# Teagasc Nursery Stock seminar
# New trends in growing media

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4 November 2021

# GrowingMedia2021

## ISHS International Symposium on Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture

GrowingMedia2021

ILVO Flanders Research Institute for Agriculture, Fisheries and Food

ISHS International Society for Horticultural Science

gent:

GHENT UNIVERSITY

provincie Oost-Vlaanderen

IPS International Peatland Society

UHASSELT

ECN

1913 we make it grow Klasmann-Deilmann

ICL Specialty Fertilizers

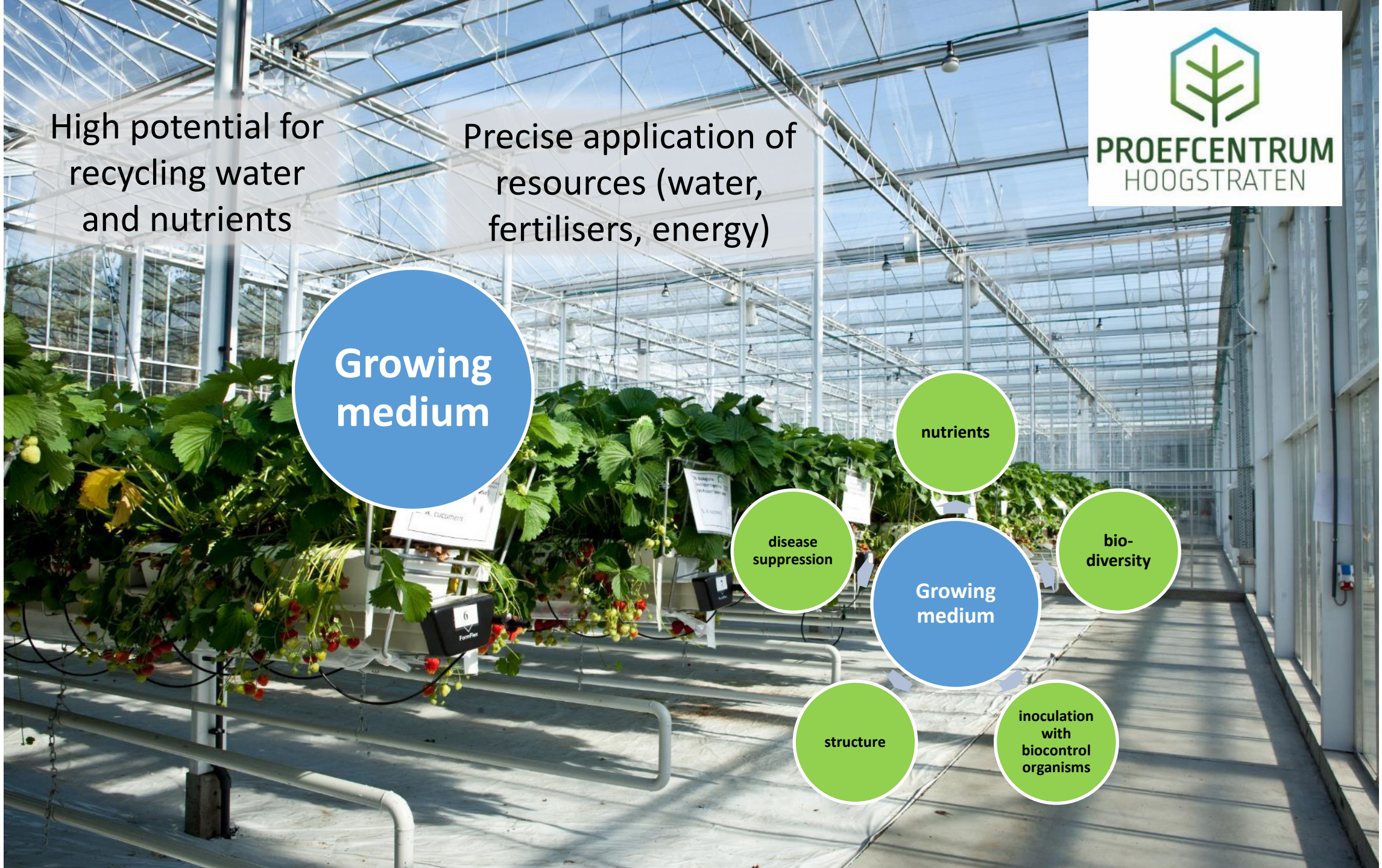
Agaris GROUP

fwo Research Foundation Flanders Opening new horizons

# Growing media: trends

New trends:

- EU Fertilizing Product Regulation – CE mark
- Circular horticulture: water, nutrients, organic matter?
- The added value of the microbiome of growing media
- Peat replacement by local materials
- Biochar: the new kid in town?
- Reuse and upcycling of spent growing media:
  extending the life of peat, coir and other materials


