European Commission

Session #4

New knowledge and innovation solutions for sustainable farming

FARM TO FORK 2020 CONFERENCE

15 - 16 October 2020

European Commission

FARM TO FORK
2020 CONFERENCE

Let's meet each other

Who is today with us in the audience?

a. a farmer
b. a representative of producer organisation / cooperative
c. an farm advisor
d. an input supplier
e. a food chain operator (processor, retailer, HoReCa, etc.)
f. a researcher / innovator
g. a policymaker (at regional, national or international level)
h. a representative of a civil society organisation
i. other

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Setting the scene

European Commission

European Green Deal

CLIMATE PACT AND CLIMATE LAW

INVESTING IN SMARTER, MORE SUSTAINABLE TRANSPORT

STRIVING FOR GREENER INDUSTRY

ELIMINATING POLLUTION

ENSURING A JUST TRANSITION FOR ALL

FINANCING GREEN PROJECTS

MAKING HOMES ENERGY EFFICIENT

LEADING THE GREEN CHANGE GLOBALLY

FROM FARM TO FORK

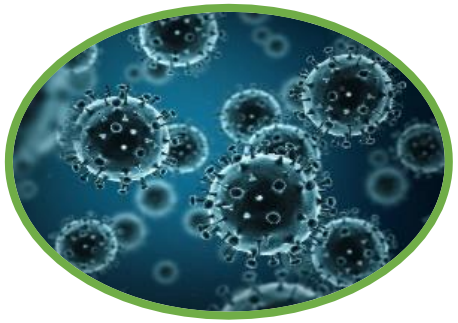
PROTECTING NATURE

PROMOTING CLEAN ENERGY

European Commission

Reduce by 50% the overall use and risk of **chemical pesticides** and reduce use by 50% of more hazardous **pesticides**

Reduce sales of **antimicrobials** for farmed animals and in aquaculture by 50%



Achieve at least 25% of the EU's agricultural land under **organic farming**

Reduce **nutrient losses** by at least 50% while ensuring no deterioration in soil fertility; this will reduce use of **fertilisers** by at least 20 %

R&I as key enablers for sustainable food systems…

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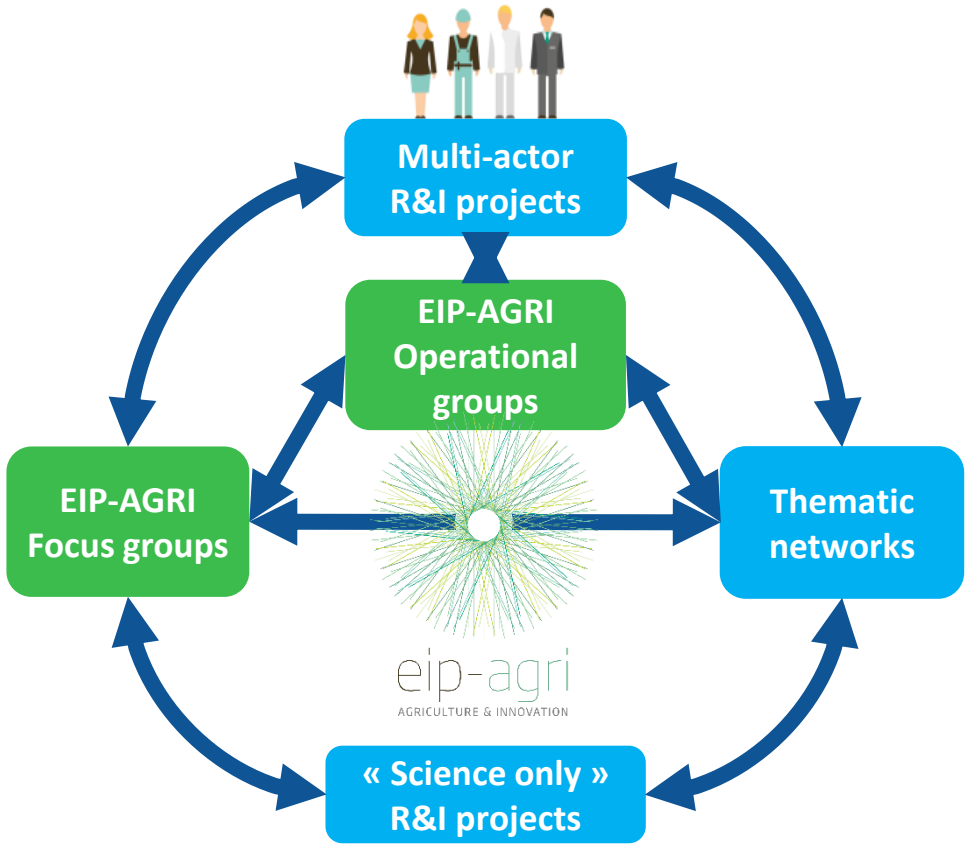
What has been achieved so far?

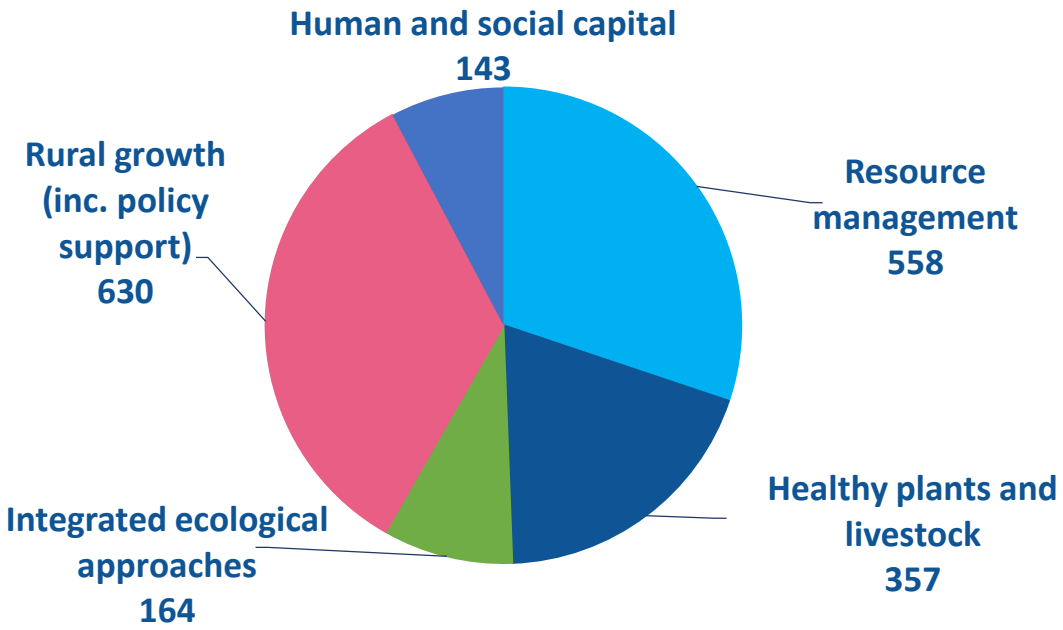
Long-term strategic approach to EU agricultural R&I

European Innovation Partnership
Agricultural Productivity and Sustainability



From strategy to action…

Distribution of budget over priorities (EUR million - 2014-2020)



315 projects – 1,9 billion €
under Horizon 2020

From strategy to action…

- ✓ **190** H2020 **multi-actor** projects (€1 billion), including **29** thematic networks; **50%** newcomers
- ✓ **27 Member States** implementing the EIP; over **2000** out of 3200 **OGs** already running
- ✓ A growing and thriving **network** and increasing volume of **practice-oriented knowledge and innovations**

eip-agri
AGRICULTURE & INNOVATION

European Commission

FARM TO FORK 2020 CONFERENCE

Showcasing innovative solutions

Let’s meet our speakers

Øyvind Overskeid

Frederik Leen

Víctor Riau Arenas

Bram Moeskops

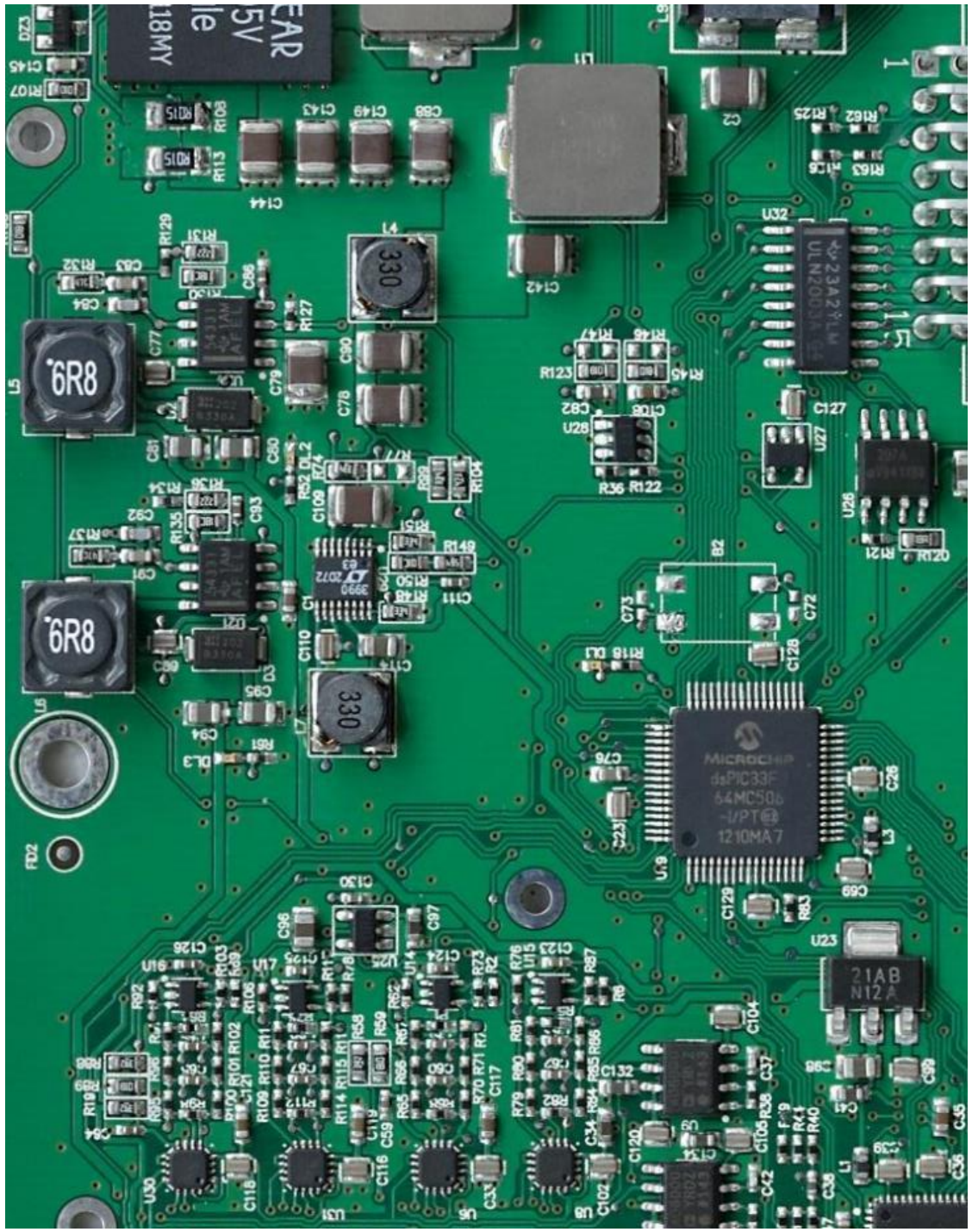
Øyvind Overskeid


Adigo
mechatronics

OUR EXPERTISE

Design of dynamic mechanics, servo systems, electronics and embedded software

Industrial design + machine + cybernetics



THE ADIGO TEAM

PROJECT ASTERIX

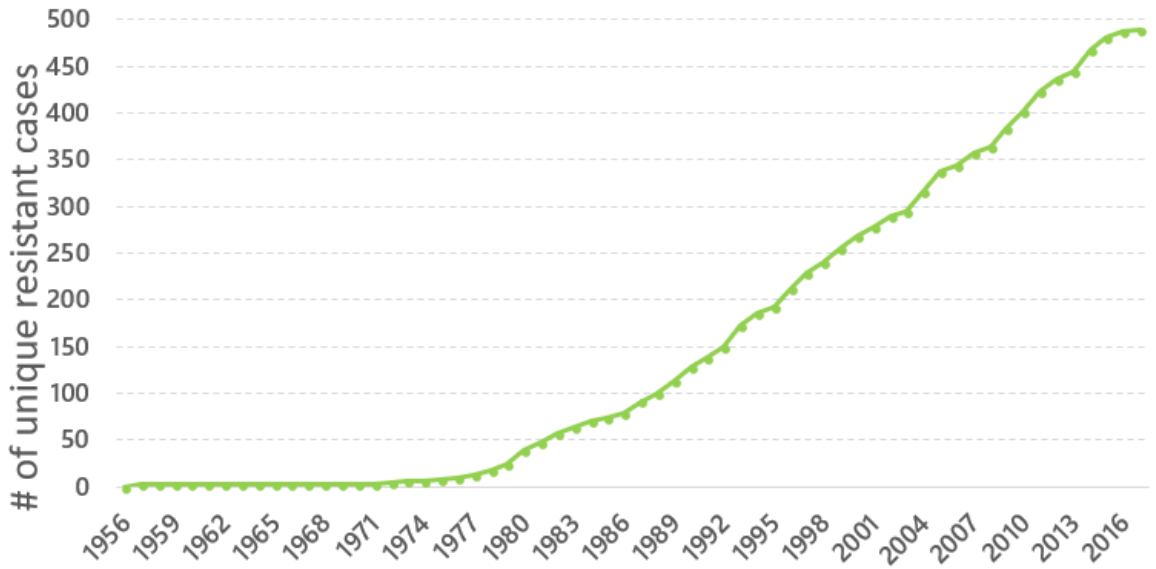
Revolutionizing vegetable production

Problem



The vegetable fields of Europe are blanket sprayed with herbicides appx. four times pr season

