Plenary pitches: Discover research from Flanders and Wallonia

Medegefinancierd door de Europese Unie

Biodiversikas

Sander Fleerakkers

Proefstation voor de Groenteteelt (PSKW)

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

Diversified unheated greenhouse growers

≠ open air culture

≠ heated greenhouse culture

→ How to increase biodiversity
+ enhance natural pest control?

→ Research & knowledge exchange

* What natural enemies are present and can enter the greenhouse?
* installing agro-ecological measures and what is their impact?

The 13 principales of agroecology

SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

Collaboration with farmers

BioForum
SECTORORGANISATIE BIOLANDBOUW EN -VOEDING

proefstation
VOOR DE GROENTETEELT

HO GENT

\+


Moesland


't Schaaphof


De Molenkouter


Rawijs


Groenlof


Plukboerderij Grondig

ILVO CCBT BioForum Wallonie recherche CRA-W

Medegefinancierd door
de Europese Unie

Implementation & communication

+

Medegefinancierd door
de Europese Unie

Next steps

Project started only recently

→ monitoring natural enemies in greenhouse + what is entering?

→ identify adapted commercial beneficials

→ identify and test agro-ecological measures for biodiversity & soil quality

→ visits to inspirational cases in and outside Flanders

Medegefinancierd door de Europese Unie

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Biodiversity at the service of farmers for a more resilient and autonomous agriculture

BOERAEVE Fanny

Plant Sciences, Gembloux Agro-Bio Tech, Liege University

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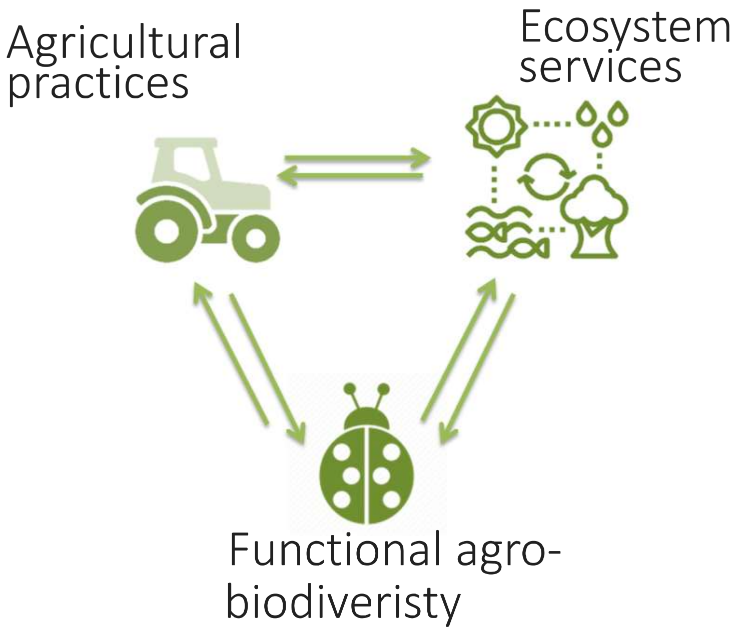
March 25, 2025, Gembloux

Context & objectives

Unravelling the complex relationships



Working with network of farmers

Understand levers and lockins to transision

Reflexive analyses of participatory research processes

Using policy as a lever to transition

Understaning how the CAP is a lever / lockin to transition

Fostering policy supporting agroecological transition

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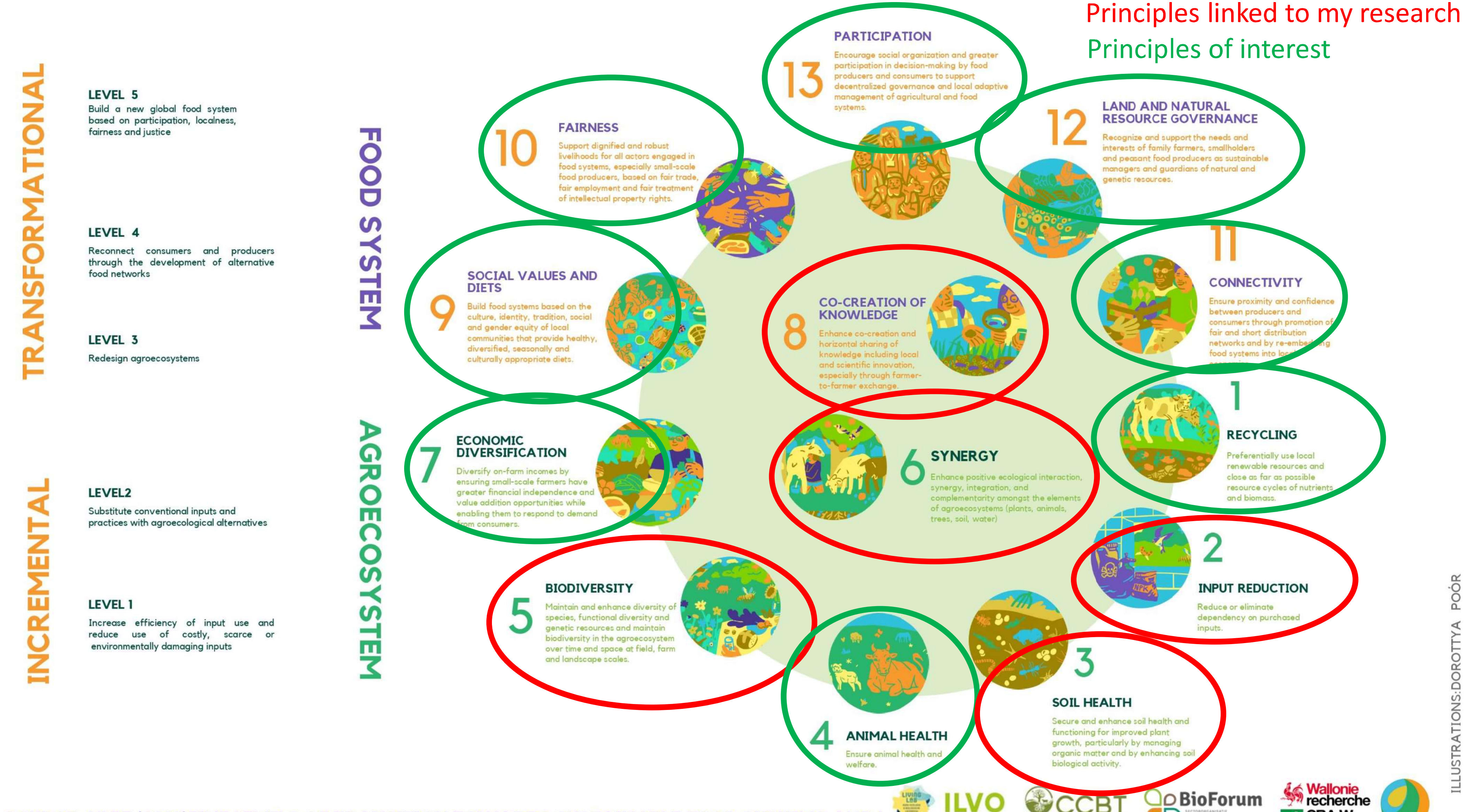
The 13 principales of agroecology

Principles linked to my research
Principles of interest



SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

Collaboration with farmers

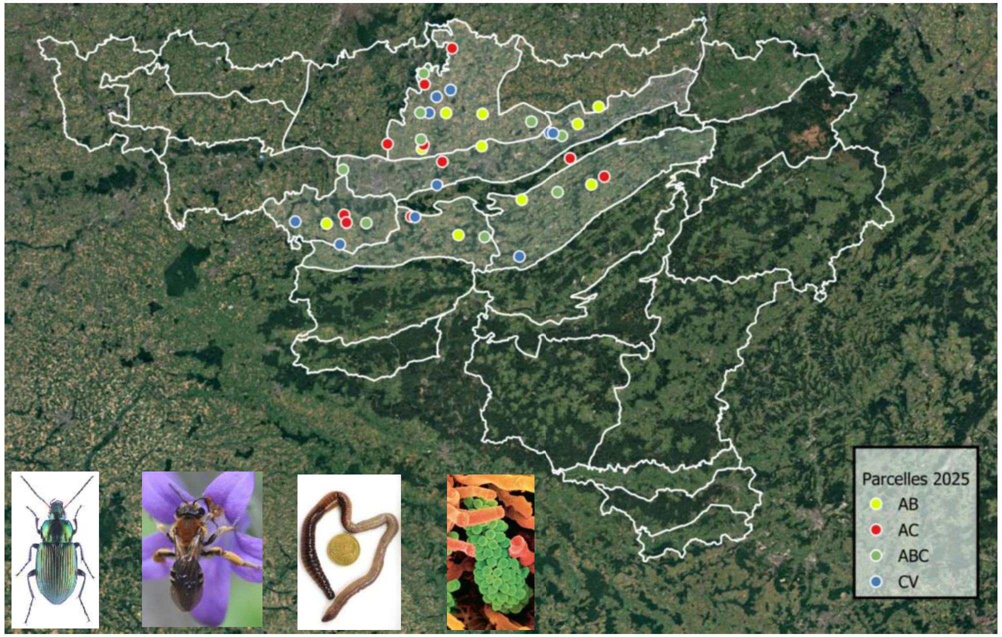
40 farms, 4 modalitie, all in winter cereals:

- CV = conventionnelle (conventional)

- AB = biologique (organic)

- AC = conservation des sols (conservation)

- ABC = biologique de conservation des sols (organic-conservation)



Implementation & communication

Individual reports to each farmers

Collective restitutions with the group (& partner projects working on functional agro-biodiversity)

Next steps

Ongoing:

Create a Living Lab around functional agro-biodiversity

Construction of an interdisciplinary edaphic lab
- Rhizosphere, roots (Prof. Pierre Delaplace)
- meso and macrofauna (Myself)
- microflora, non rhizospheric soil (Prof. C. De Clerck)
- strong interactions with physical and chemical soil Labs of GxABT

Education: Strenghten the Master on Agroecology (ULB- ULiege)

Dreaming:

Create networks of Living Labs at the belgian scale

Submit project proposals with colleagues also working in a Living Lab approach

Fanny BOERAEVE

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Monitoring Biodiversity in Agricultural Areas

Mieke Lateir

INBO

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

	Birds and mammals	Pollinators	Aquat. invertebrates	Soil biodiv	BVM + farmland flora	Natural Envir.
Nature Resto-ration law	Agriculture Birds	Pollinators Grassland Butterflies			Elements high div	
LULUCF Regulation					Ecosystem change	
CAP	Agriculture Birds	Species HD			Elements high div	
Proposal Soil monitoring directive				Soil biodiv		
Proposal directive Ecosystem Cal.	Agriculture Birds	Pollinators			Ecosystem surface	
HD + BD + PAS + KRW	Agriculture Birds Habitat D.	Agriculture species HD	Water quality agriculture		Agriculture habitats species	Ground water Surfacewater Soil

MBAG

Birds And mammals	Pollinators	Aquat. invertebrates	Soil biodiv	Farmland flora	BWK	Natural Envir.
Statistics						
Data Management						
Cocreation with farmers						
Coordination and communication						

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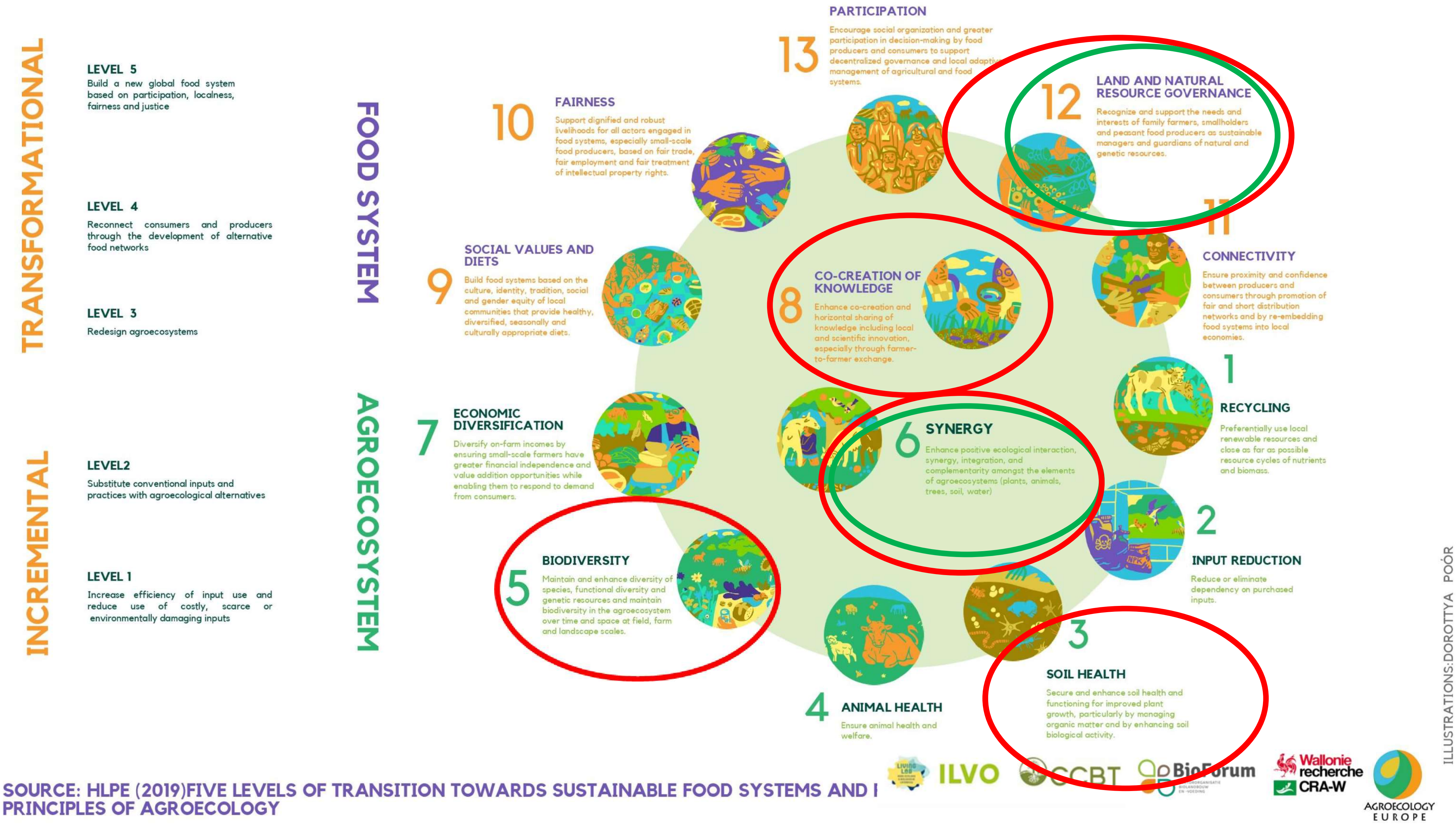
The 13 principales of agroecology

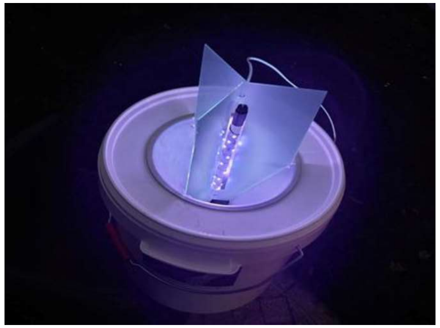


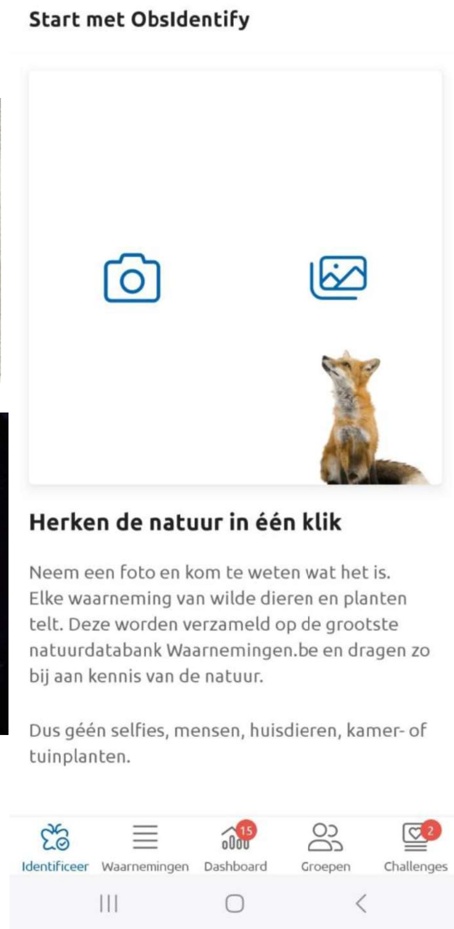
SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

Collaboration with farmers

- Share results
- Exchange of knowledge and perspective
- Measuring biodiversity on farm level

