



Koppert

**Mycotal**

Your natural  
partner for a  
healthy crop!

Partners  
with Nature

# Partners with Nature

## Introduction

Mycotal is a unique biological solution that effectively controls white flies, thrips and aphids. The winning formula of this bio insecticide contains blastospores of the entomopathogenic fungi *Lecanicillium muscarium* VEG, that have been selected and produced for biocontrol.

**The product has a long history of continuous development from a solid fermentation to the more efficient liquid fermentation method. Several production improvements were implemented in recent years, resulting in a superior product quality today! Mycotal is used successfully in many countries across the world.**

This bioinsecticide can be used to control white fly, both greenhouse whiteflies (*Trialeurodes vaporariorum*) and tobacco white flies (*Bemisia tabaci*), and thrips, and is applied as a foliar spray. After spraying the product, the blastospores germinate quickly and grow into hyphae that penetrate the pest body cavity. Once inside, the insect is killed via different modes of action:

- Mechanical obstruction of respiratory tubes
- Exhaustion of reserves and a disruption of organ functioning
- Production of specific proteins by the fungus within the insect

At high humidity, the fungus grows from within through the insect cuticle and produces spores on the outside of the dead body, which may spread the infection to other vulnerable pests. Mycotal is safe for beneficial insects, mites and pollinators and leaves no hazardous residue.

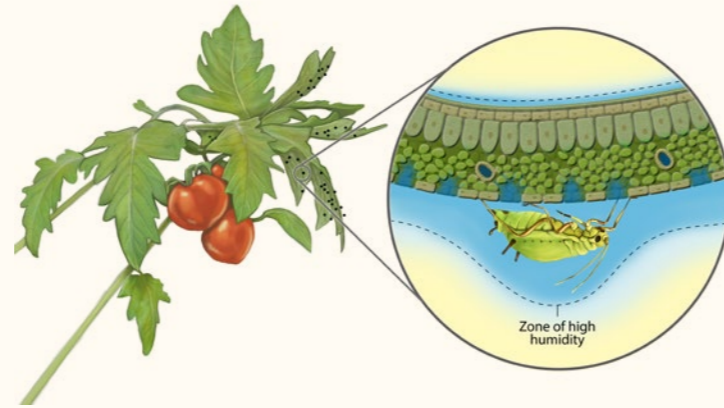
### Benefits:

- Biological product for effective control of white fly, thrips and aphids
- No hazardous residues and not subjected to MRL (Maximum Residue Level) rules
- Safe for beneficial insects, mites and pollinators
- Resistance development is very unlikely
- Compatible with a wide range of plant protection products. Check the Koppert side effects app for compatibility.

# How Mycotal works

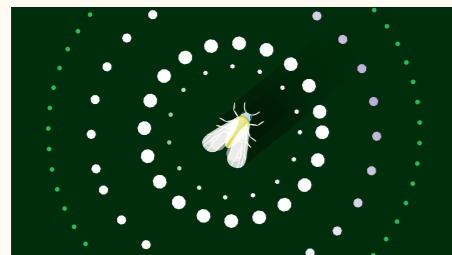
After applying Mycotal, the spores germinate and the germ tube invades the target insect. The fungus continues to grow inside the insect and subsequently kills it. At optimal conditions, new spores can be produced after the insect is killed.

Favorable conditions for the growth and development of *Lecanicillium muscarium* are temperatures between 15 and 28°C and a relative humidity of 70% or above.



The microclimate of the laminar layer underneath leaves determines the conditions for the fungus.