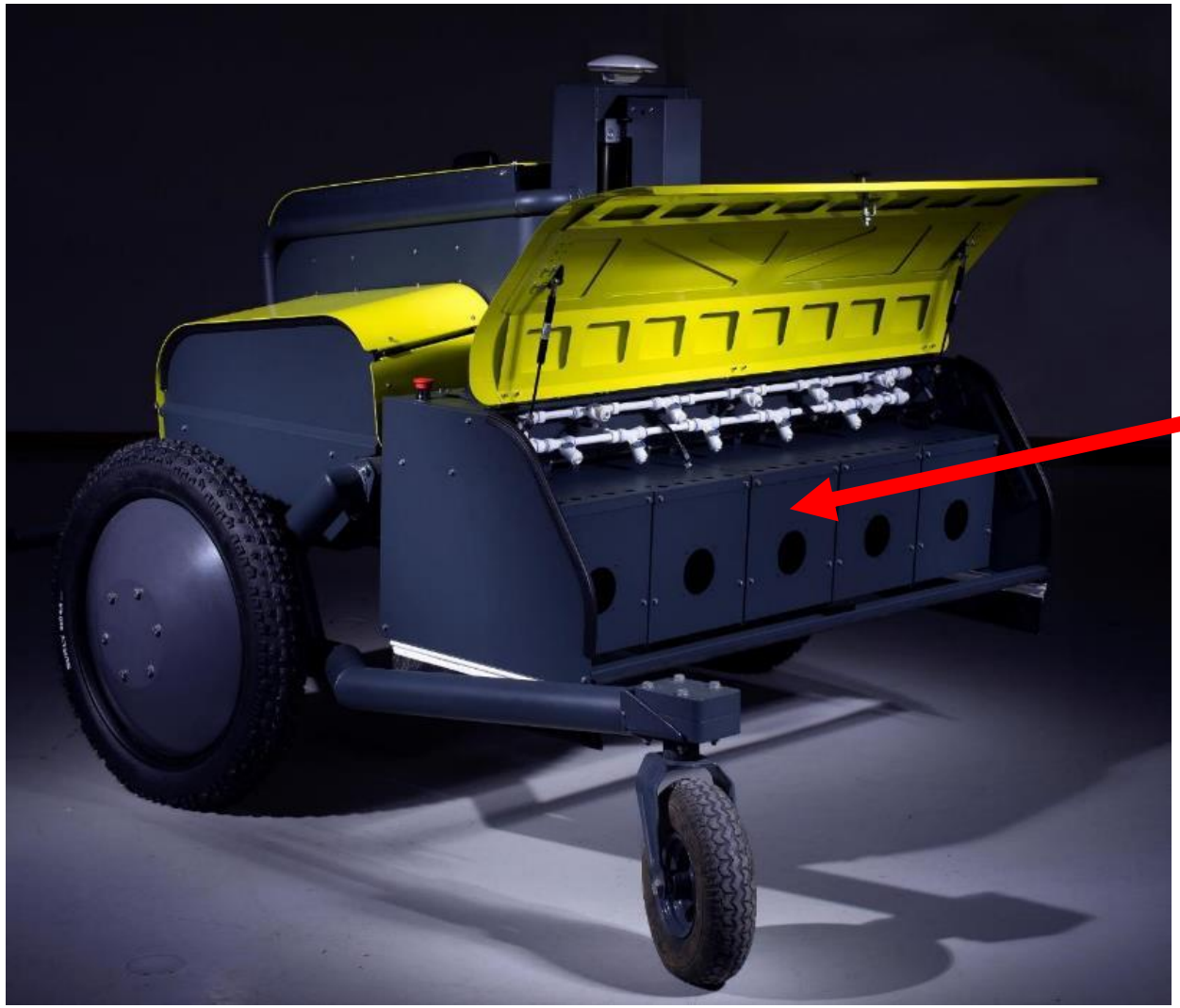
Weeding is **time consuming** and **expensive** in all vegetable fields



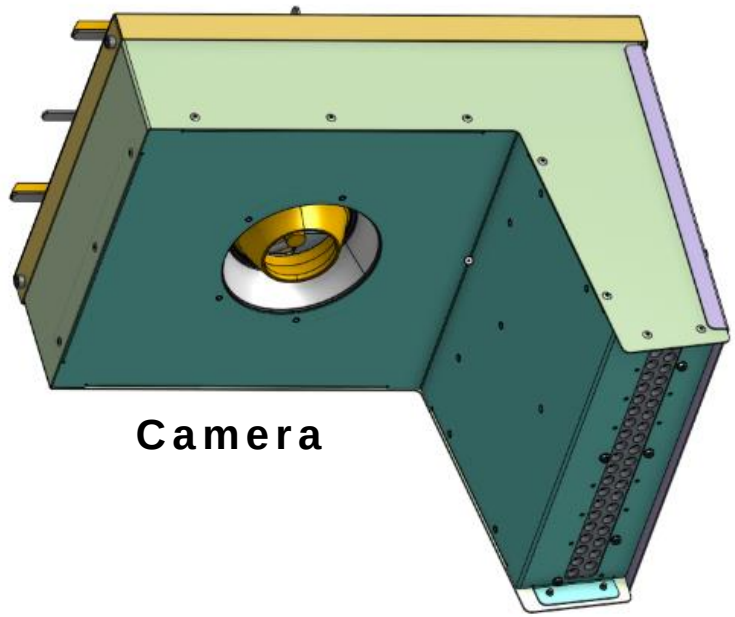
Herbicide **resistance emerge quickly** in weeds

Solution

We «print» herbicide droplets only on weeds, avoiding crops!



