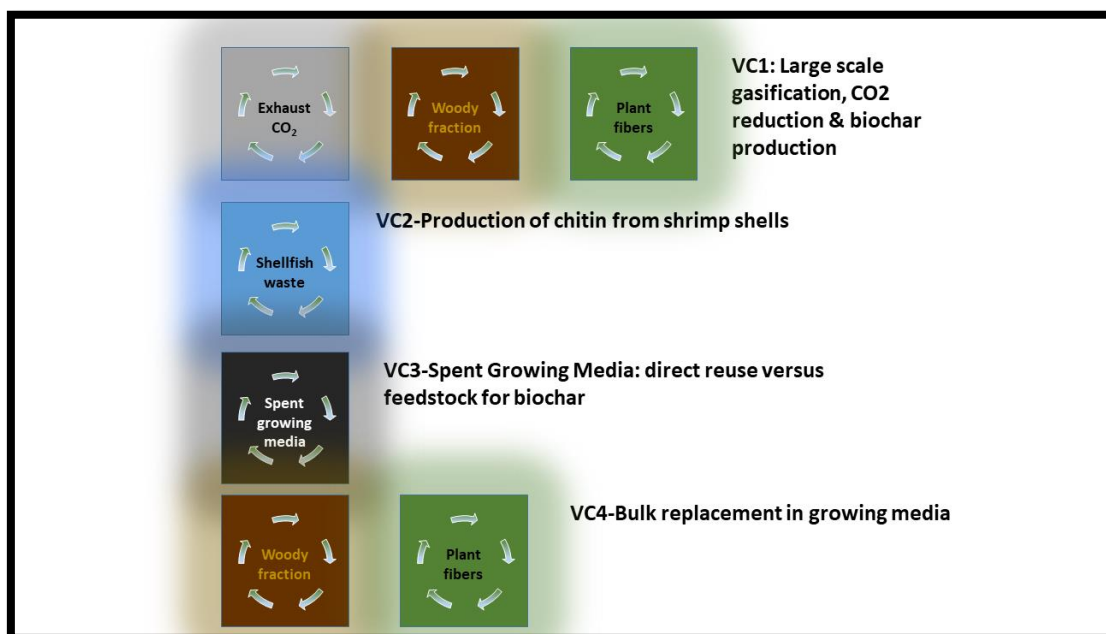


Horti-BlueC, WP4: Collaborative platform and Policy action plan

I. Intro WP4: Collaborative platform for 4 valorization chains, and Policy action plan

A. From WP3 to WP4

- new solutions provided by Horti-BlueC:
 - upcycling of waste streams
 - use in greenhouses, new greenhouse concept
 - improve current situation using new solutions
- WP3 = feasibility of these solutions: economic and technical vs. WP4 = collaboration between target groups and policy
- Focus of WP3/WP4: valorization chains (VC)
 - VC1-Large scale gasification (biochar & CO₂)
 - VC2-Production of chitin from shrimp shells (shell fish waste)
 - VC3-Spent Growing Media: direct reuse versus feedstock for biochar
 - VC4-Bulk replacement in growing media (green waste & fibers)



Link between the waste streams processed in WP1 and the 4 valorisation chains developed in in WP3 and WP4.

B. Focus of WP4

Action 4.1 of WP4 will start for the 4 VCs for the Collaborative platform, while for the policy action plan, Action 4.2 of WP4 will focus on Adoption of the 5 new solutions of Horti-BlueC:

1. Reuse of spent growing media:

- Direct reuse
- As a feedstock

2. New additives: biochar & chitins

3. New blends for strawberry/tomatoes

- T: peat-free blends
- S: Peat-reduced blends

4. New technology

5. New Greenhouse concept

Policy action plan

II. Workplan: development of an action plan in 4 steps

D4.2.1: 30/09/20, Draft set-up of the action plan

D4.2.2: 30/12/20, Draft action plan

D4.2.3: 31/05/21, Evaluation of action plan

D4.2.4: 31/05/21, action plan after project life

III. D4.2.4: 31/05/21, action plan after project life

General points of after project life have been described in the Closure Report (see specific points in the Closure Report).

A. General actions

For Flanders, The after project life of the action plan developed in WP4 is guaranteed by its inclusion in (a) the B2BE facilitator (hosted by ILVO), (b) the ILVO pilot infrastructure for Bio-Economy projects, (c) the action on peat replacement in the Biomass action plan, (d) the growing media working group within the Agrolink network, and (e) the Flanders' NutriCycle action plan:

a. 'B2BE'-facilitator will work as a collaborative platform in Flanders after Horti-BlueC has ended

- Matchmaking with different stakeholders based on the outcome of Horti-BlueC
- Horti-BlueC Webinars will be used as cases for the 'B2BE'-facilitator

b. ILVO pilot infrastructure for Bio-Economy projects at TRL 7-9 + concrete cases

Has been described in the policy action plan on bio-economy (in Dutch):

pijler 2 van Beleidsplan, actie VLAIO: het ontsluiten van pilootinfrastructuur van verschillende onderzoeksinstellingen voor pilootprojecten (TRL 7 tot 9) met bedrijven rond de bio-economie (moonshots, voucher system).

