How participatory research contributes to agroecological transition
- introducing ÖMKi's on-farm Living Lab network

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ÖMKi
Ökológiai Mezőgazdasági Kutatóintézet
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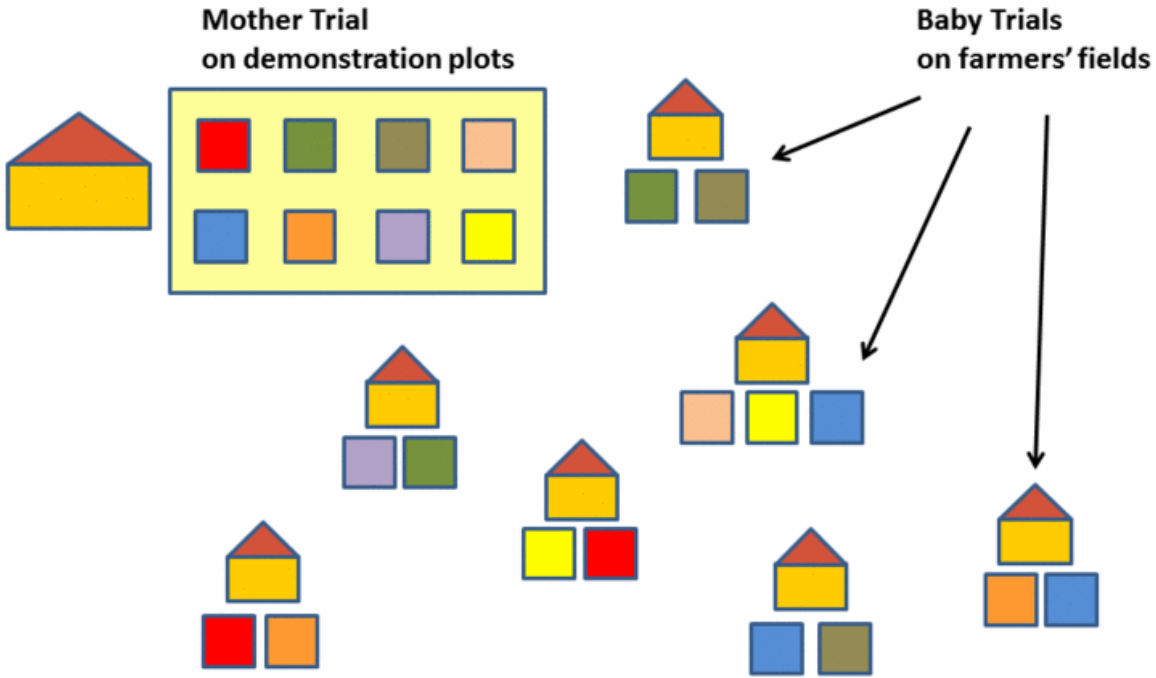
ÖMKi,
the Hungarian Research Institute of Organic Agriculture

Established in 2011 with the aim of promoting the improvement and more widespread use of organic agriculture in Hungary.

2012: Launch of On-farm participatory research network

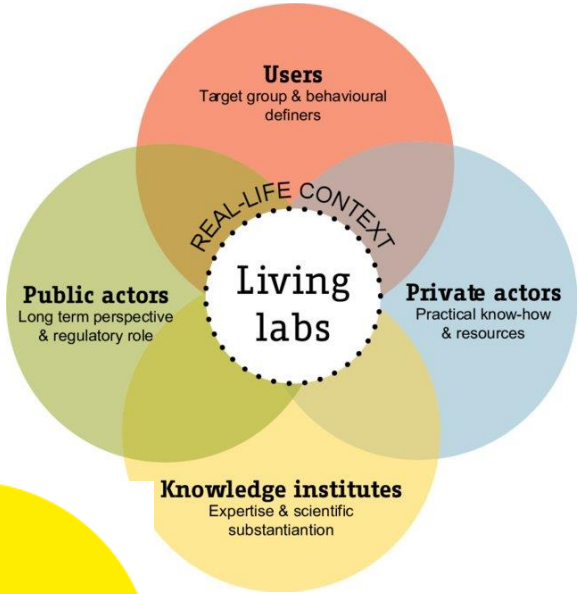
2020: Living Lab accreditation by the European Network of Living Labs (ENoLL).