➢ DIT and DIY – hands-on tools





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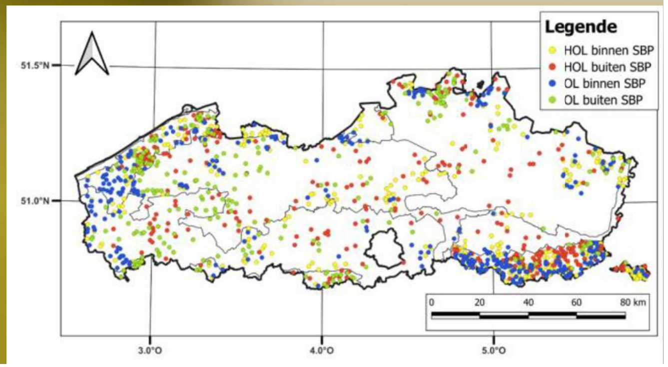
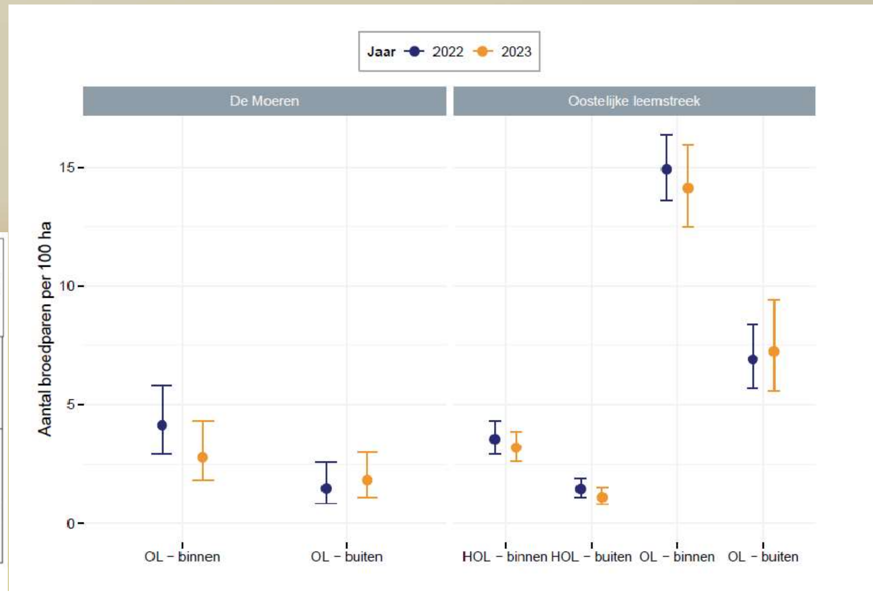
Implementation & communication

FARMLAND BIRDS

- SBP – species protection areas – umbrella species
- 1450 measuring points Flanders
- Professionals and volunteers
- Linked to agricultural parameters and the farmer's perspective





Next steps

Long term monitoring for different modules (TBC)

Joint project INBO-ILVO for Soil Biodiversity and Cocreation with farmers

Publications & data available to public according to INBO Open Access policy, Open Data policy, complying with FOSB Open Science KPI's and Belgian Open Access and Belgian Open Data regulation

Contact

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Evaluating varieties and developing innovative technical itineraries to meet the challenges of organic field crops

Anne-Michelle Faux, Feriel Ben Abdallah, Jean Bouvry, Coline Crevits, Damien Eylenbosch, Quentin Limbourg, Rodrigo Meza, Fabienne Rabier

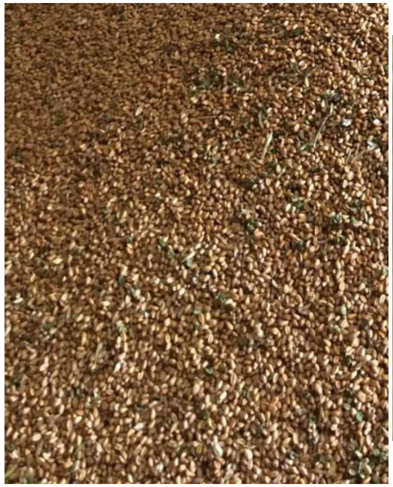
CRA-W, Crop Production Unit

Stronger together: researchers from Wallonia and Flanders join hands for organic farming
March 25, 2025, Gembloux

Challenges in organic field crops

(… among many others)

How to control weeds



How to meet the quality requirements of the processing sector

How to manage crop diseases

Objectives (1/2)

Support farmers in their **choice of varieties**

- Winter cereals :
  - **Common wheat**
  - **Spelt**
  - **Triticale**

  since 2014
  - **Durum wheat** (since 2021)
  - **Oat** (since 2024)

  www.cra.wallonie.be/fr/varcerbio
  - Variety **mixtures** in bread wheat (since 2021)
  - Screening to identify **varieties tolerant to the common wheat bunt** (*Tilletia caries)*

  www.cra.wallonie.be/fr/varcerbio-plus
  - Improving the characterization of traits of interest in organic farming

  www.cra.wallonie.be/fr/caraccerbio

- **Potatoes** (since 2019)

  www.cra.wallonie.be/fr/pdt-robustes-bio

- **Sunflower**
- **Millet**

  new in 2025

  https://www.cra.wallonie.be/fr/abc-to-food

Objectives (2/2)

Develop **adapted technical itineraries**

Improve the product quality

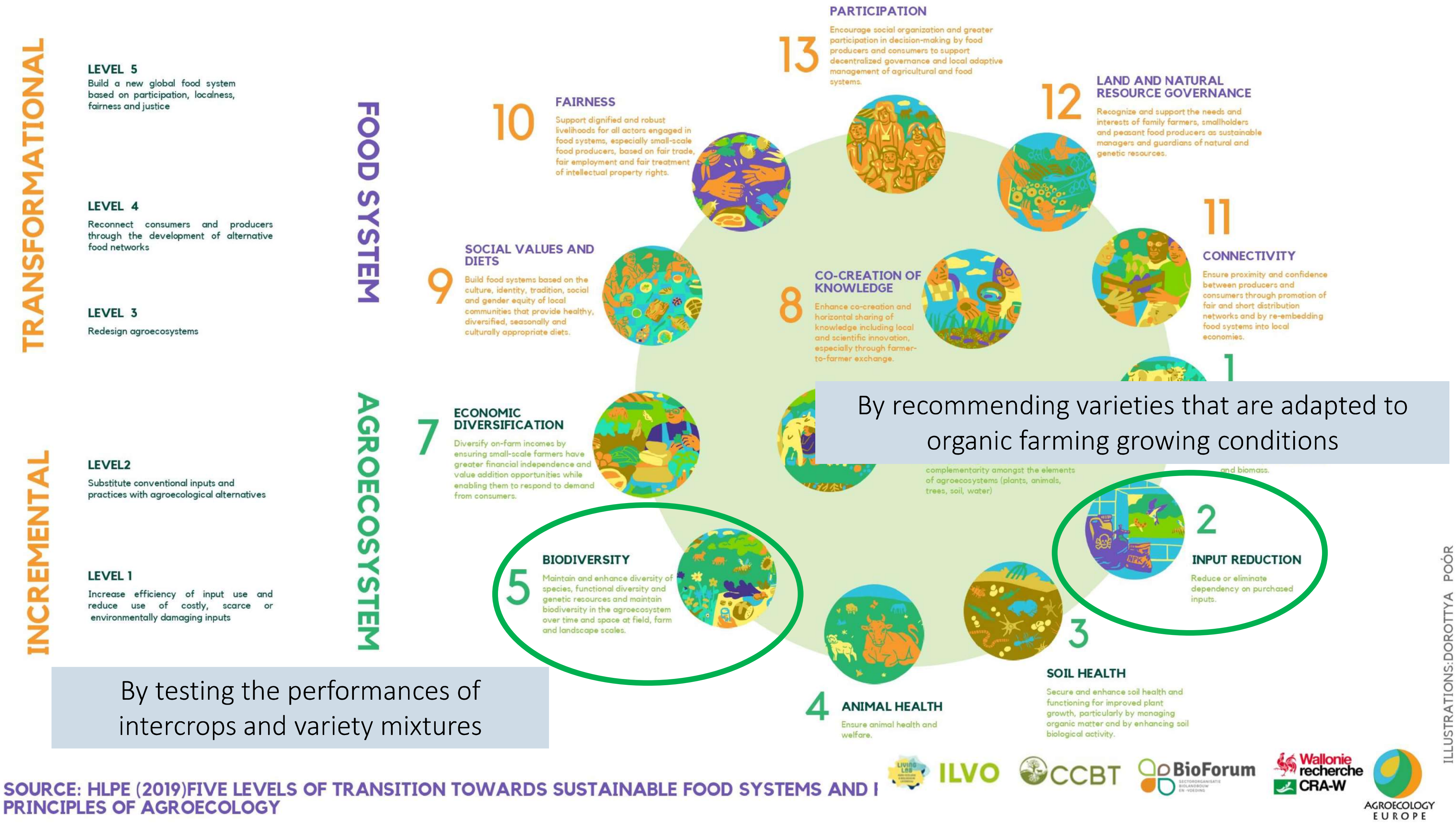
- Improving the technological quality of the grain in **durum wheat** through **adapted fertilisation schemes**
  www.cra.wallonie.be/fr/ble-dur,
  www.cra.wallonie.be/fr/itkbio

BioCoCrop

Controlling weeds by using intercrops

- **Co-cultivating a permanent legume crop** together with the cash crop **to control weeds** in organic no-till cropping systems
  www.cra.wallonie.be/fr/biococrop
- **Multi-performance evaluation** of weed management systems based on **intercropping**
  www.cra.wallonie.be/fr/cropfightsweeds
- Growing **bread wheat intercropped with white clover** (new 2025)
  www.cra.wallonie.be/fr/abc-to-food

The 13 principales of agroecology



By recommending varieties that are adapted to organic farming growing conditions

By testing the performances of intercrops and variety mixtures

Collaboration with farmers

Trials are set up either on the CRA-W's fields or on farmers' fields

Communication

- Organisation of **trial visits**
- Participation to **agricultural events** and **fairs**
- Info evenings for farmers
- **Messages for the warning network** in cereals and in oilseed and protein crops, managed by the CePiCOP
- Trial **reports and articles**
  - www.livre-blanc-cereales.be
  - www.biowallonie.com/documentation/itineraires-bio/
  - fiwap.be/documentation-fiwap/biologie-pdt/

Implementation of results

- Use of recommended varieties by the farmers
- Contribution to the development of value chains (potatoes, bread wheat, durum wheat, …)
- Development of a prototype seeder adapted for sowing co-crops in alternating rows

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Next steps

- Long-term research:
  - **Variety trials** in **winter cereals**
    - Integrating additional cereal species (e.g., oats)
    - Going further in the evaluation of varietal mixtures in bread wheat
    - Adding trial sites in other agroecological regions ?
  - **Variety trials** in **potatoes**
- The **BioCoCrop** project : validating the equipment prototypes (strip seeder, inter-rows mower, rotary tiller)
- New challenges with the recently started research projects **CropFightsWeeds** and **ABCTOFOOD**

Contact

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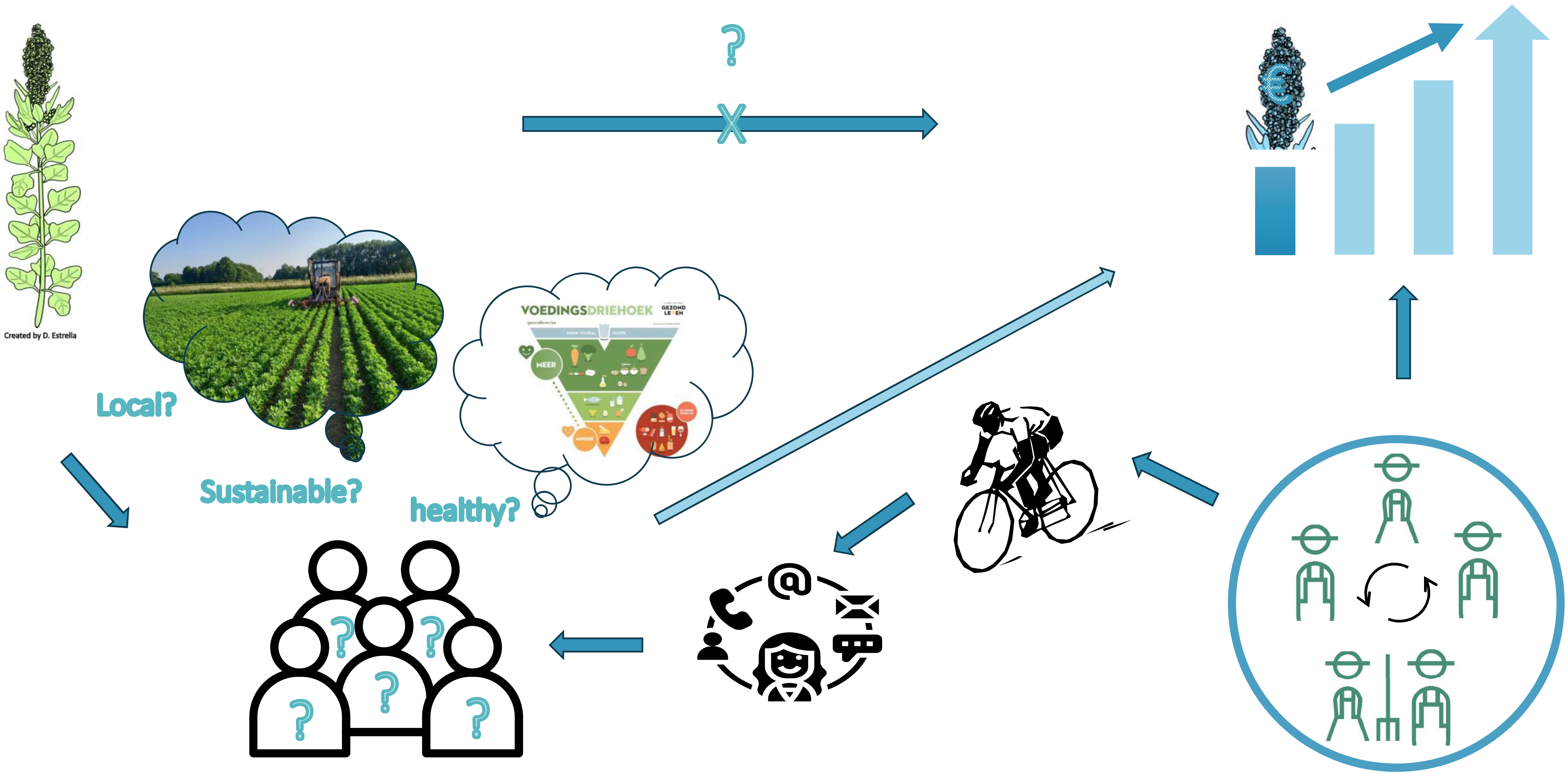
From Farm to Future: Elevating Local Quinoa Through Collaboration

Gerda Cnops

ILVO

Medegefinancierd door de Europese Unie

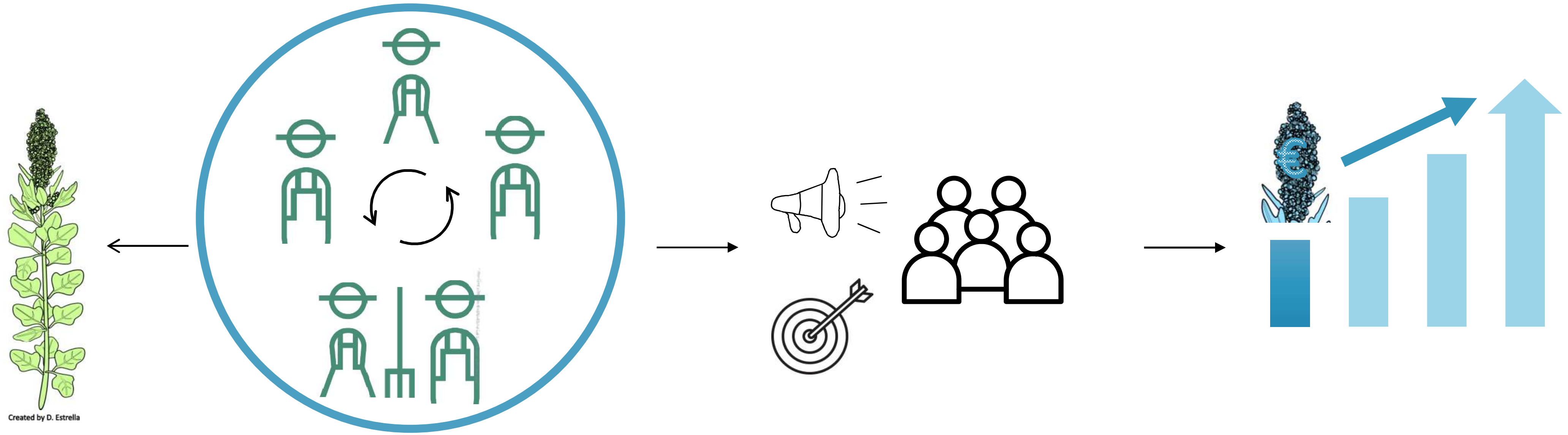
QUIKLA: quinoa becomes a classic



The 13 principales of agroecology

SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND PRINCIPLES OF AGROECOLOGY

Collaboration with farmers



Together: INFO + promotion → profitabel businessmodel

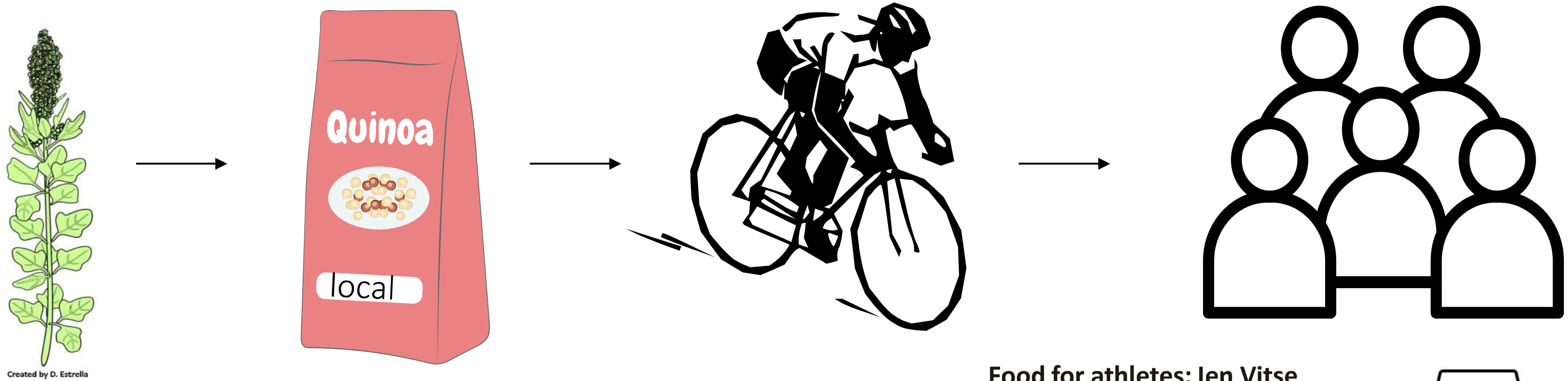
Food for athletes: Ien Vitse
Vlaamse Wielrijdersbond vzw
Gezond en Ethisch Sporten vzw
Decolef Belgian **Branch**
Pieter Serry

Medegefinancierd door de Europese Unie

Implementation & communication

Portfolio's for different target groups

Cyclists, Sportieq, website, recipes, cycling magazines, events, makethon,….