Patented technology



Solution

Emerging rutabaga

Nice timing for weed handling

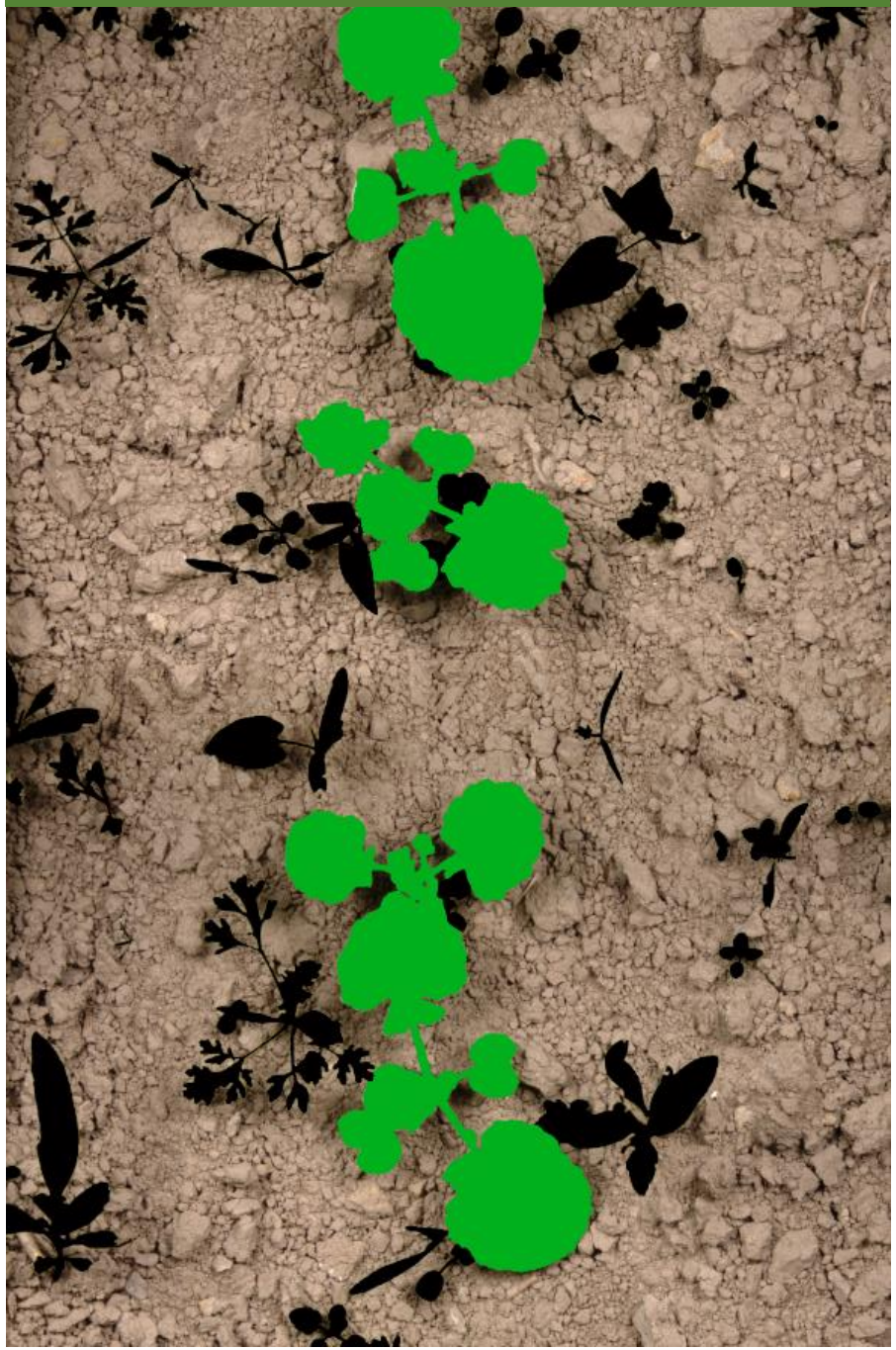
Solution

Emerging rutabaga

Nice timing for weed handling

Conventional spraying

Solution



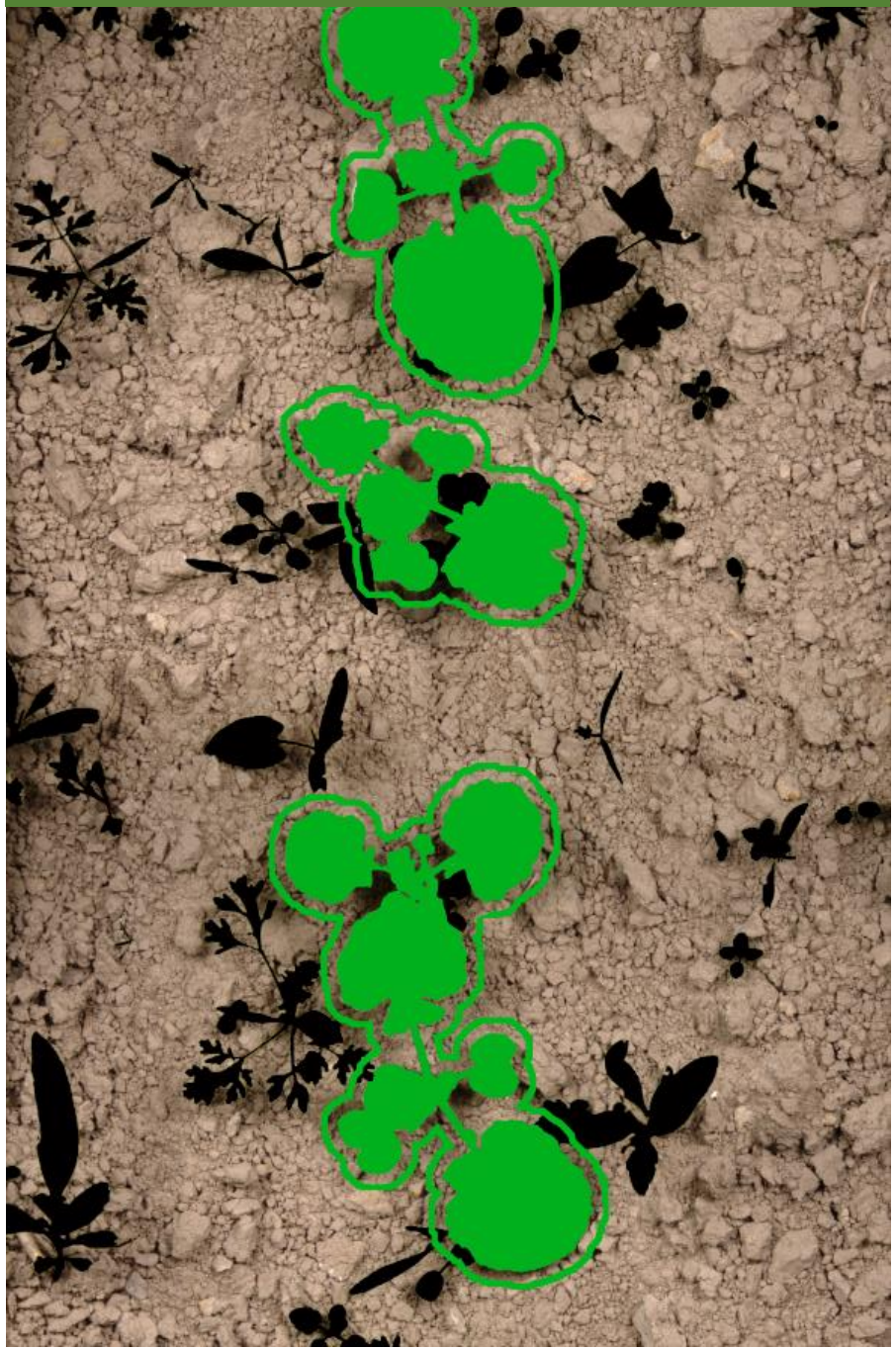
Emerging rutabaga

Nice timing for weed handling

Conventional spraying

With Asterix tech.

Solution



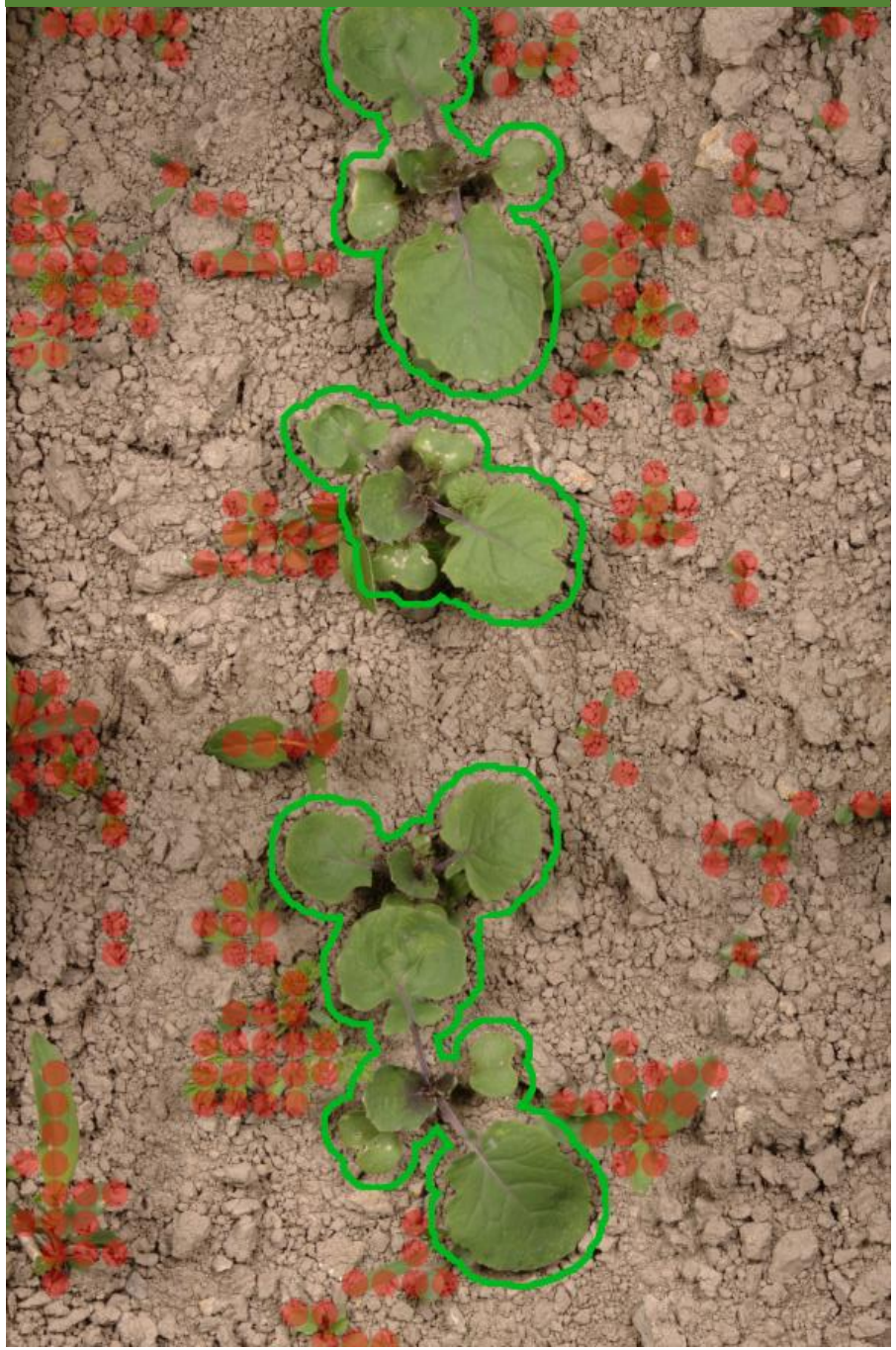
Emerging rutabaga

Nice timing for weed handling

Conventional spraying

With Asterix tech.

Solution



Emerging rutabaga

Nice timing for weed handling

Conventional spraying

With Asterix tech.

-95%

The Asterix Project

Robotic drop-on-demand intra-row weeding in seeded row crops: Results from one field trial in Parsley root in 2018

Summary and conclusions

Comparing the first robotic drop-on-demand glyphosate application in June with the blanket application of Fenix showed that the robot was better than the blanket application in controlling the total number of weeds (p= 0.001) and the dominating weed species, *Solanum nigrum* (p= 0.001), whereas the number of crop plants (p= 0.468) were indifferent.

In conclusion, the robotic drop-on-demand application of glyphosate did not accidently kill crop plants, which indicates high precision and accuracy of this novel robotic weeding implement. Depending on the time in season, robotic weeding strategies controlled the weeds better than (July 3) or equal to (August) ordinary blanket application of Centium and/or Fenix.

Asterix with Finalsan

in post-emerge Parsley root

Farmers practice

Asterix with Finalsan

in post-emerge Parsley root

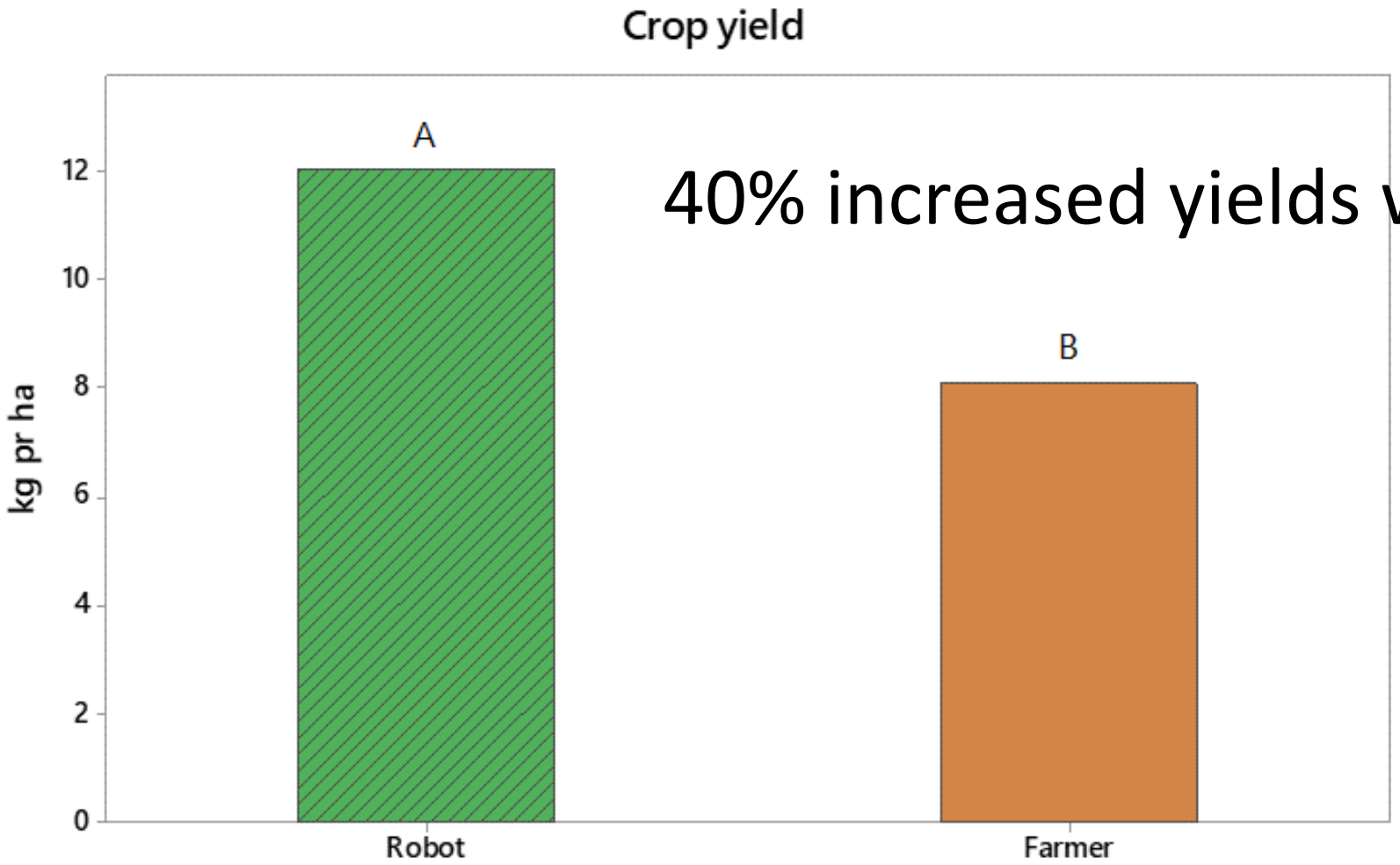
Farmers practice

VS

Asterix

601 1	R 602 3	**R 603 2**		**R 701 12**	**702 11**	**R 801 12**	**802 11**	**R 901 12**	**R 902 11**
R 501 3	**R 502 2**	**503 1**							
R 401 2	**402 1**	R 403 3		**R 401 12**	**402 11**	**R 501 12**	**502 11**	**R 601 12**	**R 602 11**
R 301 3	**R 302 2**	**303 1**							
201 1	R 202 3	**R 203 2**		**R 101 12**	**102 11**	**R 201 12**	**202 11**	**R 301 12**	**R 302 11**
R 101 2	**102 1**	R 103 3							

Field test – 2019 - yield



40% increased yields with Asterix!

Fig. 3 Sellable crop yield in Experiment 2. The mean crop yield in weeding strategy Robot (12.03 kg ha-^{1}) was significantly higher (paired t-test, p = 0.042) than the mean yield of Farmer strategy (8.11 kg ha-^{1}). The number of sellable roots of strategy Robot (120 486 roots per ha) was significantly higher (p = 0.025) than the strategy Farmer (86 806 roots per ha).

Species, so far..

