

**ECOSOM® - TV**  
*Trichoderma viride*  
Bio Fungicide  
(Regd in Central Insecticides Board, Govt of India)  
**APPROVED FOR USE IN ORGANIC AGRICULTURE**

### Introducing ECOSOM® - TV

ECOSOM® -TV is a biological fungicide based on a selected strain of naturally-occurring beneficial soil fungus *Trichoderma viride* (TNAU Strain) that protects crops from several diseases caused by seed borne and soil borne fungal pathogens like *Rhizoctonia spp*, *Pythium spp*, *Fusarium spp* and *Alternaria spp*. It is used as an effective seed dressing and soil treatment product to combat seed and soil borne fungal diseases.

ECOSOM® -TV contains spores and mycelial fragments of *Trichoderma viride*. It is formulated as Wettable Powder with CFU count of  $2 \times 10^6$  / g. ECOSOM® -TV is registered by Indian Pesticides Regulatory Authority - Central Insecticides Board, Govt of India. ECOSOM® -TV is approved for use in Organic agriculture.

### A Historical Brief

*Trichoderma spp*'s first description dates back to 1794 by Persoon. In 1865, a link to the sexual state of a *Hypocrea* species was suggested by Tulasne and Tulasne. It was morphologically difficult to distinguish the different species assigned to the genus *Trichoderma/Hypocrea* until 1969 when the development of a concept for its identification was initiated by Rifai. Post this numerous new species of *Trichoderma/Hypocrea* were discovered and by 2006, the genus comprised of more than 100 phylogenetically defined species (Druzhinina et al. 2006a).

During the World War II in 1940's it was observed that military clothing and equipment were getting degraded in the jungles of the South Pacific which wrecked a havoc with cargo shipments. Thus a research was commissioned by the U.S. Army (U.S. Army Natick Laboratories) to understand the causes. Thousands of samples collected from jungle were screened which led to the discovery and identification of one of the most important organisms in the development of cellulase enzymes — *Trichoderma viride* (eventually renamed *Trichoderma reesei*).

### Mode of Action

Substrate Competition for space and Nutrients: ECOSOM® -TV colonizes maximum space and absorbs maximum nutrients available at the target site and thereby controls the pathogens by starving them for food and competing for space- Domino effect.

**Mycoparasitism:** ECOSOM® -TV is like a prophylactic biological fungicide that attacks disease-causing pathogens before they reach the root system. It grows fast and coils around the pathogen and penetrates through it. It derives nutrition from the target pathogenic fungus protoplasm and ECOSOM® -TV spores multiply inside target pathogenic fungus body and eventually kill it.

**Enzyme production:** *Trichoderma viride* secretes Cellulase and Chitinase enzymes which react with cell wall of the disease causative pathogenic fungi or bacteria and dissolve the same.

*Trichoderma viride* also secretes toxic substances such as Glyotoxin, Viridin and Trichodermin which aid in destroying the fungal pathogens. 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.

### Method of Application

**Seed treatment:** Mix 10 g of ECOSOM® -TV with 10 g of crude sugar in sufficient water to make slurry to treat 1 Kg seed. Coat the seed with this slurry so as to have a uniform coating all over the seeds. Dry the seeds in shade for 30 minutes and sow the treated seeds within 24 hours.

**Soil application:** Mix 5- 10 Kg ECOSOM® -TV along with 1 Kg of crude sugar in sufficient quantity of organic fertilizer / de oiled cake and incubate at 30 % moisture level for 3 – 4 days and apply to root zone.

**Soil drenching, Nursery application, Root dipping:** Mix 10 g of ECOSOM® -TV per L of water and use to drench soil / nursery / dip roots.

**Drip Irrigation:** Mix 3- 5 Kg ECOSOM® -TV in 50 L of water and mix well. Allow to sediment and decant supernatant and feed it through drip irrigation.