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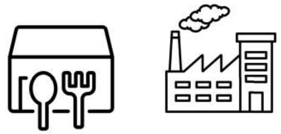

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ILVO BOERENBOND UCLL HOGESCHOOL PRAKTIJKPUNT LANDBOUW VLAAMS-BRABANT SPARKLING ARROW VLAM.be

Next steps

quinoa

- ➢VLAIO submitted: germination efficiency/ youth growth/ resilience downy mildew/ biostimulants/product development/market
- ➢Quinoa Breeding ILVO: # varieties (yield, saponins, protein content, color, size, disease resistance, …)

Mixed cropping:

- ➢Protein crop + grain/oil crop: CoolFarmLab, Tweespan, Lego, Farmers Benefits

Contact

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Technological quality of food cereals for organic farming

Bruno Godin

Walloon Agricultural Research Center (CRA-W)

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context

- No good technological food grain quality → Not a commodity

  Depends on the final buyer, the targeted product and the transformation

  Define your own specific criteria in terms of quality

  → Depend on the variety

- Short commercial lifespan and low availability of food cereal seed varieties in Belgium

Objectives

- Assess and rank the processing suitability of technologically robust varieties and nitrogen fertilization specific to organic food applications and Walloon pedoclimate

→ Varietal choice: Wheat, Spelt, Barley, Durum, Oat, Triticale

→ Varietal mix and population

→ Nitrogen fertilization: Wheat, Durum

The 13 principales of agroecology

SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

ILVO CCBT BioForum Wallonie recherche CRA-W AGROECOLOGY EUROPE

Collaboration with farmers

- Farmers : Pionneer
- Farmer-stone millers and stone millers
- Local Action Groups (GAL)
- Food cereal cooperatives : Belgrain, Cultivae, FarmForGood, …

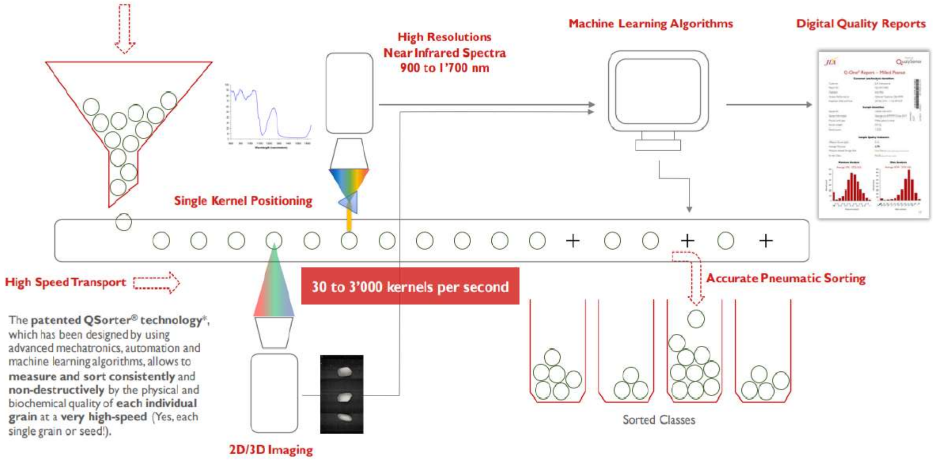
Implementation & communication

- Livre Blanc Céréales
- Biowallonie (Itinéraire BIO, BioCérès, events, visits)
- CePiCOP (weekly newsletter, visits)
- Collège des Producteurs (periodical newsletter, events, visits, supply chain, fair price)

Next steps

- Enhance technological evaluation with breadmaking and cookies test

- Post-harvest technics to ensure quality to avoid the economical loss
→ Infrared single kernel sorting (also high-speed quality control and phenotyping)



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Crop Diversification as a way to resilience

Hilde Muylle

ILVO

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

- How to increase the number of species in a rotation system?
- What species/crop to grow?
- What are the prerequisites to establish a new crop?

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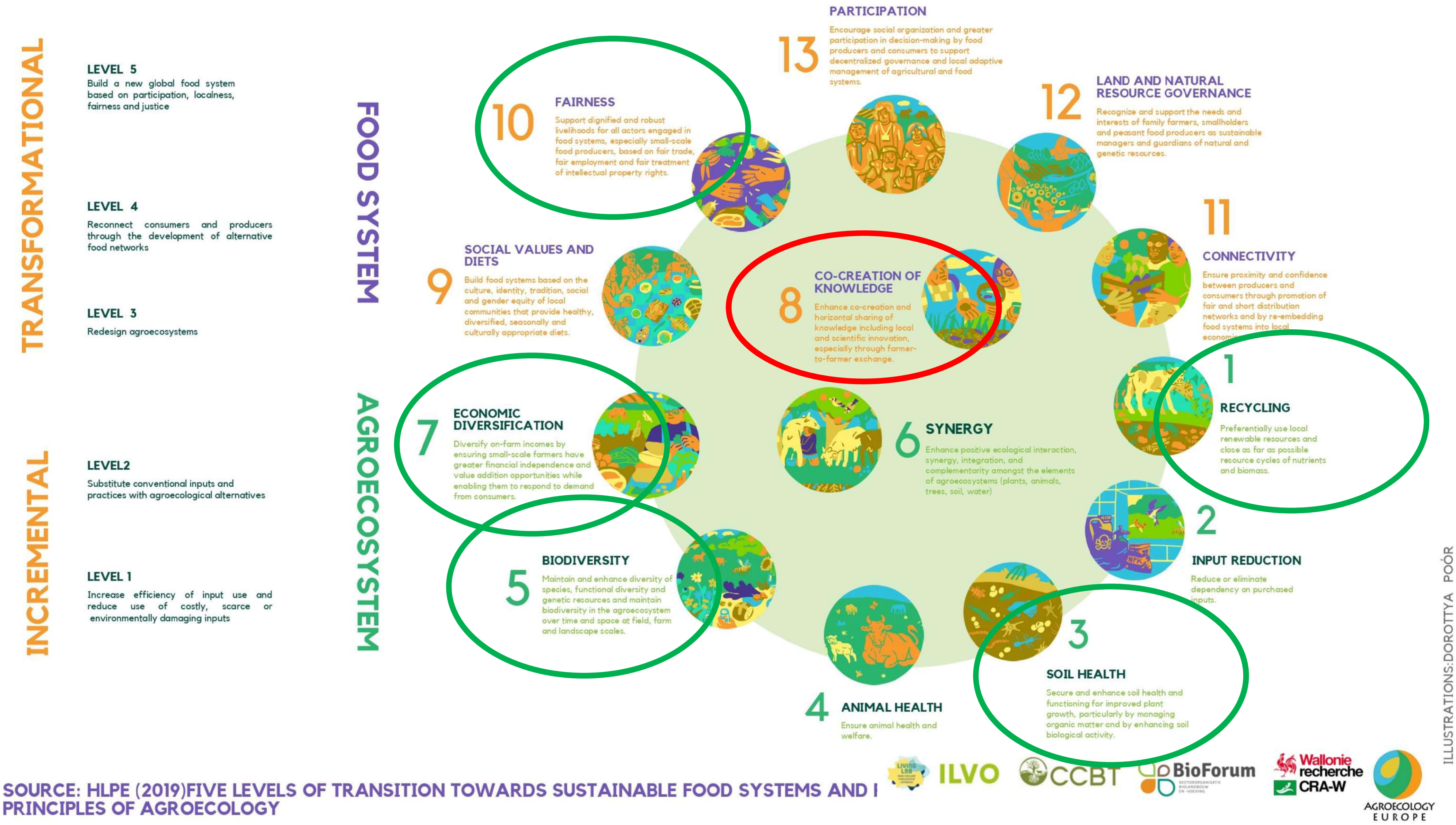
The 13 principales of agroecology



SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

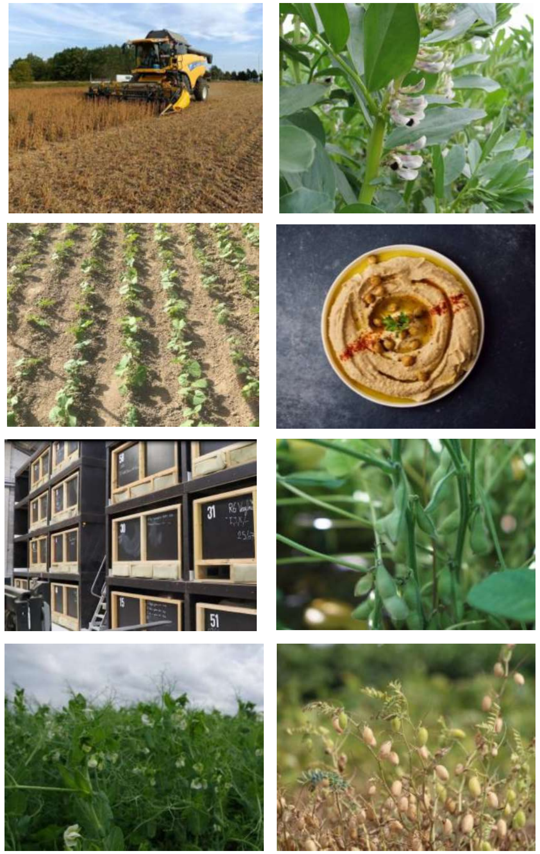
Collaboration with farmers

Participatory (pre-)Breeding

Agronomy research (nodulation, variety testing, strip cropping, mixtures, …)

Pilot facilities open to farmers : post Harvest processes (drying, cleaning, dehulling, storage, …), food pilot

Chain Development (animal husbandry, food, bio-economy, …)



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Implementation & communication

- Participatory research facilitates implementation and communication
- Through vivid Whatsapp groups
- Online tools
- Building new cooperations including different stakeholders in the value chain

Contact

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PréFertiBio

E. Montignies, R. Lambert, M. Detoffoli

brio.aa Belgian Research Institute of Organic Agriculture and Agroecology

UCLouvain

ASBL Centre de Michamps

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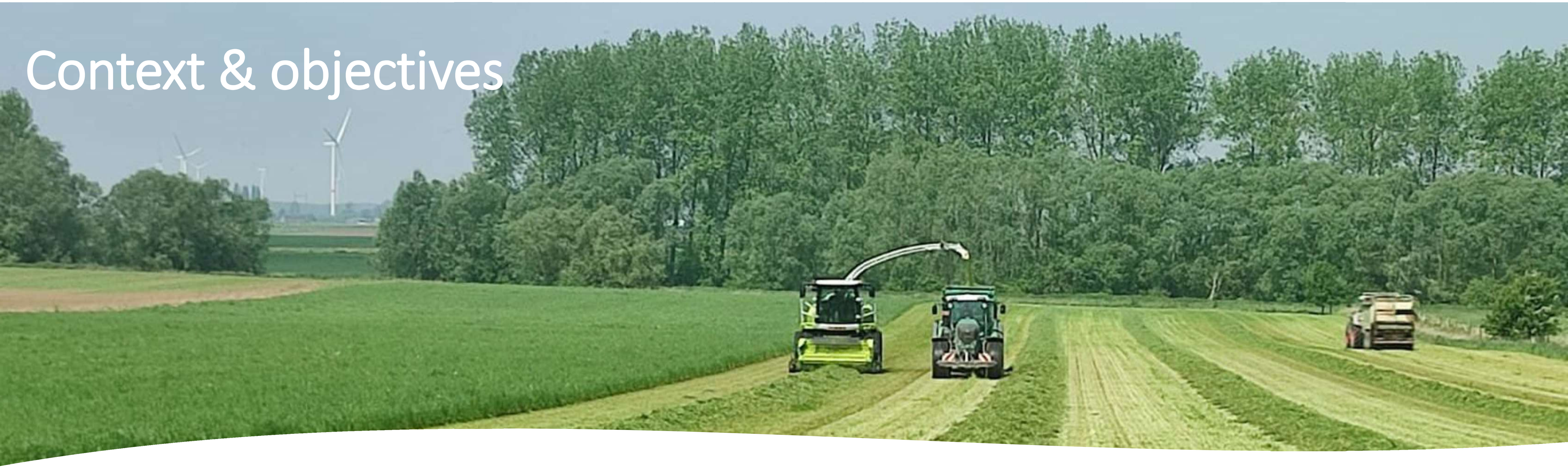
March 25, 2025, Gembloux

ILVO CCBT BioForum Wallonie recherche CRA-W Wallonie Bio mon choix PLAN BIO 2030 AGENTSCHAP LANDBOUW & ZEEVISSERIJ

Context & objectives



A systemic approach combining forage and fertiliser production and redesigning land parcels to achieve an important range of agro-ecological objectives

The different pillars of agroecology

A systemic approach

Field of production =

- Soil structuring
- Deep incorporation of OM (dead roots)
- Deep water storage (sponge)
- Limits annual and perennial weeds (thistles)
- Limits erosion in the catchment area

Alfalfa =

- Large quantity of high-quality fodder
- Adapted to drought and no inputs
- Storage and self production of fertilizer

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Economic approach

Alfalfa containt :

Kg N/TMS	Kg P/TMS	Kg K/TMS
34,9	3,9	32,3
+/- 350 UN/HA	+/- 40 UP/ha/an	+/- 320UK/ha/an

Harvesting cost (€/ha)

Mowing /Swathing (9M)	170€/h => 24,3 €/ha
silage	200€/h =>28€/ha
spreading	72€/h (5 spreaders/h) => 14,4 €/ha
Total	66,7 €/ha/cut

1,9 € for 1 UN

Without CAP aid (910€/ha)

Depreciation of alfalfa on 3 years

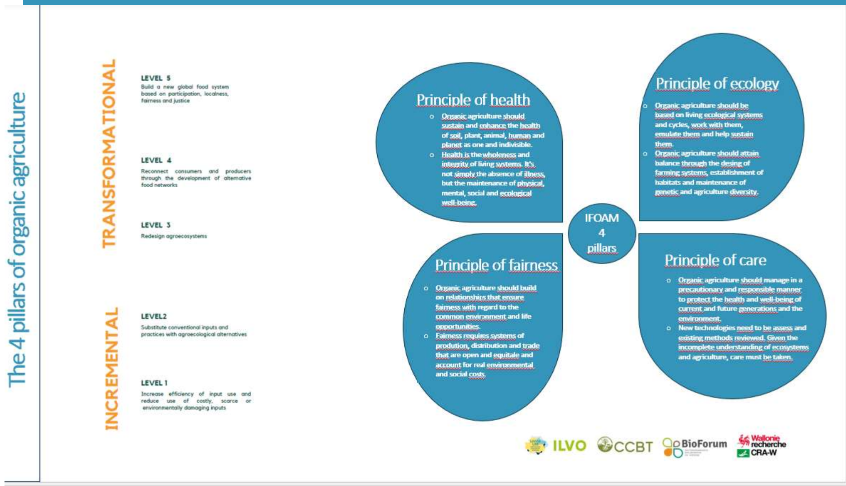
270€ location + 330 € sowing works (=1090€ year 1, on 3 years) = **600 €/ha**

Comparaison: **organic fertiliser 10-5-0**: 450 €/t = **4,5 € UN** **versus** **N27 conv: 1,2 €UN**

Collaboration with farmers

- Surveys in some farms who use this method of fertilizing
- Forrage production for 3 local farmers (sheep, cow and goat with milk transformation
- Visit and demonstration in the field

I think we touch all the 5 goals for Ifoam ...



