Bioschamp

Alternative casing for a sustainable and profitable mushroom industry

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BACKGROUND

Challenges in the Mushroom Industry

The EU needs to accelerate the transition towards a more sustainable mushroom sector.

More than 1 million tons of mushrooms are produced annually in the EU. **A crucial component in this production is casing soil**, a non-nutritive layer applied over the substrate, especially for species like Agaricus bisporus (common button mushrooms). The primary role of casing soil is to retain moisture and create a humid environment that promotes the development of mushroom fruiting bodies. This layer is vital in the mushroom industry for maximizing yields and ensuring a consistent and healthy crop.

It is key to use materials that favour rapid, replicable and quality production, since this industry utilizes 1.5 million cubic meters of casing soil annually. Until now, peat has been used, but possible changes in legislation, decreasing availability and the need for transport are motivating interest in **finding alternatives.**

The **BIOSCHAMP** approach offers new sustainable solutions to tackle the major challenges in mushroom cultivation.

BACKGROUND

About the BIOSCHAMP solution

The **BIOSCHAMP** project has developed an integrated approach to tackle the mushroom cultivation challenges during four years of work.

Two alternative and sustainable low-peat casings for the mushroom industry have been developed and tested, that could contribute to improving the productivity, sustainability and profitability of the European mushroom sector.

These two alternatives use Sphagnum moss and fermented grass fibres, respectively, which helps to **reduce the use of peat at least by 50%,** making them a sustainable option for a transition towards a greener mushroom industry.

OUTCOMES

Discovering the solutions

The project has successfully developed and tested **two innovative solutions** aimed at providing sustainable alternatives to traditional peat-based casing soils used in mushroom cultivation. The first solution involves a mixture that incorporates Sphagnum moss, while the second is based on fermented grass fibres. Both are **renewable materials**, being natural resources that can be replenished or regenerated over time, ensuring a continuous supply.

Four extensive trials were conducted across various locations in Europe to assess the effectiveness of these new casing materials in various climate-controlled conditions and mushroom production practices (including traditional and organic). **The results were highly promising**, with the mushrooms grown using these sustainable alternatives demonstrating excellent quality. In fact, their quality was comparable to, and in some cases even surpassed, mushrooms cultivated using conventional 100% peat casing soils. These trials indicate that the new solutions developed by BIOSCHAMP have the potential to significantly reduce the mushroom industry's reliance on peat, contributing to more sustainable agricultural practices while maintaining high standards of production.

OUTCOMES

The organic market, a key asset

The BIOSCHAMP project conducted rigorous trials to test the effectiveness of its innovative casing soils in one organic mushroom farm. The project's solutions were compared to the same 100% peat controls as in BIOSCHAMP's validation trials in conventional mushroom farms.

In this organic farm, **the grass and peat mixture outperformed the control**, yielding high-quality mushrooms with significantly lower infection rates. The results demonstrated that this new mixture could offer **a sustainable alternative** that may be useful for organic production.

The success of these trials underscores the potential of BIOSCHAMP's solutions to revolutionize organic mushroom farming by reducing reliance on traditional peat while maintaining or even improving crop quality.

OUTCOMES

Getting ahead of the changes

The development of these two alternative casing soil materials is **linked to the foreseen legislative changes**, such as limitations to peat extraction for agriculture production. For instance, the new EU Nature Restoration law mandates countries to restore 30% of their drained peatlands by 2030 and 50% by mid-century.

Other forces shaping the shift towards alternative casing solutions include local and national government initiatives (development of sustainability agendas), retailer preferences (increasing consumer demand of sustainable products), grower preferences (evolving towards sustainable practices and enhanced product performance). Moreover, big trends such as climate change awareness, circular economy principles, and consumer demand for eco-friendly products also affect the industry paradigm.

BIOSCHAMP consortium wants to be at the forefront of this shift, already prepared for the changes to come offering alternative casing solutions.

IMPACT

Adoption of alternative materials by mushroom growers.

Introducing alternative casing soil materials poses **a challenge for growers.** Over the past decades, growers have diligently focused on enhancing their efficiency to ensure profitability. That is why they are very cautious in adopting new practices.

Any new casing soils introduced must guarantee both yield and mushroom quality.

Fortunately, the four trials, ranging a diverse variety of European areas and types of production, predict a great future for the solutions developed within the BIOSCHAMP project. **Key attributes** such as water retention capacity, structural integrity, adhesiveness, and resistance to disease pressure **were measured and compared.**

Important first steps have been taken in BIOSCHAMP. Given the caution and delicacy involved in the craft of mushroom growing, more trials testing additional variables should be performed before accessing the European mushroom market.

CONCLUSIONS

To wrap-up...

The **sustainability of the proposed solutions** was evaluated from economic and environmental perspectives. The scope of these solutions addresses significant sustainability challenges in mushroom cultivation, such as the heavy reliance on peat.

Trials showed that **mushroom quality** using alternative casing soils mixed with peat **were virtually identical to those using peat alone**, making these alternatives more environmentally sustainable. However, adjustments are needed, particularly in managing the moisture content of the mixes and prewetting procedures.

Notably, the results from the organic mushroom farm were exceptional in quality, proving that BIOSCHAMP solutions might be a viable alternative to peat-only soils in organic mushroom farming. While further research is needed before these solutions reach the market, these advancements represent a **significant step toward a more sustainable mushroom industry.**

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