Carrots

Onion

Black beetroot

Parsley root

Cabbage

Corn salad

Beetroot

Spinach

Ruccola

Rutabaga

Cylinder radish

Strawberry

Value Proposition –Conventional farming

Drastic reduction in herbicide use

Works in sown and planted cultures

Increased yields

Reduced soil compaction

Eliminates herbicide drift

Large weather window

Attractive investment, ROI <2 years

Asterix – Adigo spin-off

Currently: Department in Adigo AS

From 2021: A separate company: Kilter AS

Our partners

Project Asterix is supported by the European Union's Horizon 2020 SME instrument phase 2

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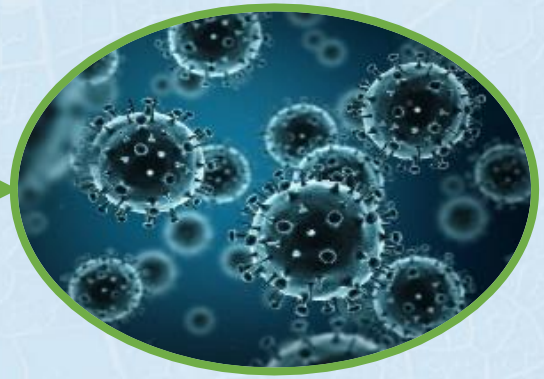
disarm



Frederik Leen

Farm Health Action plans: translating R&I to the farm-specific context to tackle AMR

Farm to fork conference 16/10/2020

Frederik Leen Ph.D.

disarm

Disseminating Innovative Solutions for Antibiotic Resistance Management

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

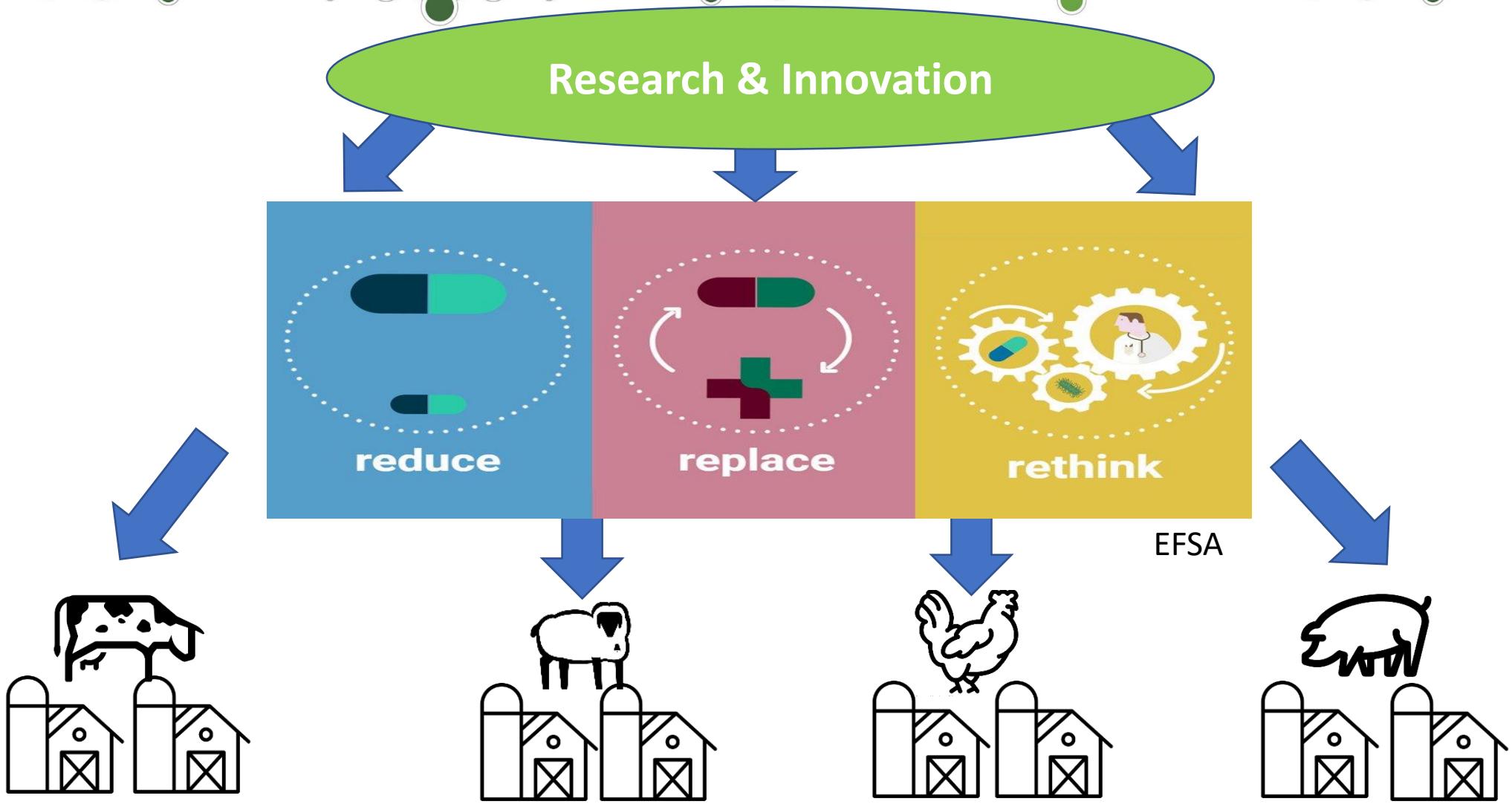
Why reducing AMU?

“Keeping the shine
on the silver bullet.”

Preserving the efficacy of antibiotics for future generations of both humans and animals

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under Grant Agreement No 817591

Translate R&I to farming context



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

- ✓ Linking stakeholders
- ✓ Collecting
- ✓ Disseminating and promoting
- ✓ Showcasing farm health teams

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

Farm Health Teams

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

FHT from science to practice

Scientific studies on Farm health teams & Farm health planning

GHENT UNIVERSITY

FACULTY OF VETERINARY MEDICINE
accredited by EAEVE

ILVO

Utrecht University

Implementation in daily practice

ZLTO

Wider promotion in EU livestock industry

disarm

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

disarm

Toolbox for FHT underway

Plan-Do-Check-Act

Assess farm status

Engage team and team collaboration

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

Keep the shine on the bullet!

Try the Farm Health Team approach!

- *for the benefit of your farm or that of your clients*
- *for the sake of safeguarding antibiotics for future generations*

Thank you for listening!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

European Commission

FARM TO FORK 2020 CONFERENCE

Circular Agronomics

Víctor Riau Arenas

FARM TO FORK
2020 CONFERENCE

15 - 16 October 2020

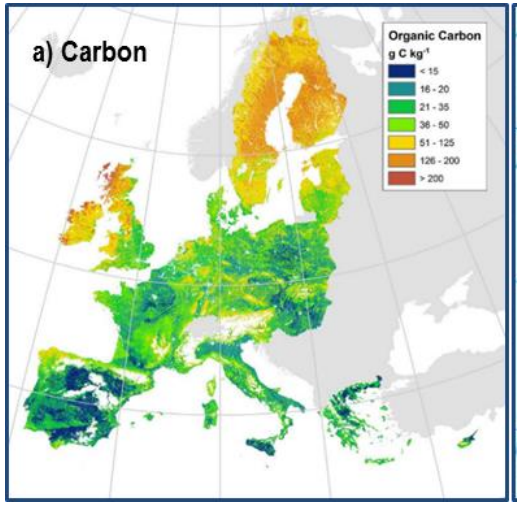
Circular Agronomics

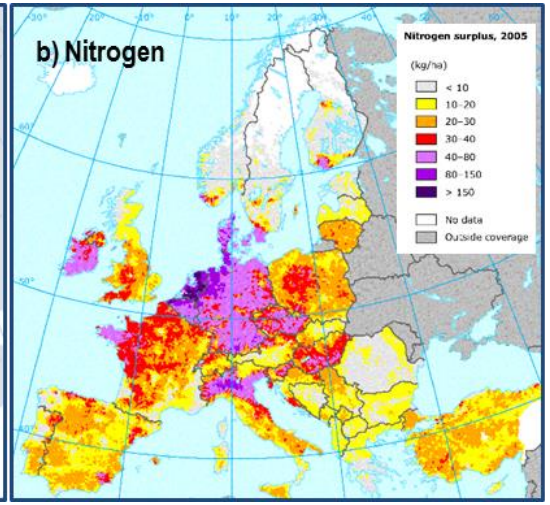
Dr. Victor Riau

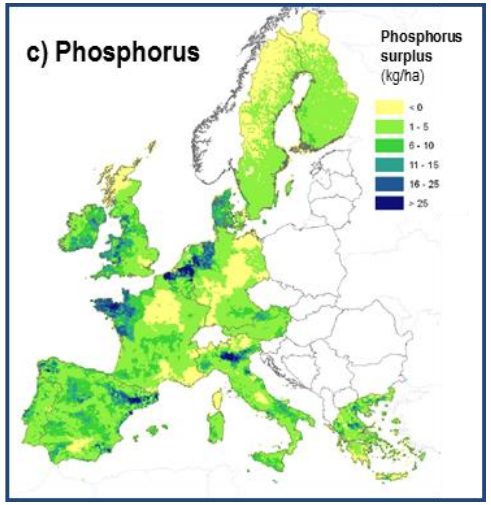
IRTA
RESEARCH & TECHNOLOGY
FOOD & AGRICULTURE

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme, under ***Grant Agreement No 773649***

