HORTI-GEN INSIGHTS
15/08/2024

Horti-Gen Insights

https://www.hortigeninsights.com/p/how-can-we-decrease-waste?utm_source=www.hortigeninsights.com&utm_medium=newsletter&utm_campaign=how-can-we-decrease-waste&_bhlid=b66f3790c65f0624fb55b5cde7f985b4337313fa

How Can We Decrease Waste?

How biochar and polyethylene film recycling can transform the industy

Corenthin (Félix) Chassouant
August 15, 2024

In the face of escalating environmental challenges, the horticulture and greenhouse industries increasingly seek to mitigate their environmental footprint. In this edition, we will look at two prominent areas of innovation: the valorization of biomass waste to produce biochar and the recycling of polyethylene film, a common material in greenhouse operations.

These technologies address waste management issues and contribute to the creation of sustainable products and practices. This newsletter explores the current trends and innovations in these fields, highlighting the potential of biochar production from greenhouse waste and the advancements in polyethylene film recycling, including the novel use of fungi to degrade plastic waste.

Special thanks to Jean Riondel, president of Mini Green Power for his valuable input.

A DEEPER LOOK

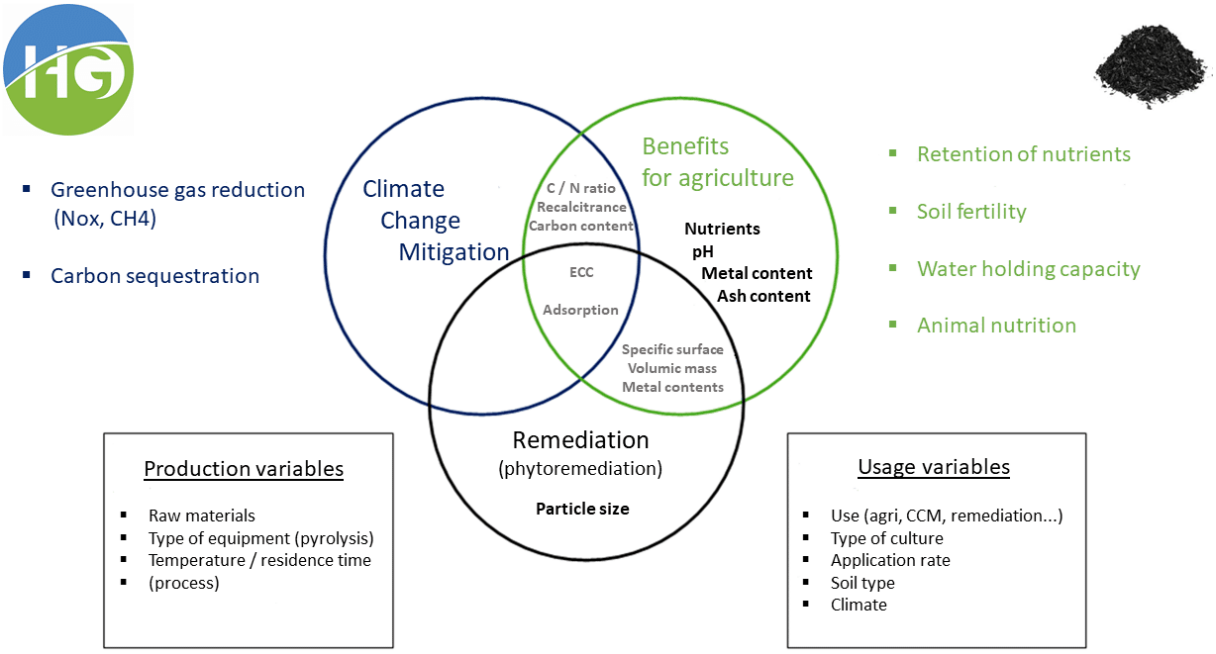
Biomass Valorization: Turning Greenhouse Waste into Biochar

Biomass valorization involves converting organic waste into valuable products such as biochar, biofuels, and biochemicals. This process is particularly relevant for the horticulture and greenhouse industries, which generate significant plant waste.

The Process and Benefits of Biochar Production

Biochar is a carbon-rich material produced by pyrolysis, a thermochemical process that decomposes organic material at high temperatures without oxygen.

The characteristics of the biochar(s) depend on the type of biomass used and the operating conditions during the pyrolysis (temperature, residence time). The UC Davis Biochar Database provides valuable additional information on biochar based on those variables.



Source: The International Biochar Initiative (IBI) - Horti-Generation post

The production of biochar from greenhouse waste offers several environmental benefits:

1. Soil Enhancement: Biochar improves soil health and substrate by increasing its nutrient retention capacity, enhancing microbial activity, and improving water retention. This leads to better plant growth and higher crop yields.

2. Carbon Sequestration: By converting organic waste into biochar, carbon is locked into a stable form that can remain in the soil for hundreds to thousands of years, thereby reducing greenhouse gas emissions
3. Waste Reduction: Utilizing greenhouse waste for biochar production helps manage organic waste more effectively, reduces the burden on landfills, and minimizes methane emissions from decomposing organic matter.

Part of biochar's agronomic properties can be explained by the presence of numerous pores in its car structure. Variability in pore size and specific surface area allows plants to retain more (usable) water, oxygenates substrates, and increases interactions with microorganisms.

A CASE STUDY
How It Can Be Leveraged: A Case With Mini Green Power

Jean Riondel, president of Mini Green Power, explains that one of the major advantages of biochar production is that it transforms waste that would otherwise be landfilled or burnt into a useful product. By sequestering carbon in the soil, biochar helps reduce greenhouse gas emissions.

When used in agriculture, biochar speeds up production: it sells for between €1,000 and €1,500/ton, depending on the country in which it is purchased. It also generates increased income as yields rise.

However, there are also obstacles to fully integrating biochar into greenhouse operations. Firstly, you need to be able to secure the supply of biochar and ensure that we qualify the best biochar for the target crop. There are as many types of biochar(s) as biomass wastes and pyrolysis processes. You must ensure that the biochar is contaminant-free (upstream quality control). Moreover, to be able to sell carbon credits, you need to get in touch with specialists to ensure you're well looked after.

For instance, GECA Environnement is North America's most qualified biochar and pyrolysis specialist active worldwide. They can support you to access biochar-based carbon credits.

Jean Riondel reports that there are several case studies and examples of companies that have successfully adopted biochar in their greenhouses. Here are a few notable examples:

- Circle Organics (Ontario, Canada): Adding biochar improved water retention, reduced dependence on chemical fertilizers, and increased plant resistance

to disease. The crops saw an overall improvement in plant health and increased yields.

- Great Northern Greenhouse (Alaska, USA): In addition to improving yields, the use of biochar has contributed to carbon sequestration, which is beneficial for the environment.

More and more companies are investigating this avenue and commercializing biochar-based products for greenhouse growers.