RACER ™

Beauveria bassiana

BioInsecticide

(Regd in Central Insecticides Board, Govt of India)

APPROVED FOR USE IN ORGANIC AGRICULTURE

Introducing RACER ™

RACER ™ is biological insecticide based on a selected strain of naturally-occurring entomopathogenic fungus *Beauveria bassiana (NCIM 1216 ATCC 26851)* that infects both larvae and adults of many insect pests. RACER™ contains spores and mycelial fragments of *Beauveria bassiana* . It is formulated as Wettable Powder with CFU count of 10 ^ 8 / g. RACER ™ is registered by Indian Pesticides Regulatory Authority - Central Insecticides Board, Govt of India. RACER™ is approved for use in Organic agriculture.

A Historical Brief

Beauveria bassiana was discovered in 1835 by an Italian entomologist Agostino Bassi de Lodi (Father of Insect Pathology)after whom the fungus is named. It was discovered as the cause of muscardine disease (derived from the French word *bonbon* denoting white mummies) of domesticated silkworms. It was formerly known as *Tritirachium shiotae.*

Mode of Action

Conidial penetration: The microscopic conidial spores of the fungus on coming in contact with the body of the insect host start germinating and penetrate the cuticle and grow inside the insect body thereby killing the insect within a few days.

Enzyme production: RACER ™ secretes enzymes which attack and dissolve the cuticle, penetrate the skin and grow into the insect body. *Beauveria bassiana* present in RACER ™ produces a toxin called beauvericin that weakens the host's immune system. After the insect dies, an antibiotic -oosporein, is produced that enables the fungus to outcompete intestinal bacteria. RACER ™ mycelia also produce an octacyclodepsipeptide toxin called bassianolide that consists of of fourmolecules each of D-hydroxyisovaleric acid and L-Nmethylleucine which have insecticidal properties.(Suzuki et al., 1977).

Growth: Once inside, RACER ™ replicates and consumes the insects' internal organs and blood-like fluid, the hemolymph. .RACER ™ has the ability to live in the vascular tissue of certain corn cultivars as an endophyte. RACER ™ infects the insect on contact and does not need to be consumed by the host to cause infection. A white mold emerges from the insects' dead body after a few days and produces new spores.

Environment factors: The rate at which RACER ™ kills the host is dependent on temperature and humidity. High humidity is essential for conidial germination and infection establishes between 24 and 48 hours. The infected insect may live for three to five days after hyphal penetration and, after death of host insect pest, the conidiophores bearing conidia are produced on cadaver.

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Method of Application

Foliar spray : Mix RACER ™ @ 2.5 Kg in 750-850 L of water and spray the solution at an interval of 15 days to control Rice leaf folder.

Mix RACER ™ @ 5 g / L of water and spray for control of Lepidopetrous pests / Caterpillar pests/ Mealy Bugs. The spray volume depends upon the crop canopy.

Target Pests

Rice leaf folder ,*Helicoverpa armigera , Spodoptera litura* , Loopers, Bunch caterpillars, Leaf eating caterpillars , Mealy bugs, Coffee Berry Borers , Fruit borer of Brinjal , Tomato. Chilly and Vegetables, Cotton boll worm, Root grubs, surface living larvae and nymphs.

Crops

Racer ™ 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.

Compatibility

RACERr ™ is compatible with BioPesticides and not with Chemical Fungicides.

Shelf Life

RACER ™ is stable for a period of 12 months from the date of manufacturing.

Mass Composition

CONSTITUENT	W/W %	FUNCTION
Beauveria bassiana (Spores and Mycelia)	01.15%	Active
Moisture	08.00% max	Inactive
Carrier Powder - Talc	90.85%	Inactive

Biological Composition

CONSTITUENT	CFU/g.	FORMULATION
Beauveria bassiana	1*10^8	Wettable Powder

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Other Formulations available

Beauveria bassiana CFU/g	1*10^9	Soluble Powder
Beauveria bassiana CFU/ml	1*10^9	Liquid
Beauveria bassiana		Lyophylized

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 RACER ™ 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 *Beauveria bassiana* as a BioInsecticide

Commitment to Nature

- RACER ™ is safe to natural parasites, pollinators and predators.
- RACER™ can be used as an effective component in IPM programmes, thereby leading to a reduction in use of chemical pesticides and creating a safer environment.
- RACER ™ does not lead to residue problems and doesn't cause resistance or resurgence problems.

Benefits from RACER™

- RACER™ effectively controls most of the economically important pests such as Rice leaf folder , *Helicoverpa spp* , *Spodoptera spp* , loopers , Borers, Cutworms and Mealy bugs.

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- Pest reduction leads to improved plant health and thereby increased crop productivity.
- RACER[M] is pet friendly , eco friendly and infant friendly

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