CASE STUDIES

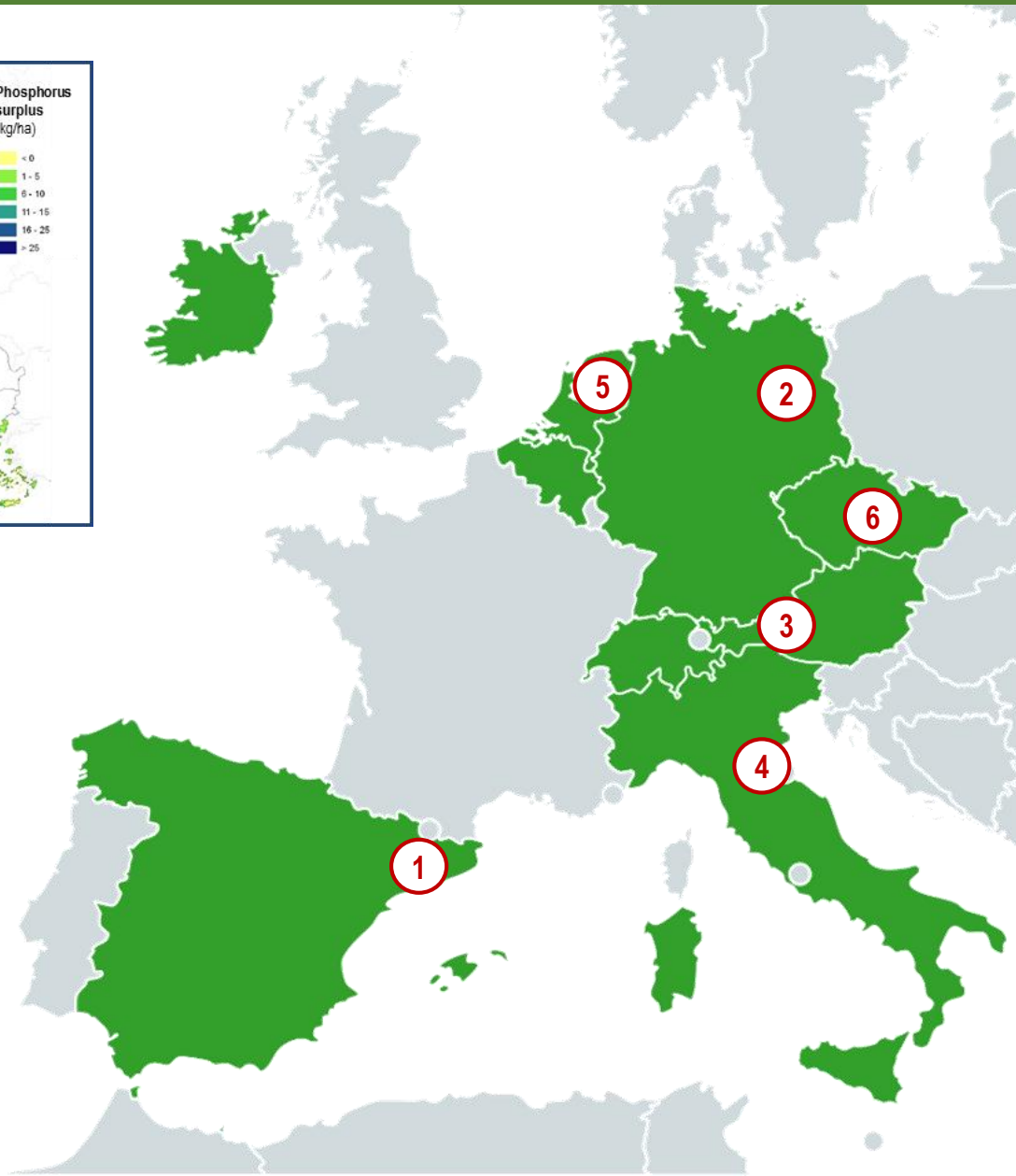


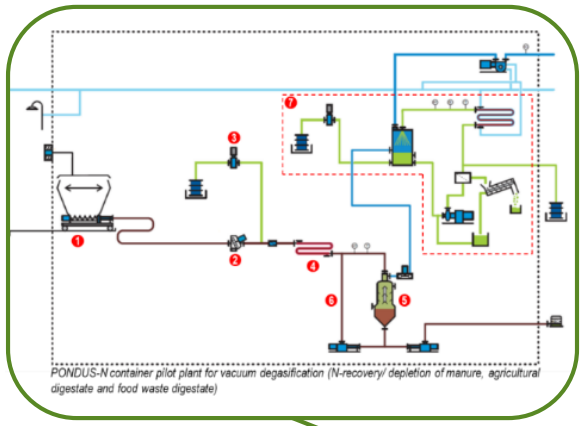


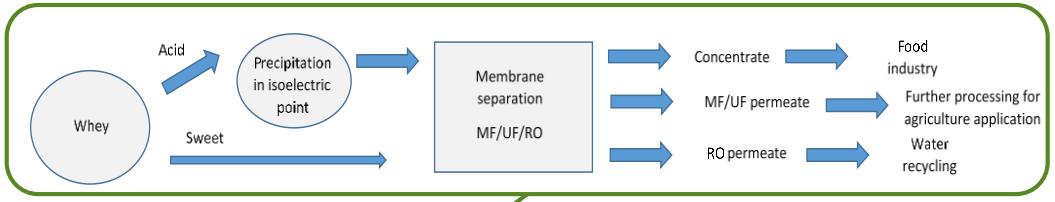


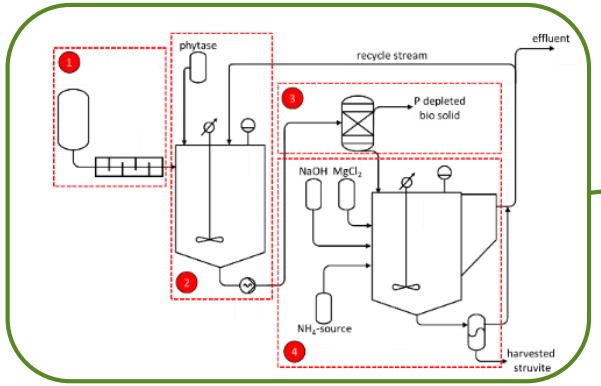
CASE STUDIES

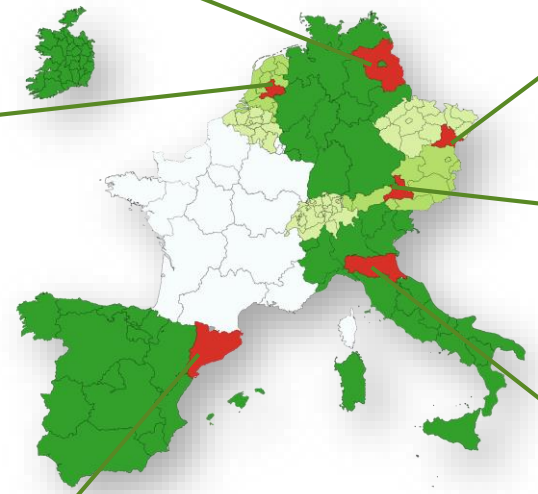
1) **Catalonia**, Spain
2) **Brandenburg**, Germany
3) **Lungau**, Austria
4) **Emilia-Romagna**, Italy
5) **Gelderland**, Netherlands
6) **South Moravia**, Czech Republic

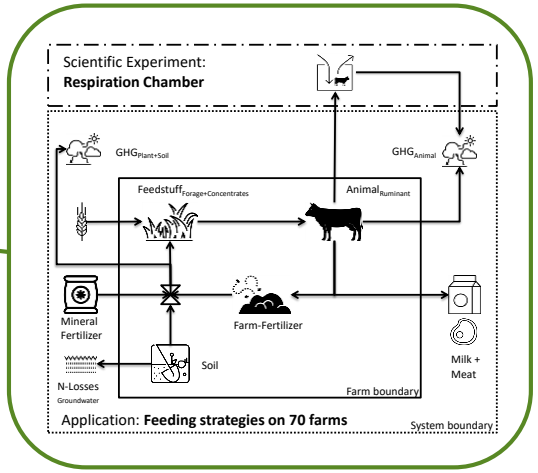


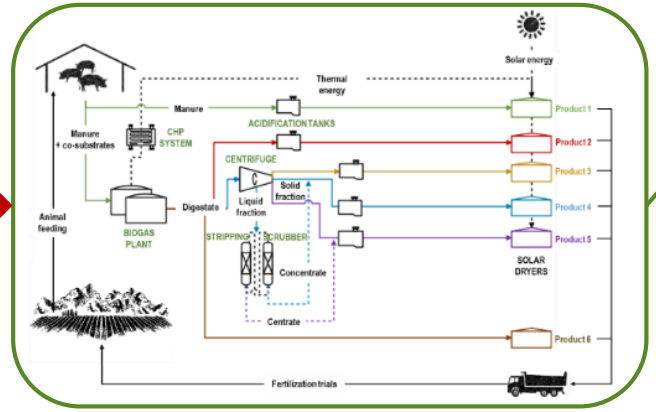

PONDUS-N container pilot plant for vacuum degasification (N-recovery/ depletion of manure, agricultural digestate and food waste digestate)

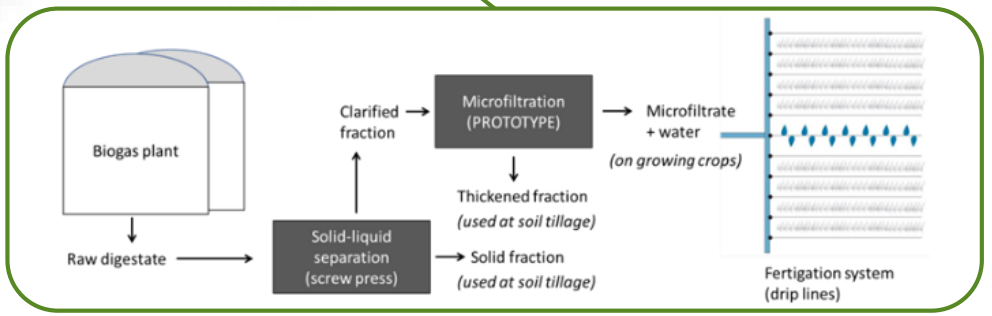

Whey
Acid
Sweet
Precipitation in isoelectric point
Membrane separation
MF/UF/RO
Concentrate
MF/UF permeate
RO permeate
Food industry
Further processing for agriculture application
Water recycling


phytase
recycle stream
effluent
P depleted bio solid
NaOH
$MgCl_2$
NH_4-source
harvested struvite




Scientific Experiment:
Respiration Chamber
$GHG_{Plant+Soil}$
GHG_{Animal}
$Feedstuff_{Forage+Concentrates}$
$Animal_{Ruminant}$
Mineral Fertilizer
Farm-Fertilizer
Milk + Meat
Soil
N-Losses
Groundwater
Farm boundary
Application: Feeding strategies on 70 farms
System boundary


Solar energy
Thermal energy
Manure
Manure + co-substrates
CHP SYSTEM
ACIDIFICATION TANKS
CENTRIFUGE
Digestate
Solid fraction
Liquid fraction
STRIPPING
SCRUBBER
Concentrate
Centrate
BIOGAS PLANT
Animal feeding
SOLAR DRYERS
Product 1
Product 2
Product 3
Product 4
Product 5
Product 6
Fertilization trials


Biogas plant
Raw digestate
Solid-liquid separation (screw press)
Clarified fraction
Microfiltration (PROTOTYPE)
Thickened fraction
(used at soil tillage)
Solid fraction
(used at soil tillage)
Microfiltrate + water
(on growing crops)
Fertigation system (drip lines)

SPANISH CASE STUDY (CATALONIA)

- **Mixed farming system** – Ruminant Production + fodder crops production. Precision feeding, bedding strategies.
- **Pig manure valorisation, bioenergy and fertilizer production from manure**. Anaerobic co-digestion, solid-liquid separation, solar drying and stripping, **fertilization trials.**
- **Long-term organic fertilization trials**. Application of organic amendments: C-sequestration, N and P assessment.

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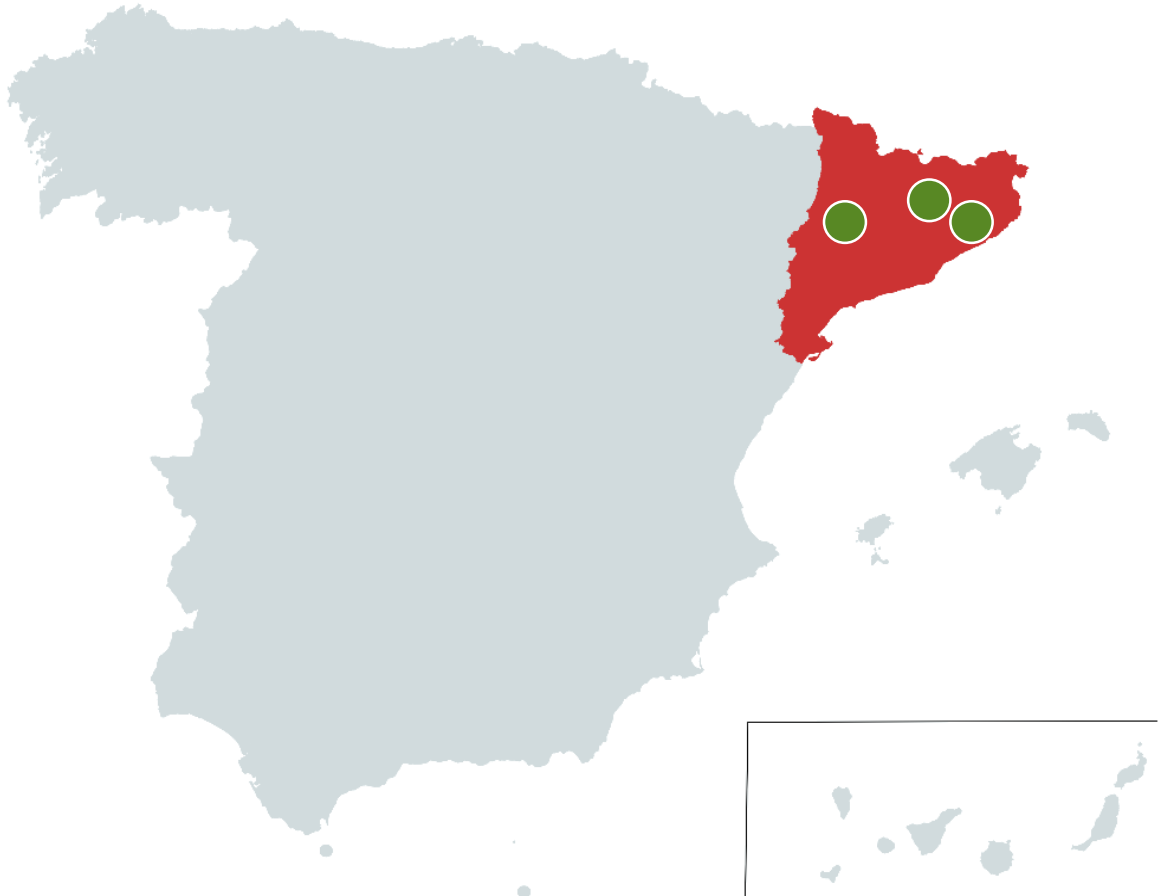
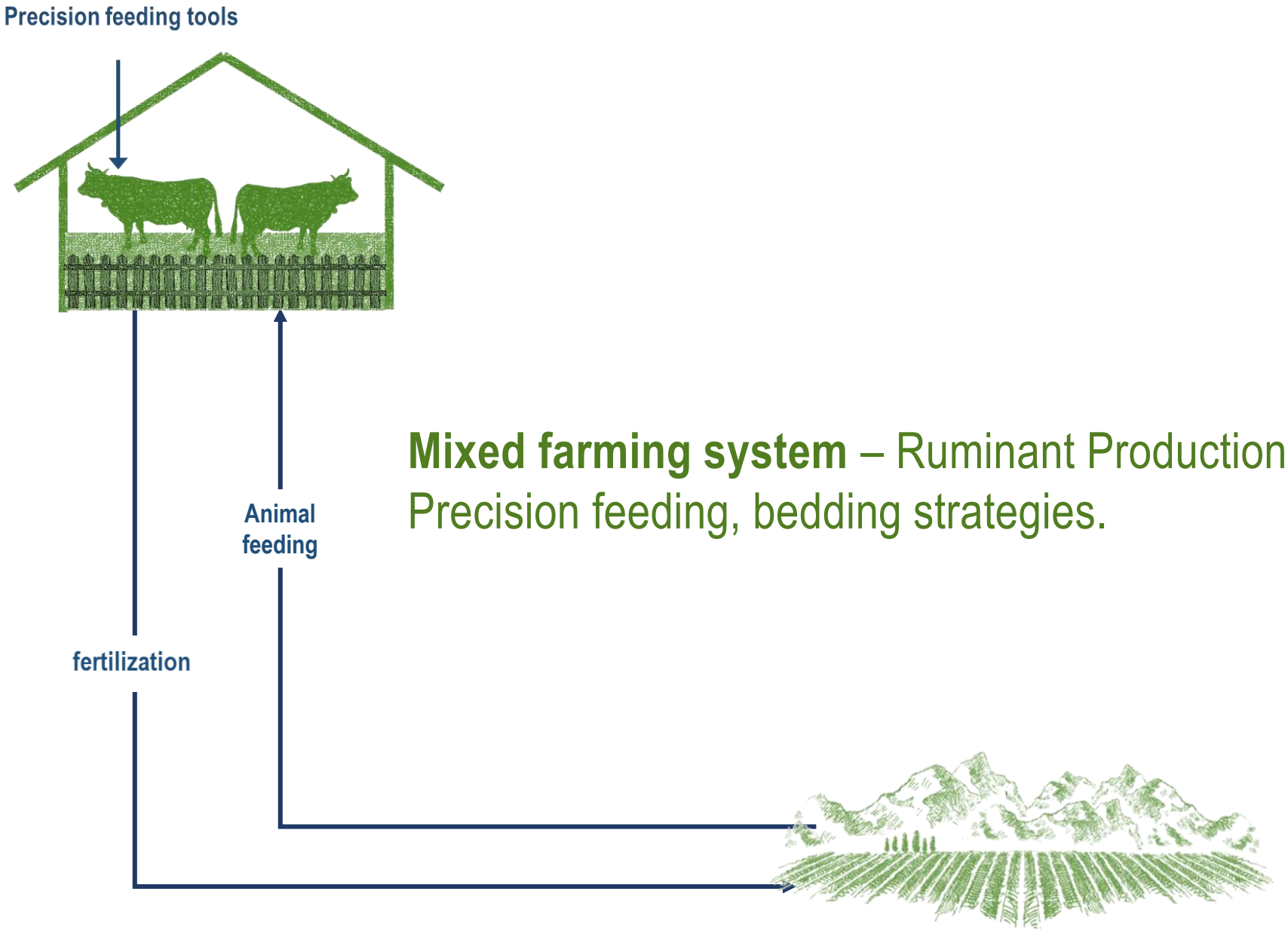
FOOD & AGRICULTURE