Implementation & communication

- consolidate results on different crops up to September 2027
- improve our knowledge of the mineralisation of this type of om in the field and in the lab
- Visit and exchanges in the fields
- Publications

Next steps

- Open doors on this “LIVING LAB” tho improve knowledges
- Collective intelligency
- Your are welcome

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ILVO CCBT BioForum Sectororganisatie biolandbouw en -voeding Wallonie recherche CRA-W

Non-inversion tillage versus "eco-plow"

Joran Barbry

Inagro vzw

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

Context

- **Climate Change Impact:** A challenge to make the soil management more robust.
- **Regenerative Soil Management:** How to apply to Flemish organic farming practices?
- **Current Practices**: Non-inversion tillage and green manures are key concepts, but there are still knowledge gaps.

Challenges

- **Intensive Non-Inversion Tillage:** Often still quite intensive.
- **Dry Conditions:** Organic material from crop residues and manure lays inert on the surface.

Project Goals

Explore Alternative Strategies: Investigate whether the eco plow, the application time of manure and/or the use of inoculants to stimulate decomposition of organic matter can be part of the solution.

Main conclusions

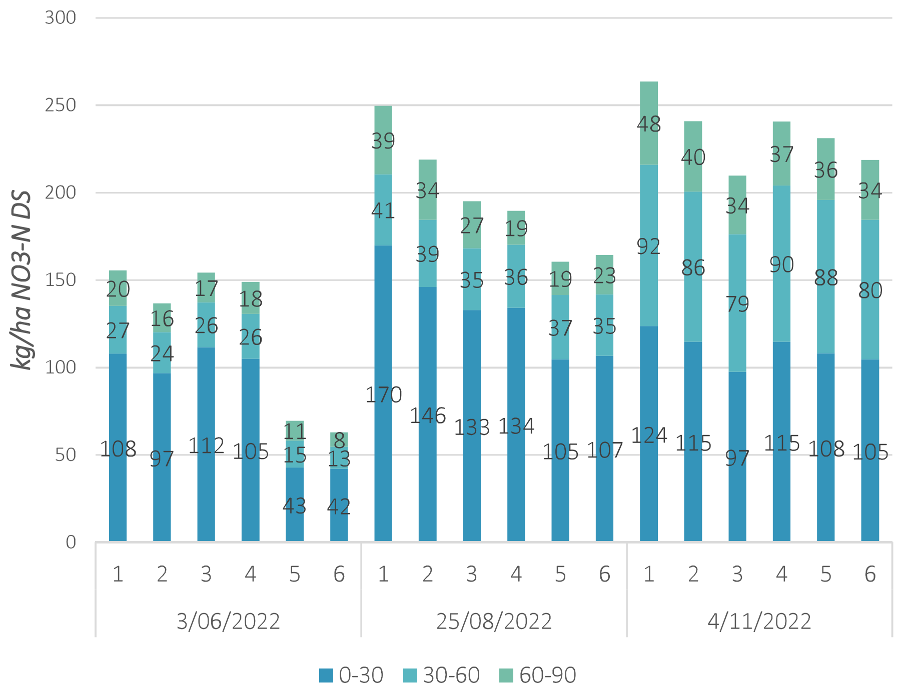
- **Soil structure** and **crop rotation choice** are most important factors

Possibilities to skip deep cultivation in spring when conditions are favorable

- Choice between eco-plow or non-inversion tillage has **limited impact**
- For leek: results depend heavily on climate conditions

Non-inversion tillage combined with timely grass clover destruction has good results in dry and wet conditions

- The application time (autumn vs. spring) of farmyard manure has no effect on yield and/or nitrogen residues in the soil -> chances for further research



The 4 pillars of organic agriculture

TRANSFORMATIONAL

LEVEL 5
Build a new global food system based on participation, localness, fairness and justice

LEVEL 4
Reconnect consumers and producers through the development of alternative food networks

LEVEL 3
Redesign agroecosystems

INCREMENTAL

LEVEL2
Substitute conventional inputs and practices with agroecological alternatives

LEVEL 1
Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

IFOAM 4 pillars

Principle of health

- Organic agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.
- Health is the wholeness and integrity of living systems. It's not simply the absence of illness, but the maintenance of physical, mental, social and ecological well-being.

Principle of ecology

- Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- Organic agriculture should attain balance through the desing of farming systems, establishment of habitats and maintenance of genetic and agriculture diversity.

Principle of fairness

- Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
- Fairness requires systems of prodution, distribution and trade that are open and equitale and account for real environmental and social costs.

Principle of care

- Organic agriculture should manage in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.
- New technologies need to be assess and existing methods reviewed. Given the incomplete understanding of ecosystems and agriculture, care must be taken.

Collaboration with farmers

Our research is **demand** driven:

1. Before projects/research:

- **Technical advisory board**
- **1 on 1 contact** e.g. advisory services, mail

2. During projects:

- **Steering committees**
- On-farm experimentation
- **Field visits**

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Implementation & communication

Communication:

- Field visits, newsletter articles, presentations

Implementation:

- Trial farm at Inagro
- New knowledge is used to guide farmers (advisory services, demonstrations…)

Next steps

Further research is needed into the best **application period for farmyard manure** in combination with **reduced (deep) tillage techniques**

- *Long term effect of application in autumn*
- *Reducing (deep) tillage even further*

New research opportunities for **the application of innoculants or ferment products** to **boost the microbial life** in the soil and to **accelerate the decomposition** processes of organic material in the soil

Possible cooperations

- *To verify our findings in the cropping systems in other regions, other soil types etc.*
- *To tackle new research opportunities together*

Joran Barbry

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RESEARCH & ADVICE IN AGRICULTURE & HORTICULTURE

Participative multi-actor research in organic cropping systems :

reduced tillage (ABC) - protein intercrops (Assobio)

Aline Fockedey, Morgane Campion and Pénélope Lamarque

CRA-W

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Logo Assobio

Context & objectives

*Collaboration on a shared **subject** between different **actors**, including farmers researchers …*

Exploratory or to handle an (previously) identified problem

Each bringing its own skills, knowledge, experience, and point of view

Putting to test low till organic cropping systems

7 farmers including 2 in no-ploughing
On farm experimentation

Wallonie recherche CRA-W ↔ agroecology transect
Performance assessment

Greenotec
Advisor, technical expertise

Barriers along the supply chain in organic legumes-cereals intercrop

~ 10 farmers
On farm experimentation

& downstream actors
Exchanges on barriers

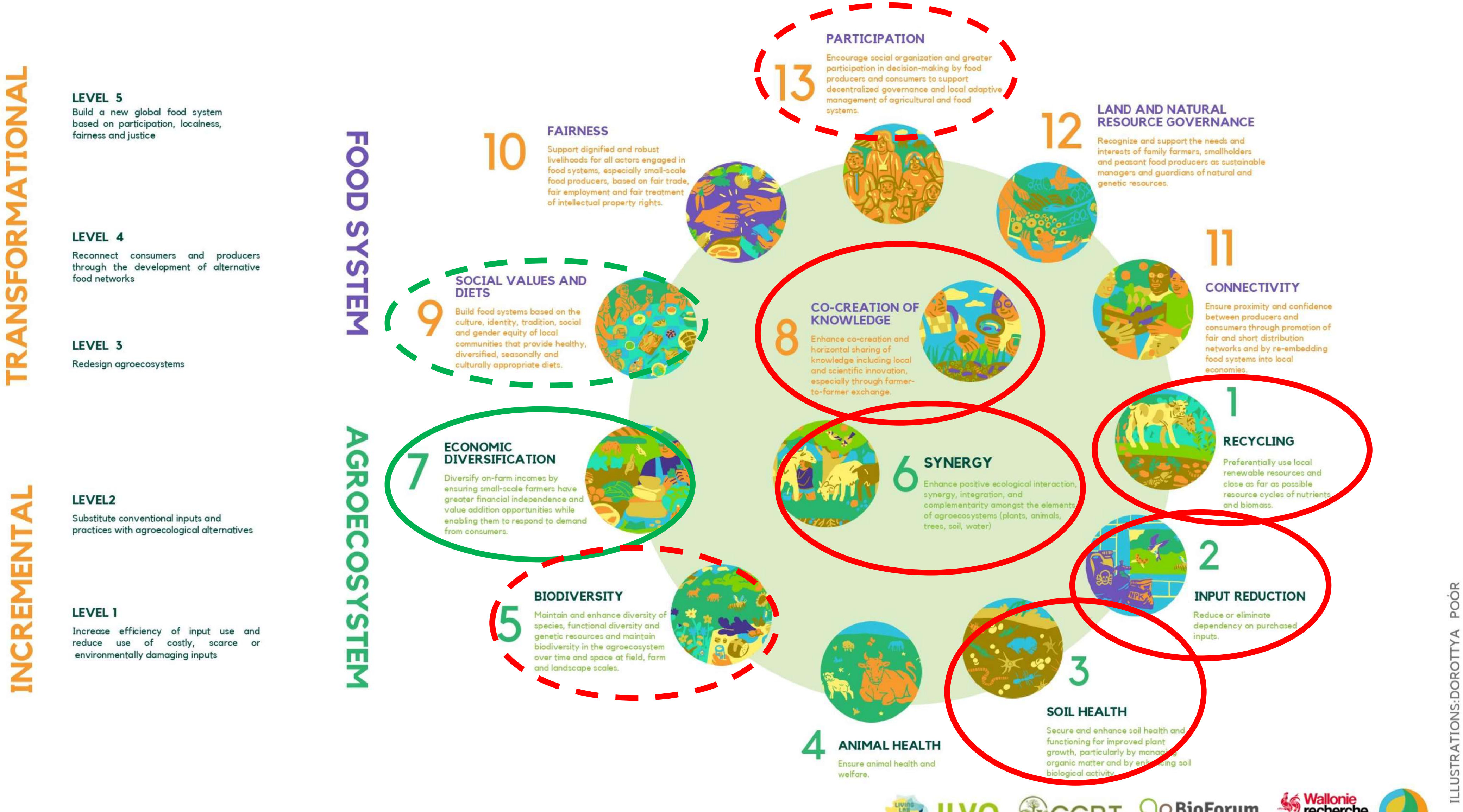
Wallonie recherche CRA-W
Performance assessment

BIOWALLONIE
Technical expertise

*… through **co-creation** of solution (combining different agroecological **practices**), and **experimenting** these **in real conditions** (on farm)*

ILVO CCBT BioForum Wallonie recherche CRA-W

The 13 principales of agroecology



SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

ILVO CCBT BioForum Wallonie recherche CRA-W AGROECOLOGY EUROPE

Collaboration with farmers

Putting to test low till organic cropping systems

7 farmers
including 2 in no-ploughing
On farm experimentation

Performance assessment

agroecology transect

Advisor, technical expertise

Shared interest for thematic between **actors**
(peripherical actors)
*Use of **tools** such as workshops, interviews, **facilitation skills**, …*

On farm experimentation
(systemic, long term) (systemic, yearly)

Co-construction of solutions,
with **iterative** loops from year to year
(at researcher or group level)

Collective + **individual** approach

(workshops, groups' assessment)
(group or network)

(technical itinerary adaptations, plots monitoring)
(qualitative and quantitative data)

Barriers along the supply chain in organic legumes-cereals intercrop

~ 10 farmers
On farm experimentation

& downstream actors
Exchanges on barriers

Performance assessment

Technical expertise

Biophysical assessment
Weeds ⇔ Soil
Production

Identified barriers and levers
Socio-economical
Institutional
Logistical
…

Implementation & communication

- **Identification** of problematics (illustrated and/or assessed by field experiments) **:**
  - **Raising awareness of problematics** of different actor,
  - Searching **viable solutions**

- Links with **downstream actors** (discussion of alternatives, …) **directly** or **indirectly**

- In collaboration group at first
  (+ by word of mouth / mimicry)
  - Field visits
  - Experiment assessment
  - Joint reflections

- End-of-project events and festivals : Greenotec, Biowal'innov, …

- Press release

- Possible educationnal resources for dissemination (Epasc - Ciney)

- Scientific publication and conferences

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Next steps

Identification, within the issues raised, of :

I. What **participatory research can still make progress on** (and with which disciplines, focus)
E.g.: what protocols (researchers) can make it easier for collaborators (farmers - downstream) to find their way around, e.g. for the cereal-protein crop ratio?

Thematic focus

- Experiment with reduced tillage (in organic systems)
- Appropriate monitoring of perennial weeds (thistle)
- Disease/pests on legumes in cereals-protein crops ?
- Socio-economic study for better intercrop valorization

Methodological / LL approaches

- Follow-up of systemic long-term trials
- Experience in participatory research (scientific - methodological)
- Exchanges between livings labs (actors)

II. What **needs to be taken care of at other levels** (giving over to other institutions, legal framework, … => non-scientific organizations)
E.g.: Since we see that **weed management capacity** and **nitrogen requirements** are strongly linked to the **presence of livestock**, how can we manage the reduction of livestock in arable farming areas? (Wallonia)
Or, value chain development in intercrop?

Contact

a.fockedey@cra.wallonie.be Aline Fockedey

m.campion@cra.wallonie.be Morgane Campion

p.lamarque@cra.wallonie.be Pénélope Lamarque

Ammonia emissions in organic poultry & pig farms

Reconciling organic and welfare-enhancing practices with emission regulations for pigs and poultry (BOWIE)

Laura Peeters

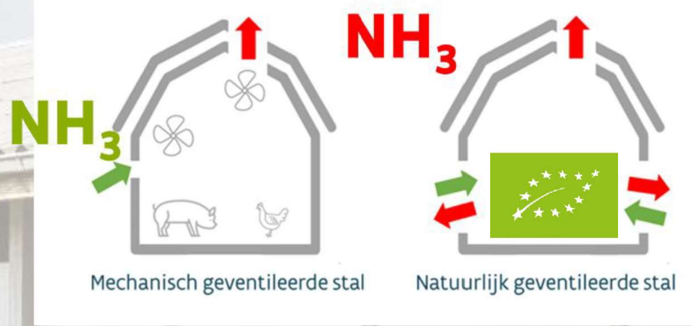
ILVO

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & Objectives

NH3 in
NH3 out



WHAT ?

Emission NH3 (g/s) =

Conc NH3 (g/m³) x Flow rate (m³/s)

No data available for **organic or other non-conventional farms!**

HOW ?

No methods available for emission measurements **naturally ventilated** barns with **outdoor run**

WHY ?

EF organic = EF conventional ...

effect organic management practices?

How to reduce emissions?

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Photo: Bioforum

The 4 pillars of organic agriculture

TRANSFORMATIONAL

LEVEL 5
Build a new global food system based on participation, localness, fairness and justice

LEVEL 4
Reconnect consumers and producers through the development of alternative food networks

LEVEL 3
Redesign agroecosystems

INCREMENTAL

LEVEL2
Substitute conventional inputs and practices with agroecological alternatives

LEVEL 1
Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

IFOAM
4
pillars

Principle of health

- Organic agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.
- Health is the wholeness and integrity of living systems. It's not simply the absence of illness, but the maintenance of physical, mental, social and ecological well-being.

Principle of ecology

- Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- Organic agriculture should attain balance through the design of farming systems, establishment of habitats and maintenance of genetic and agriculture diversity.

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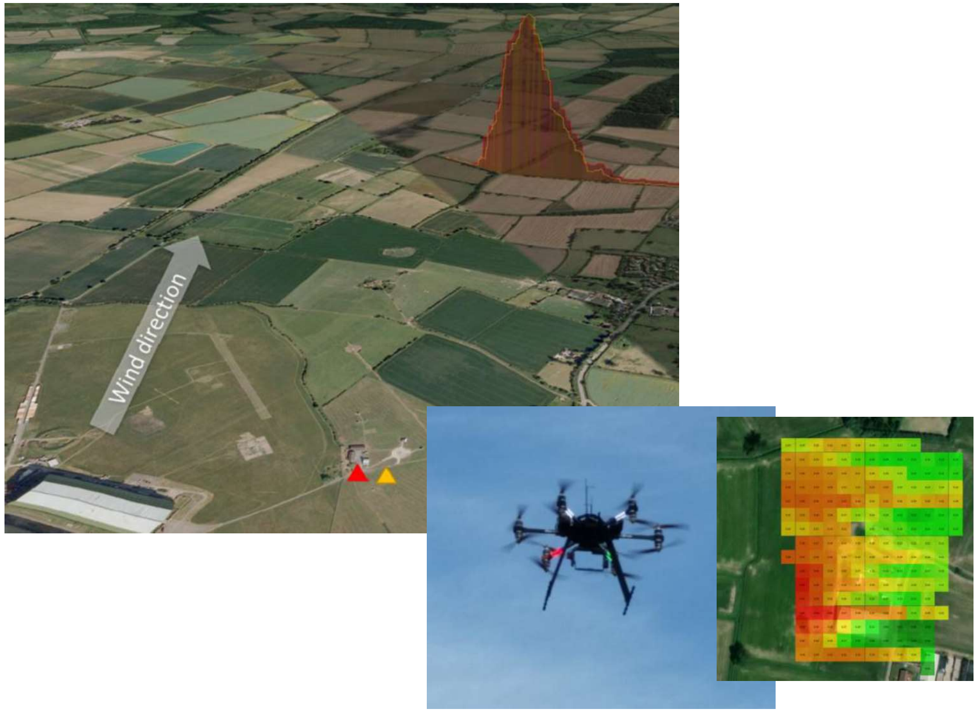
- Fairness requires systems of production, distribution and trade that are open and equitable and account for real environmental and social costs.

