New growing media blends: interaction with organic fertilizers and effect of fertigation

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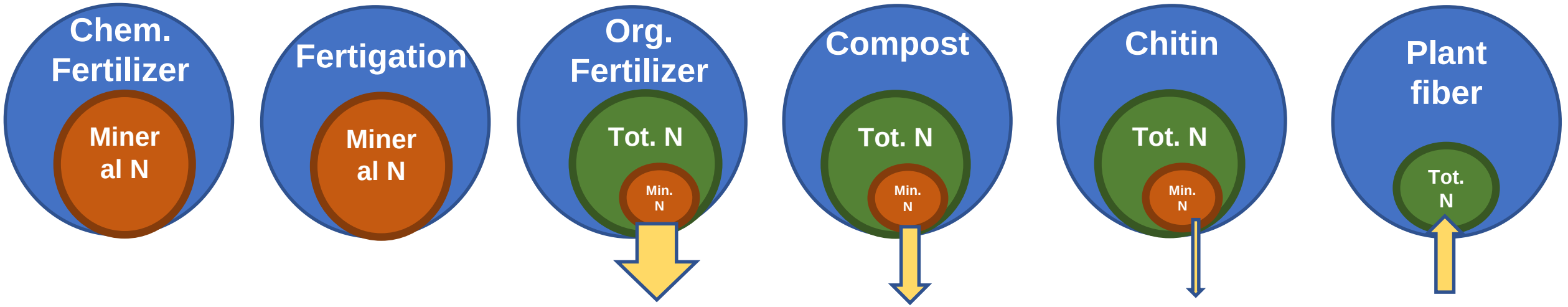

N mineralization: microbial process

N immobilization: microbial process

High microbial activity => high N dynamics

Change in fertilizer application needed when using new growing media blends?

New media blends and fertilizers

Poll:
What is the link between the change in microbial biomass and the nitrogen release from organic fertilizers in a growing medium blend?

1. More nitrogen release = strong increase in microbial biomass
2. No link between nitrogen release and increase in microbial biomass
3. More nitrogen release = less increase in microbial biomass

Growing media: microbiome

	n	N-immob. risk	Microbial biomass	CO_2 release
		%	**nmol/g OM**	**mmol CO_2/kg OM/hr**
peat	9	15	166	1,2
wood fiber	6	7	77	1,5
bark compost	5	20	341	2,6
green compost	9	23	968	3,6
plant fiber	9	**60**	550	7,0

New materials = more microbiology => positive or negative?

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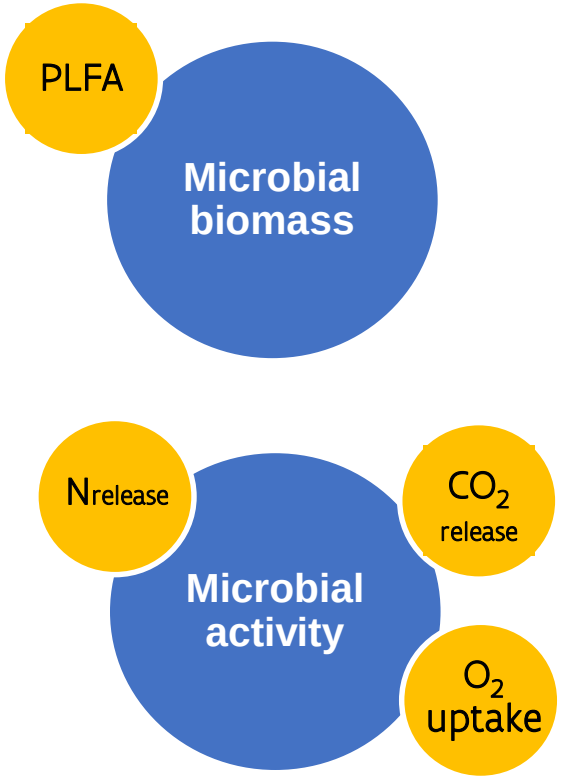
	M1	M2	M0
Composition			
Woody Compost 1 (vol%)	40		
Woody Compost 2 (vol%)		40	
Black peat (vol%)	15	15	50
White peat (vol%)	15	15	50
Bark compost (vol%)	30	30	
Wood Fiber (vol%)			
Coir fiber (vol%)			

More info:
10.3390/agronomy12020422

Growing media:
link between N release and microbial biomass?