EMA
Depuració i Enginyeria de l'Aigua, slu.

PORGA PORCS SL



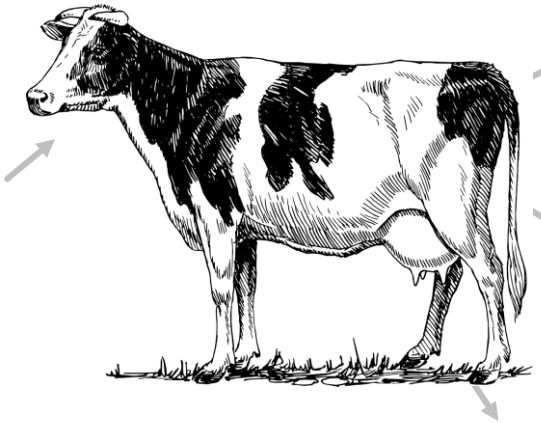
SITE 1 (CATALONIA)



Mixed farming system – Ruminant Production + fodder crops production.
Precision feeding, bedding strategies.

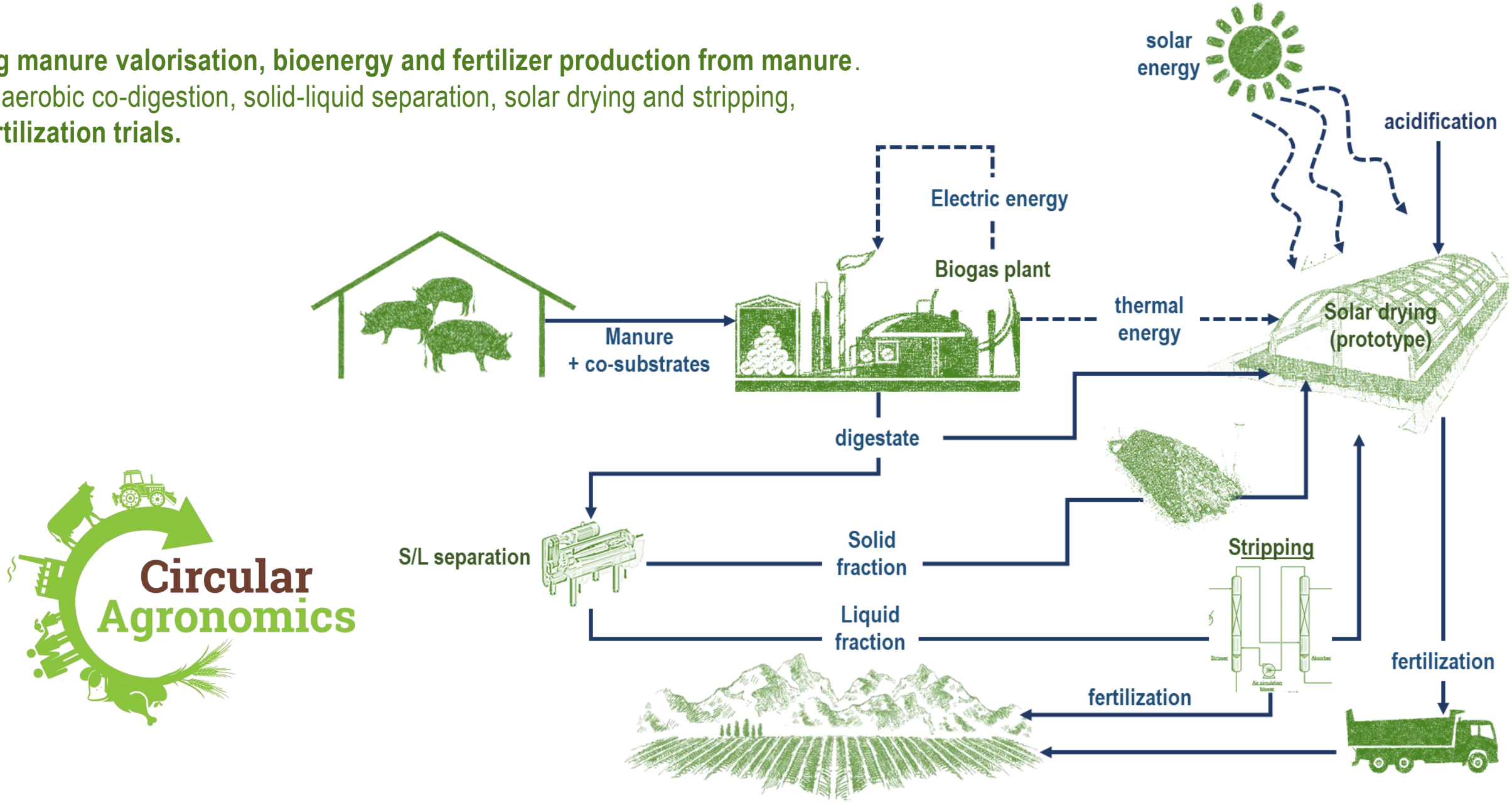
PRECISION FEEDING SYSTEM (CATALONIA)

	CONVENTIONAL	PRECISION
INTAKE	674 g/d N	637 g/d N
FECES	2.91 g N total/100 g	2.84 g N total/100 g
URINE	196 g N total/d 145 g N urea/d	142 g N total/d 85 g N urea/d
MILK	194 g/d N total 130 mg/dl urea	183 g/d N total 77 mg/dl urea
PLASMA	Urea 17.8 mg/dl	Urea 15.1 mg/dl



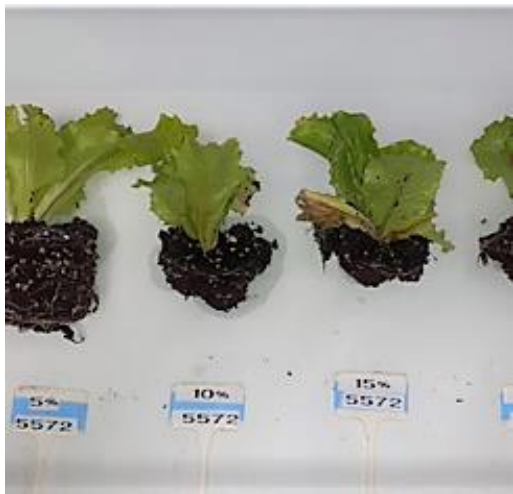
SITE 2 (CATALONIA)

Pig manure valorisation, bioenergy and fertilizer production from manure.
Anaerobic co-digestion, solid-liquid separation, solar drying and stripping,
fertilization trials.



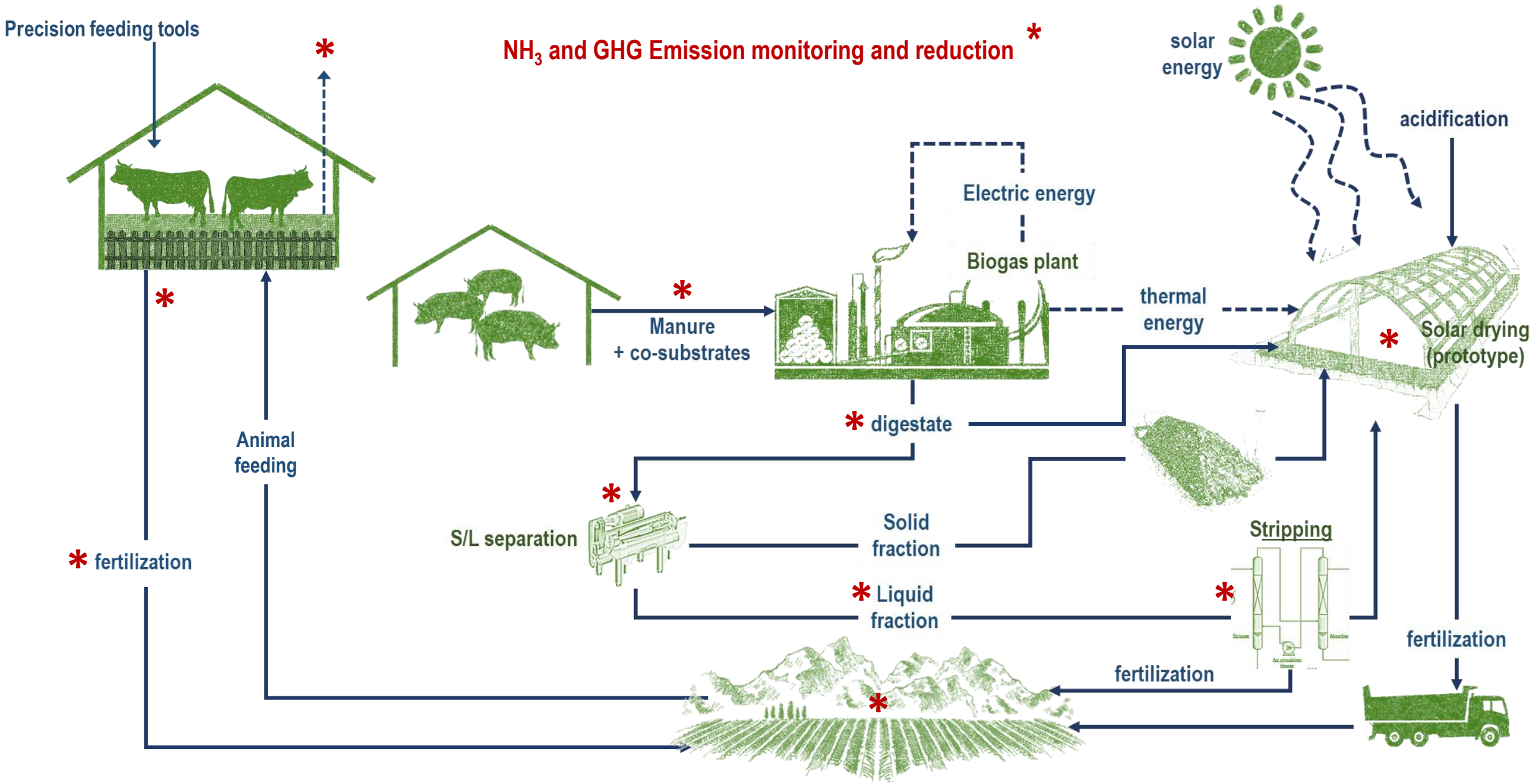
Circular Agronomics


REDMI NOTE 8T
AI QUAD CAMERA


5%
5572
10%
5572
15%
5572

SOLAR DRYING (CATALONIA)