High potential for recycling water and nutrients
Precise application of resources (water, fertilisers, energy)
Growing medium
nutrients
disease suppression
bio-diversity
Growing medium
structure
inoculation with biocontrol organisms
PROEFCENTRUM HOOGSTRATEN

# Growing media: microbiome

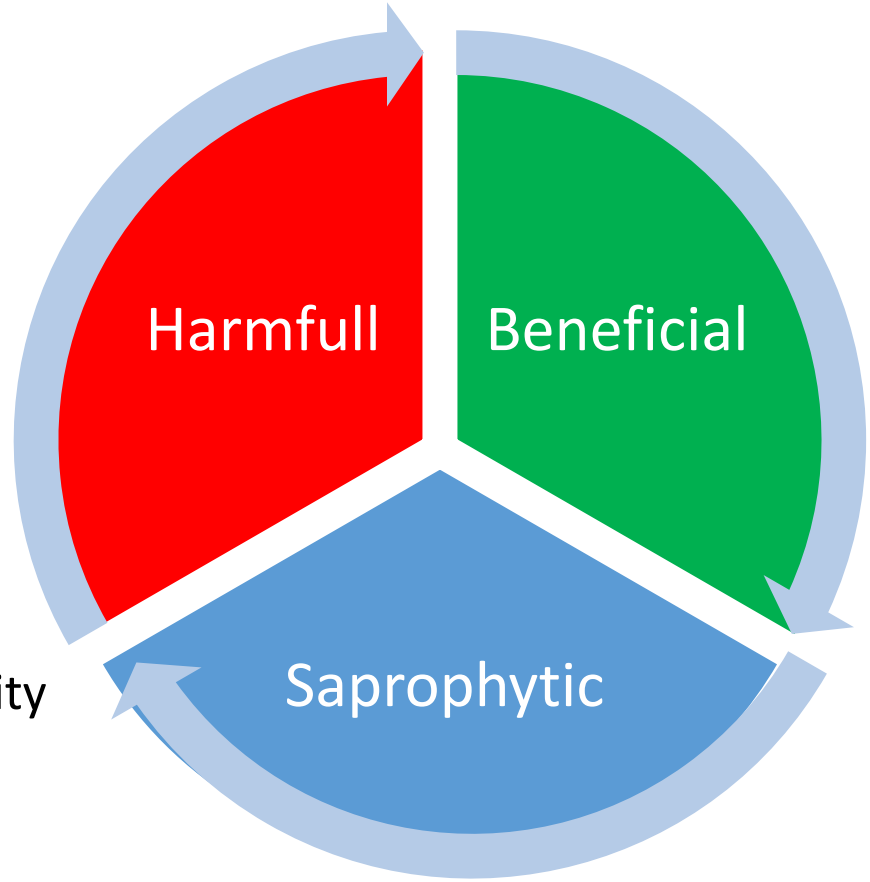
Contradiction?

- High stability = low microbial activity
- High microbial biomass
- High microbial diversity
- Low risk for pathogens
- Microbial functions, i.e., nitrification