Pilot infrastructuur ILVO: Some proposals for case studies:

- Veenvervanging in en langere levensduur van teeltsubstraten (bijv. ReGrow4C)
- Optimaliseren van de organische bemesting bij veenvervanging door compost en/of houtvezel in relatie tot de microbiële activiteit
- Testen en optimaliseren van compostering van schors voor gebruik in teeltsubstraten
- Testen en optimaliseren van het opschalen van inoculatie van plantenvezels met nuttige schimmels of broed

c. action on peat replacement in the Biomass action plan

OVAM has launched the action on peat replacement within the Biomass action plan in spring 2022. All stakeholders in the sector are invited to sign the agreement with specific actions to reduce the use of peat in growing media.

d. the growing media working group within the Agrolink network

A growing media working group has been started within the Agrolink network in spring 2022. Agrolink Flanders is a collaboration platform of 16 knowledge institutions and research stations in Flanders (Belgium) active in primary production. The research capabilities within Agrolink Flanders support the innovative development of animal and plant production. Agrolink Flanders' partners advance product concepts and identify new opportunities in agriculture industry.)

e. Flanders' NutriCycle action plan

specific tasks related to biochar, sustainable growing media and soilless cultivation are listed in the Flanders' NutriCycle action plan: <https://nutrecycle.vlaanderen/>

- Actieplan 'transitie nutriëntenverwijdering naar -recuperatie'
- Nutricycle Actie 5.3: Vervanging van veen door gerecupereerde organische substraten in groeimmedia
- HL4 Reststroomcascade
- HL6 Bodemverbetering
- Nutricycle Actie Actie 6.1
- Nutricycle Actie Actie 6.5

At the interregional level, 4 important actions can be mentioned:

- ILVO and observer partner Wageningen University and Research is involved in a COST Action proposal, to be submitted in fall 2022, on the topic of sustainable growing media. If this COST Action is granted and can start, all (observer) partners of Horti-BlueC are able to join the actions and meetings of this project.
- The Euvrin meeting of the Working group of Fertilisation and Irrigation will be held at ILVO on 13-15 Sept. 2022. Euvrin is the Organization of research institutes or research institutes departments that specialize in research, development, and extension on vegetable production and which are based within countries of the European Union. This meeting is another opportunity to further communicate the final outcome of Horti-BlueC.
- Workshop during GrowingMedia2021 on EU legislation:
see <https://www.growingmedia2021.com/en/industry-and-policy-day-programme>
- EU GREEN DEAL TARGETS: 2 EU GREEN DEAL TARGETS are linked to Horti-BlueC:
 - Reduce by 50% the overall use and risk of chemical pesticides and reduce use by 50% of more hazardous pesticides by 2030
 - Reduce nutrient losses by at least 50% while ensuring no deterioration in soil fertility; this will reduce use of fertilisers by at least 20 % by 2030

B. Specific actions

Action 1: Update SWOTs

- For all VCs: the SWOTs developed in WP3 are available as fact sheet on the website for at least 5 years after the project.

Action 2: Strategies for CO₂

- Follow-up of the evolution of different strategies for CO₂
 - o ECN>TNO(Dutch National project): recuperation
 - o PCHoogstraten: reuse in greenhouses

Action 3: New materials in growing media blends

- New materials in growing media blends:
 - o Fact sheet with Summary Table “Building blocks for sustainable growing media” on the website for at least 5 years after the project.

Action 4: Life Cycle Assessment (LCA)

- LCAs are important in policy-related decisions:
 - o LCA on biochar production (ECN>TNO): results presented in Webinar 5, recording available on the website for at least 5 years after the project.
 - o linked presentations during the Policy workshop on 26/10/2021 at GrowingMedia2021

Action 5: Measuring the stability of materials in growing media

- A comparison of methods for measuring the stability of materials to be used in growing media has been made (ILVO)
 - o measuring the stability of plant/wood fibres: regional, national (Belgium: FOD) and European methods
 - o Scientific paper: Respiration rate for stability assessment of woody materials with high C:N ratio versus green composts: need for a clear differentiation in criteria
 - OUR is not the best stability method for (soft) plant fibers: reed straw, miscanthus straw, flax shives
 - Has been submitted to Waste Management, review reports received, major revisions requested
 - Will be published open access
 - o Draft version of new CEN method => has been released in summer
- Interaction between new growing media blends and organic fertilizers, and the value of the microbial biomass versus the the initial mineral N concentration as indicator of N release:
 - o For composts, the initial mineral N concentration is more indicative of N release than the microbial biomass, even when an organic fertilizer was added.
 - o In contrasts, for blends with or without composts the microbial biomass is more indicative of N release than the initial mineral N concentration. This was tested when an organic fertilizer was added.
 - o In collaboration with Observer Partner Vlaco
 - o Manuscript published open-access in Agronomy