Effects specific for each combination of blend and organic fertilizer, more release from chitin

6 different blends: the larger the change in microbial biomass, the lower the mineral N concentration in the blend

Compost in the blend: higher NO_3-N/NH_4-N ratio = more nitrification

New materials: higher microbial biomass and activity, interacting with organic fertilizers

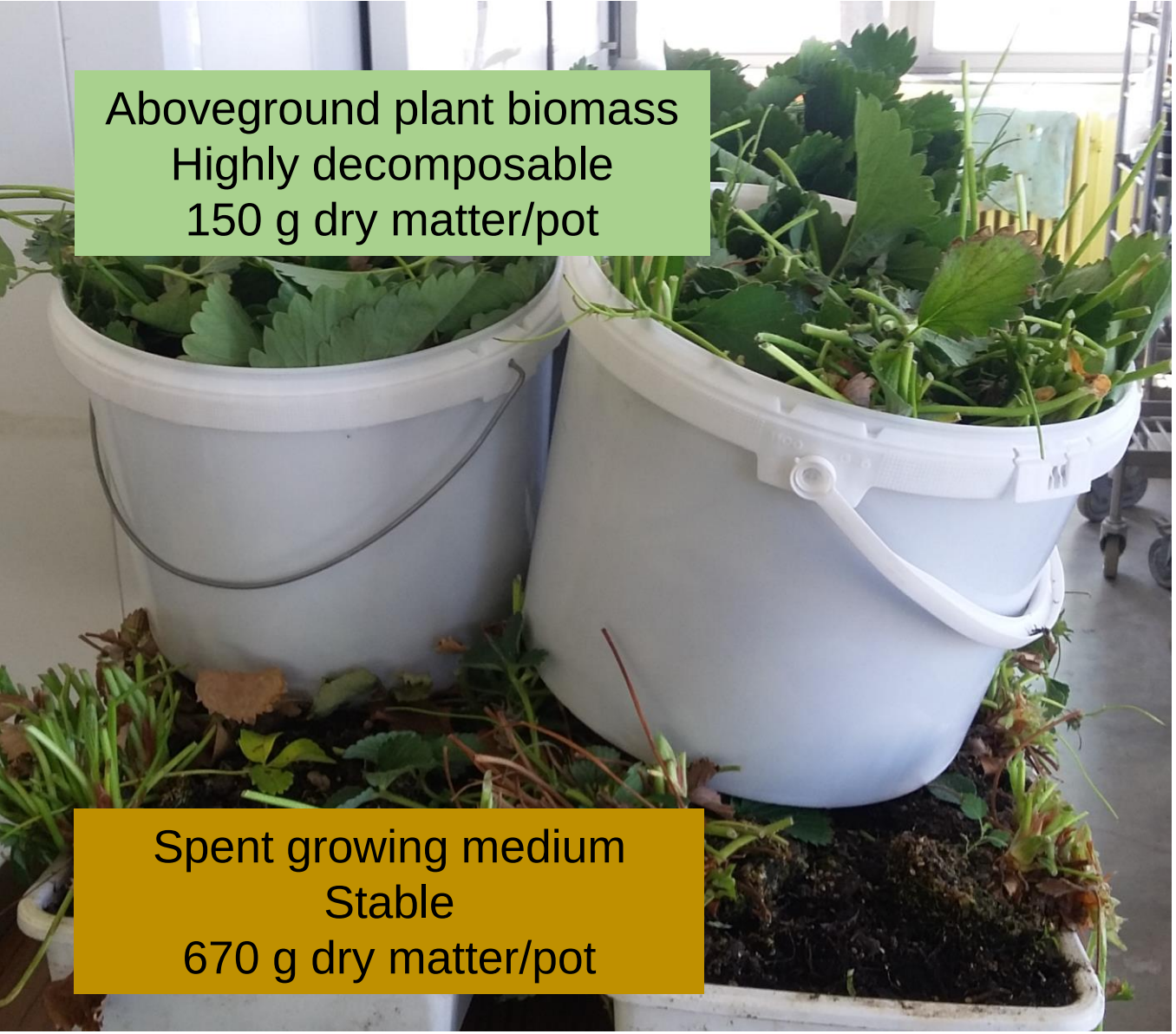
Let the mineralisation process start before plant growth

