Innovation Centre
for Organic Farming

CARBON FARM

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Anton Rasmussen.

Ministeriet for Fødevarer, Landbrug og Fiskeri
gudp

Carbonfarm aims

- Develop, test and document sustainable farming systems based on conservation agriculture principals in both organic and conventional farming CA
- CA: 1 minimum tillage and soil disturbance. 2 permanent soil cover with crop residues and live mulches. 3 crop rotation and intercropping
- In living labs placed on 4 Danish farms.

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Carbonfarm partners

Partners:

Innovationscenter for organic farming (project managing)

Danish low-till association, FRDK,

Aarhus University, dept. Of Agroecology,

Copenhagen Universitet, dept. Of plant and enviromental science

AgroIntelligence.

4 Farmers: Anders Lund, Per Bundgaard, Jacob Justesen, Søren Havgaard Christensen

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Carbonfarm research

- **Agronomic, climate and environmental effects of CA systems:**

Soil structure, weeds, yields and quality, nitrous oxide emissions; nutrient assimilation - and leaching, etc.

- **Effects of CA systems on biodiversity**

(Bees, beetles, earthworms, soil surface predators, antipodes (collembola), Arbuscular mycorrhiza, etc.

- **Effects and mechanisms of CA for building up the soil carbon content**

Measuring and modeling carbon content in soils

for Økologisk Landbrug

Carbonfarm demonstration and development

- Implement, improve and document CA systems for conventional farming in a Danish context
- Develop and implement a sustainable system with CA elements suitable for Danish organic farming systems.
- Develop mechanical solutions for Danish CA primarily in organic trials
- Demonstration and dissemination of project results to farmers, researchers and advisory services

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CarbonFarm – Living lap – Field trials

Treatment 1: Reference (Normal tillage intensity with plowing). Limited use of catch crops .

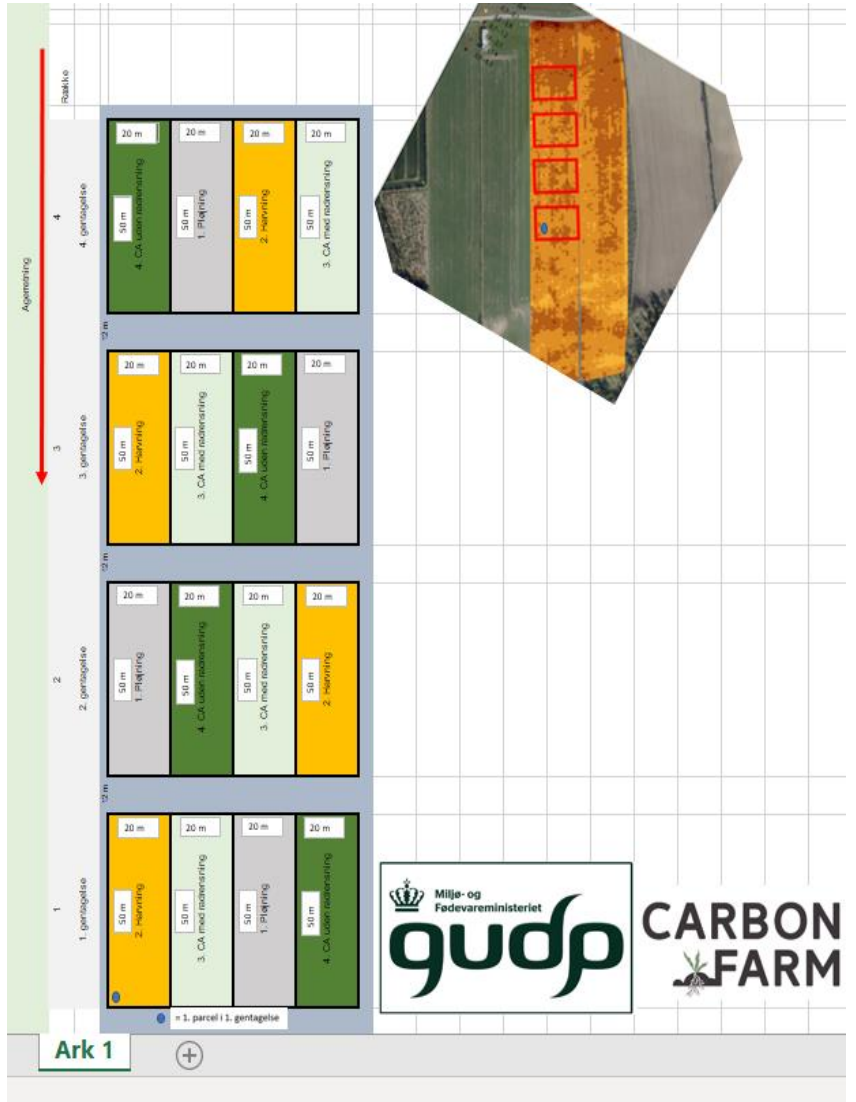
Treatment 2: "Low tillage". Without ploughing mainly cultivation by harrowing and use of catch crops.

