

Identification, prevention and control of dry bubble

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The problem

Dry bubble caused by the fungal pathogen *Lecanillium fungicola* (Preuss) Zare (formerly *Verticillium fungicola*) is a recurring disease of mushroom cultivation that causes production losses in all producing countries.

Currently there is only one pesticide agent authorized to fight the dry bubble in mushroom crops: prochloraz-Mn. However, strains resistant to this fungicide (Sporgon) have been noted and this year the manufacturer has stopped producing it and it is only available until June 2023.

The solution

First, specific measures aimed at **prevention and addecaute disease treatment** have a positive impact stopping the spread of the disease.

Then, the BIOSCHAMP project also recommends the use of **specific biostimulant solutions**, like the use of specific *Bacillus* strains with selective antifungal activity.

Benefits

Good cultivation practices & biostimulant solutions provide alternative & effective control measures to prevent diseases.



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Practical recommendations

It is essential to locate the early outbreaks of disease by making frequent visits to the crop with a flashlight to facilitate the identification of the disease that appears in the casing. The dispersion of the dry bubble (it generates spores with a sticky tegument that adheres them to the surfaces) requires vectors that distribute pathogenic spores.

(1) Recommendations on specific measures to apply once the disease has appeared:

- Remove the bubbles (undifferentiated diseased tissue) with a bag/tissue to avoid touching it into a bucket with salt or desinfectant.
- Avoid irrigation on bubbles that will facilitate the dispersion of spores.
- Cover with salt the hole from where we have removed the bubble.
- Avoid touching the bubble, and if you do touch it, change your gloves immediately.
- Use hydroalcoholic gel to disinfect the hands of the harvesters.
- Use adequate filters that prevent the entry of diptera into the crop.

(2) Recommendations on general good cultivation practices to prevent dispersion:

- Effective control of the populations of dipterans (phorids and sciarids) that are dispersal vectors.
- Use black lights in the gates and plastic treated with insecticide for the control of pests.
- Use adhesive plates with pheromones to attract dipterans.
- Store casing containers in a clean area to prevent contamination.
- Discard the leftover casing material from covering a previous crop.
- Use adequate air filters to prevent spread of the disease.

(3) Recommendations on the use of biostimulants

The use of different bacterial strains from *Bacillus* genus, native from the casing material, produces secondary metabolites that inhibit the germination and growth of the fungal pathogen, limiting the capacity of infection. BIOSCHAMP identified these strains and their effects as inhibitors of the mentioned disease.



About BIOSCHAMP and this practice abstract

This practice abstract was elaborated in the BIOSCHAMP project, based on the EIP AGRI practice abstract format. © 2022

Project duration: from October 2020 to March 2024.

Goal: develop an integrated approach to tackle the mushroom cultivation challenges, improving the mushroom sector industrial profitability while reducing the agronomical need for pesticides by 90 %.