Principle of care

- Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.
- New technologies need to be assess and existing methods reviewed. Given the incomplete understanding of ecosystems and agriculture, care must be taken.

Collaboration with farmers

1. Emission measurements at farms



2. Measures for ammonia reduction

- Co-create **selection criteria** for measures that should be tested in the project

- **Input** of potential ammonia reducing management practices /measures

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Implementation & communication

WHAT ?

Events

Yearly workshops farmers
1st: 22-05-2025

Two demonstration events
Closing event
Yearly Steering Committee

WHAT ?

Written/online communication

4 monthly newsflashes with vlogs
Social media, webpages
Scientific and vulgarizing articles
Guide: ammonia emission reduction in organic pigs/poultry

WHO ?

Steering committee

Policy, farmers, sector org., scientists, companies,…

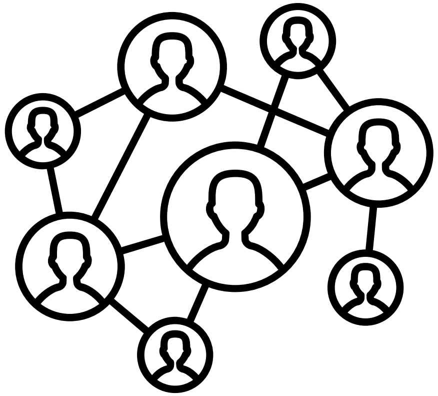
Photo: Bioforum

Next steps

1. **Development of methodology**

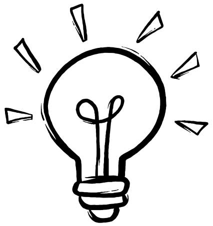
2. **Emission measurements at farms**

Recruitment of volunteers!



3. **Potential ammonia reducing measures?**

   (experiments 2027)



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Reconciling organic and welfare-enhancing practices with emission regulations for pigs and poultry (BOWIE)

Contact

Laura Peeters – Laura.Peeters@ilvo.vlaanderen.be

Liên Romeyns – Lien.Romeyns@bioforum.be

How to measure soil health, and how soil health responds to management practices in OA?

Brieuc Hardy

Centre wallon de Recherches Agronomiques

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

1. **How to measure soil health?**

The **IQSW** project (Index of soil quality in Wallonia) : developing a methodology to measure soil quality
https://www.cra.wallonie.be/fr/iqsw

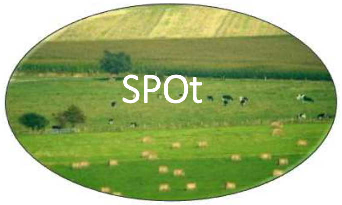
2. **How soil health responds to agricultural practices in OA ?**

Sol-plateformes : the effect of innovative organic cropping systems on soil chemical, physical and biological fertility
https://www.cra.wallonie.be/fr/sol-plateformes

Market gardening

Arable cropping

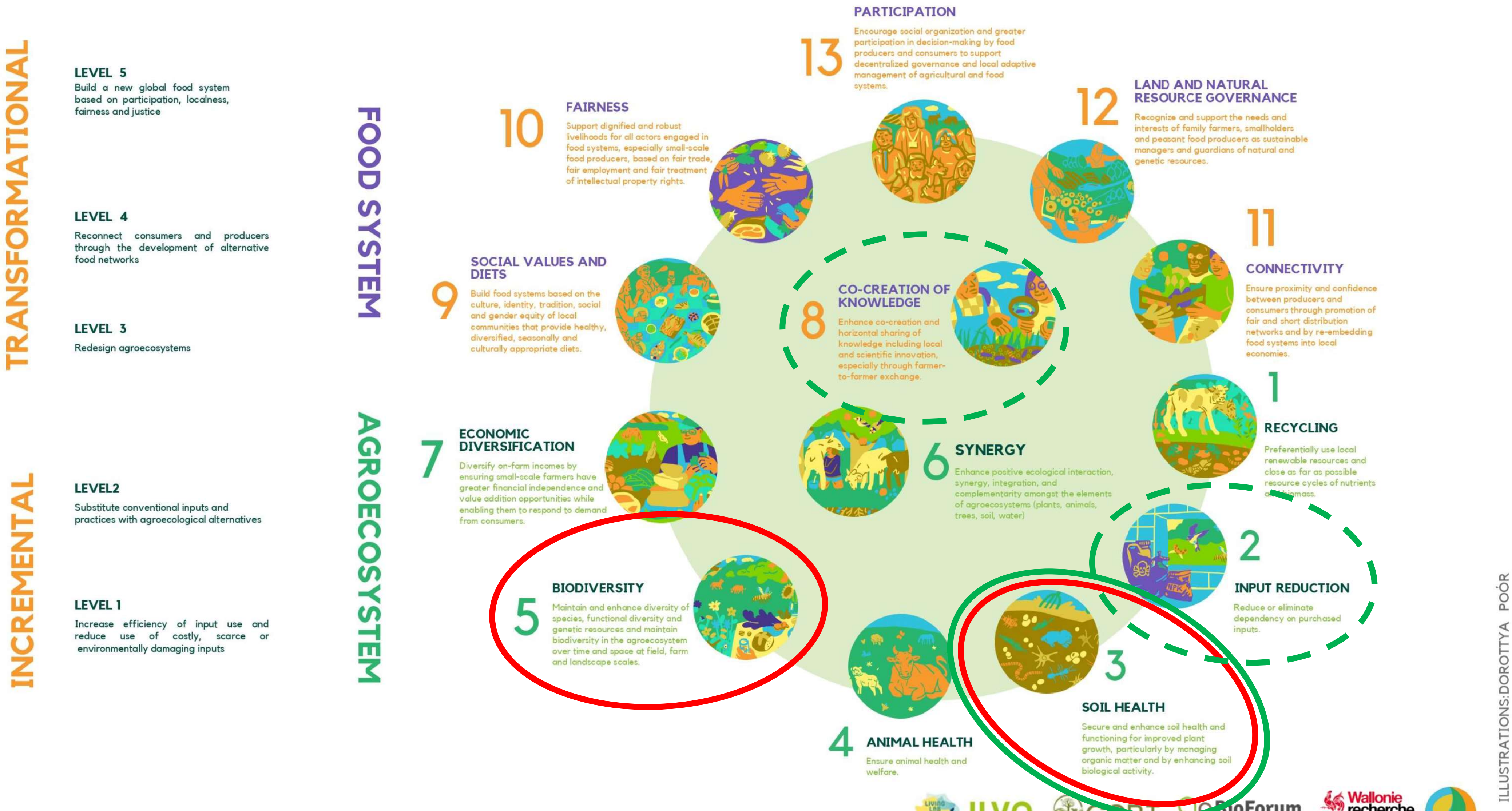
Mixed crop-livestock



SolAB : Soil management in organic farming : How to optimize soil ecosystem services ?
https://www.cra.wallonie.be/fr/solab

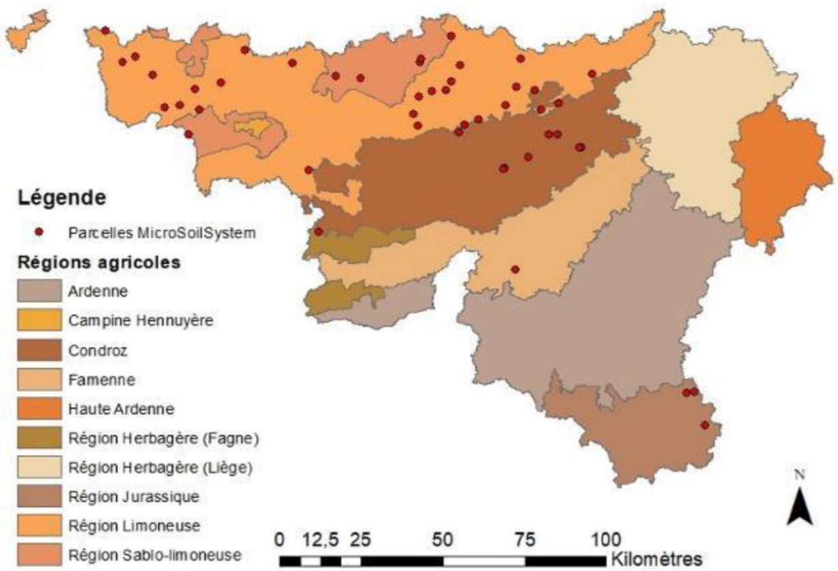
- Fields (n=40)
  - Arable cropping
    - vegetables
      - Irrigation
      - No irrigation
    - Cereals
  - Cropping & livestock
    - TG <<
    - TG >>

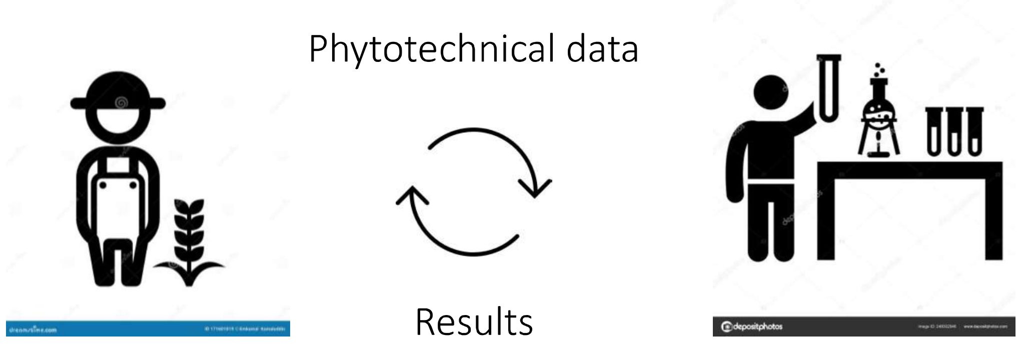
The 13 principales of agroecology



SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

Collaboration with farmers
SolAB project





Implementation & communication

- Feedback to farmers
- Field visits/excursions
- Agricultural press articles
- Scientific publications
- Seminar to present the results

Next steps

Integrating/creating a soil living lab at EU level ?

Unité Sols, Eaux & Productions Intégrées

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Gembloux
Belgique

Brieuc Hardy
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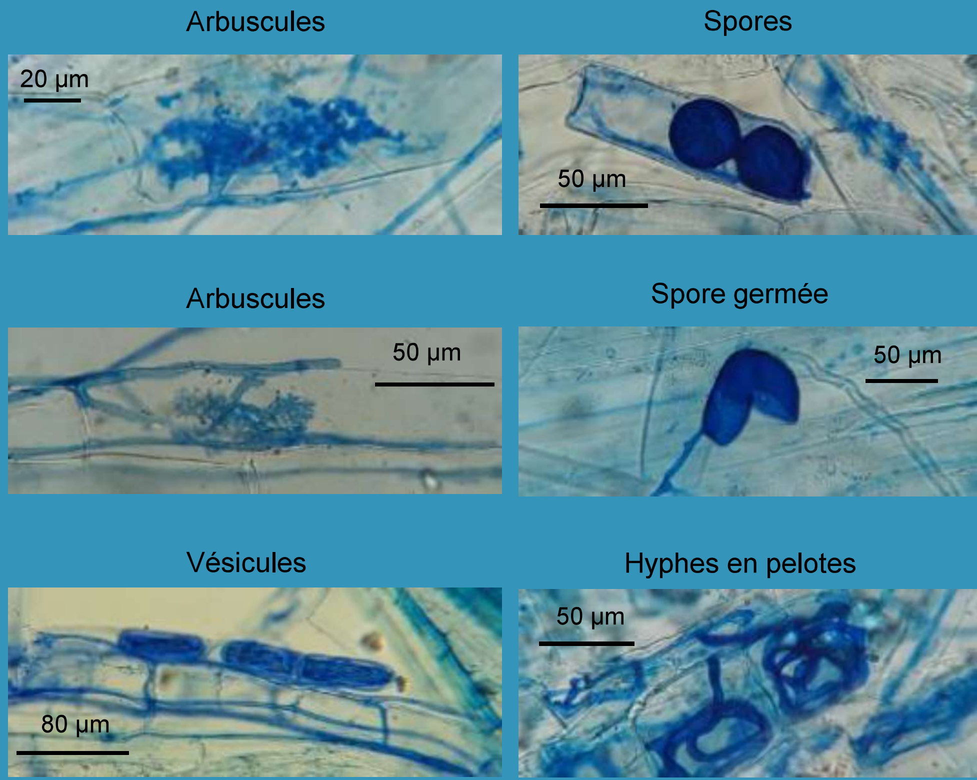
081/874340



AM fungi structures in winter wheat roots, Microsoilsystem project

ILVO CCBT BioForum Wallonie recherche CRA-W

Smart organic cultivation

Koen Willekens

Research Institute for Agriculture, Fisheries and Food (ILVO)

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

Topics

- Soil Organic matter supply and turnover
- Smart cropping systems
- On farm composting

Objectives

- Closing nutrient cycles
- Enhancing soil health
- Optimizing crop performance and yield

The 4 pillars of organic agriculture

TRANSFORMATIONAL

LEVEL 5
Build a new global food system based on participation, localness, fairness and justice

LEVEL 4
Reconnect consumers and producers through the development of alternative food networks

LEVEL 3
Redesign agroecosystems

INCREMENTAL

LEVEL2
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Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

IFOAM 4 pillars

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- New technologies need to be assess and existing methods reviewed. Given the incomplete understanding of ecosystems and agriculture, care must be taken.

Collaboration with farmers

Farmers fields monitoring for a better understanding of nutrient availability and soil quality building in relation to soil management (fertilization, tillage practices and crop choice)

Demand-driven research on ILVO organically managed experimental fields

[Experimental Platform for Agroecology - PPAE Hansbeke]

Initialising composting practices on farm

Implementation & communication

– User groups

– Professional press

– Lectures (study days and webinars)

– Demonstrations

Next steps

Documenting by research and teaching basic mechanisms of:

–soil fertility building

–plant nutrition

–crop protection

Developing advisory basis for N-supply in organic cropping systems, using a system approach

Contact

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Co-design and experimentation of sustainable mixed crop-livestock systems in Belgian Ardenne (SPoT-)

Mathot M., Lagneaux S., Mertens A., Stilmant D.