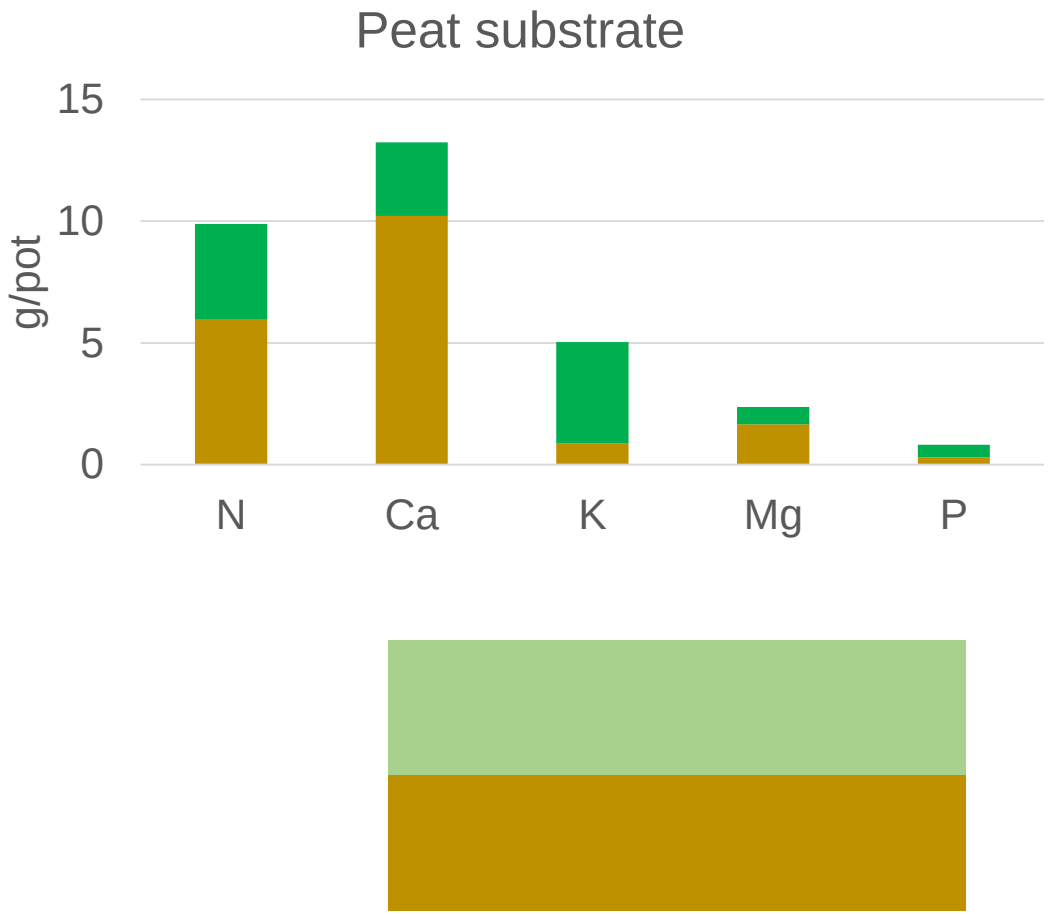
Peat-reduced organic growing media for strawberry

