



RootShield® Biological Fungicide

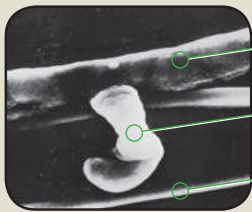
Healthy Roots, Healthy Plants

Before planting, choose RootShield® Granules to mix in your soil/media or drench with RootShield® WP wettable powder for greenhouse, nursery and vegetable crops. The active ingredient is a unique hybrid fungus, *Trichoderma harzianum*, strain T-22 that protects roots from many pathogens. Within 24-hours RootShield blocks and actively attacks pathogens by “eating” them; ensuring uninterrupted plant growth.

RootShield is a preventative biofungicide and should be applied to “clean” plants. Diseased plants should be chemically treated first, since the aggressively growing active ingredient, strain T-22 only grows on the outside of roots and does not enter the plant tissue. RootShield is compatible with fertilizers, algacides, insecticides, disinfectants, miticides, herbicides, growth regulators, and nearly all fungicides.

Root Protection:

- Grows on the roots “shielding” them against root damaging fungi for 12 weeks!
- Controls: *Pythium*, *Fusarium*, *Rhizoctonia*, *Thielaviopsis*, *Cylindrocladium*
- Releases enzymes that dissolve the cell wall of many fungal pathogens
- Promotes a healthier root system increasing root mass potential
- 0-hour REI
- OMRI Listed
- Reduces or eliminates chemical fungicide applications
- Grows between pH 4-8; at soil temperatures between 48° - 97° F
- Costs less than 2¢ per 6 – inch pot for a root protection program
- Reduces effects of environmental stresses that challenge the root system



RootShield strand
Strand eating pathogen
Rhizoctonia

RootShield in action: This magnified photo shows RootShield (thinner top strand) coiled around and attacking the pathogen *Rhizoctonia* (lower strand).



RootShield strand has been removed to reveal the damage (holes) eaten into the cell wall of the *Rhizoctonia*.

(photo courtesy of Professor Ilan Chet, The Hebrew University of Jerusalem, Israel)

To find out more about the BioWorks family of products, please contact us at 800-877-9443 or visit www.bioworksinc.com.



Sizes: 1lb., 3lb. and 30lb.

Sizes: 10lb., 40lb., 500lb. and 1000lb.



BioWorks®

How You Grow Matters™

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Application

Apply RootShield right away, before roots have emerged or fully developed. Within 24 hours, the actively growing fungus forms a “shield” by growing around the roots. Forming that “shield” right away is key to preventing pathogens from damaging the roots.

RootShield Granules

RootShield Granules grow on the plant’s root system and is compatible in all bark, coir, peat based and soil-less mixes and will protect plugs, cuttings, liners and all container plants.

Packaging and Product Shelf Life

The granules are packaged in 10 lb. boxes, 40 lb. bags, 500 lb. and 1,000 lb. bulk bags. Shelf life: 6 months at 50° F (10° C) to 77° F (25° C); 9 months at 32° F (0° C) to 50° F (10° C); and 12 months below 32° F (0° C). If desired, request your distributor to direct ship, Freight Pre-paid!

Blend Rates

For small volumes blend 3 tbsps. per cubic foot (ft.³) of potting soil. If you prefer large volume custom blending with your media, contact your mix company. Large volume blend rates are 1.25 -1.5 lbs./yd.³ of mix, or a minimum of three 40 lb. bags per truckload of mix (100 yds.³). The shelf life of RootShield Granules when blended at 1.5 lbs. per yd.³ is 12 weeks at 5° F (-15°C), 20 weeks at 40° F (4°C) to 77° F (25°C), 8 weeks at 100° F (39°C).

RootShield WP

This wettable powder can be drenched into the soil for root rot protection on ornamentals and edible crops.

Packaging and Product Shelf Life

RootShield WP is packaged in 1lb., 3 lb., and 30 lb. boxes. Shelf life: 4 months at 50° F (10° C) to 77° F (25° C); 6 months at 32° F (0° C) – 50° F (10° C) and 8 months below 32° F (0° C). If desired, request your distributor to direct ship, Freight Pre-paid!

Application

Suspend RootShield WP (4-5 oz./100 gals. or for smaller volume: 1-2 tbsps./5 gals. of water) in sufficient water with agitation and apply as a drench to greenhouse planting mixes and container nursery crops. Constant agitation in a stock tank is required to maintain RootShield WP in suspension.

RootShield WP can be applied through low pressure watering nozzles, overhead boom type sprayers or sprinklers, sub-irrigation (5-6 oz./100 gals.) or other drench watering systems. When using a fertilizer injector to drench RootShield WP, keep the injector pickup tube screen at least 1”-2” from the bottom of the stock tank.

Soil/Media Coverage

- Trays/flats/liners and pots less than 4-inches deep – 100 gals./800 ft.²
- Beds and pots 4-inches deep or deeper – 100 gals./400 ft.²
- For 6-inch pots use approximately 1 cup, (8 fl. oz. of solution)/pot
- One pound of RootShield WP will treat 6400, 6-inch pots

Enclosed scoop holds 1.5 oz. (Three scoops equals 4.5 oz.)

Maintenance Programs

Seeding/Flats/Liners/Woody Cuttings

Plant seeds into propagation mix containing RootShield Granules (1.25 – 1.5 lbs./yd.³) or drench flats with RootShield WP immediately after seeding (4-5 oz./100 gals).

Cuttings; Poinsettias/Mums/Geraniums

Place unrooted or rooted cuttings directly into propagation media containing RootShield Granules or apply RootShield WP approximately 7 days after sticking unrooted cuttings or drench rooted cuttings.

Bulbs

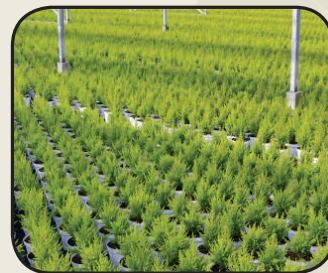
Pre-blend RootShield Granules (1.25-1.5 lbs./yd³) or apply RootShield WP immediately after planting (4-5 oz./100 gals.). Bulbs may be dusted with RootShield WP (0.5 lbs./100 lbs. of bulbs) immediately before planting or may be dipped in a drench slurry (0.5 lb./5 gals.). Treated bulbs can be case or pot cooled. Or, apply RootShield WP immediately after removing the crop from cold storage, or replant in media containing RootShield Granules. Pre-cool bulb application protects the basal roots while post-cool application protects the stem roots.

Extended Root Protection

To ensure good root protection over extended periods or at transplant, re-apply RootShield Granules or RootShield WP every 10-12 weeks after initial application or when stepping up/transplanting to a larger container or out into the field. Second applications can be made at half the initial rate.

Woody Propagation

A healthy start for woody cuttings is key to producing a healthy plant in the container. Treat the woody cuttings as described above with RootShield. After 3 months or when stepping up into larger containers, retreat at half the initial rate to ensure prolonged protection in the field.



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Please refer to product labels for complete application details. Additional technical information is available from either our website: www.bioworksinc.com, or your BioWorks sales representative. Always read and follow label directions.

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