Mother-baby experimental design – a participatory research approach



Living Labs (LLs)

Living Labs (LLs) are defined as **user-centred**, open **innovation ecosystems** based on systematic user **co-creation approach**, integrating research and innovation processes in **real life communities and settings**. (ENoLL 2020)



European Network of Living Labs

Steen & van Buerren 2017

ÖMKi's Participatory On-Farm research method

Product development process

On-Farm Research

Engaging wider range of stakeholders

Practical problem definition (ÖMKi together with farmers)

- Farmers from around the country, other R&D institutes, breeders, traders etc.

Field trials and experiments adjusted to the farms' everyday practice (real-life production scenarios)

Recording data (ÖMKi together with the farmers)

Analysis and presentation of the results (ÖMKi) and discussion (together)

Publications, open access, workshops, knowledge sharing events (ÖMKi with sectoral stakeholders)

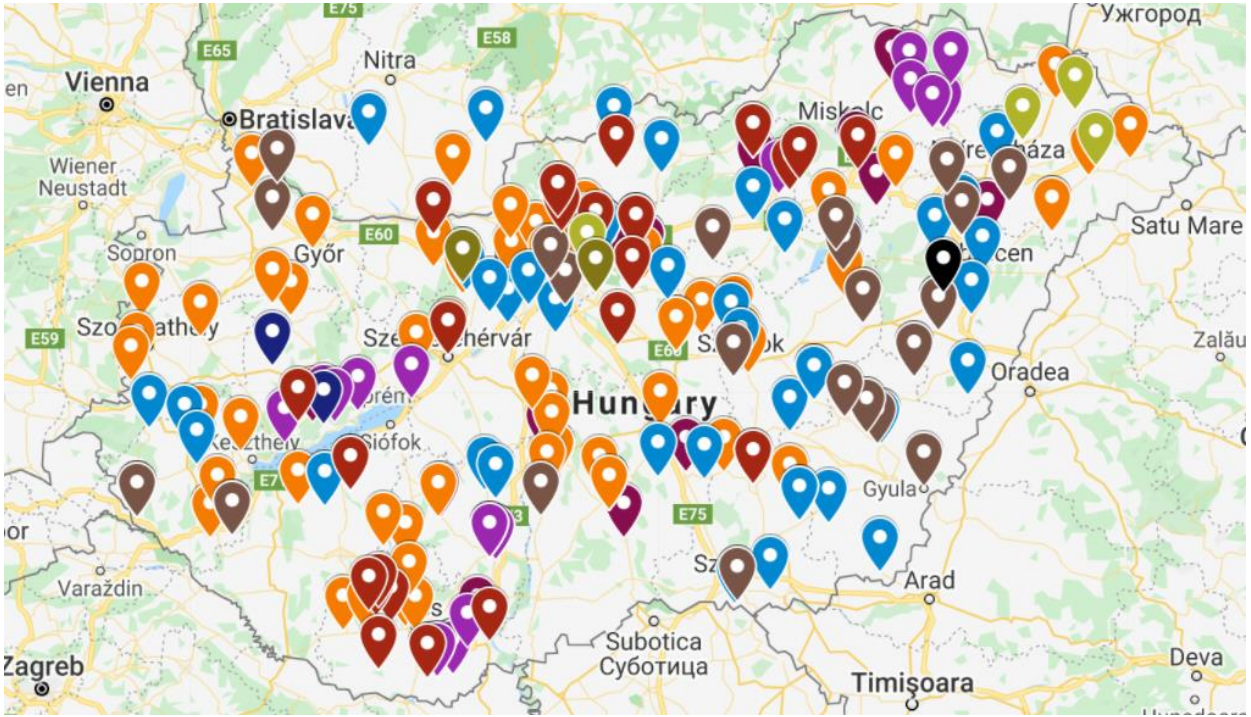
Aim: reaching and sharing new scientific results that are implemented in practice.

