



# TRICHODERMA HARZIANUM

***Natural protection for your crops!***

*T. harzianum* is a naturally-occurring beneficial soil fungus that protects crops from several diseases caused by seed and soil borne fungal pathogens including Rhizoctonia spp., Pythium spp., Fusarium spp. and Alternaria sp., and fruit rots caused by Botrytis and plant pathogenic nematodes. Our product contains spores and mycelial fragments which are formulated as a wettable powder that is used for organic agriculture.

## Mode of Action

**Substrate Competition for Space and Nutrients:** *T. harzianum* colonizes available niches and absorbs nutrients available at the target site. This controls pathogens by starving them for critical nutrients and competing for space.

**Mycoparasitism:** *T. harzianum* acts in a manner consistent with prophylactic biological fungicides that attacks disease-causing pathogens before they reach the plant. It grows fast and coils around the pathogen and penetrates it. It derives nutrition from the targeted pathogenic fungi and kills them.

**Enzyme Production:** *T. harzianum* secretes gliotoxins, which are antagonistic to pathogenic fungi or bacteria. It also excretes antifungal metabolites including 4-hydroxy-6,6-dimethoxy-3-(2-methyl-1-oxohex-4-enyl)pyridin-2-one, 6-Pentyl-alpha-pyrone, and harziapyridone which are antagonistic to pathogenic fungal species and suppress their growth. It also inactivates the pathogen's enzymes by secreting certain plant growth stimulating substances. A long-lasting effect against pathogens is thus observed owing to the secondary metabolite secretion, which exhibit antibiosis effect on the pathogen.

**Nematocidal effect:** Our proprietary strain of *T. harzianum* produces toxins that kills pathogenic nematodes.

## Target Disease and Pests

Fungal diseases like fruit rot caused by Botrytis spp and other fungal pathogens attacking the crops. *T. harzianum* assists in controlling Root knot nematode in Tomato, Brinjal, Carrot, Okra (Lady's finger), Gerbera, Carnations, Tuberose and Banana. Also controls reniform nematode of Papaya and the citrus nematode of Acid lime.

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## Crops and Compatibility

*T. harzianum* is suitable for application on Cereals, Millets, Pulses, Oilseeds, Fiber Crops, Sugar Crops, Forage Crops, Plantation crops, Vegetables, Fruits, Spices, Flowers and Medicinal crops.

*T. harzianum* is compatible with bio-pesticides but not with chemical fungicides.

### Conditions for Use

1. Avoid inhalation and skin contact while diluting as there could be spillage/splashes of the product.
2. Mixing and spraying equipment MUST be thoroughly rinsed with water and detergent before using the same equipment for spraying other pesticides.
3. Surplus spray solution should not be disposed in crop lands / stagnant waters / flowing water where there is a possibility of causing pollution to natural resources.
4. Direct contact with *T. harzianum* may cause irritation and therefore it is recommended that the operator should use protective gear viz gloves, apron, mask, eye gear and hood.

### STORAGE AND HANDLING

Store in a cool dry place at room temperature. The recommended storage temperature is within a range of 1°C and 23°C (34°F to 73°F). Avoid excessive inhalation. Avoid contact with eyes. Wash hands thoroughly with warm, soapy water after handling.

#### Physical Aspect:

Off-white to brown powder

**Packaging:** 20 kg pails

**Stability:** 12 months under cool conditions

**Moisture content:** Below 15%

**pH:** 6.8 - 8.5

**Product Density:** 0.5 – 0.61 g/cm<sup>3</sup>

**Bacterial concentration:** 2 x 10<sup>9</sup>

#### Preparation

<i>Trichoderma harzianum</i>	1.00%	Active
Carboxy Methyl Cellulose	1.00%	Inactive
Carrier Powder - Kaolin	98.0%	Inactive
<b>BIOLOGICAL COMPOSITION PRODUCT CONSTITUENT</b>	CFU/g	Formulation
<i>Trichoderma harzianum</i>	1*10 <sup>6</sup>	Powder

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