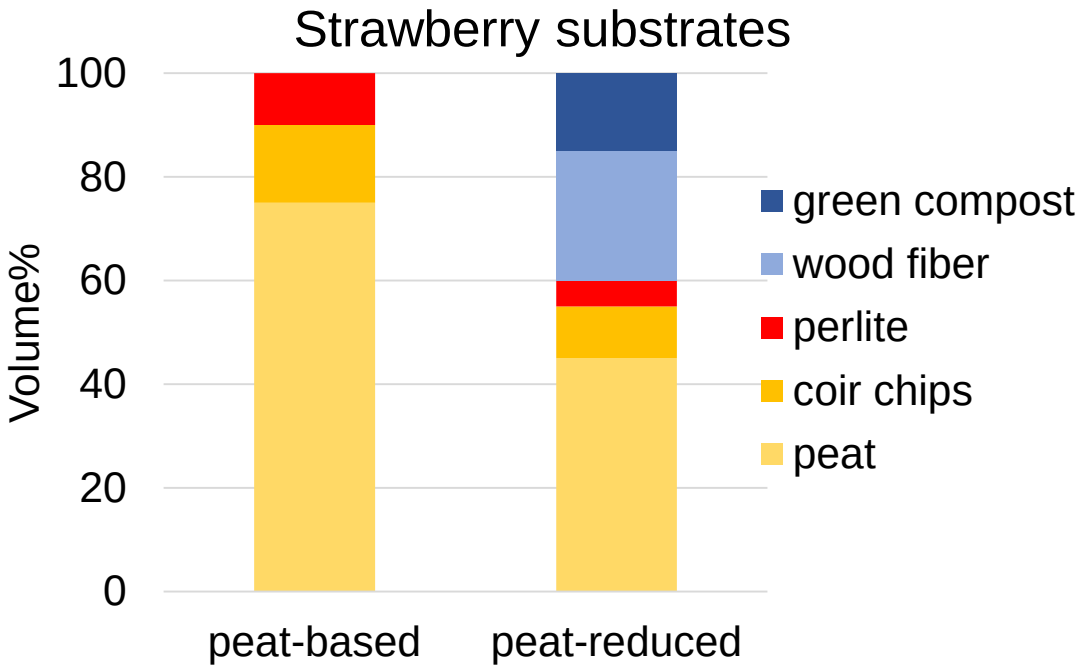
Reference: peat-based

Reference: 100% coir

- Proefcentrum Hoogstraten
- Gutter system, double-cropping: autumn 2020 + spring 2021 cultivation
- Reduced (65%) vs conventional (100%) fertigation
- Peat-based vs peat-reduced blend (+ biochar)


Aboveground plant biomass
Highly decomposable
150 g dry matter/pot
Spent growing medium
Stable
670 g dry matter/pot


