

BLUEGRASS

Promuovere lo sviluppo di un agroalimentare verde mediante l'introduzione dell'acquaponica

Spodbujanje razvoja trajnostnih pridelovalnih praks v kmetijstvu z vpeljevanjem akvaponike



Specific objective 6f – Development and testing of innovative green technologies.

Started: October 2017

Duration: 30 months





SHORELINE (Trieste)

- Aquaculture
- Environmental monitoring
- Education activities

UNIVERSITY OF LJUBLJANA

- Rural economy
- Market analysis
- Hydroponics - COST member (FA1305)

CA' FOSCARI UNIVERSITY OF VENICE

- Aquaculture
- Modelling
- Life Cycle Assessment

KZ AGRARIA (Koper)

- Network of agricultural producers
- Knowledge of agriculture practices and market

ASSOCIATED PARTNERS

- ☆ AGROITTICA FRIULANA (fish farmer)
- ☆ WWF OASI

UTI DEL NONCELLO (Porcia Municipality) Strong connections with local stakeholders and schools

ÖSTERREICH

HRVATSKA

Wp3 - implementation

1 Market analysis



Oct17-May18

2 Stakeholders engagement
(aquaponic working groups)



Jan-Jul 18

3 System design



Mar-Aug 18

Nov-Dec 18

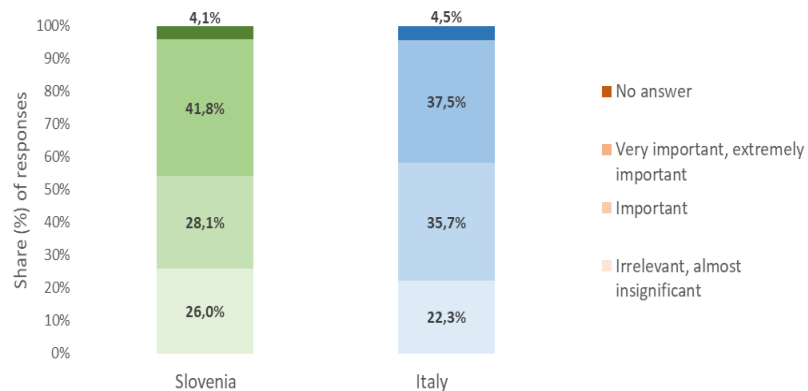
Pilot systems were initialized in Nov-Dec 2018

2019: activities with target groups and characterization of the system functioning (monitoring, LCA modelling, protocols)

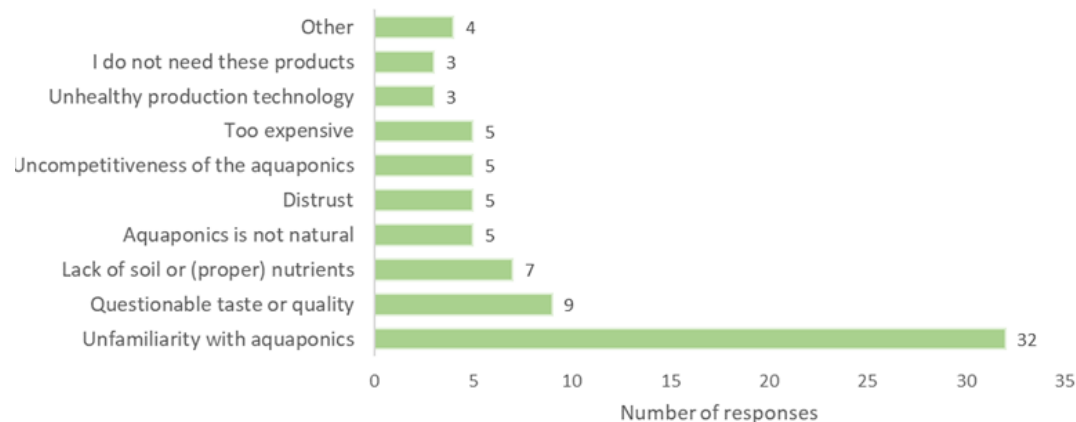


Market analysis

The importance of knowledge of production technology for the purchase of agricultural products



