

Chair of Bioprocess Engineering

MycoAgrar - Natural soil additives from basidiomycota

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 **Müthing**

Fungi – can improve agricultural efficiency and sustainability

- **Maintain soil fertility**
- **Form humus**
- **Mycorrhizal association**
- **Plant hormones**
- **Prevent diseases**
- **Control some insect pest**
- **Predators to nematodes**



Enzymes

Urease
Glucosidases
Cellulases
Laccases
Pectinases
Nitrogenases
Phosphatases
Sulfatases

β -Glucanes

Chitin

Cooperation with Müthing

Strict prevention of synthetic pesticides such as glyphosate, etc.

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Motivation

Circular bioeconomy

- Plant adjuvants from fungal cultures via agricultural residual and by-product streams
- Natural alternatives for chemical (poisonous) crop protection products
- Environmental friendly production of crops

Applied techniques

Fermentation of fungi

- Submerge fermentation of different fungi (shake flasks, 7 L – 70 L bioreactor) → media optimization
- Emerse fermentation (agar plate to rotating drum reactor, various solid substrates)

Soil testing of experimental plots

Soil respiration

Enzymatic assays (cellulase, xylanase, laccase)

Monitoring of plants (numbers, species)

Litter mining

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State of the project - Test of soil additives

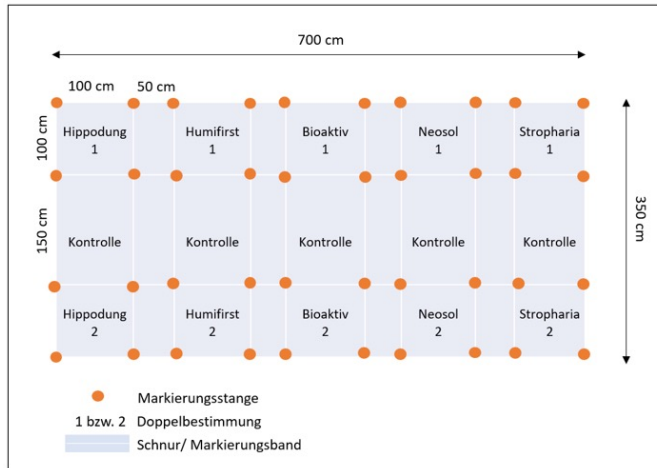
Humifirst

Neosol

Bioaktiv

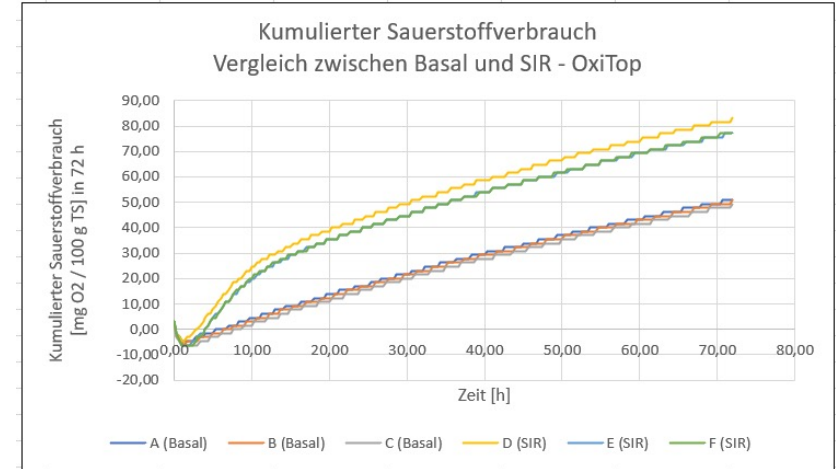
Hippodung (Melasse)

different Basidiomycota (produced in our lab)



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State of the project Soil Respiration



Enzyms

Phosphatases
Ureases
Glucosidases

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Open topics

Test of different Basidiomycota (Mycorrhiza and others)

- Optimisation of growth
- Formulation of Application in agriculture (Lab Tests)
- Results of application on soil respiration and soil microbiology
- results of application to the crop

other questions

- Media optimisation for the basidiomycota
- upscale: 70 L submerge cultivation and more