ÖMKi On-Farm Living Lab Network

It is an agroecology-focused
nationwide
participatory experimentation network
that includes variety of field trials and technology tests
co-designed and co-implemented with farmers
with the aim to improve and/or develop
new organic/agroecological practices,
products, technologies

Participating farmers gain feedback directly from their own production experiences, creating space for open innovation and dynamic knowledge co-creation between stakeholders

ÖMKi’s On-farm Network (2012 -



- Cereal variety trials
- Protein crop variety trials
- Animal husbandry
- Interrow cultivation
- Soil tillage management
- Landrace tomato trials
- Organic beekeeping

ÖMKi's Living Lab Achievements

Living Lab Products/Services on the Market:

1. **ÖMKi Living Interrow**: Species rich seed mixture developed for interrows.

2. **Landrace Tomato Seedling:** Re-introduction of landrace tomatoes as seedlings

3. **Organic Landrace Flour** (Einkorn, Emmer): Reintroduction of ancient cereals in arable cropping

4. **Advisory service for organic and agroecological farmers**

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Research Institute of Organic Agriculture | Forschungsinstitut für biologischen Landbau

ÖMKi’s open access booklets – dissemination efforts

Participation in EU projects through the living lab network

DiverIMPACTS

DIVERSIFOOD

LIVESEED

PREP SOIL

ALL Ready

DIVINFOOD

RELACS
IMPROVING INPUTS FOR ORGANIC FARMING

i2connect
INTERACTIVE INNOVATION

GO-GRASS

I. Insight into ÖMKi's living lab on inter-row cover crop seed test

Lead researchers: Tamás Miglécz, PhD and László Mezőfi, PhD

Problem definition

- Detrimental effects of intensive agricultural practices
- Deterioration and loss of soil
- Decreasing biodiversity (and abundance)
- Decreasing ecosystem services
- Demand to mitigate these adverse effects

Expectations

- In vineyards and orchards, by keeping inter-rows green we can overcome many of these negative effects.
- these plantations can serve as 'green corridors' or 'stepping-stones' by creating connections among scattered populations of many species.

Relevance to CAP Conditionality: GAEC, Good Agricultural and Environmental Condition Requirements

- in areas with a slope exceeding 12%, inter-row soil cover must be established in the plantations through mulching or the sowing of **annual cover crops**
- In case of grubbing-up of a plantation, **soil cover must be ensured** until replanting, regardless of the slope gradient
- The condition of terraced plantations must be maintained and preserved

I. Insight into ÖMKi's living lab on inter-row cover crop seed test

Research and product development:

- 2012, first experiments started
- 2017, „Living-interrow" inter-row cover crop seed mixture launched (a total of 22 species, in 3 seed mixtures)
- 2020, LIFE VineAdapt project started at 6 locations, in two wine regions (Eger and Tokaj), using ÖMKi's seed mixture