Reasons of slovenian surveyed consumers against aquaponics product purchase

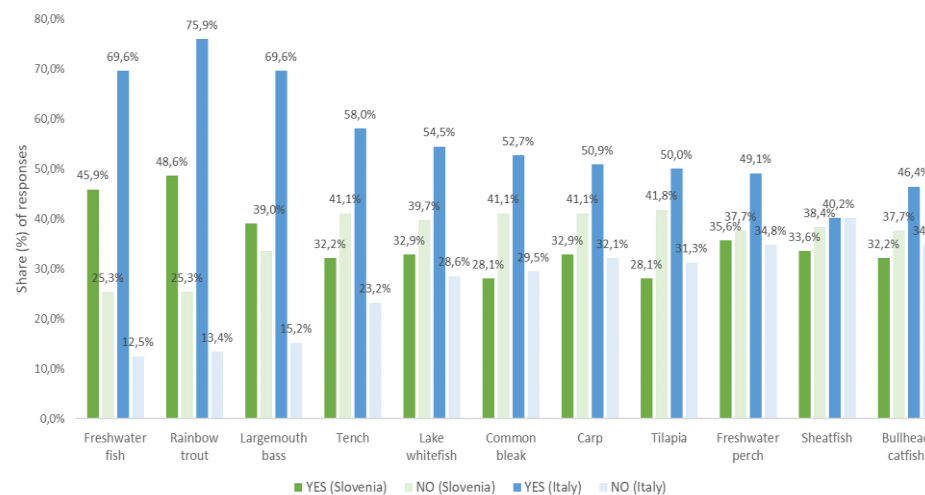


258 questionnaires answered
(146 SLO; 112 ITA)

semi-structured questionnaires

Online+physical version

Willingness of surveyed consumers to buy aquaponics products
FRESHWATER FISHES



SLOVENIA		
Product/YES	N	%
Lettuce	84	57,5%
Ornamental plant	82	56,2%
Rampion	81	55,5%
Strawberry	80	54,8%
Tomato	78	53,4%

ITALY		
Product/YES	N	%
Lettuce	100	89,3%
Strawberry	95	84,8%
Spinach	92	82,1%
Tomato	92	82,1%
Marrow	92	82,1%



Coupled systems

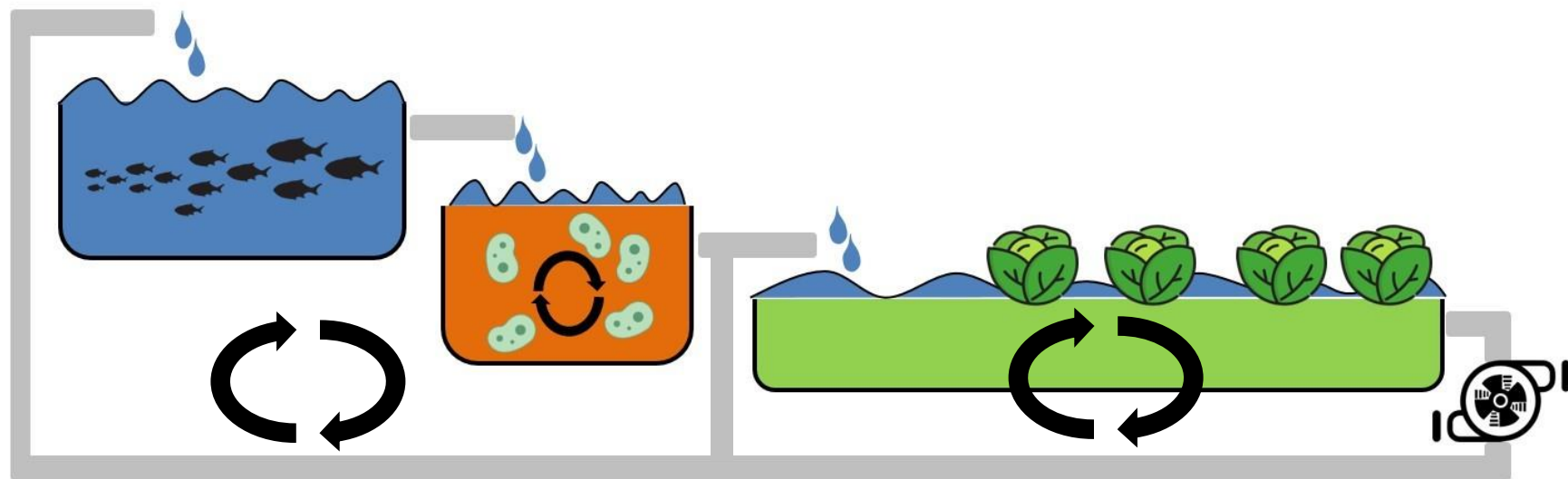
Designed to provide approx. $20 \text{ g m}^{-2} \text{ d}^{-1}$ of feed

Different choices for infrastructure/tech level

Diversifying production in an existing greenhouse



Modular transportable system (container) – urban? Emergencies?