Peat substrate
15
10
5
0
g/pot
N
Ca
K
Mg
P

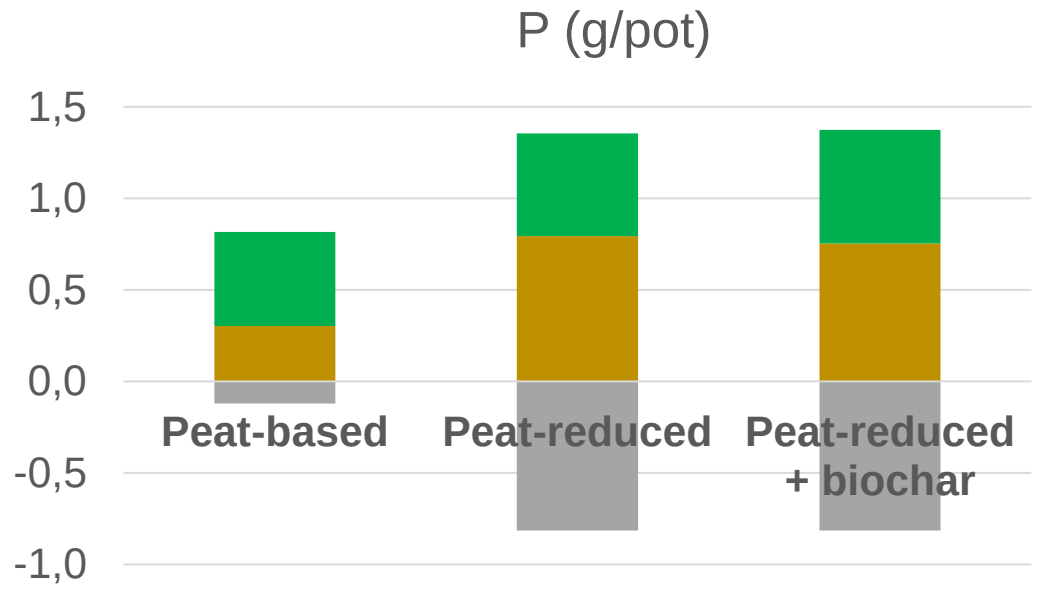


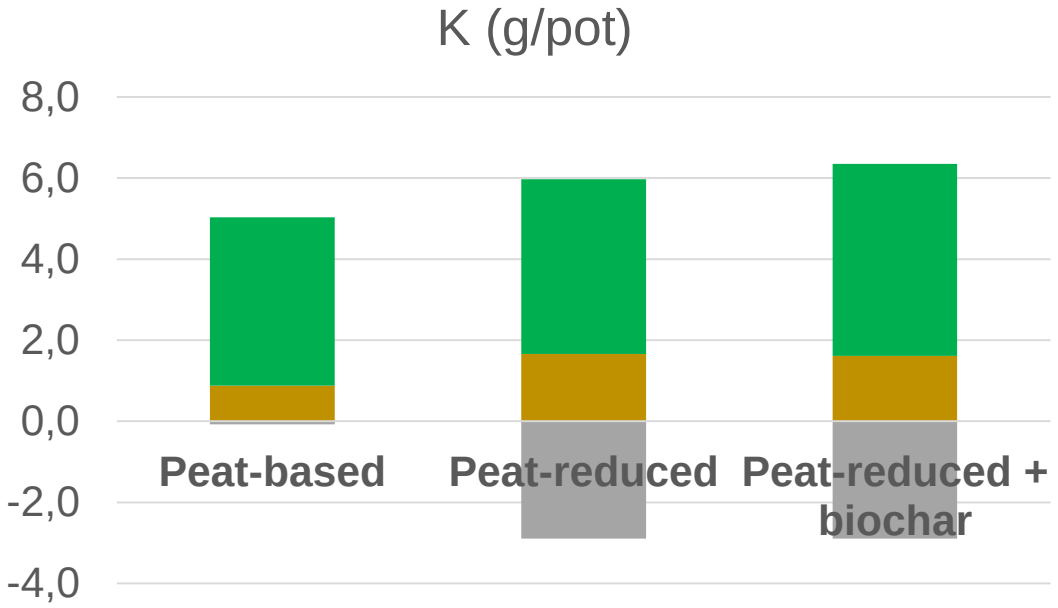
Aboveground plant biomass

Spent growing medium

Initial growing medium

Nutrient export:
N, Ca, Mg: plant biomass < growing medium
P: depending on the blend
K: plant biomass > growing medium





Fertigation vs. blend

- Reduced fertigation: 35% reduction in nutrients
  - Reduced yield in autumn (>10%) and spring (>15%) cultivation
  - Small reduction in nutrient export with spent growing media
  - No change in the fertigation regime needed
- No net effect of blend on nutrients in spent growing media
- End-of-life nutrient export in kg/ha:
  - Plant biomass, kg/Ha: N: 70, P: 10, K:70
  - Spent growing medium, kg/Ha: N: 100, P: 5, K:15

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Building blocks for sustainable growing media: more info?

	Video	Fact sheet	Paper	Decision tool
Chitin	https://youtu.be/yUymPsQwS44	Chitin fact sheet	Chitin from shrimp shells or crab Chitin in Strawberry Cultivation	https://www.horti-bluec.eu/en/decision-tool
Biochar	https://youtu.be/jiccJc9d-Gg https://youtu.be/9YpdSjLu-Zc	Biochar fact sheet	Biochar for Circular Horticulture Strawberry Rhizosphere and Biochar	
Spent growing media	https://youtu.be/MXcMc0vS0f0	Spent growing media fact sheet	Grow - Store - Steam - Re-peat	
Green compost		Microbiome of growing media	Composts versus woody management residues Woody composts and organic fertilizers	
Plant fibers	https://youtu.be/fCiJ_20c8FQ	New growing media fact sheet	Plant fibers for renewable growing media	

New information on the website

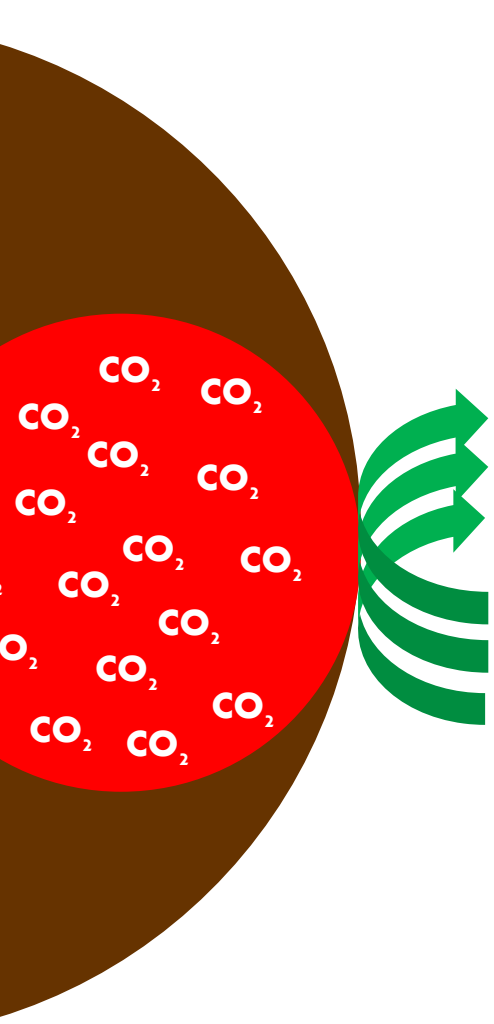
New factsheet:

Building blocks for sustainable growing media, with a focus on microbiology

Overview of the full scale greenhouse trials for tomato and strawberry:

https://ilvo.vlaanderen.be/uploads/documents/Summary-full-scale-greenhouse-trials.pdf.

Thanks for your attention!



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Horti-BlueC YouTube channel
https://www.youtube.com/channel/UCAmlINw5Yndql8UMLsEhLJQ