

Practice BBF n° 13

FERTIBIO DEVELOPMENT OF THE PRODUCTION PROCESS OF BIO-FERTILIZERS

Introduction

Category: Good Practice (GP)

Practice identity card

#Bio-based fertilizers, food, GP, The Netherlands, biostimulants, nutrient efficiency

#The biofertilizer is composed of microorganisms like arbuscular mycorrhizal fungi, bacteria, and other fungi

It is best applied after planting or in early stages to boost root interaction

The biofertilizer improves nutrient uptake efficiency, particularly phosphorus, and reduces dependency on mineral fertilizers

Short description

- The biofertilizer contains primarily of beneficial microorganisms, including arbuscular mycorrhizal fungi (AMF), bacteria, and other fungi. These microorganisms are produced in vitro, in axenic cultures, and in vivo, resulting in effective inoculants. The AMF included in the biofertilizer belong to species such as *Funneliformis mosseae*, *Rhizophagus irregularis*, and *Archaeospora* spp., which have been isolated, multiplied because of their effectivity and efficiency.
- The fertilizer is delivered in the form of alginate-based capsules containing the inoculum, which includes spores, hyphae, and colonized roots, as well as phosphate-solubilizing bacteria capable of making phosphorus more accessible.
- It is suitable for use on crops such as wheat, barley, sunflower, tomato, chickpea and alfalfa. Application is most effective directly after planting or during early crop stages to maximize the interaction between the microorganisms and plant roots. The biofertilizer stimulates nutrient uptake efficiency and supports crop growth. This way, the biofertilizer can be a potential to mineral fertilizers.

Implementation process

Which fertiliser type is considered as the standard in this region? All kind of fertilizer, chemicals and organic fertilizers

What was the on-farm issue/challenge/opportunity that led to the implementation of the practice? Biofertilizers, efficient in conventional agriculture, can be used effectively to reduce the use of mineral fertilizers and pesticides with a positive environmental impact on soil fertility and the diversity of agroecosystems.

How long did it take to implement the practice and which are the measures needed to monitor: 32
Months

Application process/mode

- **In which form is the BBF applied?** solid
- **How is the BBF applied on the field?** band placement

Logistics

- **Storage safety risk:** low
- **Logistic aspects to consider:** Develop an "industrial" production protocol for biofertilizers to be applied in Tuscan agricultural areas, including peri-urban ones, creating a high-quality supply chain.
- **Skill/education level required for safe and effective application of the BBF?** rather low
- **Availability of the BBF in this region:** sufficiently available
- **Availability of the BBF in the wider EU:** sufficiently available

Agronomical traits

- **Is it a 'slow-release' fertiliser?** yes
- **N-P-K composition of the BBF:** Yes
- **C:N ratio of the BBF:** Yes
- **Expected availability of nitrogen (N) in the BBF:** higher
- **Expected availability of phosphorus (P) in the BBF:** higher
- **Expected availability of potassium (K) in the BBF:** higher
- **All materials present in the BBF:** micro-organisms
- **Can the BBF be applied to a multitude of cultivation techniques, or is the use limited to one or a few techniques?** Yes
- **Targeted crop categories:** feed, fibre, food, oil, ornamental, industrial
- **Influence on soil quality:** Yes
- **Soil types suitable for the BBF:** peaty, sandy, clay, loamy, chalky, silty
- **Expected effect on crop yield:** increase
- **Expected effect on crop yield variation:** increase
- **Expected effect on crop quality:** increase
- **Expected effect on crop quality variation:** increase
- **Which costs may increase upon using the BBF?** equipment
- **Which costs may decrease upon using the BBF?** equipment
- **Expected long-term/indirect benefits of using the BBF:** Realization of two prototypes for the production of biofertilizers: one for the in vitro and axenic culture production of arbuscular mycorrhizal fungi (AMF), bacteria and other beneficial fungi and one for the production of crude inoculum (spores, hyphae, colonized roots) of AMF (homogenized and concentrated inoculum).
- **Is the use as fertiliser the most valuable application of the material at hand?** Yes

Administrative context

- **Does the use of the BBF qualify for subsidies?** Yes
- **Status of the legal framework that regulates the use of the BBF:** existing, however with gaps

- **Are there any policy barriers complicating the use of the BBF?** None
- **Does the BBF contain any hazardous substances, and if this is the case, which one(s)?** No
- **Is the use of the BBF compliant with EU organic farming practices?** Yes
- **Expected effect on the leaching of nutrients?**
None
- **Are there any gaseous emissions to be considered upon using the BBF?** No
- **Greenhouse gas (GHG) reduction potential of the BBF:** negative: GHG emissions may increase upon using the BBF
- **Effects expected on the time occupation of the farmer upon using the BBF?** time-saving
- **May the use of the BBF contribute to a better public image of agriculture?** Yes in this situation.

Contact

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Find out more

Source of information: Data base of OG RRN

Additional info/links:

<https://fertibio.ciatoscana.eu/>