SPANISH CASE STUDY (CATALONIA)



THANKS FOR YOUR ATTENTION

victor.riau@irta.cat

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme, under ***Grant Agreement No 773649***

European Commission

FARM TO FORK 2020 CONFERENCE

OK NET arable

OK NET ecofeed

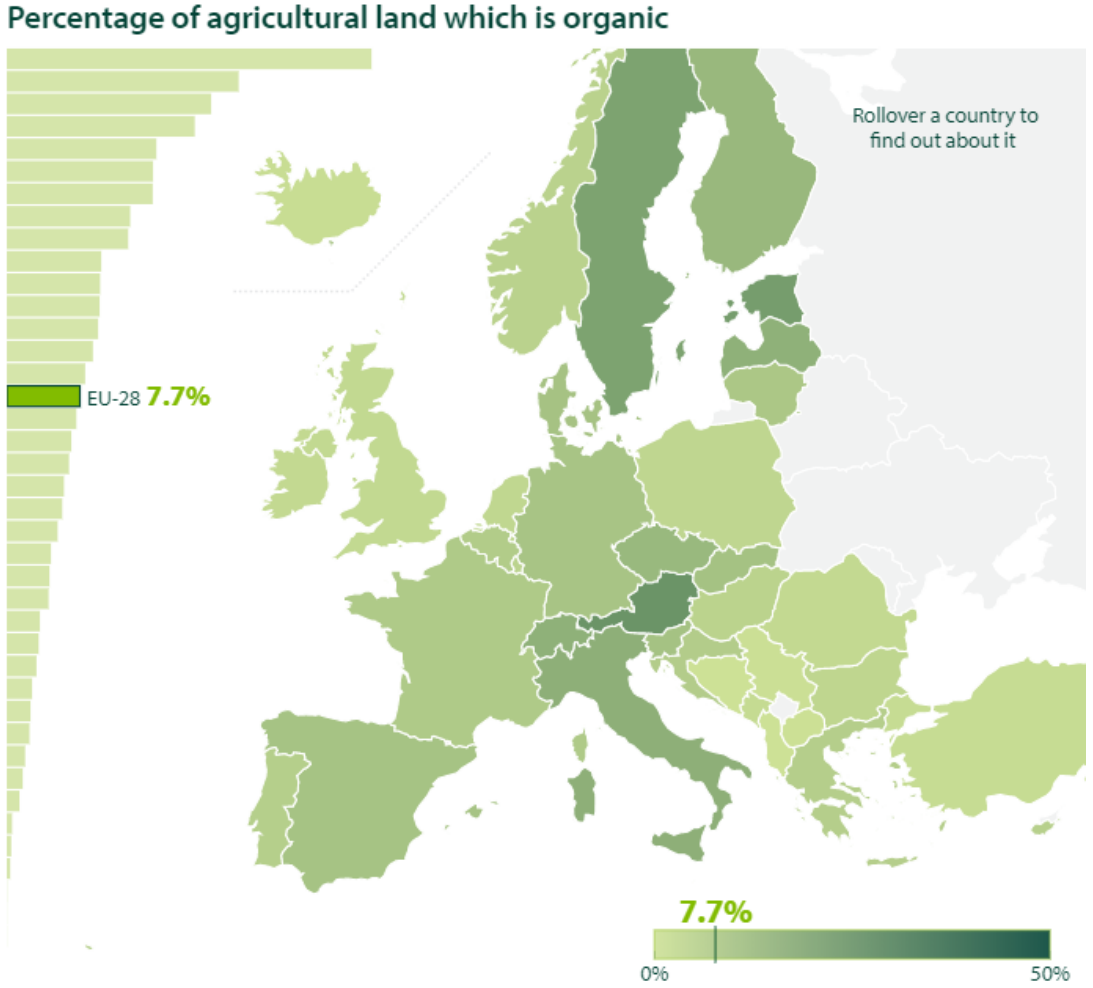
Bram Moeskops

Research and innovation for achieving 25% organic farmland

Bram Moeskops, Research & Innovation Manager

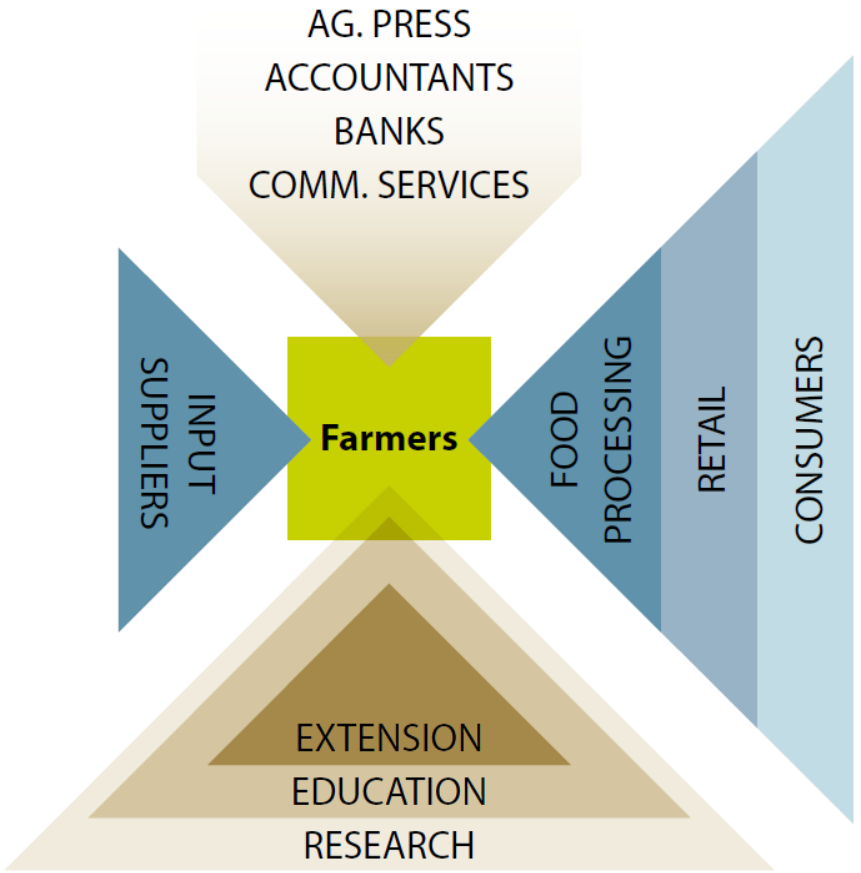
IFOAM ORGANICS EUROPE

Organic farmland in the EU: From 8% to 25%



IFOAM ORGANICS EUROPE

Reaching 25% organic farmland requires R&I at all levels of the food system



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Input supply
Organic seed from adapted cultivars

Farming methods
No-till system with cover crops

Farming methods
Better livestock management for less antibiotics

RELACS
IMPROVING INPUTS FOR ORGANIC FARMING

IFOAM
ORGANICS EUROPE

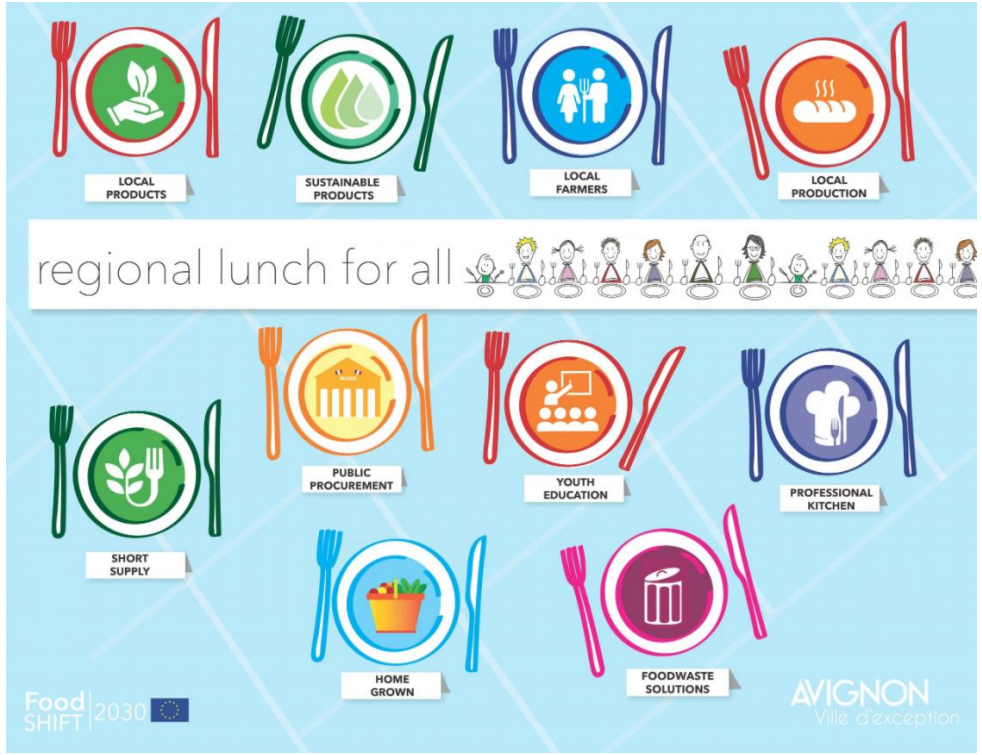
Food processing
Enhanced quality certification in organic wine

INTERNET OF FOOD & FARM

IFOAM ORGANICS EUROPE

Consumption
Public procurement as a driver for regional, sustainable and organic food systems