1021 L h^{-1}

306 L h^{-1}

13-16 renewals d^{-1}



Koper (KZ-Agraria)



Porcia (Agroittica Friulana)



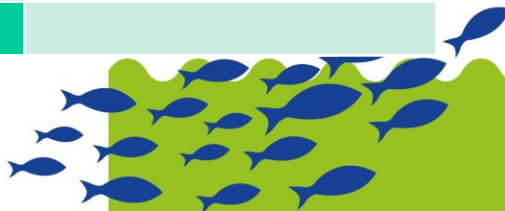
Koper	Porcia
Fish tanks 2 m3	Fish tanks 3.6 m3
Growth beds 10m2	Growth beds 10m2

Porcia	Koper
Lettuce	Lettuce
Basil	Basil
Barbatelle di vite – grape roots	Cauliflower
Green zucchini	Radicchio
Cucumber	
Cauliflower	
Red chard	
Red turnip	
Fennel	
Chicory	
Radicchio	
Coriander	
Mint	

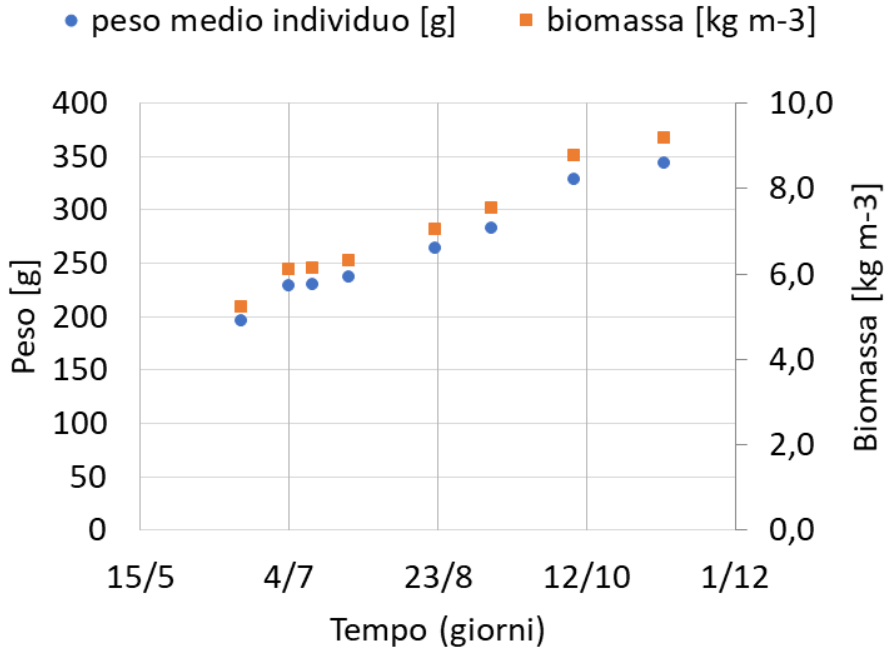
6 cycles of lettuce + additional trials

Based on the market analysis results, and fish welfare and energy requirements (working groups discussions), the following fish species were considered for the pilot systems activities:

- European perch (*Perca fluviatilis*),
- Black bass (*Micropterus salmoides*)
- Striped bass (*Morone chrysops x Morone saxatilis*) * previously farmed at Agroittica Friulana
- Common carp (*Cyprinus carpio*)
- Tench (*Tinca tinca*)