# Importance

Bulk

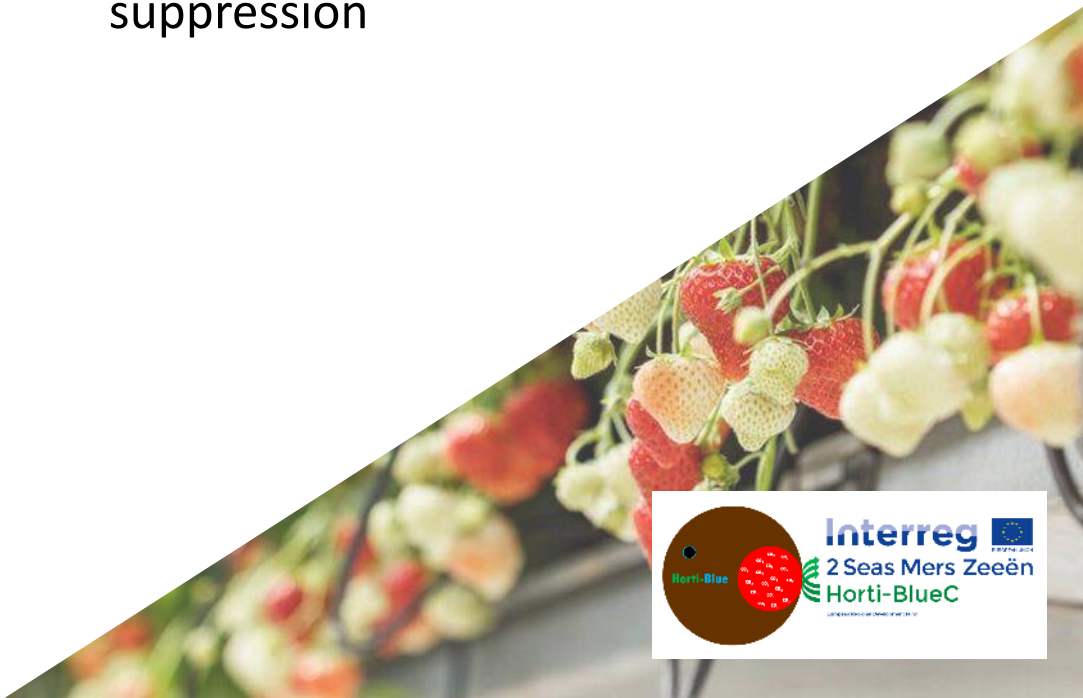
Rhizosphere




Plant pathogens
Human pathogens

Hydrophobicity

Naturally present in or added to the GM
Plant growth promotion or disease suppression



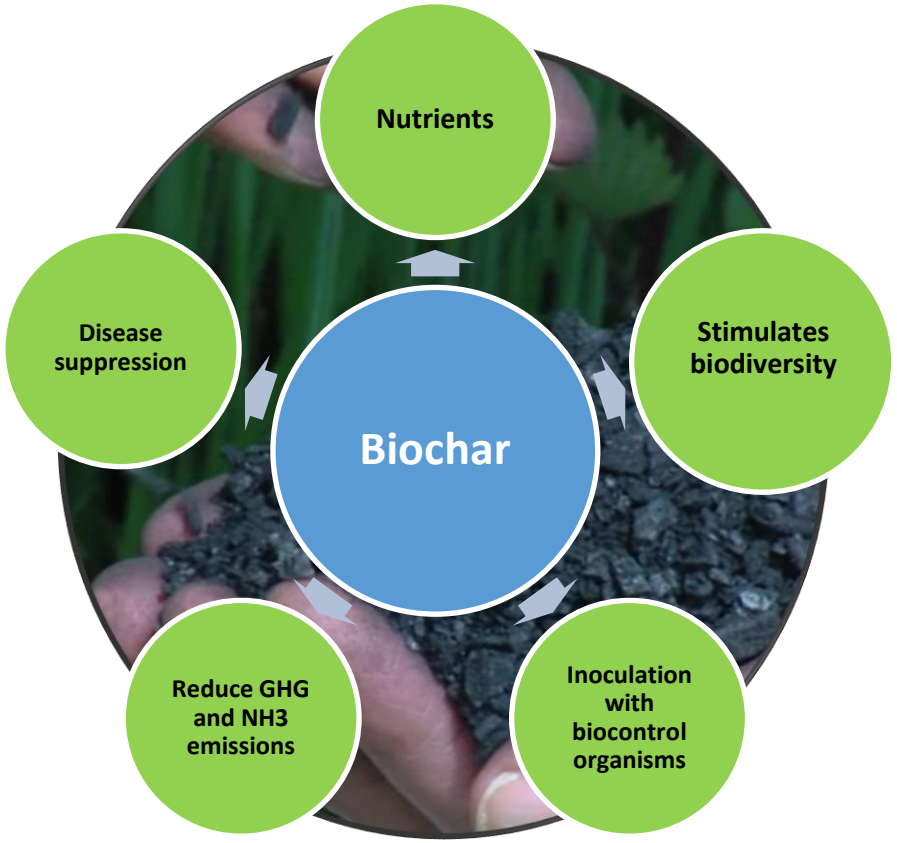

Nutrients
Disease suppression
Chitin
Stimulates biocontrol organisms
Plant immunity

