

## Overview – Circular Agronomics

- **6 Case Studies**

-  **Catalunia, ES (lead: IRTA)**
-  **Brandenburg, DE (lead: IASP)**
-  **Lungau, AT (lead: AREC)**
-  **Emilia-Romagna, IT (lead: FCSR)**
-  **Gelderland, NL (lead: WUR)**
-  **South Moravia, CZ (lead: ASIO)**

- 6 strategies
- 10 experiments
- 7 experiments suitable for LCA (highlighted in green)

<b>Management- / Production strategy</b>	<b>Assigned experiments</b>	<b>Case Study</b>	<b>Exp. No.</b>
Nutrient management in crop production	Conservation tillage	IT	3
	Test of solar dried fertilizers in crop rotations	ES	4
Fertilization strategy	N use efficiency of winter wheat	DE + CZ	1
	Slurry application techniques	DE	2
	Fertigation with microfiltered digestate	IT	5
	Field test of novel PONDUS fertilizers	DE + NL	6
	Test of recovered NuReSys fertilizers	NL	7
	Acid whey application to soil	CZ	8
Nutrient management in livestock production	Fertilization of slurry from different feeding regimes	ES	9
	Extensive management and feeding strategy of cows	AT	10
Feeding strategy	Precision feeding of cows	ES	9
Waste management	Fertilizer production by solar drying	ES	4
	P fertilizer production from waste water (NuReSys)	NL	7
Nutrient/Carbon recovery	Microfiltration of digestate	IT	5
	PONDUS fertilizer production	DE	6
	Acid whey separation	CZ	8



## Goal and Scope of LCA

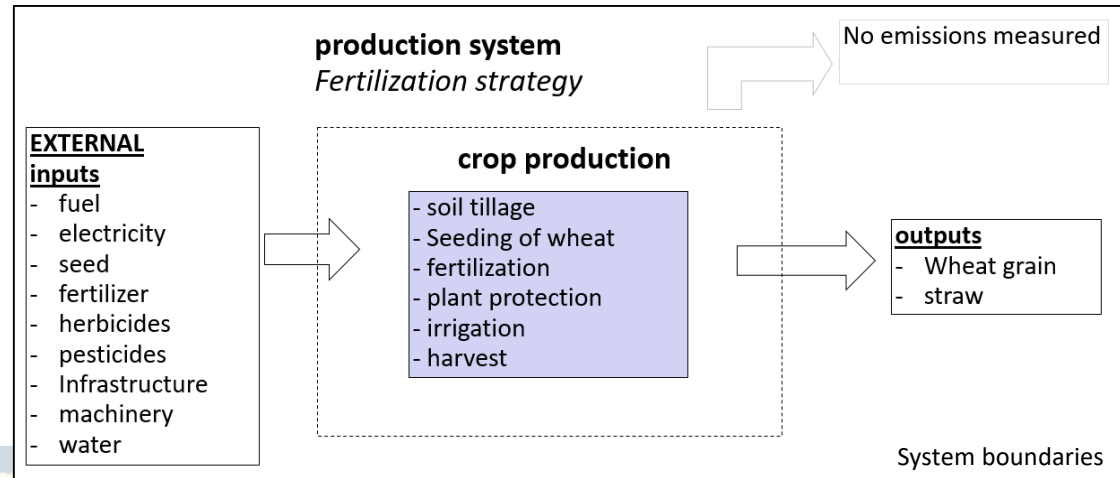
- **Goal** – calculate environmental impacts and resource uses of production systems of the 6 strategies
- **Scope** - depending on experiment
- **LCIA calculated with SALCA<sup>1)</sup>**
- **4 aggregated indicators**
  - **Exergy**
  - **GWP 100**
  - **Normalised eutrophication**
  - **Aquatic ecotoxicity**

Impact category	Aggregation for Circular Agronomics
Non renewable energy resources (CED)	Exergy
Abiotic resource depletion	
Water stress index	
Land competition	
Deforestation	
Climate change	GWP 100a (with CC feedbacks, IPCC 2013)
Ozone formation	
Ozone depletion	
Acidification	nc (high correlation with terr. Eutr.)
Eutrophication terr.	Normalised eutrophication (GLO)
Eutrophication aq. N	
Eutrophication aq. P	
Aquatic ecotoxicity	UseTox 2.0
Human toxicity	
Biodiversity	
Soil Quality	
Landscape aesthetics	

<sup>1)</sup>Gaillard, G., Nemecek, T., 2009. Swiss Agricultural Life Cycle Assessment (SALCA): An integrated environmental assessment concept for agriculture, AgSAP Conference. Egmond aan Zee, The Netherlands, pp. 134-135.

## Experiment 1 – N use efficiency of winter wheat (DE + CZ)

- 3 wheat genotypes
- 5 nitrogen application levels
- 2 different weather situations  
(irrigation; non-irrigation)



- **Functional unit:**
  - 1 Mg wheat grain
- **Allocation**
  - DE: no allocation
  - CZ: allocation based on monetary criteria