Fajnév - tudományos	Fajnév - magyar	Biocont-Ecovin			Legume			Grass-forb		
		1.	2.	3.	1.	2.	3.	1.	2.	3.
Achillea millefolium	közönséges cickafark	-	-	-	-	-	-	0.1	0.1	0.0
Centaurea cyanus	kék búzavirág	-	-	-	-	-	-	1.5	0.0	0.6
Centaurea jacea	réti imola	-	-	-	-	-	-	0.1	0.1	0.3
Coronilla varia	tarka koronafürt	-	-	-	0.1	1.6	0.5	2.0	6.7	6.3
Daucus carota	vadmurok	0.7	0.1	0.2	-	-	-	-	-	-
Fagopyrum esculentum	hajdina	2.3	0.0	0.0	-	-	-	-	-	-
Festuca rupicola	pusztai csenkesz	-	-	-	-	-	-	0.0	1.5	8.2
Galium verum	tejoltó galaj	-	-	-	-	-	-	0.1	0.4	0.5
Linum perenne	évelő len	-	-	-	-	-	-	0.3	0.2	0.1
Lotus corniculatus	szarvaskerep	0.3	4.7	25.0	4.0	13.8	7.8	4.7	19.5	18.2
Medicago lupulina	komlós lucerrna	16.7	37.0	2.8	21.5	6.9	3.1	10.4	16.5	0.7
Onobrychis viciifolia	takarmánybaltacim	0.8	0.8	2.2	0.3	0.1	0.4	-	-	-
Phacelia tanacetifolia	facélia	4.9	0.0	0.0	-	-	-	-	-	-
Plantago lanceolata	lándzsás útifű	0.4	0.6	0.1	5.0	14.8	4.3	10.6	18.3	5.4
Salvia nemorosa	ligeti zsálya	-	-	-	-	-	-	0.0	0.1	0.0
Sanguisorba minor	kis vérfű	0.1	0.2	0.0	0.1	0.2	0.8	0.0	0.1	0.0
Silene vulgaris	hólyagos habszegfű	-	-	-	-	-	-	0.1	0.2	0.0
Sinapis alba	fehér mustár	5.0	0.0	0.0	-	-	-	-	-	-
Trifolium incarnatum	bíbor here	10.2	0.8	0.1	-	-	-	-	-	-
Trifolium pratense	réti here	-	-	-	20.8	37.7	12.0	2.0	12.0	1.1
Trifolium repens	fehér here	1.4	18.3	14.4	6.2	5.2	14.7	5.1	8.3	7.6
Vicia sativa	vetési bükköny	1.6	0.1	0.1	2.9	0.0	0.2	3.1	0.0	0.1

I. Insight into ÖMKi's living lab on inter-row cover crop seed test

Key Research Outcomes and Observations:

- **Species establishment and presence** – Whether the sown species could be detected in the sampling plots (presence/absence data)ű
- **Vegetation cover and abundance** – The **average cover (%)** of each species within sampling units, indicating dominance, rarity, or sparse occurrence.
- **Drought tolerance and performance under different soil conditions** – Observations of how the mixtures performed in contrasting sites (e.g., better vs. poorer water retention soils) during an extremely dry year (2022).
- **Identification of promising species** – Qualitative evaluation of which species performed best under local conditions in specific wine regions
- **Cost-effectiveness and mixture optimization considerations** – Practical evaluation of whether all species are necessary or if the mixture could be optimized (economic and ecological efficiency).

II. Insight into ÖMKi's living lab on non invasive sensors for pasture-based beef cattle farming

Lead researchers: Petra Balogh, Éva Stibinger and Miklós Biszkup

Importance of using sensors:

- aging agricultural society, labour shortage
- „making the invisible visible"
- provide objective decision support
- farmers' primary concern: prediction of calving time

Sites:

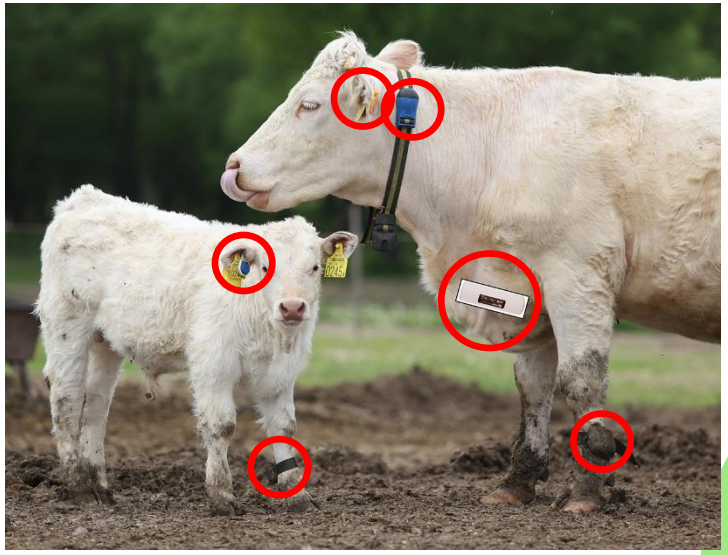
2021-2023: 1 farm, had no equipment before