CRA-W

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

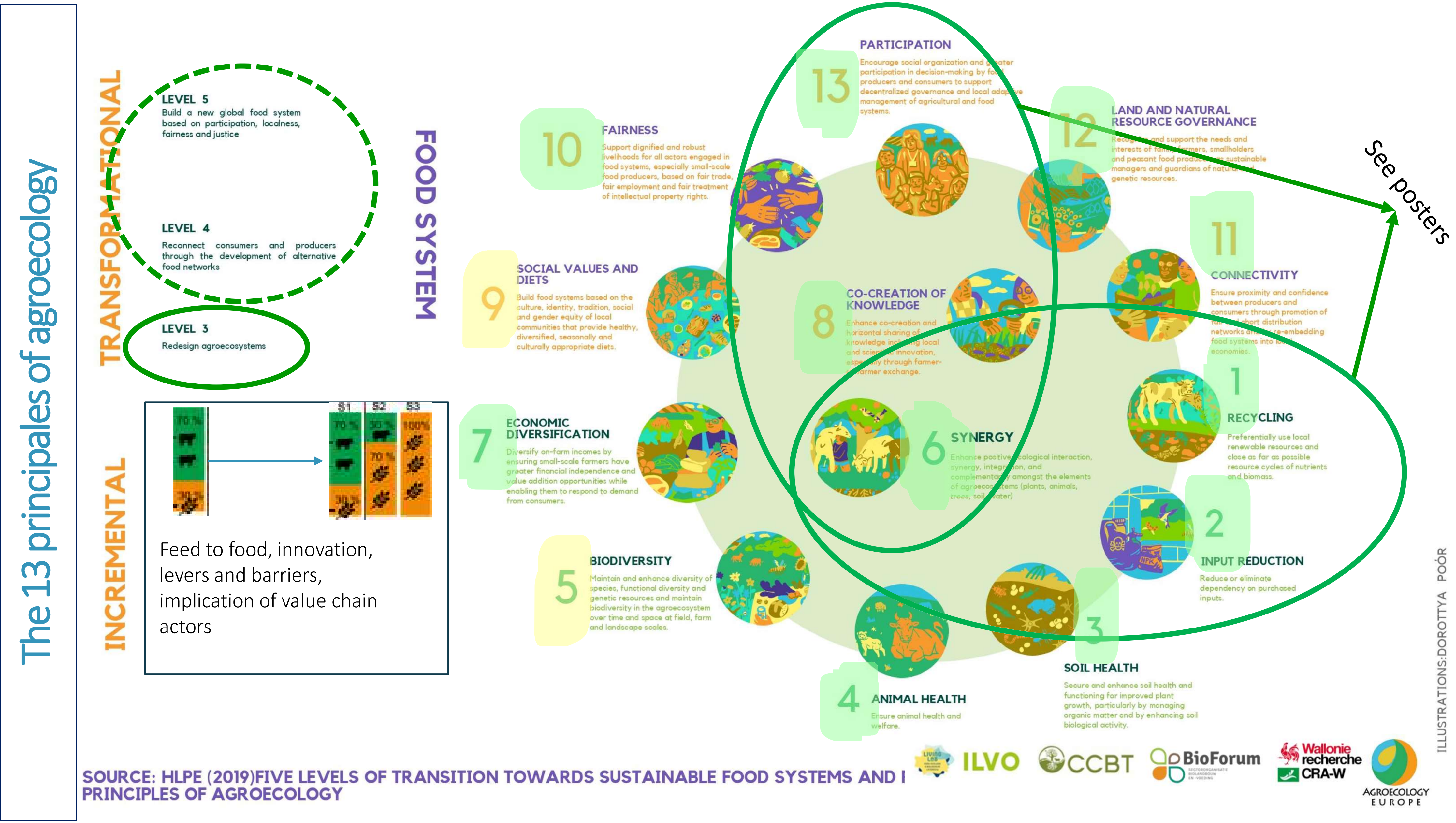
March 25, 2025, Gembloux

Context & objectives

Can mixed crop-livestock systems, relying on agroecological management, be a solution to :

- High food production
- Climate challenges (reduction and adaptation)
- More circularity (reduce losses and resources consumption)

=> Test on experimental site of three contrasted (various share in crop and grassland cattle) and independent systems for their ability to reach the main goals


The 13 principales of agroecology
TRANSFORMATIONAL
INCREMENTAL
LEVEL 5
Build a new global food system based on participation, localness, fairness and justice
LEVEL 4
Reconnect consumers and producers through the development of alternative food networks
LEVEL 3
Redesign agroecosystems
70 %
30 %
S1
S2
S3
70 %
30 %
30 %
70 %
100%
Feed to food, innovation, levers and barriers, implication of value chain actors
FOOD SYSTEM
13
PARTICIPATION
Encourage social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems.
10
FAIRNESS
Support dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.
12
LAND AND NATURAL RESOURCE GOVERNANCE
Recognize and support the needs and interests of family farmers, smallholders and peasant food producers as sustainable managers and guardians of natural and genetic resources.
See posters
11
CONNECTIVITY
Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies.
9
SOCIAL VALUES AND DIETS
Build food systems based on the culture, identity, tradition, social and gender equity of local communities that provide healthy, diversified, seasonally and culturally appropriate diets.
8
CO-CREATION OF KNOWLEDGE
Enhance co-creation and horizontal sharing of knowledge including local and scientific innovation, especially through farmer-to-farmer exchange.
7
ECONOMIC DIVERSIFICATION
Diversify on-farm incomes by ensuring small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers.
6
SYNERGY
Enhance positive ecological interaction, synergy, integration, and complementarity amongst the elements of agroecosystems (plants, animals, trees, soil, water)
1
RECYCLING
Preferentially use local renewable resources and close as far as possible resource cycles of nutrients and biomass.
2
INPUT REDUCTION
Reduce or eliminate dependency on purchased inputs.
5
BIODIVERSITY
Maintain and enhance diversity of species, functional diversity and genetic resources and maintain biodiversity in the agroecosystem over time and space at field, farm and landscape scales.
4
ANIMAL HEALTH
Ensure animal health and welfare.
3
SOIL HEALTH
Secure and enhance soil health and functioning for improved plant growth, particularly by managing organic matter and by enhancing soil biological activity.
ILLUSTRATIONS:DOROTTYA POÓR
SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND 1
PRINCIPLES OF AGROECOLOGY

Collaboration with farmers

- Value chain actors and advisors implied in the governance of the project

- Regular visits and discussions about the project, recording and analysis of the feedbacks

- Related research programs on particular topics for accompanying transition with farmers

    Transdisciplinary exploration of organic dairy beef production based on grassland and by-products

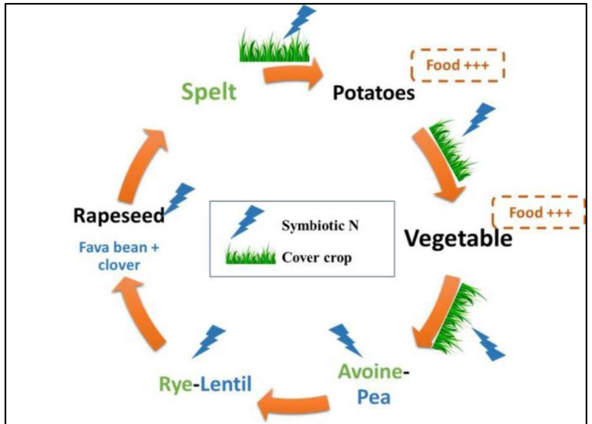
        Group of farmers

        Experimentation in farms

        etc.

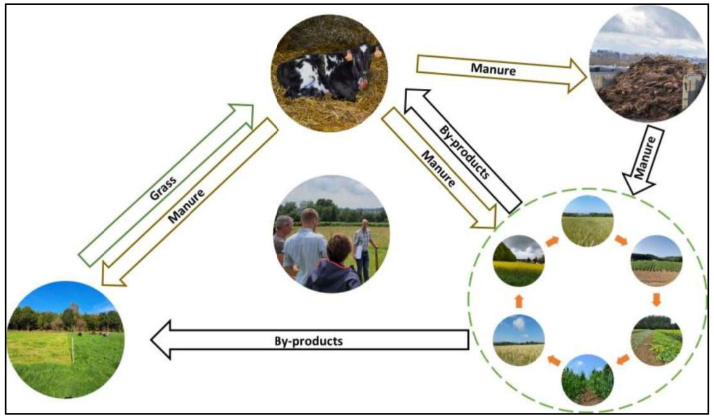
Implementation & communication

- 2022 for 12 years
- 3 experimental systems (about 30 ha)
- Implementing co-design (particular governance)
- Rules and decision trees
  - First food then feed (which rotation?)
  - Constrain on inputs (see poster)
  - Agroecological management (ex: prevention then curative), …
- Evolutive
- Measure (productions, GHG, internal flows, etc.)
- Analysing transition (levers and barriers, etc.) => transdisciplinary team
- Frequent visits



Initially identical crop rotation for the 3 systems, S1, S2 and S3

Next steps



- Lots of… and … on long term, evolutive.
- Detailed comprehension of the systems (incl products characteristic and images)
- Optimisation of “internal resources” and management

    => *Crop rotation*

    => *Animal feeding*
- Accompanying transition at local scale with living labs

    => New topics (ex : circularity, food vs feed, climate change, …)

ILVO CCBT BioForum Wallonie recherche CRA-W

Contact

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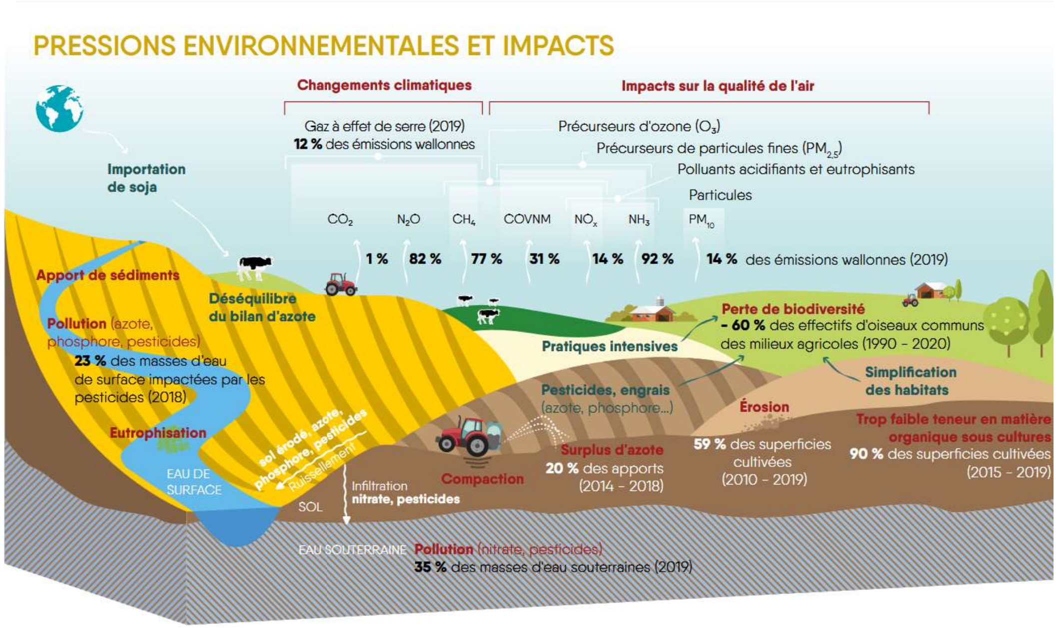
FOOD AUTONOMY IN WALLONIA
Towards sustainable diets and farming systems through land use optimization

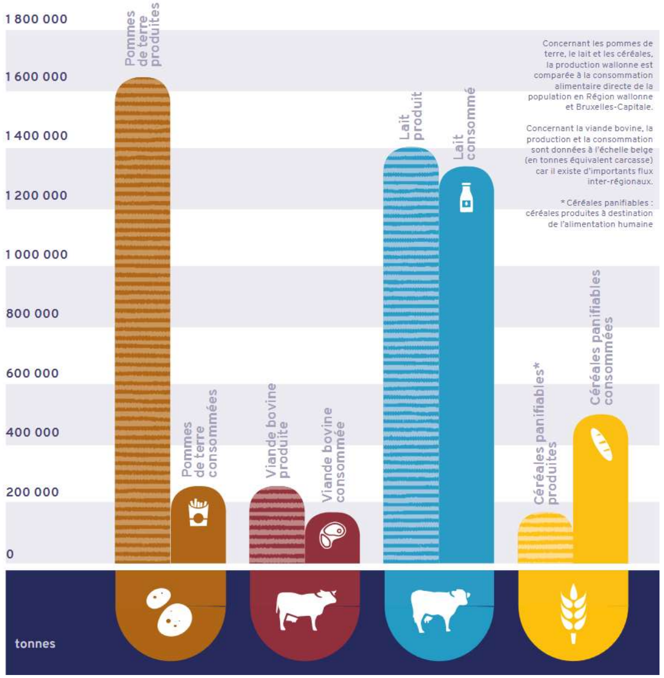
Tom Desmarez

Gembloux Agro-Bio Tech - ULIEGE

Stronger together: researchers from Wallonia and Flanders join hands for organic farming
March 25, 2025, Gembloux

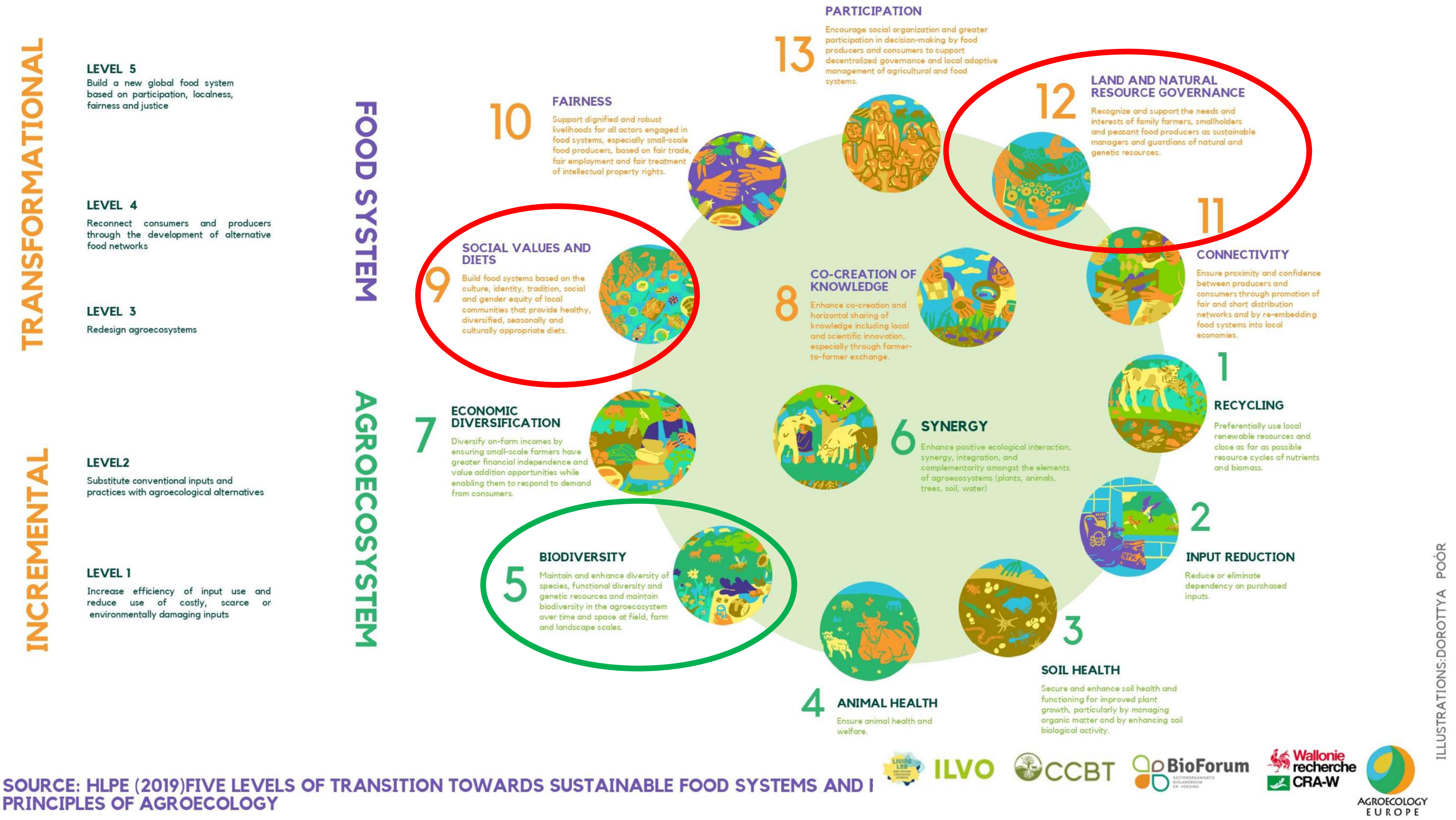
Context & objectives





Is it possible to feed the inhabitants of Wallonia and Brussels with organic food using the available arable land in Wallonia?

