or tiller
	Container topdress	Use Container Topdress Rates chart below
Fruiting Vegetables, including: Eggplant, Sweet and Hot Peppers, Tomatillos, Tomatoes	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Container topdress	Use Container Topdress Rates chart below
Herbs and Spices	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Container topdress	Use Container Topdress Rates chart below
	Mints	In-furrow
Greenhouse planting mix		1.0 – 3.0 lb/cubic yd soil mix
Container topdress		Use Container Topdress Rates chart below

CROP	USE	APPLICATION RATE OF ROOTSHIELD GRANULES BIOLOGICAL FUNGICIDE
Leafy and Brassica (Cole) Leafy Vegetables, including: Arugula, Celery, Chervil, Endive, Fennel, Lettuce (head and leaf), Parsley, Radicchio, Rhubarb, Spinach, Swiss Chard, Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collards, Kale, Kohlrabi, Mustard Greens ** Refer to excluded crops above table	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery bed application	0.5 – 7.5 lb/1000 sq ft bed, incorporate with rake or tiller
	Container topdress	Use Container Topdress Rates chart below
Legume Vegetables (Succulent or Dried), including: Beans (soybean, snap, dry), Lentils, Peas **Refer to excluded crops above table	In-furrow	2.5 – 6.0 lb/1/2 acre
Oilseeds, including: Cotton, Canola, Safflower, Sunflower	In-furrow	2.5 – 6.0 lb/1/2 acre
*Peanut	In-furrow	2.5 – 6.0 lb/1/2 acre
Pome Fruits, including: Pears, Quince **Refer to excluded crops above table	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Trees and shrubs	0.2 – 8.0 oz/transplant hole and incorporate
Root and Tuber Vegetables, including: Beets, Sugar Beets, Carrots, Celeriac, Chicory, Horseradish, Parsnip, Radish, Rutabaga, Salsify, Turnips, Ornamental Root and Tuber Vegetables Potatoes, Sweet Potatoes, Yams, Jerusalem Artichoke, Cassava, Ginger, *Ginseng	In-furrow	2.5 – 6.0 lb/1/2 acre
Shadehouse and Outdoor Nursery Crops, including: Deciduous Trees (e.g., Maple, Oak), Ornamentals, Pine	In-furrow	2.5 – 6.0 lb/1/2 acre
	Shadehouse or outdoor nursery use	1.0 – 3.0 lb/cubic yd soil mix, incorporate with rake or tiller
	Nursery planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery bed application	0.5 – 7.5 lb/1000 sq ft bed, incorporate with rake or tiller

	Container topdress	Use Container Topdress Rates chart below
	Trees and shrubs	0.2 – 8.0 oz/transplant hole and incorporate
Stone Fruits, including: Apricots, Cherries, Nectarines, Peaches, Plums, Prunes	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Container topdress	Use Container Topdress Rates chart below
	Trees and shrubs	0.2 – 8.0 oz/transplant hole and incorporate
*Tobacco	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Container topdress	Use Container Topdress Rates chart below
	Trees and shrubs	0.2 – 8.0 oz / transplant hole and incorporate
Tree Nuts, including: Almonds, Beech Nuts, Brazil Nuts, Butternuts, Cashews, Chestnuts, Filberts, Hickory Nuts, Macadamia Nuts, Pecans, Pistachios, Walnuts	In-furrow	2.5 – 6.0 lb/1/2 acre
	Greenhouse planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Nursery planting mix	1.0 – 3.0 lb/cubic yd soil mix
	Container topdress	Use Container Topdress Rates chart below
	Trees	0.2 – 8.0 oz / transplant hole and incorporate
*Tropical and Subtropical Fruit Inedible Peel, including: Banana, Plantain, Passionfruit Edible Peel, including: Starfruit	In-furrow	2.5 – 6.0 lb/1/2 acre
	Container topdress	Use Container Topdress Rates chart below

*Not for use in California

IN-FURROW SOIL TREATMENT: Apply RootShield Granules Biological Fungicide from a granular applicator at the rate of 2.5 – 6.0 pounds per 1/2 acre. Apply granules using a metering device, such as a Gandy applicator or equivalent, mounted to deliver granules into the furrow just behind the furrow opener. Apply in furrow at seeding or to established crops as a side dress and incorporate into soil.

GREENHOUSE PLANTING MIX AMENDMENT: Mix RootShield Granules Biological Fungicide with planting mixes at a rate of 1.0 – 3.0 pounds per cubic yard (loose) mix. Thoroughly incorporate RootShield Granules Biological Fungicide into planting mixes during mix preparation or at pot filling.

CONTAINER TOPDRESS: Apply RootShield Granules Biological Fungicide evenly to the surface of container medium using the following rates:

Container Topdress Rates

Size	Volume (liters)	Rate (grams per pot)
6" pot	1 – 1.5	1.0
7" pot	2.3	2.0
8" pot	3.4	2.5
8" mum pan	3	2.0
9" mum pan	4.6	3.5
9.5" mum pan	5.8	4.5
8" hanging basket	2.5 – 3	2.0
10" hanging basket	4.7	3.5
12" hanging basket	8.7	6.5
14" hanging basket	15	11.0
1 gal	3.785	3.0
2 gal	6	5.5
3 gal	11	8.0
5 gal	14	10.5
For larger containers	Topdress 34 grams for every cubic foot of pot volume.	

Equivalent measures: 1 tablespoon = 9 grams,
1 teaspoon = 3 grams

Irrigate after topdressing with at least 1/8" of irrigation water to help move RootShield Granules Biological Fungicide into the growing medium.

NURSERY PLANTING MIX AMENDMENT, NURSERY BED APPLICATION, AND SHADEHOUSE USE:

For nursery planting mixes and shadehouse use, apply RootShield Granules Biological Fungicide at the rate of 1.0 – 3.0 pounds per cubic yard (loose) mix. For nursery beds, incorporate RootShield Granules Biological Fungicide at a rate of 0.5 – 7.5 pounds per 1000 square feet of bed by raking or tilling. Application of at least 1/8" of irrigation water will help move RootShield Granules Biological Fungicide into the soil. If soil is fumigated or steam sterilized, apply RootShield Granules Biological Fungicide after treatment.

TREES AND SHRUBS: Apply RootShield Granules Biological Fungicide to the planting hole at a rate of 0.2 – 8.0 ounces and incorporate into the planting soil or soil mix.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in original container under refrigerated conditions. Short periods at room temperatures below 75° F will not affect performance. Keep container tightly closed when not in use.

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

[10-lb unit packaged in polyethylene bag and placed into corrugated carton] Completely empty bag by shaking and tapping sides and bottom to loosen clinging particles.

Empty residue into application equipment. Then offer for recycling if available, dispose of empty bag in a sanitary landfill or by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. If outer box is contaminated, dispose of it in the same manner as required for the bag.

[40-lb bag, 500-lb bag, 1000-lb bag] Completely empty bag into application equipment. Then offer for recycling if available, dispose of empty bag in a sanitary landfill or by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

WARRANTY: Seller warrants that this product conforms to the description on this label and is reasonably fit for the purposes stated on this label when used and stored in accordance with the directions for 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. To the extent consistent with applicable law, Seller disclaims all other warranties, express or implied, including any warranty of fitness or merchantability. To the extent consistent with applicable law, 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.

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

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