Example, striped bass + lettuce in Porcia

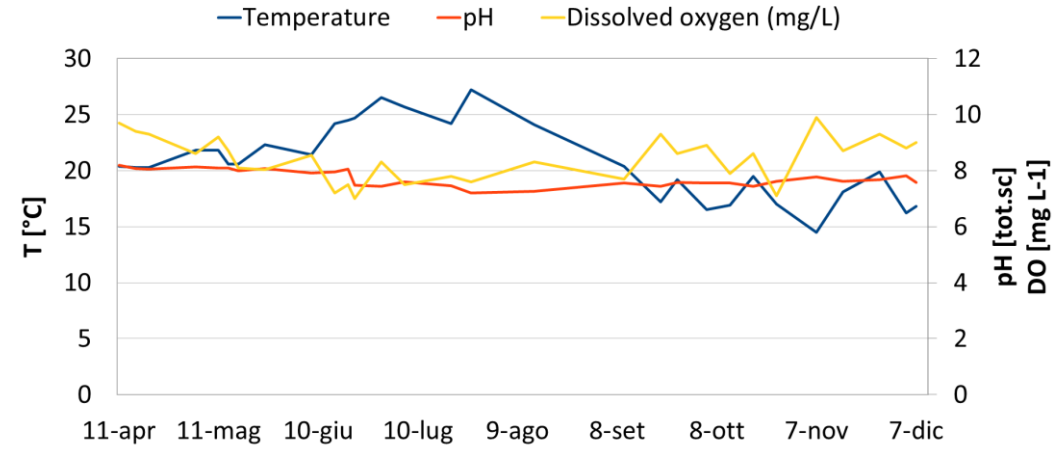


Overall good conditions – no mortality

Plants ok

Low Fe

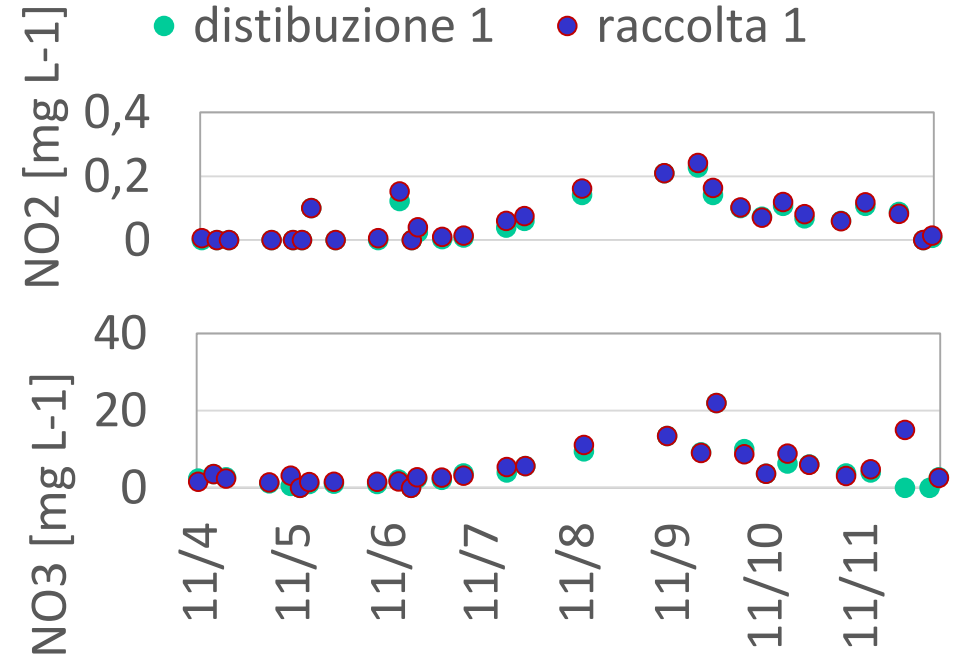
High energy demand for conditioning