The 13 principales of agroecology



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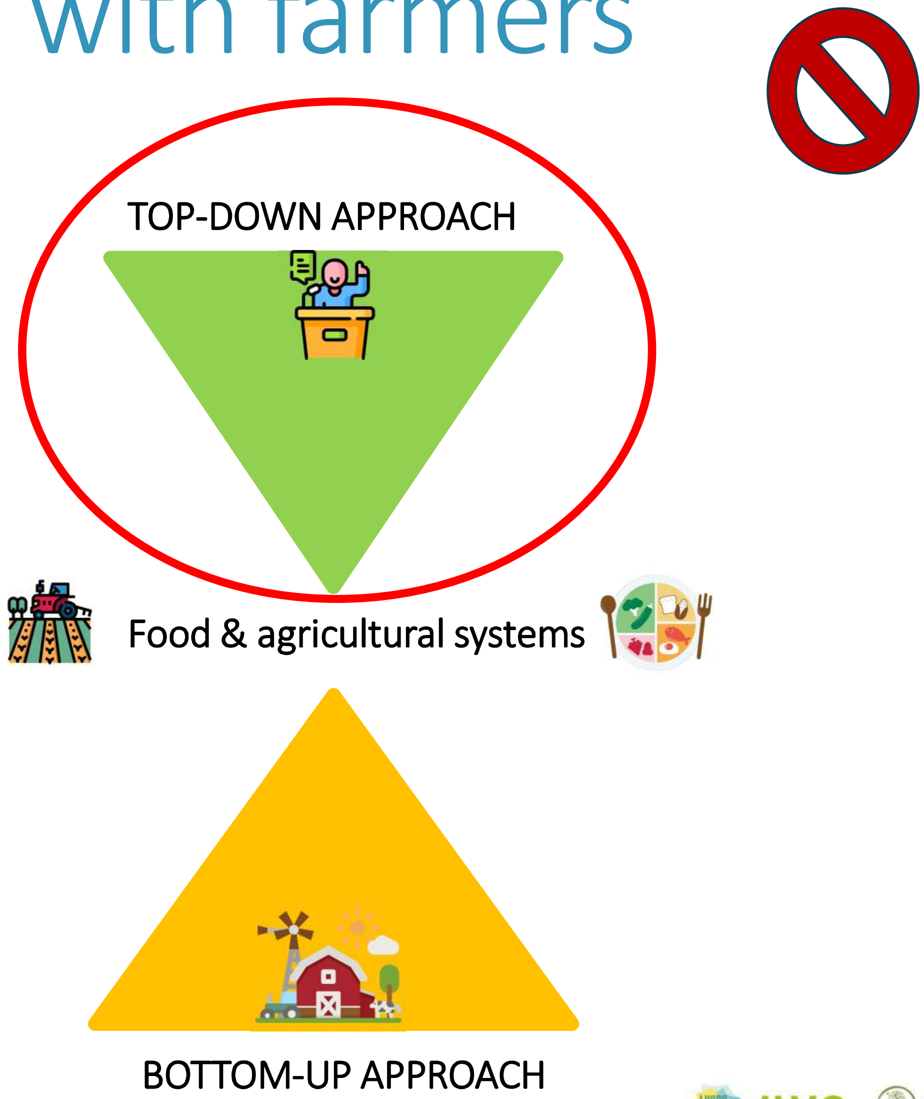
PRINCIPLES OF AGROECOLOGY

Collaboration with farmers



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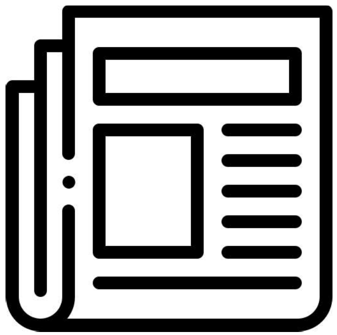
Key Results

- Feeding Wallonia and Brussels with current dietary habits is not feasible under current practices.
- Full food self-sufficiency is achievable if the population adopts alternative diets
- Transitioning to sustainable diets frees up land for other crop uses.
- Reducing food waste from 30% to 10% is crucial for achieving food self-sufficiency in an organic farming scenario

Implementation & communication

Oral communications

Scientific papers online
linked to my PhD



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Next steps

- 

- Assessing the performances of our agricultural system in the future according to different IPCC scenarios

Contact

E-mail : tom.desmarez@uliege.be or during the poster session

Promoting biocontrol with banker plants and insect frass

Femke Temmerman

Inagro vzw

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

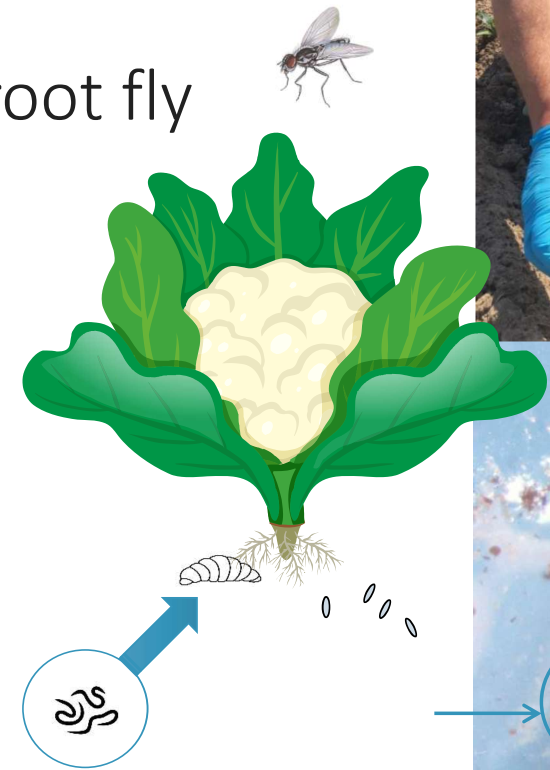
March 25, 2025, Gembloux

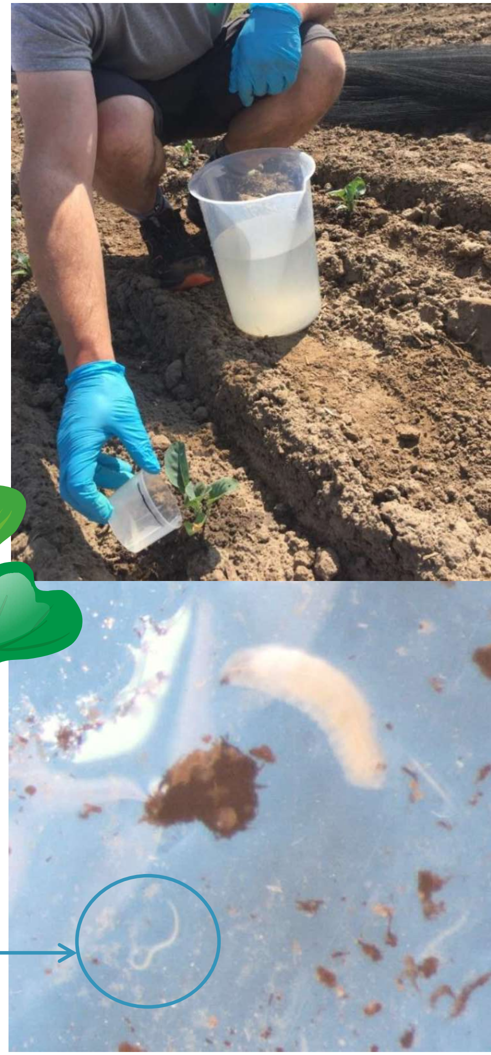
AGENTSCHAP INNOVEREN & ONDERNEMEN

Vlaanderen is ondernemen

Context & objectives

Improve biocontrol of cabbage root fly & thrips in leek





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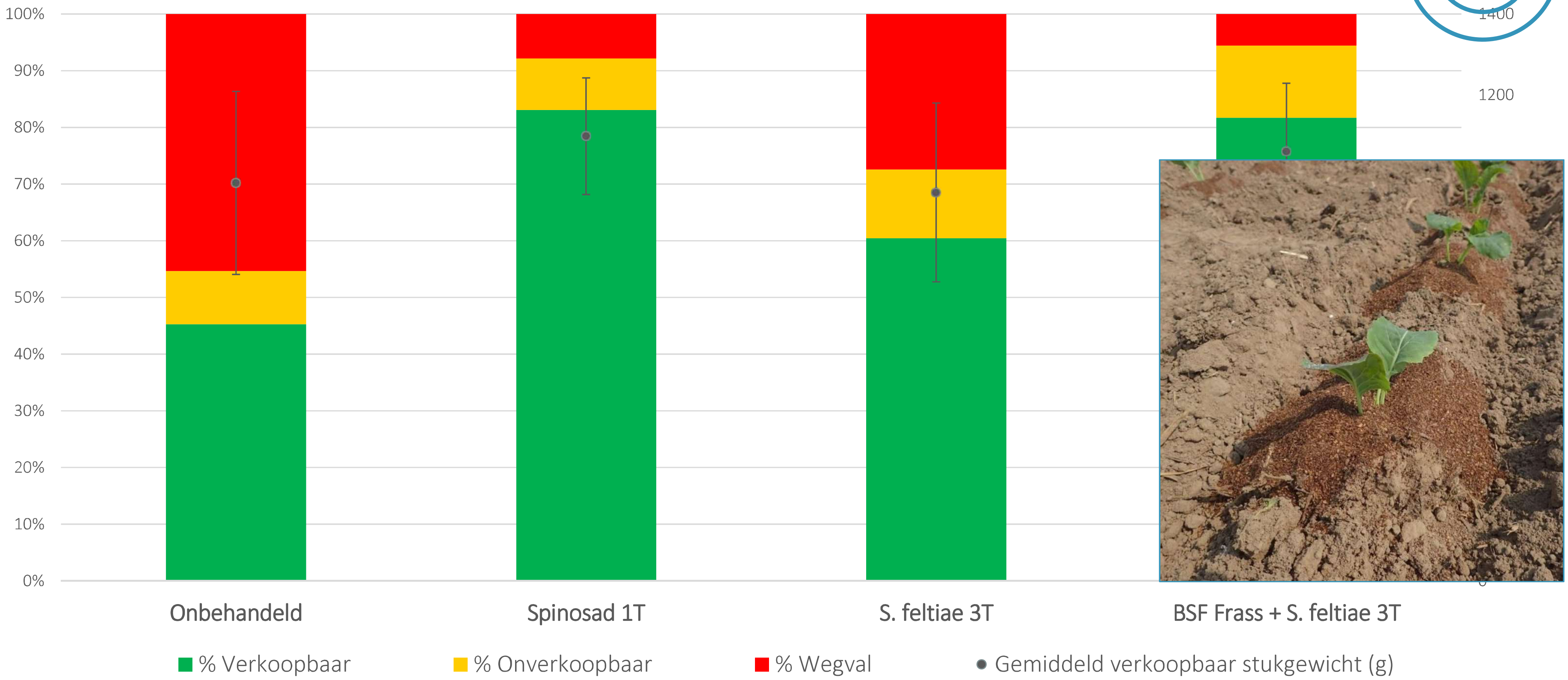
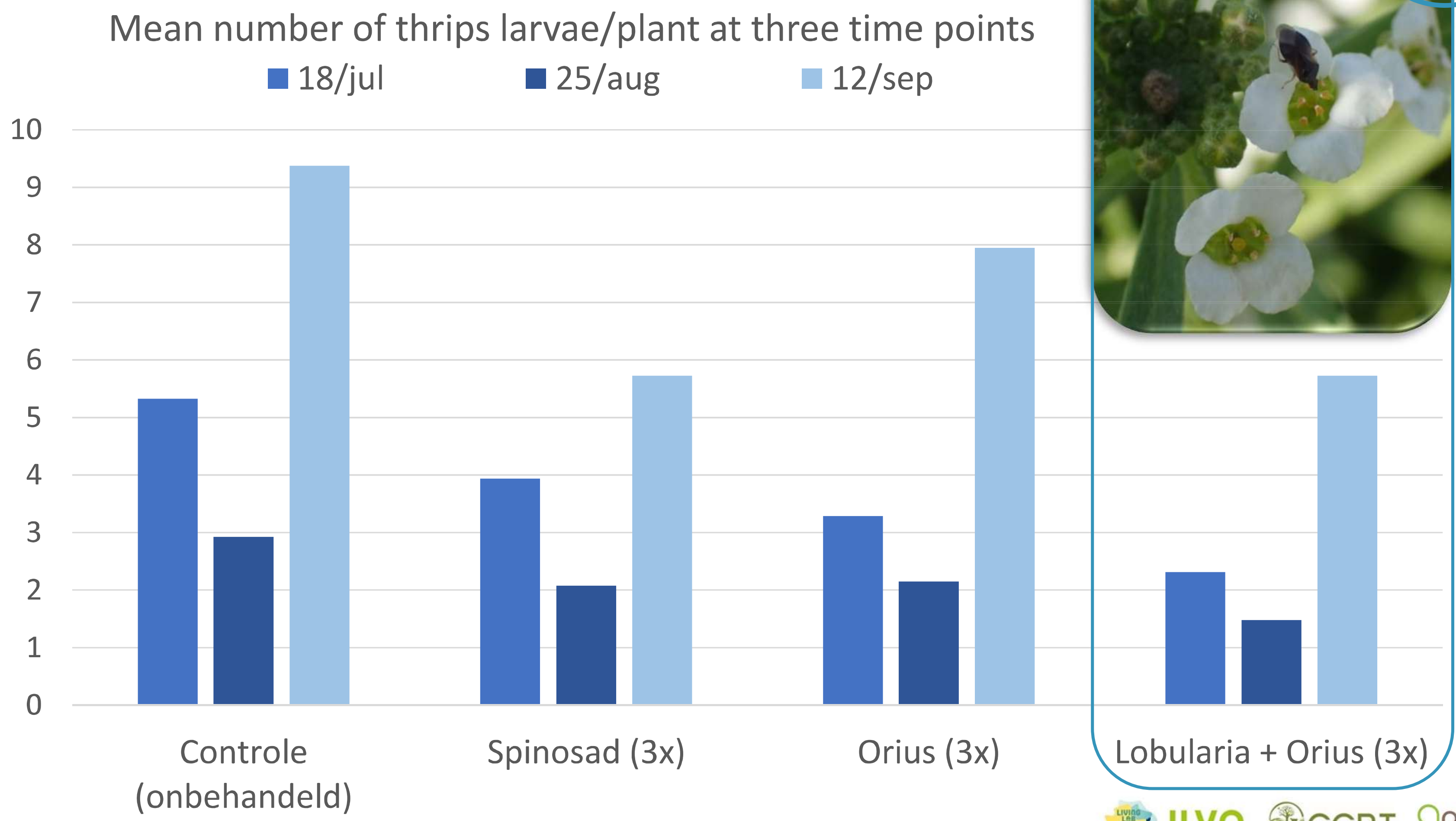
Trial results in cauliflower

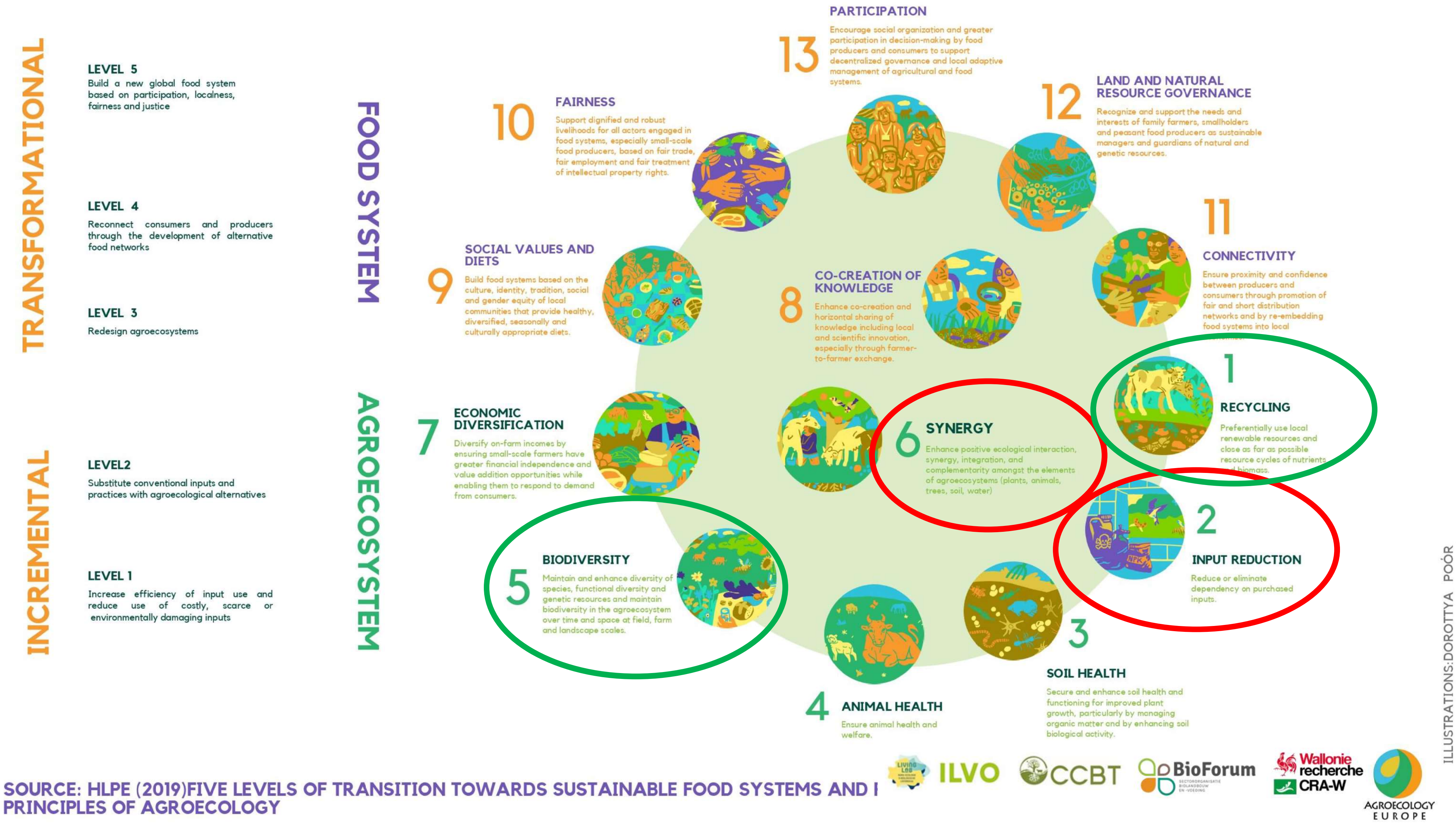


Average of resp. 12, 12, 8 en 3 field trials in 2021 - 2024 in cauliflower spring culture.