2023-2025-2027: 4 farms, 3 already have own equipments

Information in the morning reports:

- Health
- Reproduction
- *Oestrus*
- *Anoestrus*
- *Irregular oestrus*
- *Suspected abortion*
- Heat stress
- Rumination (weekly and daily)
- Technical alerts

II. Insight into ÖMKi's living lab on non invasive sensors for pasture-based beef cattle farming



Equipped sensors

All sensors are NON-INVASIVE

- Allflex neck and ear transponders
- ENGS pedometers Moovement GPS
- Moonsyst rumen boluses

The sensor algorithm is programmed to learn the normal behaviour of each individual animal, so it can later interpret data accurately.

Rumination
Irregular oestrus
Health index
Heat stress
Distress monitoring
Suspected abortion

Rumen temperature
Low water intake
Suspected abortion

Activity
Oestrus

Lying counter
Irregular oestrus
Sickness
Increased lying time

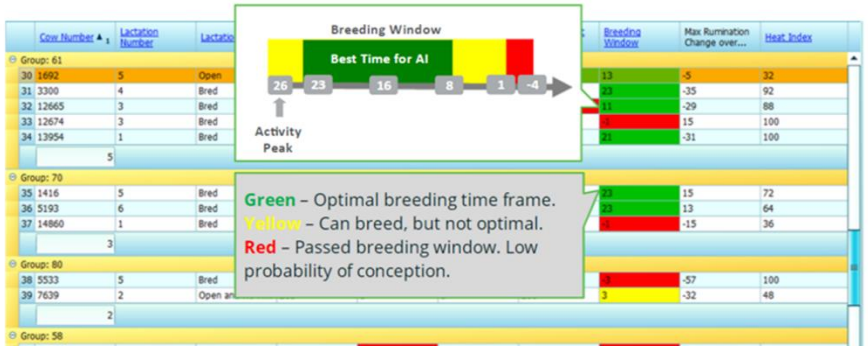
II. Insight into ÖMKi's living lab on non invasive sensors for pasture-based beef cattle farmin

Positive outcomes of using sensors:

- Decrease in veterinary medicine use (antibiotics)
- Reduction or elimination of hormone treatments (oestrus detection, timed insemination)
- Detection of non-pregnant cows
- Heat stress detectable (panting)
- Decrease in animal mortality (cows, calves)
- Optimal utilization of pasture areas – reduction in feed costs
- **GPS ear tags:** Location of the herd, location of an animal: alert when an animal leaves the pasture + Combined with NDVI

Positive outcome of cameras in calving paddock:

- Offspring loss reduced significantly compared to previous years by surveillance



Lead researchers: Petra Balogh, Éva Stibinger and Miklós Biszkup

How participatory research contributes to agroecological transition

Sustainable new practices

Validated new information

Community and professional network

Research answering real life challenges

Up-to-date connection with practice

Horizon Europe project success

Increasing agri-competitiveness

More sustainable food systems

More attractive agriculture for young generation

Challenges of working as a Living Lab

- **Multiple competences needed:**

  research, communication, organization, facilitation

- **Training internally** for „benchmarking” our living lab activities, and enabling multidisciplinarity

- **Explaining the living lab concept externally**, e.g. to academia and policy making

- **Communicating** with actors and ensuring that trials are realized according to plan.


Thank you for your kind attention!
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