Treatment 3: CA "Minimal tillage, " leaving plant residues and optimal use of catch crop in mixtures.

Treatment 4: CA "Carbon optimizing", with minimal tillage

Carbonfarm Living lab/field trials

- Started 2017
- 4 farmers
- 2 conventional and 2 organic
- 4 treatments/systems with 4 repetitions
- Plots 20 – 24 x 50 meters
- Trials run by/with farmers using their own machinery – with a few ecceptions



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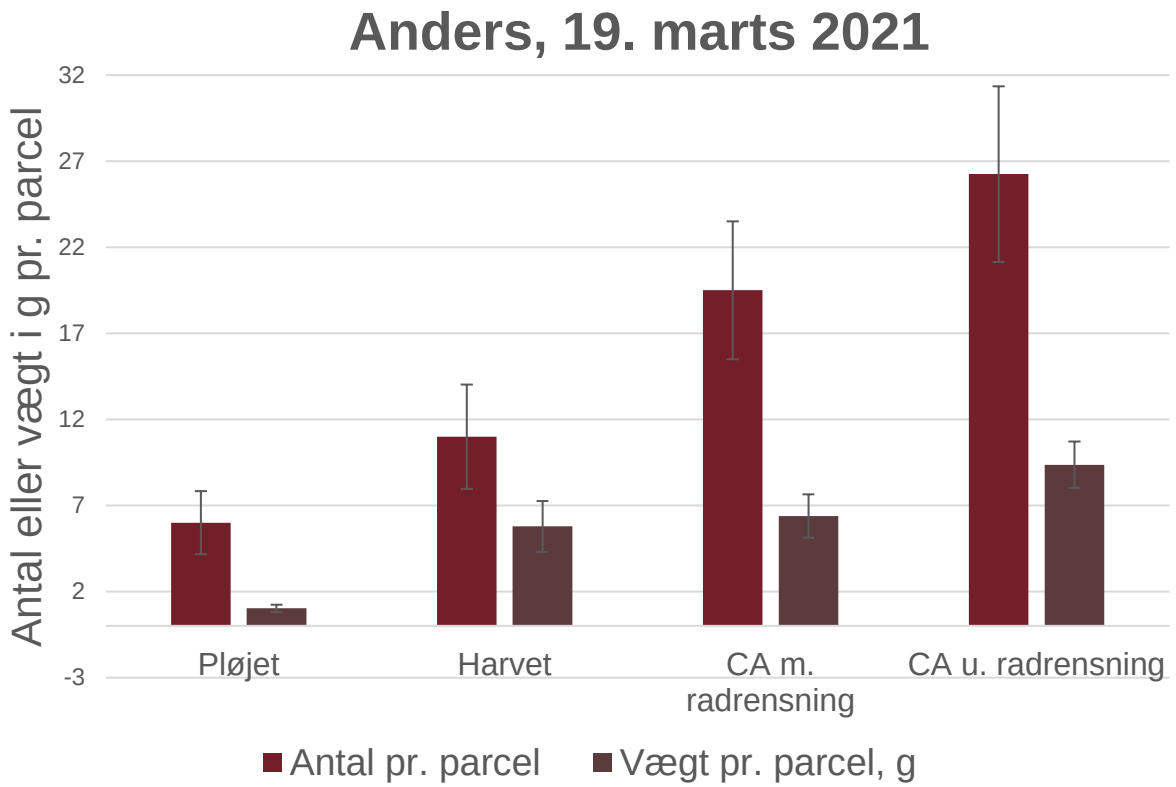
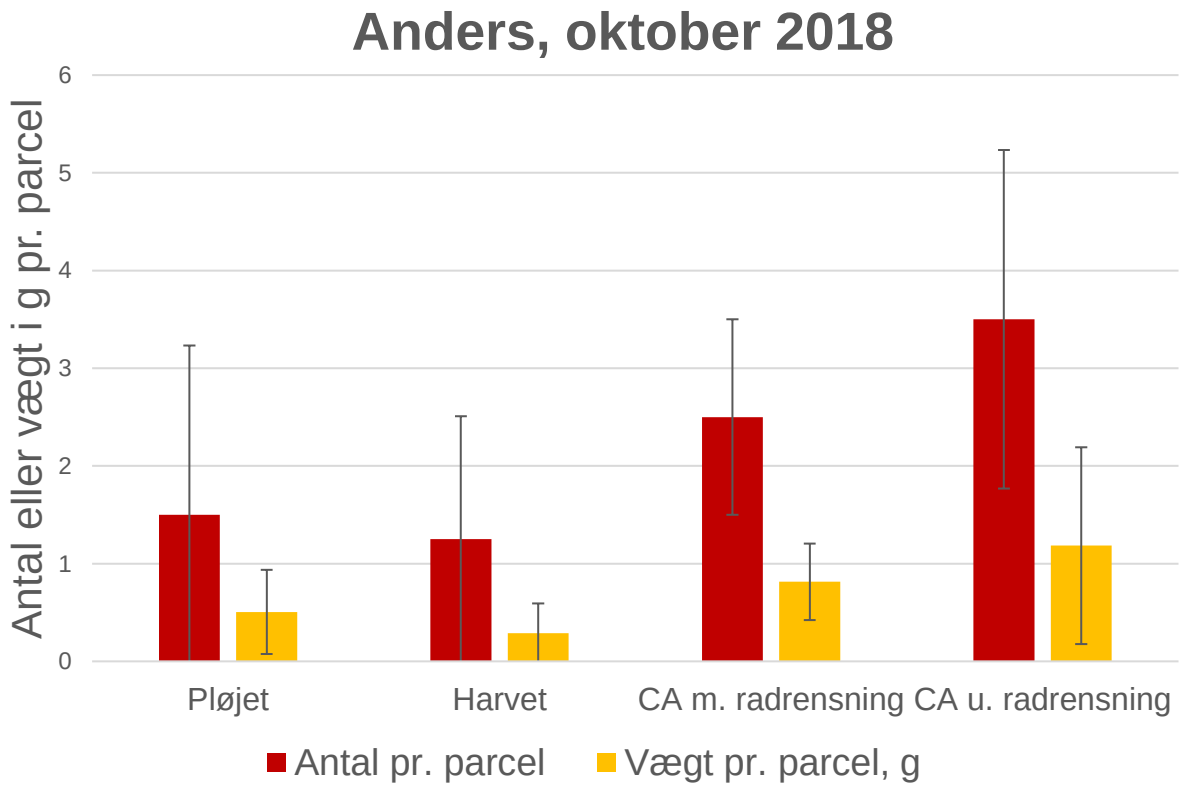
Number and weight Earthworms, Anders 2018 and 2021