# Biochar: Building block for sustainable growing media?

**Biochar in small amounts:**

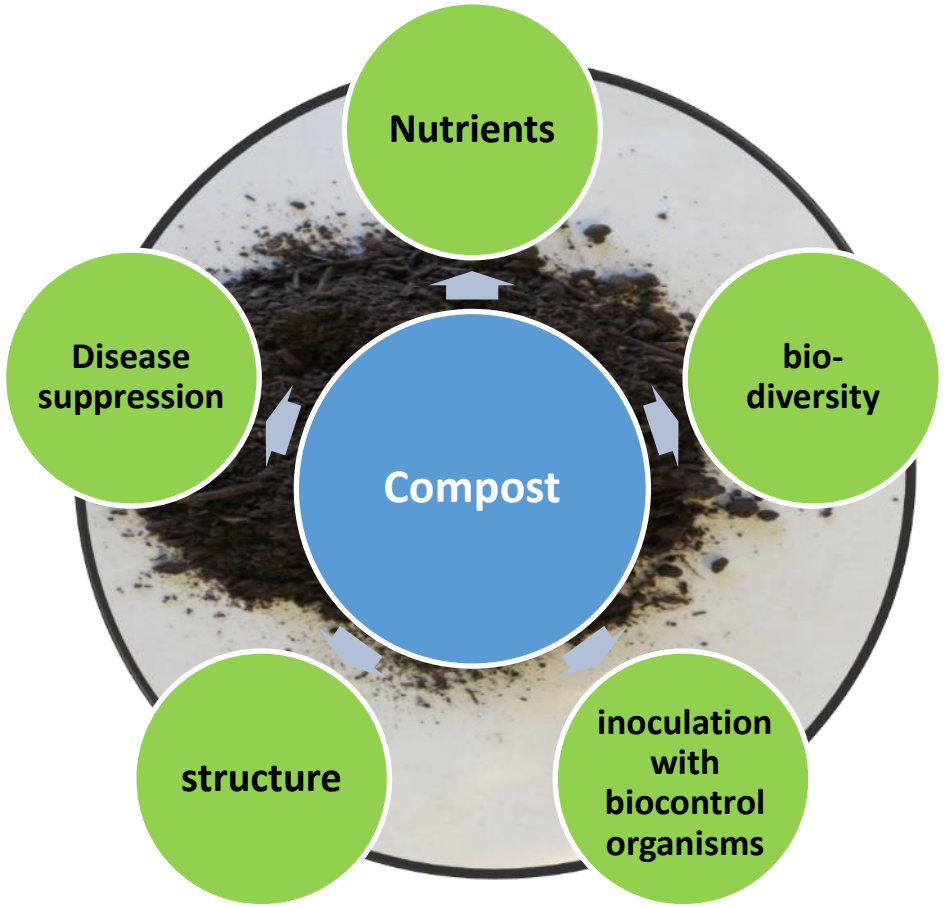
- Disease suppression (small amounts – growth conditions)
- Fertilizer (P, K)
- Liming agent

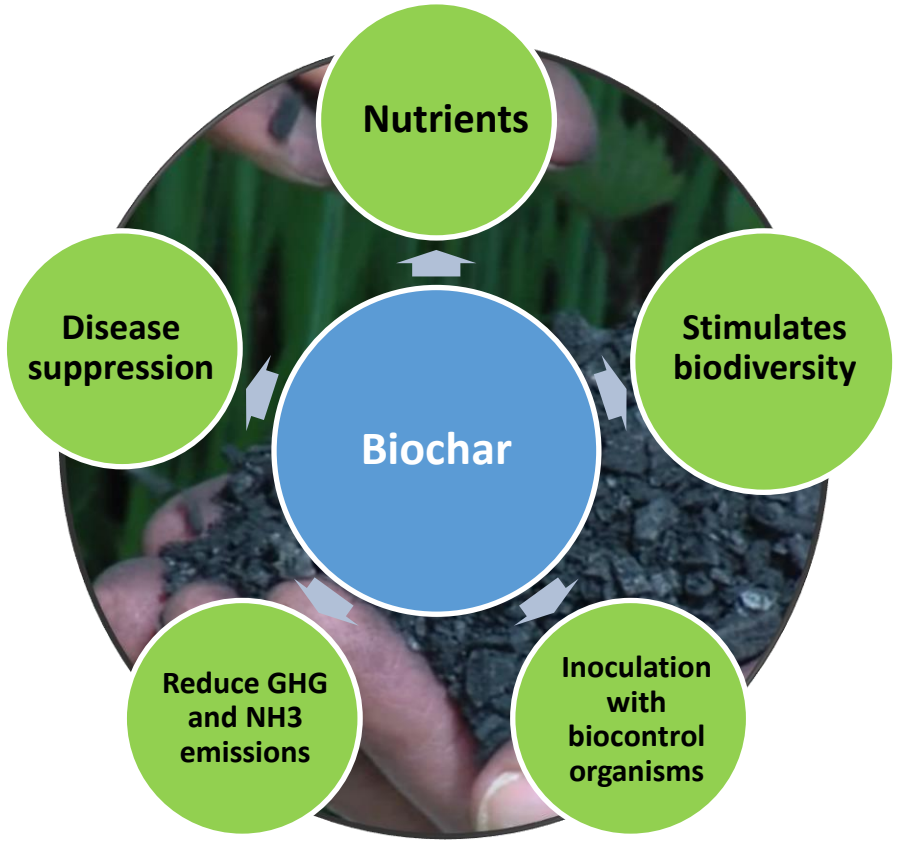
**Biochar as bulk replacement**




ECN TNO innovation for life

# Compost and biochar: added value in sustainable growing media




Horti-Blue

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# Interaction between plant growth and growing media

## Growing media can affect plant growth …


Growing medium blend

## … and plant growth affects the potential for reuse of growing media


Grower's practice

# Reuse of spent organic growing media

Direct use as a soil improver

Bulking agent for composting

Direct reuse after steaming

Feedstock for biochar production

The reuse scenario will affect the fate of nutrients and carbon in spent growing media