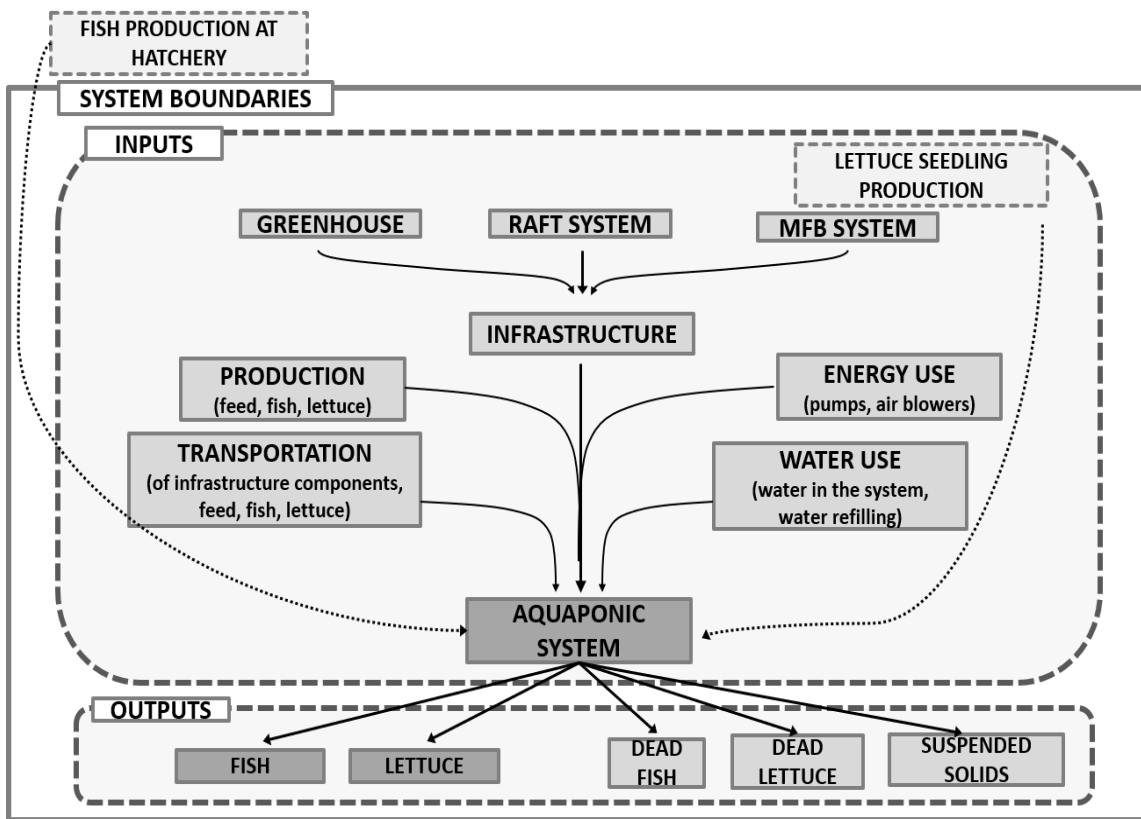
Additional variables monitored:

Ca²⁺ Mg²⁺ Carb. Cl⁻ K⁺ SO₄²⁻ Fe²⁺ PO₄

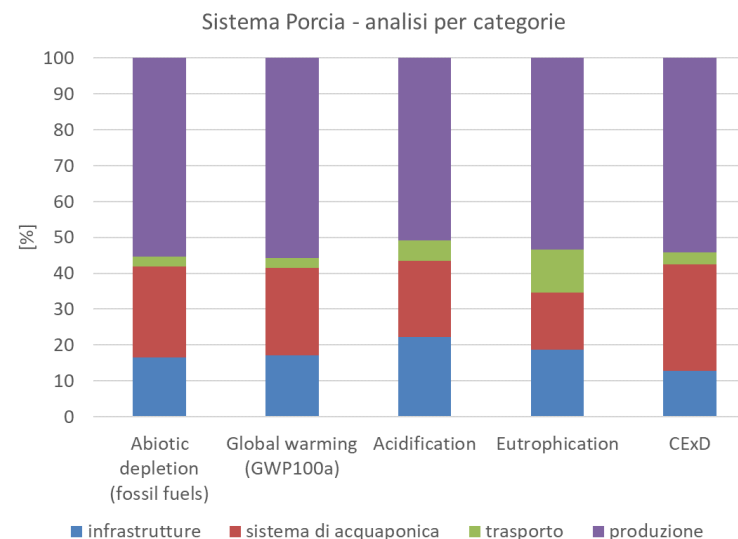
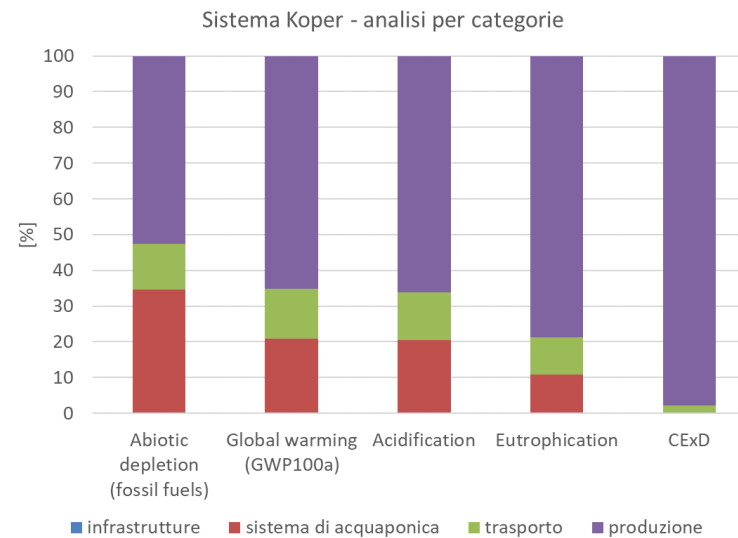
C:N:P sludge Solids – suspended/sedimented