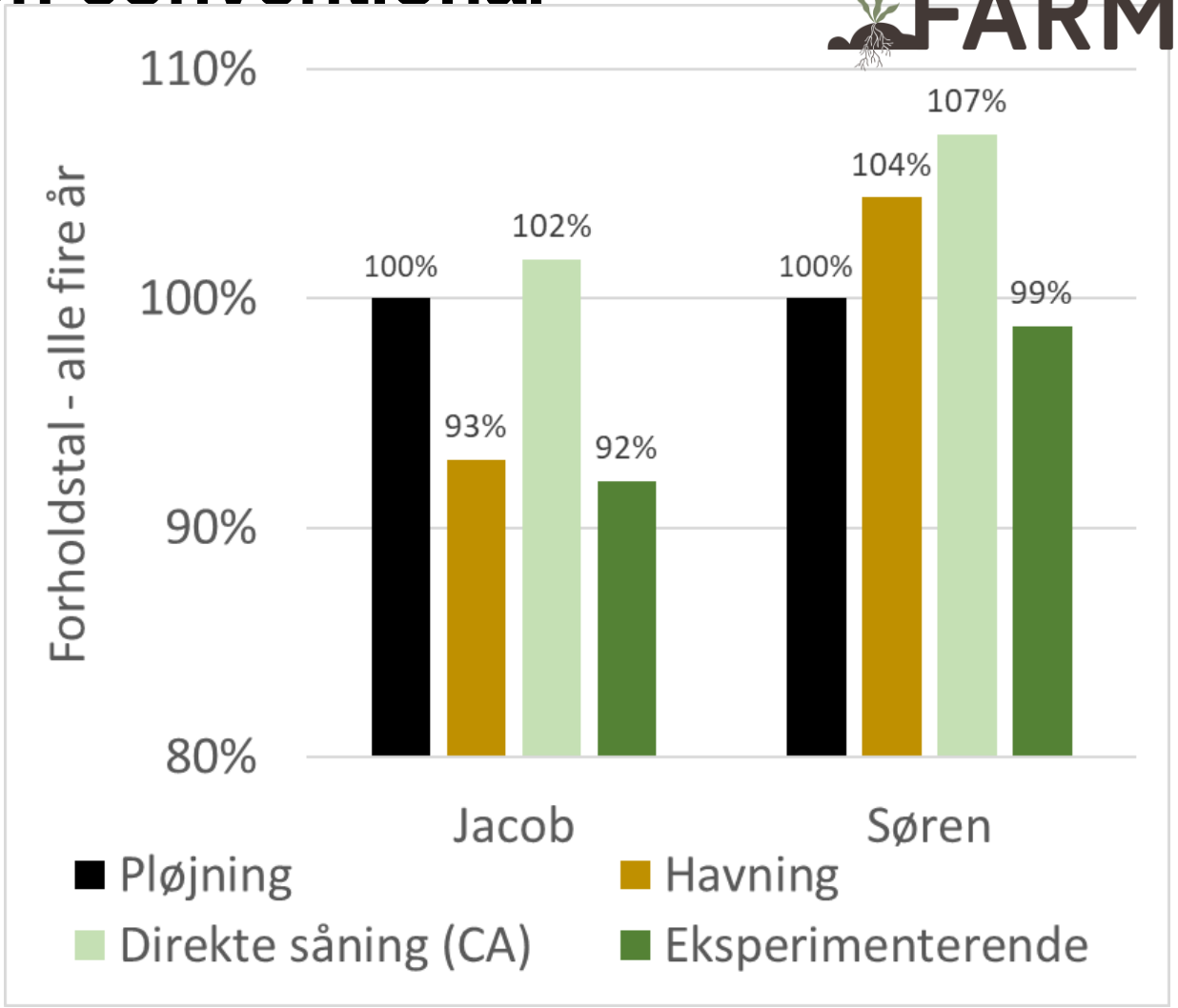




Jørgen Axelsen og Marianne Bruus
Aarhus University Bioscience

Yields and crop rotation conventional

- 2018: Fababean
- 2019: Wheat with catchcrops
  2020: Spring Barley
- 2021: Wheat with catchcrops
- *2022: Pea/Barley. White clower*
  micro clower in experimental
- *2023: Winterbarley and catchcrops*
  Efterafgrøder
- *2024: Oats*



April 2018 – sowing faba bean Søren

Ploughed

Fotos: Hans Henrik Pedersen

CA

Yields and crop rotation organic trials

- August 2017: 2-3 kg/ha honningurt, 4-6 kg/ha olieræddike, ca. 40 kg/ha vårbyg
- 2018: Fababeans
- 2019: Rye
- 2020: Oats
- 2021: Rye og Barley/peas lay of microclower in CA-trials
- *2022: oats*
- *2023: not decided*
- *2024: not decided*

Hestebønner 2018	Anders	Per
Behandling	hkg/ha	hkg/ha
1	Ikke høstet	10,9
2		11.1
3		10,7
4		11,1
Vinterrug 2019		
Behandling	hkg/ha	hkg/ha
1	8,1	31,1
2	15,7	41,4
3	18,1	43,8
4	10,2	3,8

Havre 2020	Anders	Per
Behandling	hkg/ha	hkg/ha
1	48	Ikke høstet
2	35	
3	Ikke høstet	
4	Ikke høstet	
2021	**Byg/Ært**	**Rug**
Behandling	hkg/ha	
1	ikke klar	63,2
2	ikke klar	62,4
3	ikke klar	ingen høst
4	ingen høst	ingen høst