# Adoption of new solutions

**Poll: 150 participants (60 on-site + 90 online) => answers from 50%**

**Q1: sustainability of growing media: focus on peat replacement or more general: also replacement of coir and mineral products?**

**Q2: What is the best strategy for implementing the increase in the sustainability of growing media?**

**Q3: Important to focus specific on local alternatives, rather than alternatives in general?**

# Adoption of new solutions

**Q4: Should the role of microbiology as a criterion be included in the sustainability assessment?**

**Q5: Should the use of fertilizers (source and dose) be included in the sustainability assessment, or is this independent from the blend composition?**

**Q6: Sustainable blends: Label (added-value) or general prerequisite?**

# Adoption of new solutions

**Q7: For pre-planting substrates/substrates for transplant production, should the added value as source of C for arable soils (C storage) be included as a potential advantage of the replacement?**

**Q8: Should the potential for reuse/recycling of the growing media (End-of-Life) be included in the sustainability assessment?**

# Adoption of new solutions

**Q9: For the feasibility of replacing conventional blends in professional applications, do you expect a large effect of the fertilizer supply system used during cultivation (i.e., fertigation, organic/slow release)?**

**Q10: For the feasibility of replacing conventional blends in professional applications, do you expect a big effect of the water supply strategy used during cultivation?**