Action 6: Horti-BlueC blends versus the legal criteria and certification

- Composition of the blends versus the legal criteria and criteria imposed by quality labels:
 - o EU fertilising product regulation: will be implemented in 2022 as a framework
 - o National legislation: an exemption for biochar is needed, chitin is allowed as fertilizer

Action 7: NIRS as a tool for fast screening of materials

- Current trend: From more standardized towards more variable feedstocks for growing media blends: more batches of materials to be screened
- Near-infrared reflectance spectroscopy (NIRS) can be used for time- and cost-efficient assessment of chemical properties
- More dried and ground samples of different materials are scanned with NIRS to test opportunities for fast screening of materials, even after the end of Horti-BlueC
- See ISHS paper:

Vandecasteele, B. and Van Waes, C. (2021). NIRS as a fast screening technique for total nutrients in strawberry leaves and in spent growing media. Acta Hortic. 1309, 963-970, DOI: <https://doi.org/10.17660/ActaHortic.2021.1309.137>

- o Promising for nutrient concentrations in strawberry leaves
- o Promising for composts and plant fibers for biochemical composition and nutrients
- o Not applicable yet for spent growing media (biochemical composition and nutrients)

- Additional research paper in preparation

Action 8: System for scoring the suitability of composts, woody materials and biochars for peat, lime and fertilizer replacement

- Simple system for scoring the suitability of composts, woody materials and biochars for peat, lime and fertilizer
- The simple scoring system can be used for different purposes:
 - o to assess the suitability of materials to replace peat, lime and fertilizers in growing media blends (select the most promising materials)
 - o to measure the need and focus of further optimization of materials
 - o to quantify the net effect of additional treatment of materials (i.e., does a specific treatment result in a clear increase or decrease of the suitability score)
 - o to assess in what volume rates a material can be used in the blend (with higher volume rates for higher scores)
 - o to compare different treatment options of a material (e.g., the processing of spent growing media for reuse) and the potential for reuse
- See ISHS paper: Bart Vandecasteele, F. Amery, Liesbet Blindeman, R. Visser, 2021. Circular use of nutrients in soilless strawberry cultivation: spent growing media as key element. Acta Horticulturae, 1309, DOI: <https://doi.org/10.17660/ActaHortic.2021.1309.73>

Action 9: End-of-life of (new) growing media blends

- For the use of new blends with new materials, the End-of-life of these (new) growing media blends is documented
 - o Focus: end-of-life of renewable growing media versus growing media based on peat or coir
 - o Spent media for the Horti-BlueC trials are collected and analyzed
 - o Chemical composition and stability of new growing media blends is compared with the reference blends (i.e., growing media based on peat, coir, mineral wool)
 - o Results will be reported in a scientific paper, manuscript will be submitted in fall 2022
 - o Results are presented at the International Horticultural Congress in Angers, 14-20 August 2022

Action 10: Biochar and the microbiome of growing media

- ISHS Paper on the different methods to assess microbiological properties available: Debode, J., Vandecasteele, B., Ommeslag, S. and de Tender, C. (2021). Identification of microbial life in sustainable and disease suppressive growing media: the role of beneficial microorganisms. Acta Hort. 1305, 115-124, <https://doi.org/10.17660/ActaHortic.2021.1305.17>
- Fact sheet with Summary Table "Building blocks for sustainable growing media" on the website for at least 5 years after the project.

Action 11: Reuse of new growing media and risk for diseases/pests

- Reuse of spent growing media: data summarized on risk for diseases when SGM are only stored versus sanitized spent media
 - o Based on the trial at NIAB: see deliverable report and ISHS paper

Action 12: Legislation and reuse of new growing media

- VC3: Assess the link between legislation and reuse of new growing media
 - o Local reuse => regional legislation
 - Belgium: criteria for a "generic" rather than a farm-specific feedstock declaration for spent growing media => is part of the OVAM action plan on biomass 2022-2025.
 - o ILVO is involved in an Operational Group on reuse of spent growing media: "Re-Peat: Reuse of growing media for a circular horticulture (01/01/2022 → 31/12/2023)"

Action 13: Stimulation of the use of new growing media

- OVAM
- VC4: Legislation and stimulation of the use of new growing media: assess the opportunities

- Grower checklist for sustainable growing in Belgium: growing medium can be an important topic for this list: a meeting with the Department agriculture and fisheries of the Flemish Government was held on 1/12/2021, follow-up is planned

C. Other actions or events:

- Participation in Growing Media Europe webinar: Growing Media Europe's virtual event 'Farm-to-Fork: what role for modern horticulture?', 28/1/2021
 - Future: more knowledge intensive horticulture
 - Horticulture: tiny area within the EU agriculture. Small impact of protected horticulture within agriculture.
 - Growing media will be mentioned in the update of the F2F-strategy
 - EU-population will decrease, so EU population is not a driver for more production
 - 65% of growing media ingredients is peat. Coir: washed with a lot a water, then buffered: needs a lot of treatments. Same for green compost.
 - Strong point of growing media: materials can be reused, recycled, so more control on the emissions and the fate
 - Composting of growing media => more sustainable and reusable growing media? Big volumes are needed of these processes, to be collected from remote greenhouses