Life cycle assessment



Estimated cost of 1 kg of lettuce:
€ 4.06 Koper; € 12.8 Porcia !!



Stakeholder recruitment started in early 2018: currently 209 potential stakeholders in Italy and 86 in Slovenia have been selected; 20% took actively part to project activities (technical tables)

2 Working Groups (1 ITA + 1 SLO): activities started in July 2018

Main events

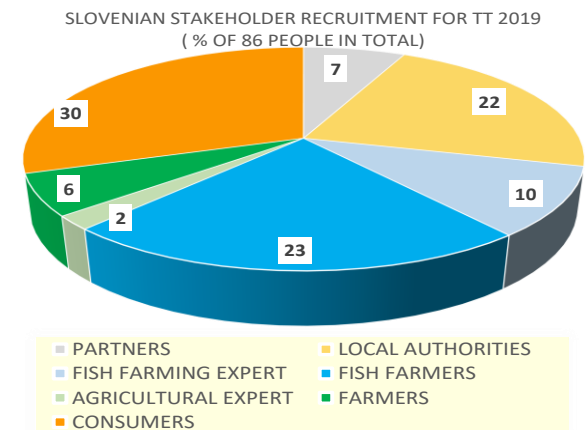
ITA+SLO joint technical table in february 2019 (Trieste) : focus on aquaponic CS

Workshop: Researchers, producers and regulators, April 2019 (Venice)

Thematic table: regulatory aspects of aquaponic productions in Italy and Slovenia (Palmanova, September 2019)

Cross-border exchanged visits at the two pilot systems (October-November 2019) – practical activity)

Final technical table: sharing results (upcoming, 28/2, Trieste)



Consumers:

Activities with **secondary schools** (classroom activities + school trips at the aquaponic pilots) (412 students)

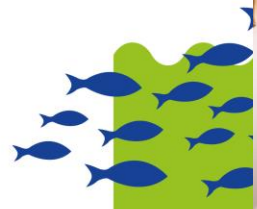
Purchasing groups engagement (presentation events + visits at the pilots) June-October 2019

Creating networks among perspective workers:

Two mini-workshops organized in Lubiana and Venice in February and March 2019 for bachelor and master students in agronomy and environmental sciences – activity: designin of an educational module in aquaponics

December 2019, meeting with local cooperative disadvantaged and disabled workers

Meetings with local entepreneurs (2018 and 2019)



Lessons learned, challenges, opportunities for aquaponics in the region:

1. **Customer interest** in quality and local origin of food is high
2. **Customer resistance** is accompanied by a limited knowledge of the production technique
3. High **interest of potential investors**, and of farmers/fish farmers on the aquaponics technique
4. Demand for a **clear definition of the regulatory context** for developing an aquaponic business
5. Need for assessing the environmental and economic **sustainability** (energy requirements)

A. Effort within Bluegrass **to identify communication tools** (lessons with schools; activities with purchasing groups; showcooking/blind tasting events; training at pilots with farmers/technicians)

B. Effort within Bluegrass **to identify and test monitoring protocols** aimed at supporting the aquaponic farm management, in an early warning perspective

C. Effort within Bluegrass to compare systems with different characteristics by means of an **LCA-LCC analysis**

Impact: UNIVE researchers invited to an informal audition for contributing to the law proposal C. 1258 “valorizing and promoting soilless cultivation techniques applied to hydroponics and aquaponics production systems”. Agriculture commission, Italian chambers of deputies (Nov 19)

<https://www.ita-slo.eu/it/bluegrass>

Thank you!



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