**Note:** ECOSOM® -TV should not be used in mushroom farming as it causes disease in mushrooms.

### Target Diseases

ECOSOM® -TV is approved for seed / soil treatment of root rot of pulses ( cowpea , mung bean , and urad bean) , damping off of chilli seedling, wilting of cowpea , root rot diseases of sesamum , root rot diseases of pigeon pea ,

ECOSOM®-TV can also be used for fungal diseases ( Seed / Soil borne ) caused by *Pythium spp*, *Phthophthera spp* , *Alternaria spp* and the like that cause diseases such as Root rots, Wilts, Brown rot, Damping off, Charcoal rot and other seed borne and soil borne fungal diseases in crops.

## Crops

ECOSOM® -TV is suitable for application on Cereals , Millets , Pulses, Oilseeds, Fibre Crops , Sugar Crops , Forage Crops , Plantation crops ,Vegetables, Fruits, Spices , Flowers , Medicinal crops , Aromatic Crops , Orchards and Ornamentals

## Shelf Life

ECOSOM® -TV is stable for a period of 12 months from the date of manufacturing.

## Mass Composition

CONSTITUENT	WW %	FUNCTION
<i>Trichoderma viride</i> (Spores and Mycelia)	1.00%	Active
Carboxy Methyl Cellulose	0.50%	Inactive
Carrier Powder – Kaolin	98.5%	Inactive

## BIOLOGICAL COMPOSITION

CONSTITUENT	CFU/g.	FORMULATION
<i>Trichoderma viride</i>	2*10 <sup>6</sup>	Powder

## OTHER FORMULATIONS AVAILABLE

<i>Trichoderma viride</i> CFU/g	1*10 <sup>9</sup>	Soluble Powder
<i>Trichoderma viride</i> CFU/ml	1*10 <sup>9</sup>	Liquid
<i>Trichoderma viride</i>		Lyophilized

*Free from Salmonella, Shigella , E.Coli*

## Cautions for handling and use of product

1. Avoid inhalation and skin contact while diluting as there could be spillage / splashes of the product.
2. Mixing and spraying equipment is to 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 water / flowing water where there is a possibility of causing pollution to natural resources.
4. Do not eat / drink / smoke during application.
5. Direct incidence of ECOSOM® -TV may cause irritation and therefore it is recommended that the operator should use protective gear viz gloves, apron, mask , eye gear and hood.

## Symptoms and Antidotes

**Symptoms:** Occasional symptoms include head ache and nausea

**Antidote:** In the case of ingestion: symptomatic treatment is advised. In the case of contact with Eyes: Flush with water liberally for 20 minutes. In case of Skin contact, wash the affected area with plenty of water and soap.

## Citations

There are many citations in public domain on effectiveness of *Trichoderma viride* as a BioFungicide

## Commitment to Nature

- **ECOSOM<sup>™</sup>-TV** is safe to use using organic fertilizers and inoculums like Agri Life Nitrofix<sup>™</sup> (Nitrogen Fixing bacteria) ; P Sol B<sup>®</sup> (Phospho bacteria) ; K Sol B<sup>®</sup> (Potash mobilizing bacteria); Zn Sol B<sup>®</sup> (Zinc mobilizing bacteria) ;S Sol B<sup>®</sup> ( Sulphur solubilizing bacteria ) : Si Sol B<sup>™</sup> ( Silica solubilizing bacteria ) : Fe Sol B<sup>®</sup> ( Iron / Ferrous solubilizing bacteria ) : Mn Sol B<sup>™</sup> ( Manganese solubilizing microbe ) and Agri Life Agrivam<sup>®</sup> (Vesicular-arbuscular mycorrhiza)
- ECOSOM<sup>®</sup>-TV can be used as an effective component in IPM programmes, thereby leading to a reduction in use of chemical pesticides/ fungicides and creating a safer soil environment.
- ECOSOM<sup>®</sup>-TV does not lead to residue problems and doesn't cause resistance or resurgence problems.

## Benefits from ECOSOM<sup>®</sup> - TV

- ECOSOM<sup>®</sup> -TV effectively controls most of the economically important fungal diseases like Root rots, Wilts, Damping off and other seed borne and soil borne fungal diseases in crops.
- Pathogenic fungi load reduction leads to improved plant health and thereby increased crop productivity.
- ECOSOM<sup>™</sup> -TV is earthworm friendly , pet friendly , eco friendly and infant friendly