## Mode of action



Spores of *L. muscarium*



After application of the product, spores reach the insect and start to germinate



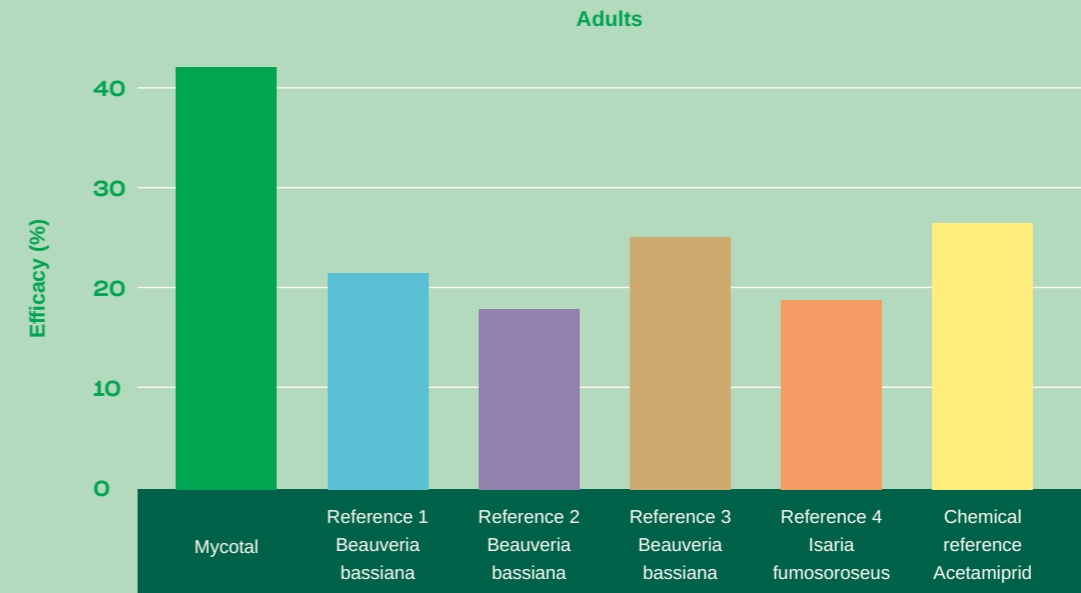
Growing hyphal threads of the fungus



External sporulation may spread to other pests

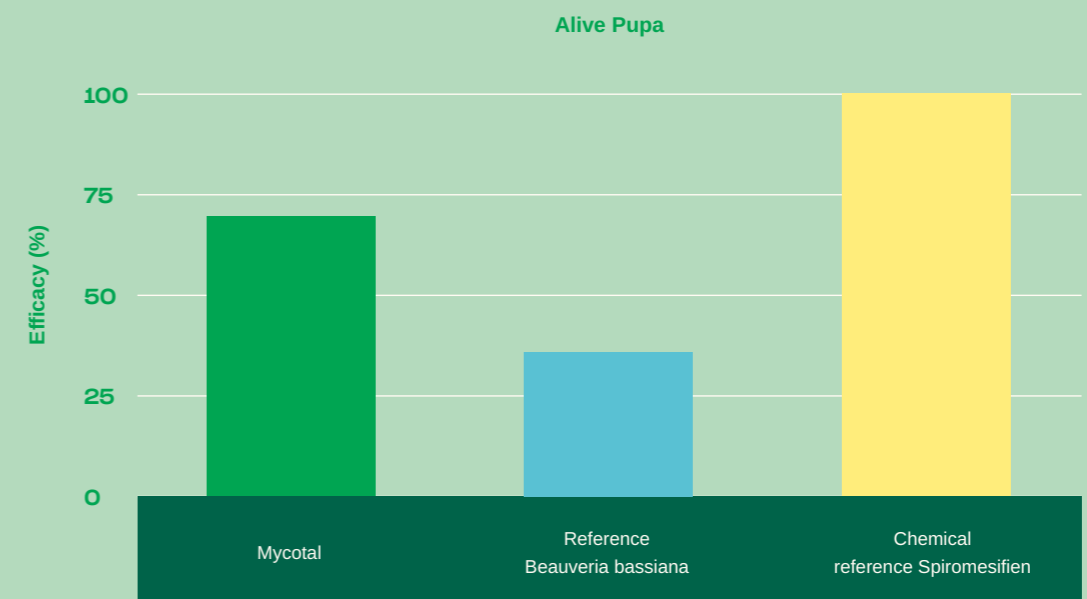
# Effective results

Efficacy of Mycotal against greenhouse whitefly (*Trialeurodes vaporariorum*) in cucumber



Trial with Mycotal against white fly (*Trialeurodes vaporarium*) in cucumber, research station Anadiag in Italy, 2022. The crop was treated 3 times with a 7 day interval. The graph shows the observations 2 weeks after the last treatments.

