Grabów “Modele” OLTE, PL

Organic farming since 1994

certified acc. (EU) 2018/848

View on experimental site

Yield enhancing strategy, what makes the farm special??
The Grabów Organic Long-Term Experiment (OLTE) is a long-term experimental platform established and maintained by the Institute of Soil Science and Plant Cultivation – State Research Institute (IUNG-PIB), Poland. The experiment represents three ecological farm models designed to reflect typical production systems found in European organic agriculture.The systems differ primarily in crop rotation structure and the share of legumes, which are adapted to farms:
Dairy system (A) – designed for farms with dairy cattle, with a high share of forage crops and grass-clover mixtures used for feed and soil fertility management. Pig system (B) – adapted for pig production, with a larger share of cereals and grain legumes in the rotation. No-livestock system (C) – representing stockless organic farms relying on legumes and green manure for nitrogen supply and soil fertility.
Optimisation wishes and questions: There is growing interest in identifying practical solutions to improve yield stability and nutrient management in organic cropping systems. Key questions addressed in the Grabów OLTE include: how the share of legumes in crop rotation affects nitrogen availability and crop yields, how different organic farm models perform under similar soil and climate conditions, how to optimise crop rotations for farms with livestock compared with stockless farms,how organic systems can maintain productivity while relying primarily on biological nitrogen fixation and organic fertilisation.

Farm: Organic Long-Term Experiment (OLTE) located in “Grabów” Research Experimental Farm. Approx 1.5ha total area (organic).

Soils: Light soils typical for central Poland (sandy loam / loamy sand)

Rainfall and temperatures

1990-2020	J	F	M	A	M	J	J	A	S	O	N	D	Year
Rainfall [mm]	27	25	32	37	67	70	83	65	52	40	32	32	562
Temperature [°C]	-2.5	-1.4	2.4	8.7	13.9	17.3	19.3	18.6	13.5	8.1	3.2	-1	8.3

Crops, yields and fertilisation, 2022-2023 [t/ha]

Crop	2021	2022	2023	Mean
Dairy (A) – Silage maize	40.25	37.92	37.79	**38.65**
Dairy (A) – Cash crop mixed intercrop	24.59	21.71	13.65	**19.98**
Dairy (A) – Grass-clover mixture, 1st/2nd year	60.68 / 60.36	83.45 / 82.58	81.67 / 82.85	**75.27***
Dairy (A) –Winter Cereals (triticale)	5.34	7.5	6.25	**6.36**

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Crop	2021	2022	2023	Mean
Pig (B) – Corn maize	9.13	5.94	7.19	**7.42**
Pig (B) – Barley	3.8	3.87	3.65	**3.77**
Pig (B) – Cash crop mixed intercrop	4.26	3.97	3.79	**4.01**
Pig (B) – Peas	3.27	2.8	3.39	**3.15**
Pig (B) – Winter Cereals (triticale)	5.48	7.92	5.77	**6.39**
No-livestock (C) – Corn maize	6.34	5.42	6.88	**6.21**
No-livestock (C) – Spring wheat (rotation phase C2)	3.91	4.17	3.58	**3.89**
No-livestock (C) – Spring wheat / undersown cereal phase (C3)	3.97	4.15	3.66	**3.93**
No-livestock (C) – Red clover	64.43	98.27	89.33	**84.01**
No-livestock (C) –Winter Cereals (triticale)	5.05	6.98	5.31	**5.78**

Fertilisation [mean kg/ha·year]: Silage maize (Dairy rotation A) 2021-2023 with 30 t/ha cattle solid manure composted: 75 N, 26 P, 75 K, 11 Mg; Corn maize (Pig rotation B and No-livestock rotation C) 2021-2023 with 30 t/ha cattle solid manure composted: 75 N, 26 P, 75 K, 11 Mg. No external fertilisation recorded for grass-clover, cash-crop mixed intercrop, triticale / spring wheat, barley, peas or red clover — nutrient supply in these phases relies on manure, N_2-fixing legumes and cover crops.

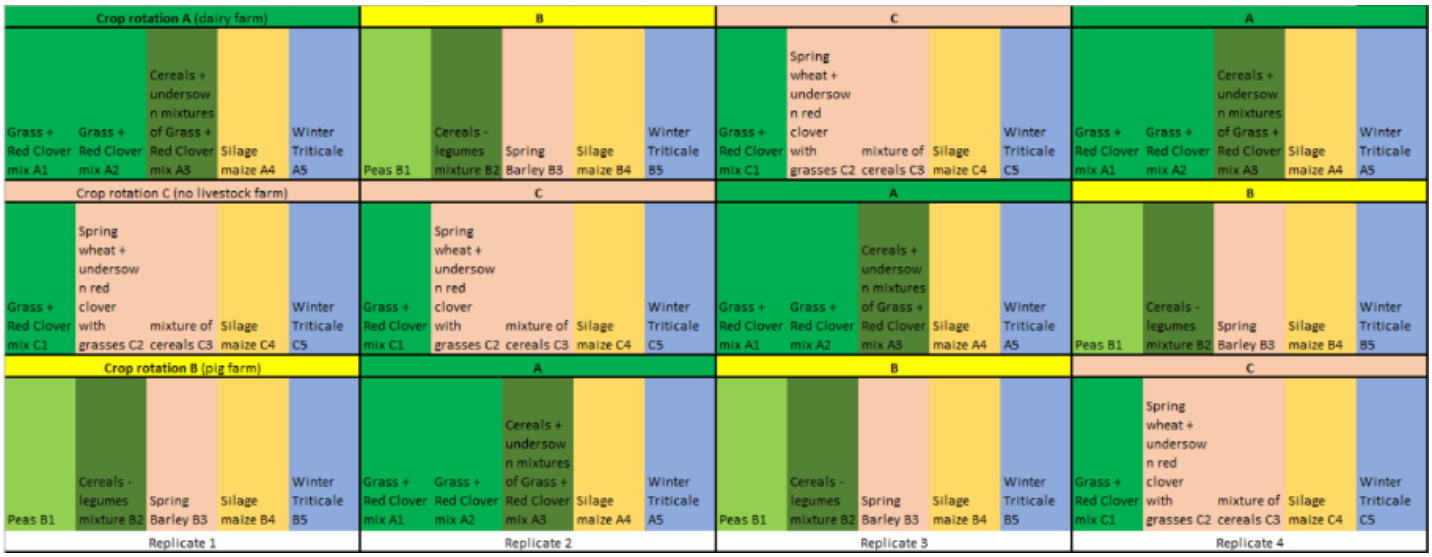
Machinery

Tractors	**Power HP**
New Holland TM150	140
Fendt 936 Vario	360
Valtra T191	190

Cultivation	**Working width (m)**
Harrow (disc) BTC30	3
Harrow (disc) BTC60	6
5 skid rotary plow Koja 5-por	2
Weeder harrow P-510/2	6

Fertilisation	**Working width (m)**
Suspended fertilizer spreaderAmazone za-v	10-36
Cereal suspended seed planter Amazone D9	3

Trial layout



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