

MEALIKIL®
Verticillium lecanii
BioInsecticide
(Regd in Central Insecticides Board, Govt of India)
APPROVED FOR USE IN ORGANIC AGRICULTURE

Introducing MEALIKIL®

MEALIKIL® is a unique biological insecticide based on a selected strain of naturally-occurring entomopathogenic fungus *Verticillium lecanii* (NCIM 1312) that infects and kills mealy bugs and sucking insects like thrips, jassids, aphids, white flies and mites. MEALIKIL® contains spores and mycelial fragments and metabolites of *Verticillium lecanii*. It is formulated as Wettable Powder with CFU count of 1×10^8 / g. MEALIKIL® is registered by Indian Pesticides Regulatory Authority - Central Insecticides Board, Govt of India. MEALIKIL® is approved for use in Organic agriculture.

A Historical Brief

Entomopathogenic property of *Verticillium lecanii* was described first in the year 1861. It is known as the "white-halo" fungus owing to the white mycelial growth on the edges of infected insects. It was formerly known as *Cephalosporum lecanii*. An approved name of *Verticillium lecanii* is now *Lecanicillium lecanii*.

Mode of Action

Conidial penetration: The microscopic conidial spores of the fungus are slimy and attach to the cuticle of the insect. Hyphae from the germinating spores are produced that penetrate the insect's integument and destroy the internal contents of the insect.

Enzyme production: MEALIKIL® mycelia produce an octacyclodepsipeptide toxin called bassianolide that consists of four molecules each of D-hydroxyisovaleric acid and L-Nmethylleucine which have insecticidal properties. (Suzuki et al., 1977). The fungus produces other insecticidal toxins such as dipicolinic acid. These toxins weaken the host's immune system (of insect) and aid in eventually killing it.

Growth: Once inside, MEALIKIL® replicates and consumes the insect's internal contents eventually killing it. The fungus eventually grows out of the insect's cuticle and starts sporulating. Infected insects appear as white to yellowish cottony particles. MEALIKIL® infects the insect on contact and does not need to be consumed by the host to cause infection.

Method of Application

Foliar spray: Mix MEALIKIL® @ 5 g / L of water and spray for control of target pests like mealy bugs and sucking insects. The spray volume depends upon the crop canopy.

Target Pests

Mealy bugs, Thrips, Jassids, Aphids, White flies and Mites.

Crops

MEALIKIL® 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

MEALIKIL® is compatible with BioPesticides and not with Chemical Fungicides.

Shelf Life

MEALIKIL® is stable for a period of 12 months from the date of manufacturing.

Mass Composition

CONSTITUENT	W/W %	FUNCTION
<i>Verticillium lecanii</i> (Spores and Mycelia)	01.15%	Active
Carboxy Methyl Cellulose	00.50%	Inactive
Moisture	08.00% max	Inactive
Carrier Powder - Kaolin	q.s.	Inactive

Biological Composition

CONSTITUENT	CFU/g.	FORMULATION
<i>Verticillium lecanii</i>	1*10 ⁸	Wettable Powder

Other Formulations available

<i>Verticillium lecanii</i>	CFU/g	1*10 ⁹	Soluble Powder
<i>Verticillium lecanii</i>	CFU/ml	1*10 ⁹	Liquid
<i>Verticillium lecanii</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 MEALIKIL[®] 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 and vomiting may be induced. 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 *Verticillium lecanii* as a BioInsecticide

Commitment to Nature

- MEALIKIL[®] is approved for use in Organic Agriculture.
- MEALIKIL[®] is safe to natural parasites, pollinators and predators.
- MEALIKIL[®] 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.
- MEALIKIL[®] does not lead to residue problems and doesn't cause resistance or resurgence problems.

Benefits from MEALIKIL[®]

- MEALIKIL[®] effectively controls most of the economically important pests such as Mealy bugs , Aphids ,Thrips, Jassids ,White flies and Mites
- Pest reduction leads to improved plant health and thereby increased crop productivity.
- MEALIKIL[®] is pet friendly , eco friendly and infant friendly