Interreg

EUROPEAN UNION

2 Seas Mers Zeeën

# Horti-BlueC

European Regional Development Fund

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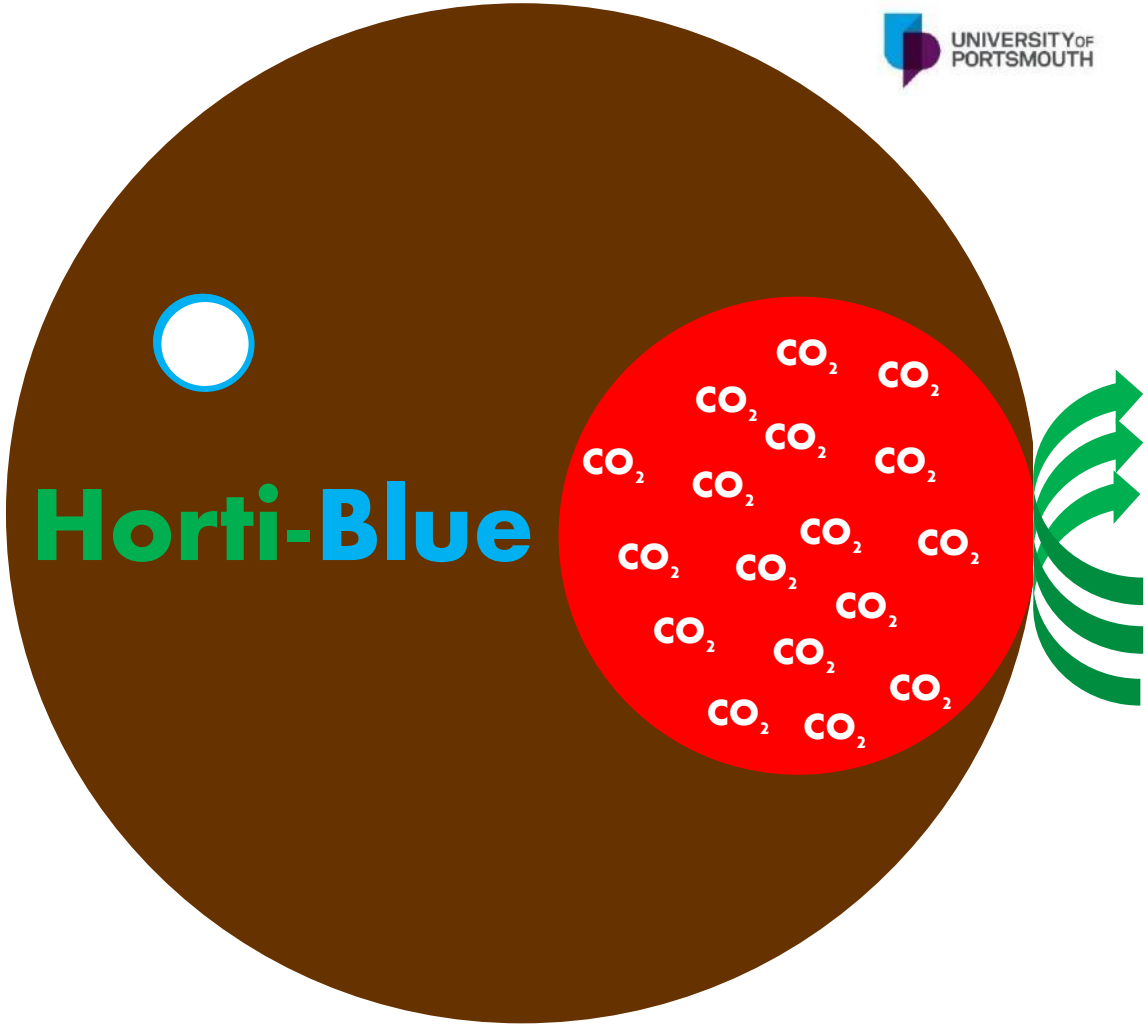
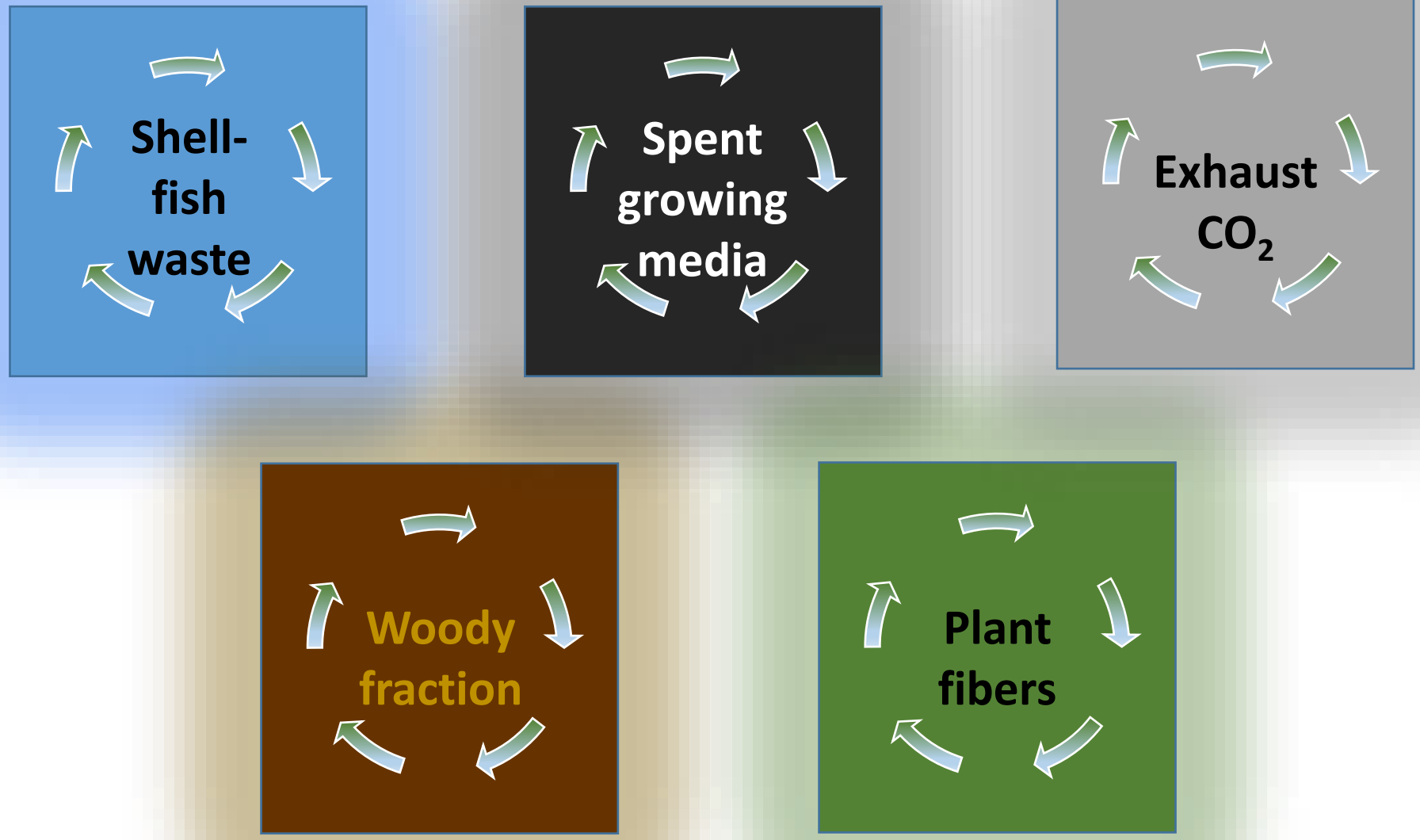
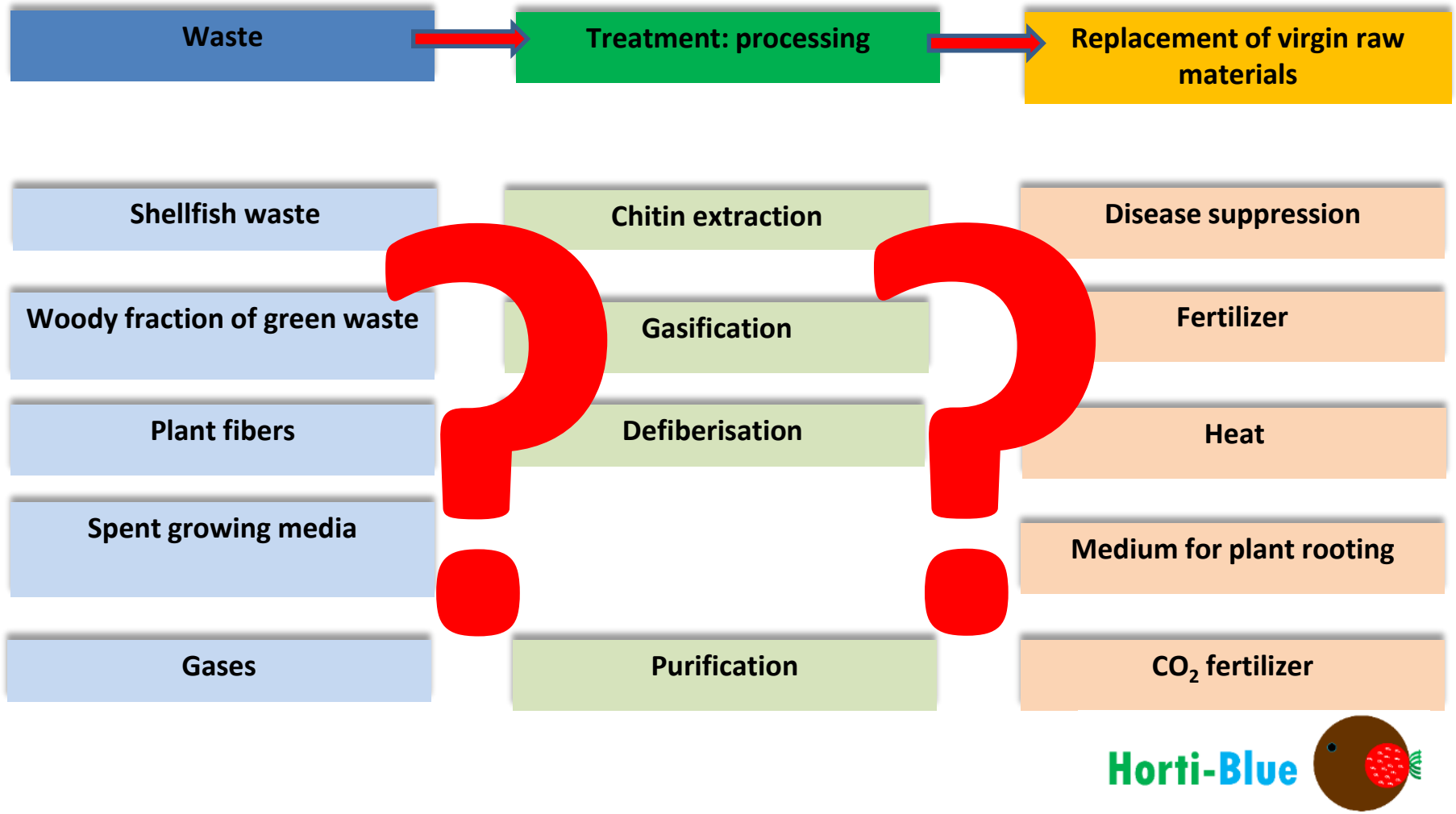
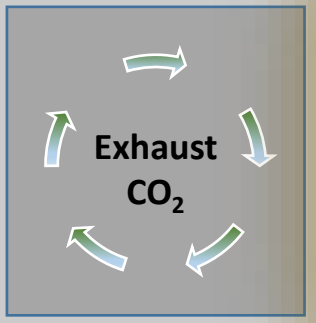