FOODSHIFT 2030



IFOAM ORGANICS EUROPE

Knowledge networks for accelerating adoption

Face-2-face knowledge exchange

On-line knowledge exhange

Organic Farm Knowledge

https://organic-farmknowledge.org/

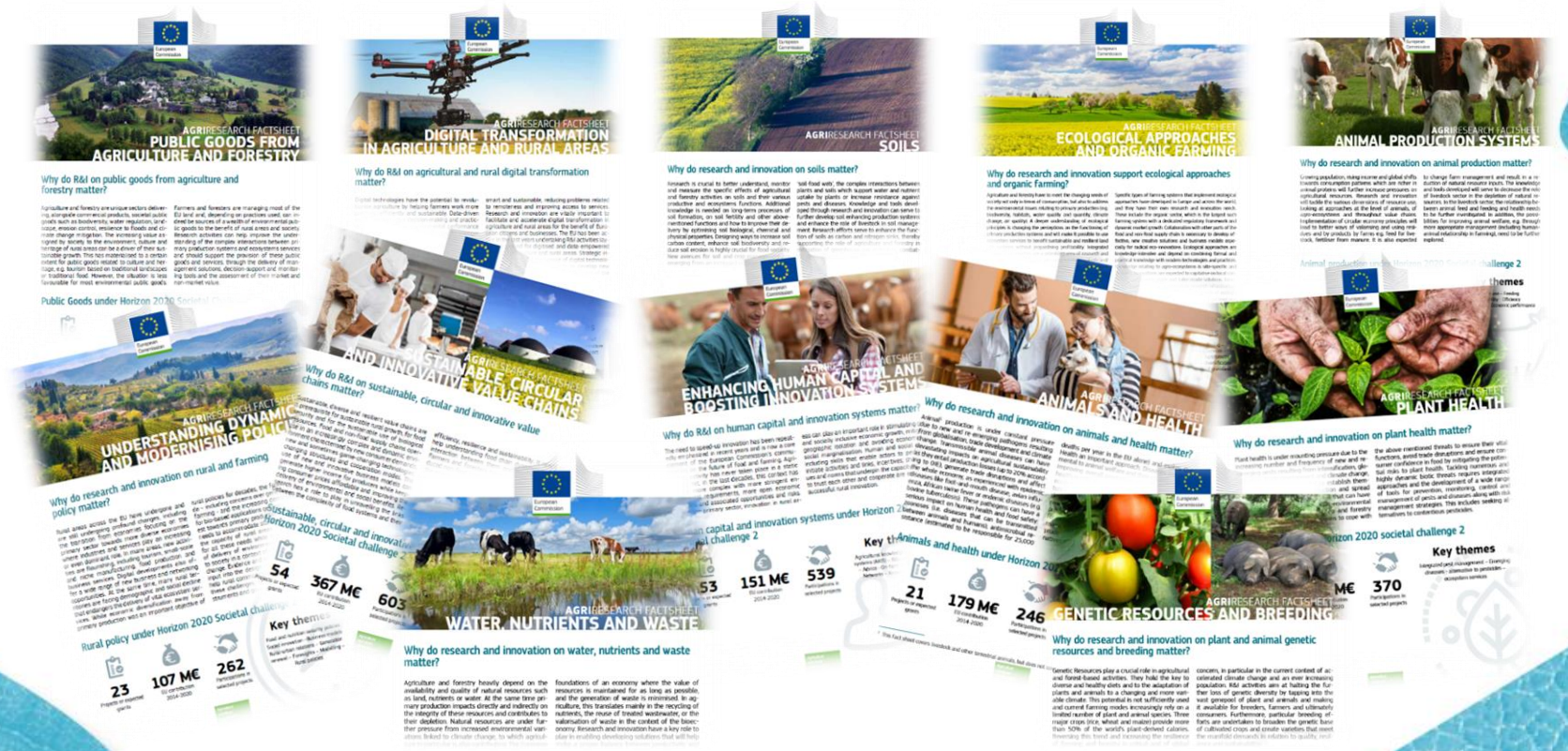
IFOAM ORGANICS EUROPE

Take home messages

- Building on dynamics of organic agriculture to create sustainable food systems is smart and reasonable
- Research & Innovation is needed at all levels of the organic food system
- A strong organic “Agricultural Knowledge and Innovation System” is crucial
- And… don’t forget the CAP. It should be fully aligned with Farm to Fork Strategy.
- Bram.Moeskops@organicseurope.bio

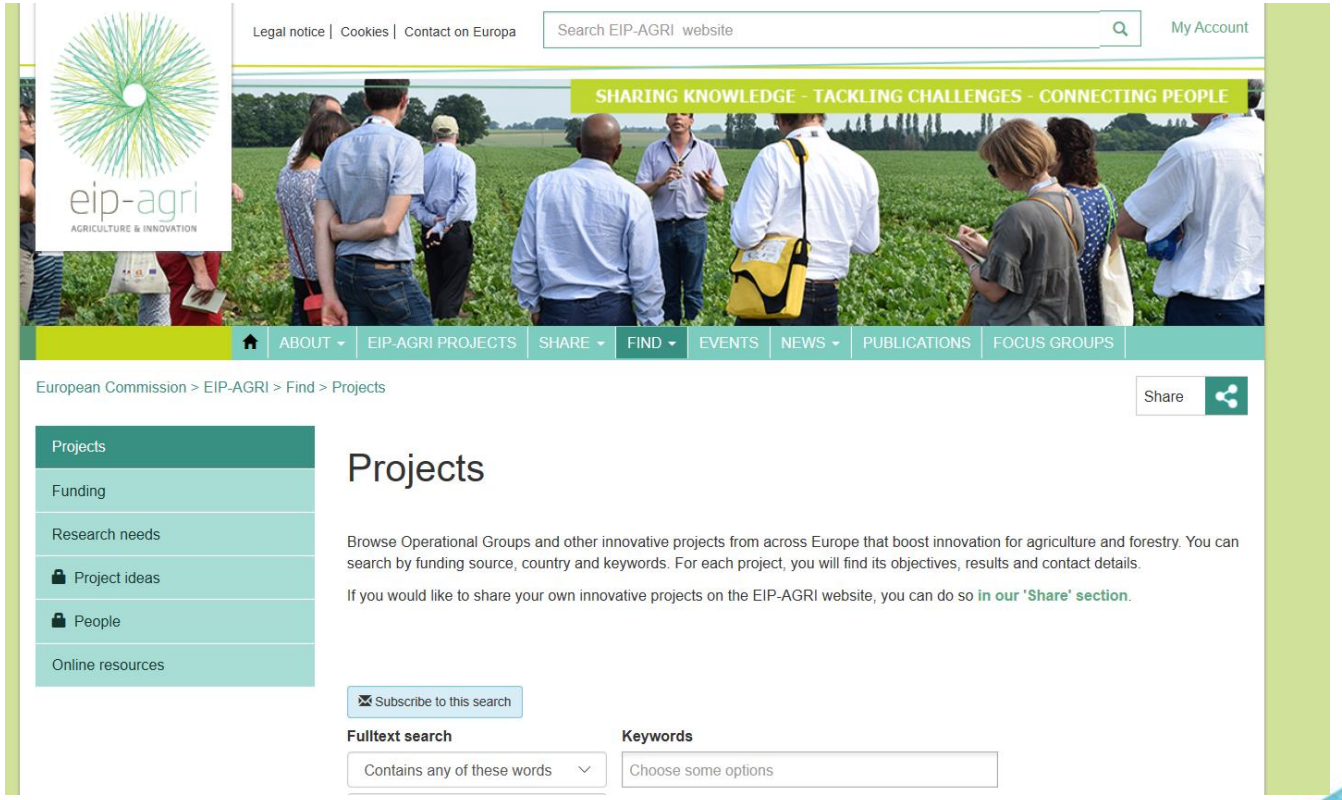
IFOAM ORGANICS EUROPE

More Horizon 2020 projects…



https://ec.europa.eu/agriculture/research-innovation/documents-links_en

… and EIP-AGRI operational groups



https://ec.europa.eu/eip/agriculture/en/find-connect/projects

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FARM TO FORK 2020 CONFERENCE

What is planned for the future?

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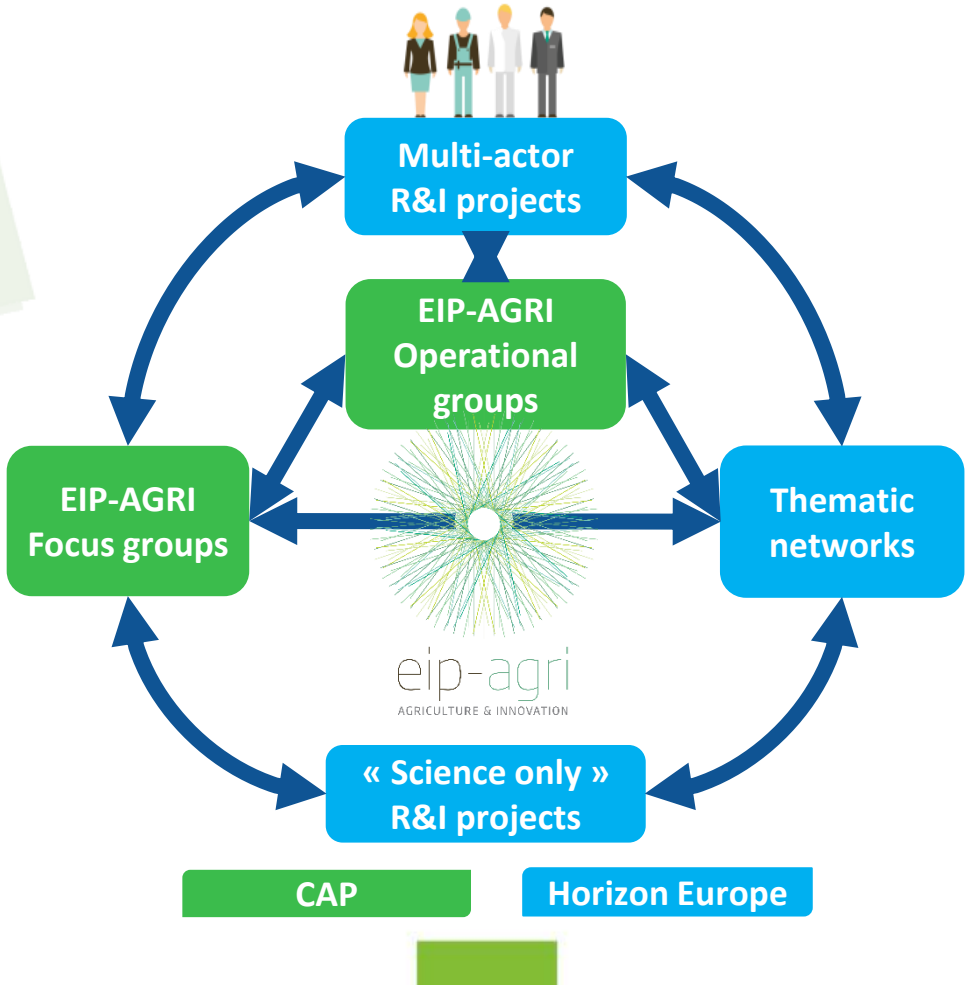
How to maximise the impact of research and innovation on the ground supporting farmers in the transition to sustainable food systems from farm to fork?

Investing in research and innovation

Around 9 billion € food, bioeconomy, natural resources, agriculture and environment

Boosting implementation & impact on the ground



Boosting implementation & impact on the ground

Encouraging synergies

Accelerating farming systems transitions: agroecology living labs and research infrastructures

Safe and sustainable food systems for people, planet and climate

Agriculture of data

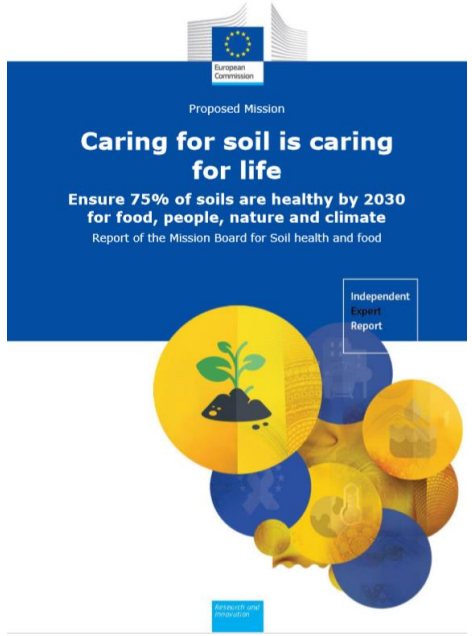
Animals and health

Leaving space for new approaches

R&I Mission

Caring for soil is caring for life

Ensure 75% of soils are healthy by 2030
for healthy food, people, nature and climate



SOIL HEALTH AND FOOD

European Commission

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Panel discussion

Let’s meet our panellist

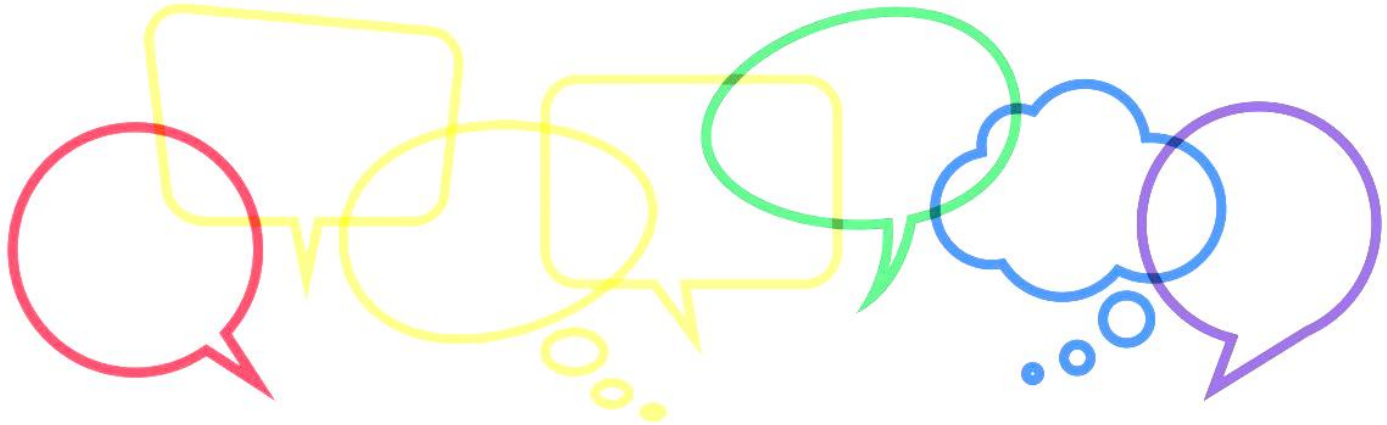
Isabel Carvalhais

Anikó Juhász

Doris Letina

Monika Beck

European Commission



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Conclusions