

BIOECONOMY WORKING GROUP PROJECT FACILITATION WORKSHOP – CBE JU CALL FOR PROJECT PROPOSALS

DISCUSSION TABLE 3

Call number: HORIZON-JU-CBE-2022-IA-04: Co-processing of mixed bio-based waste streams

Table facilitator: Poznan Science and Technology Park

Project idea:

The proposed project idea is to understand the characteristics of potential and designated agricultural waste, **Spent Mushroom Substrate (SMS)**, by investigating its physical, chemical and biological properties, and then formulate different substrate mixtures together with commercial peat/growing media to develop potential, novel and a sustainable peat-alternate substrate formulation/s for commercial horticulture purposes. The outcomes of the proposed project will reduce the environmental hazards associated with the improper disposal and reuse of fresh spent mushroom substrate while reducing the extensive exploitation of peat resources, thereby creating a transition towards sustainability and a circular economy for both mushroom producers and commercial horticulture industries.

Background:

Spent Mushroom Substrate (SMS) is the residual material left over after commercial mushroom production and is a designated agro-waste. For every kilogramme of mushrooms produced, about five kilogrammes of SMS are generated. On this account, the annual production of SMS in the mushroom industry worldwide is estimated at more than 60 million tonnes. **Due to a lack of scientific knowledge on how to handle and/or reuse this potential agro-waste, SMS generated in large quantities from mushroom farms are often incinerated, thrown away or simply disposed of, which is neither economically nor environmentally sound.** The increasing mushroom production in recent years and the expected increase in the future will lead to a significant accumulation of SMS, this accumulation of a huge amount of SMS can pose a potential environmental threat if not disposed of properly or used effectively.

Problem:

SMS: Fresh SMS has a high EC (salinity) value due to excessive accumulation of salts during mushroom cultivation and unfavourable pH, which severely limit the use of fresh SMS for agricultural and horticultural purposes. The use of SMS is recommended only after further decomposition/weathering processes of 6-24 months. It has been evident that SMS can release a significant amount of soluble solids and leachate during and after passive weathering, which would significantly increase the salinity of the underlying soil and groundwater. **Therefore, it will be of great importance to develop a simple, easy and cost-effective handling/re-using method for this potential agricultural waste.**

Peat: Peat is predominantly used as a commercial substrate for various horticultural purposes. However, due to extensive use and exploitation, peat resources are on the verge of depletion. Considering its non-renewability, increasing cost, future availability and environmental sustainability, gardeners around the world need a high-quality, renewable and sustainable substitute. At the same time, many reports and legislation emphasise the restriction of peat in the near future with an urge to find potentially peat-free and/or peat-reduced growing media.

Potential:

The SMS left over after growing *Agaricus bisporus*, *Lentinus edodes* and *Pleurotus ostreatus* consists of various organic materials such as poultry manure, sawdust, wheat straw, etc. Against the backdrop of increasing environmental concerns and the need for effective utilisation and disposal of agricultural wastes for sustainability, the use of the potential agro-industrial residues generated has been promoted in horticulture. Therefore, it is important to understand the physical, chemical and biological properties of the SMS and find a simple, effective, immediate and low-cost utilisation methodology which will be environmentally and economically beneficial.

Project owner: Poznan Science and Technology Park

Partners sought: RTOs and universities