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Establishing living mulch (microclower) at organic trials

Anders april 2021

Anders juni 2021

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Per august 2021

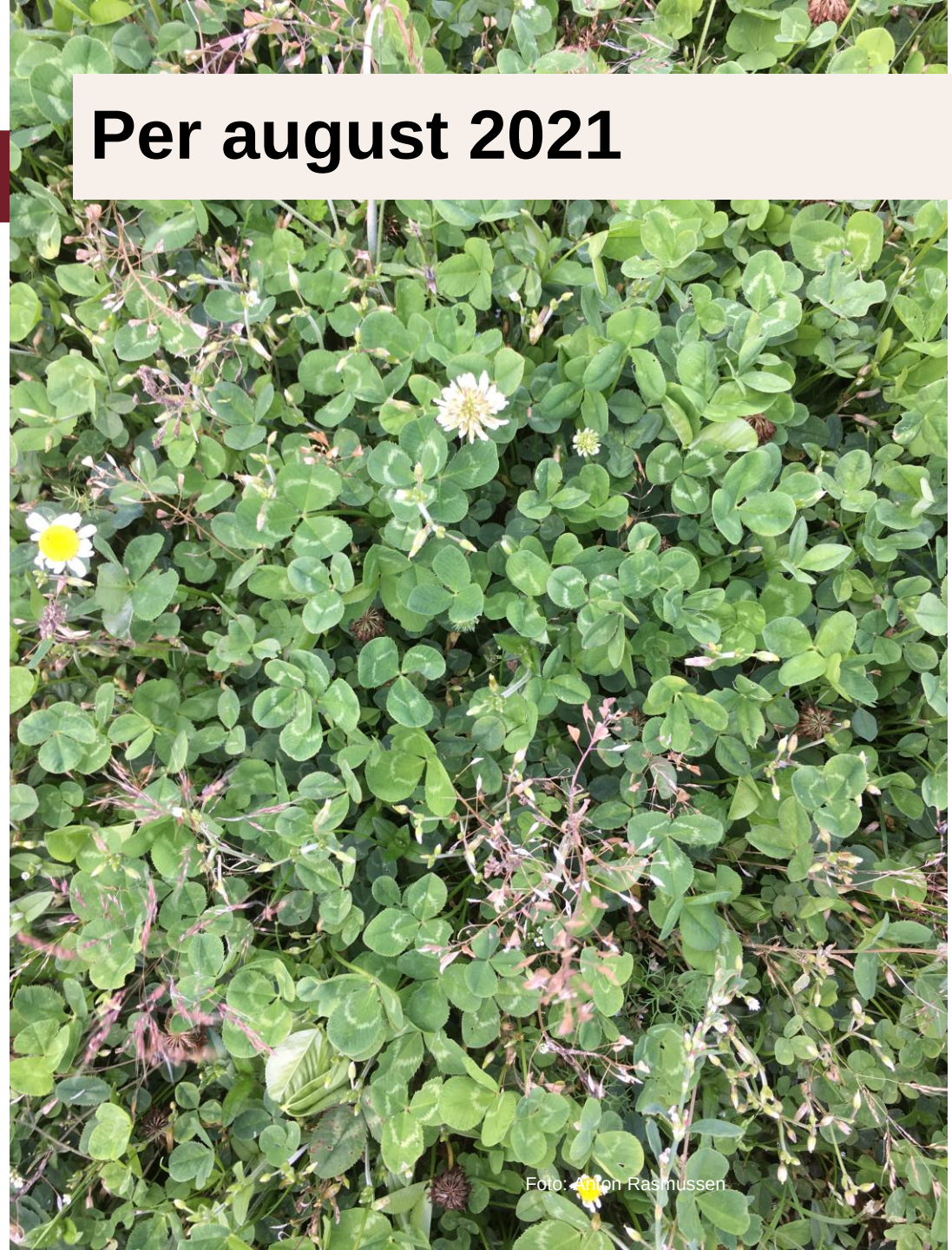

Foto: Anton Rasmussen

Test of a prototype in august 2021

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CARBON FARM

Video about Carbonfarm (in Danish)

https://www.youtube.com/watch?v=VD0hPdOZaUo

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