Control of greenhouse whitefly (*Trialeurodes vaporariorum*) in tomato



Trial with Mycotal against white fly (*Trialeurodes vaporarium*) in tomato, research station Eurofins – De Bredelaar in the Netherlands, 2020. The crop was treated 3 times with a 7 day interval. The graph shows the observations 2 weeks after the last treatments.

# The effects of Mycotal



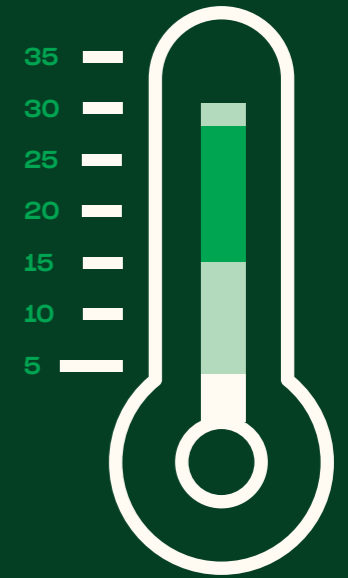
Fungal hyphae development on the insect after Mycotal application



Shriveled insect after Mycotal application

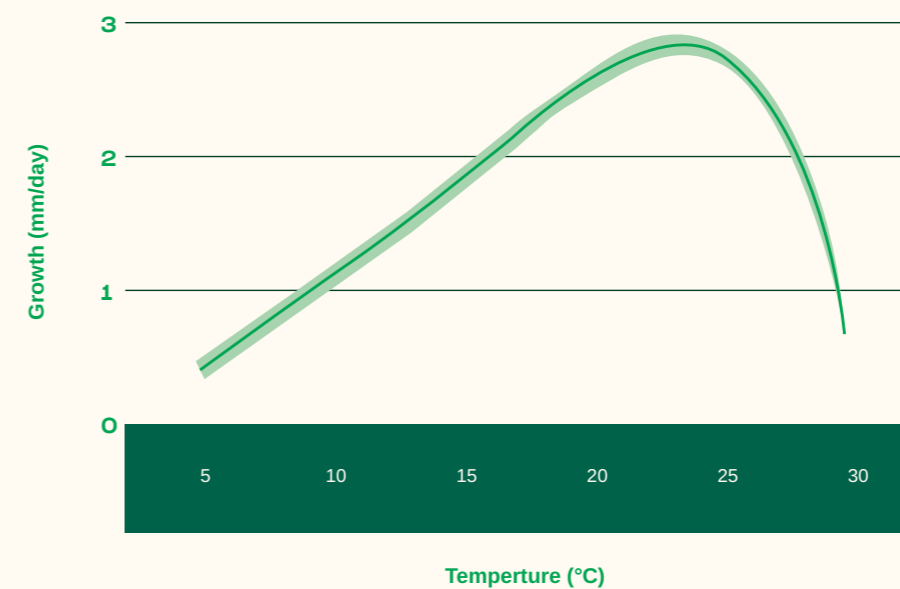
## 7 tips to reach the optimal results with Mycotal

1. Store the product refrigerated between 2 and 6°C until use
2. Start applications at the first sign of pest infestation
3. Use an appropriate amount of water to ensure a good wetting of the leaves, pH of spray solution should be between 4 and 10
4. Make sure leaves (undersides) are thoroughly covered
5. Apply in late afternoon or early morning for the highest possible level of humidity on leaf surface
6. Frequent applications are needed to break the pest cycle. For the optimal results, repeat the application with a 7 day interval
7. Adjuvants can improve the efficacy of Mycotal by improving the wetting period after application, or by improving the distribution and stickiness of the spores to the leaf surface



Mycotal is active between 5°C and 30°C and the optimum temperature range lays between 15°C and 28°C

Average growth at different temperatures (25 days after spot inoculation)



Mycotal can be used in a wide range of conditions, one of its unique properties is its ability to grow at low temperatures.

#### Disclaimer

The general conditions of Koppert (Koppert B.V. and/or of its affiliated companies) apply. Only use products that are permitted in your country/state and crop. Check local registration requirements. Koppert cannot be held liable for unauthorized use. Koppert is not liable for any loss of quality if the product is stored for longer than recommended and/or under incorrect conditions.

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