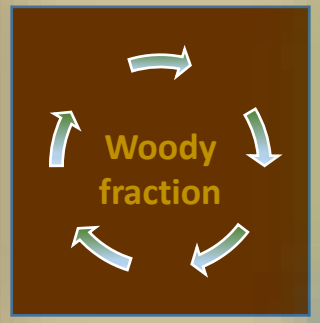
# Demand: upcycling of one gaseous and four solid residual materials

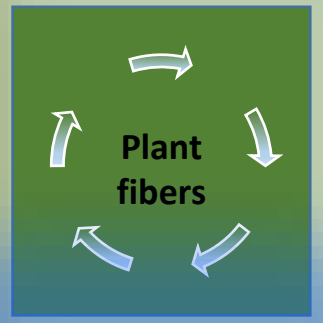


# Solution: upcycling with optimized technique for replacement of virgin raw materials



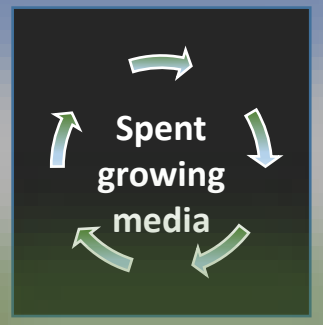


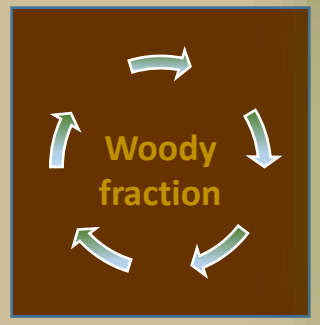



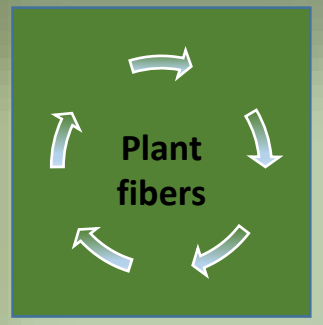

VC1: Large scale **gasification**, $CO_2$ reduction & **biochar** production


VC2-Production of **chitin** from shrimp shells




VC3-**Spent Growing Media**: direct reuse versus feedstock for biochar




VC4-**Bulk replacement** in growing media

# 4 Horti-BlueC webinars

- Horti-BlueC webinar 1: Large scale gasification for energy and biochar production
- Horti-BlueC webinar 2: Production of chitin from shrimp shells or Chinese mitten crab
- Horti-BlueC webinar 3: Recycling spent growing media: Direct reuse or feedstock for biochar or compost
- Horti-BlueC webinar 4: new growing media blends: November 9th, 2021

# 4 Horti-BlueC webinars

Fact sheets + recordings: https://www.horti-bluec.eu/

## Horti-BlueC webinar 1:

webinar 1
https://www.youtube.com/watch?v=gRz54R8rED4

## Horti-BlueC webinar 2:

webinar 2
https://www.youtube.com/watch?v=2mSEuQsKqm4

## Horti-BlueC webinar 3:

webinar 3
https://www.youtube.com/watch?v=aHeSGuxrTqA

# Building blocks for sustainable growing media: more info?

| | Video | Paper | Decision tool |
|---|---|---|---|
| Chitin | https://youtu.be/yUymPsQwS44 | Chemically versus thermally processed brown shrimp shells or Chinese mitten crab as a source of chitin<br><br>https://doi.org/10.1094/MPMI-08-20-0223-R | https://www.horti-bluec.eu/en/decision-tool |
| Biochar | https://www.youtube.com/watch?v=jiccJc9d-Gg<br><br>https://youtu.be/9YpdSjLu-Zc | https://www.mdpi.com/2073-4395/11/4/629<br><br>https://www.frontiersin.org/articles/10.3389/fmicb.2016.02062/full | |
| Spent growing media | https://youtu.be/MXcMc0vS0f0 | Grow - Store - Steam - Re-peat: Reuse of spent growing media for circular cultivation | |
| Green compost | | Acidification of composts versus woody management residues: Optimizing biological and chemical characteristics for a better fit in growing media | |
| Plant fibers | https://www.youtube.com/watch?v=fCiJ_20c8FQ | https://www.sciencedirect.com/science/article/abs/pii/S0959652618325101 | |

# Peat-free 100% organic growing media for tomato

**Reference: 100% mineral wool**

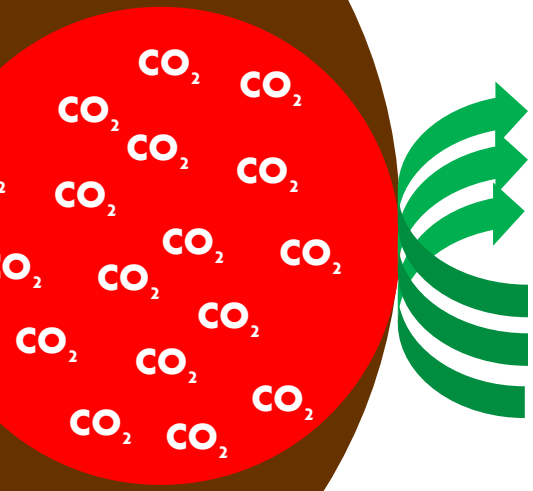
**Reference: 100% coir**

# Peat-reduced organic growing media for strawberry

**Reference: 100% peat**

**Reference: 100% coir**

# Thanks for your kind attention!




www.horti-bluec.eu
www.growingmedia2021.com

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https://www.youtube.com/channel/UCAmlINw5Yndql8UMLsEhLJQ

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# Thank you!

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