Trial results in leek 2023



The 13 principales of agroecology



SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

Implementation & communication

1
- Field trials on experimental farm

2
- Field visits
- Dissemination of results

3
- Explore feasibility in practice
- adoption by commercial suppliers

4
- Demonstration on experimental farm
- On-farm trials

Next steps

1
- Field trials on experimental farm

2
- Field visits
- Dissemination of results

3
- Explore feasibility in practice
- adoption by distributors

4
- Demonstration on experimental farm
- On-farm trials

Contact

femke.temmerman@inagro.be

Organic vegetable cropping systems - a long term experiment

Clément Nieus, Laurent Jamar

CRA-W

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context and objectives

Context :

- Vegetable production growing in Wallonia
- But many challenges :
    - *labour and equipment intensive,*
    - *weed and pests management,*
    - *soil conservation,*
    - *lack of organic matter,*
    - *use of nutrients from conventionnal source.*

Objectives :

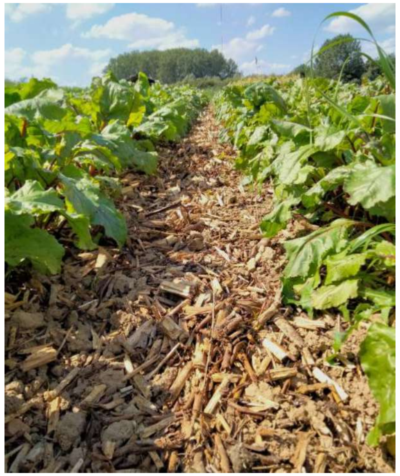
- Reduce reliance on import of external ressources in organic vegetable production
- Build references through long term experimentations

Co-Design of the cropping systems

Design of the cropping systems with farmers and stakeholders of the horticultural sector

After the first 6-year rotation : the cropping systems will be refined

The 4 cropping systems

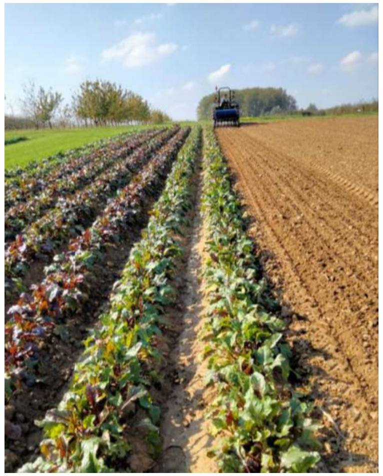


CS-1
Multi-crop farming without livestock

CS-2
Mixed farming with livestock

CS-3
Soil-conservation vegetable farming

CS-4
Standard vegetable organic farming



4 agronomic levers

1. rotation
2. tillage
3. fertilisation
4. cover-crops

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The experimental design

- Since 2020, over 3 rotations of 6 years
- Every year, all crops of the rotation are cultivated in each 4 cropping systems
- 72 experimental plots
- Split-plot design (3 replicates)
- Alfalfa and rameal wood chips (willow) produced on site to be used as input

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Scientific Monitoring

- Every farming operations
- Nutrient flows
- Crop yields and quality
- Pests and diseases
- Weeds
- Soil (mineral, biological and physical)

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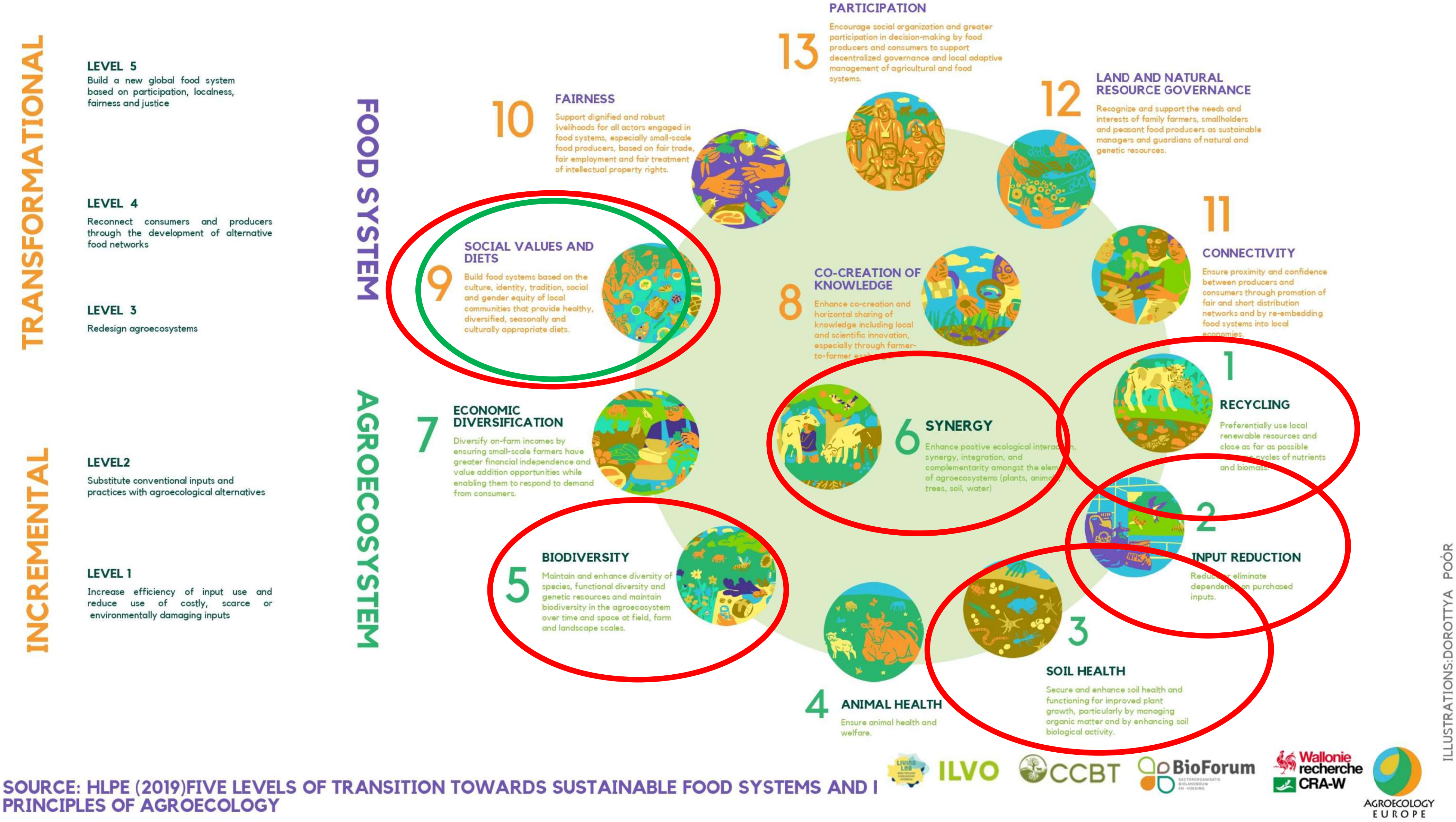
The 13 principales of agroecology



SOURCE: HLPE (2019)FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND I
PRINCIPLES OF AGROECOLOGY

Communication

- ➢ Technical days dedicated to growers
- ➢ Several visits of the experimental fields every year
- ➢ Articles in technical and scientific journals
- ➢ National and international conferences

Ongoing collaborations and next steps

- Project “Semences d’ici”

- Project Interreg VI “REFLECHI”

- Project “SOL-PLATEFORMES”

We are open to participate in projects with trials in vegetable production and willing to network with projects with a similar cropping system approach

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Research related to agroecological principles at Viaverda

An Van de Walle

Viaverda – Researcher organic agriculture

Stronger together: researchers from Wallonia and Flanders join hands for organic farming

March 25, 2025, Gembloux

Context & objectives

An Van de Walle

Researcher organic agriculture – vegetables under protection – at Viaverda

- (Non) heated greenhouses
- Plastic tunnels

Also (personal interests) :

- Ornamentals (slow flowers)
- Permaculture
- Agro forestry
- Local production- CSA communities

The 4 pillars of organic agriculture

TRANSFORMATIONAL

LEVEL 5
Build a new global food system based on participation, localness, fairness and justice

LEVEL 4
Reconnect consumers and producers through the development of alternative food networks

LEVEL 3
Redesign agroecosystems

INCREMENTAL

LEVEL2
Substitute conventional inputs and practices with agroecological alternatives

LEVEL 1
Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

Principle of health

- Organic agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.
- Health is the wholeness and integrity of living systems. It's not simply the absence of illness, but the maintenance of physical, mental, social and ecological well-being.

Principle of ecology

- Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- Organic agriculture should attain balance through the desing of farming systems, establishment of habitats and maintenance of genetic and agriculture diversity.

IFOAM
4
pillars

Principle of fairness

- Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
- Fairness requires systems of production, distribution and trade that are open and equitale and account for real environmental and social costs.

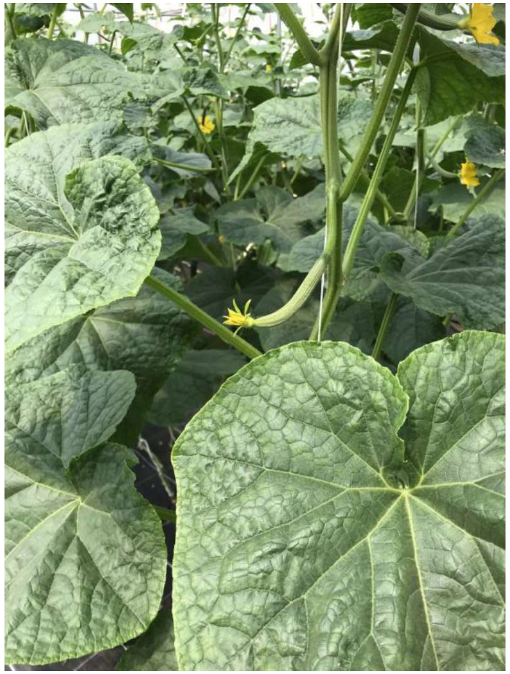
Principle of care

- Organic agriculture should manage in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.
- New technologies need to be assess and existing methods reviewed. Given the incomplete understanding of ecosystems and agriculture, care must be taken.

The four pillars of organic agriculture— Health, Ecology, Fairness, and Care.

Principle of Health – Strengthening plant resilience

- *By supporting plant and soil health, we reduce the need for chemical treatments, contributing to a more **balanced ecosystem and healthier food production**.*
- *This also aligns with my personal interest in finding **natural ways** to strengthen plant resilience.“*
- *project Resculeaf “**Boost Resilience of Cucumber plants to powdery mildew through foliar applications**”*



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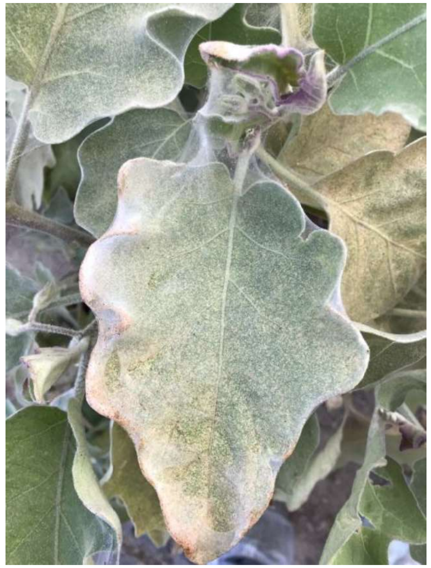
The four pillars of organic agriculture— Health, Ecology, Fairness, and Care.

Principle of Ecology – Enhancing soil life and biodiversity

"Soil is the foundation of agriculture".

- *organic fertilization strategies and organic matter management in plastic tunnels*
- *BIOBM: support organic farmers in **good organic fertilization practices** so that they can further develop as a 'sustainable cultivation practice'.*
- *B-Lab / WWBIO: monitor pests and **benificial insects** to investigate how we can attrack natural enemies against aphids in plastic tunnels .*
- *JOWOBO: recycle on the farm "**waste streams**" to (worm) compost, bokasshi, Johnson Su*



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The four pillars of organic agriculture— Health, Ecology, Fairness, and Care.

Principle of Fairness – Circular and local resource use

- ***CSA communities and local production***, *where farmers and consumers work together for fairer food systems.*
- *Once I hope to gave my own CSA (even if it is a very small one…) ☺.*
- *I hope to find projects where this principle can be explored.*

The four pillars of organic agriculture—Health, Ecology, Fairness, and Care.

Principle of Care – Innovation with sustainability in mind

- *collaborate more with farmers to test agroecological alternatives, ensuring that **innovations** are not just **effective** but also **environmentally** responsible and **sustainable**.*

- *interest in sustainable farming approaches like permaculture, which emphasize **working with nature** rather than against it."*

Collaboration with farmers

All my projects are

- *started from **problems or opportunities** mentioned by **farmers** and*
- *together with them I **seek for solutions** and then*
- *we start **projects**.*

Some experiments take place at Viaverda and some at growers places.

Implementation & communication

- (Winter)meetings- symposia with farmers
- Articles
  - ✓ Proeftuinnieuws : https://www.proeftuinnieuws.be/
  - ✓ Boer en tuinder: https://www.boerenbond.be/publicaties/boertuinder
  - ✓ CCBT: https://www.ccbt.be/nl
- Website
  - ✓ Viaverda
  - ✓ Facebook – Linked in
- Farm/ cultivation oriented advice to farmers

Next steps

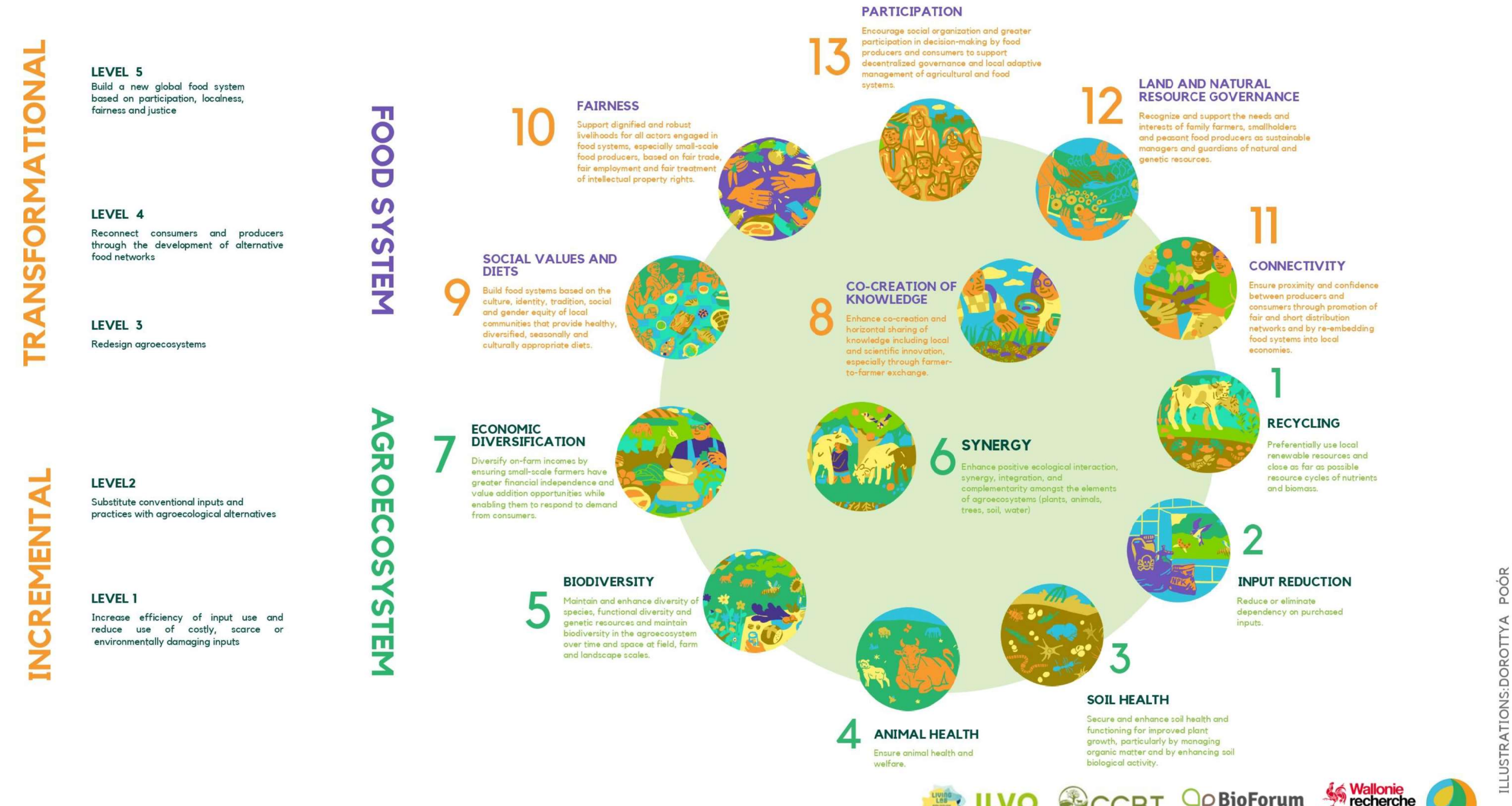
Organic farming is about more than just growing food—

it is about respecting nature, improving health, and ensuring fairness.

I want to focus on practical solutions that bring these principles to life in greenhouse vegetable production.

I invite you to collaborate, share ideas, and work together toward a more sustainable food system!“

The 13 principales of agroecology



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