



Organic rice production in Tuscany

# Tenuta San Carlo, IT

Marina di Grosseto, Grosseto, Tuscany, Italy

Organic farming since 2016 acc. to EU 2018/848



## Yield enhancing strategy, what makes the farm special??

Green mulching on rice, minimal tillage, long rotations, no fertilisers or irrigation except for rice, low level of external inputs to the farm.

**Optimisation wishes and questions:** Difficulties in soil preparation/tillage (clay soils) after rainfall, challenges in expanding crop rotation in rice fields, and difficulties in integrating livestock grazing on fallow land due to logistical constraints.

## Ariane Elizabeth Lotti

**Farm:** Mixed farm: rice 45 ha, cereals 60 ha, legumes 20 ha, clover (seed production) 222 ha, pasture and traditional cow breed (19 cows, 1 bull, 8 feeder calves, 10 young calves)

**Soils:** Texture: Clay 41 % - Loam 45.4 % - Sand 13.6 %

Organic matter: 1.50 %. Total nitrogen: 0.14 %. Available phosphorus: 41 mg/kg. Exchangeable potassium: 330 mg/kg. Ca: 3943 mg/kg. Mg: 508 mg/kg. Na: 216 mg/kg. pH: 7.96. Active limestone: 7.4%. Organic carbon: 0.87%. CEC: 18.7 meq/100

## Rainfall and temperatures

2003-2023	J	F	M	A	M	J	J	A	S	O	N	D	Year
Rainfall [mm]	62	62	56	60	44	28	16	22	78	109	129	83	745
Temperature [°C]	8.4	8.6	10.9	13.8	17.6	21.9	24.6	24.8	21.1	17.5	13.3	9.8	16

## Crops, yields and fertilisation, 2021-2024 [t/ha]

Crops	2021	2022	2023	2024	Mean
1 Carnaroli rice	4.3	2.9	4	3.5	3.7
2 Ribe rice	3.6	NA	4.8	4.4	4.3
3 Emmer Wheat	NA	2	1.8	3	2.3
4 Turanicum or Cappelli Durum wheat	1.8	1.8	1.5	2.3	1.85
5 Chickpea	0.16	NA	1	3.7	1.62
6 Clover (seed production)	0.5	0.4	0.2	0.1	0.3

Grains: 86% dry matter, NA: yields not available, General rotation scheme: cereals – legumes – green manure (clover, faba bean)

Fertilisation: only to rice after incorporation of green manure: 1 t/ha organic fertiliser (AZOCOR 10.5 N: oilcake/horn-/feathermeal), only in 2022: test on different rice fields with 12 t/ha cattle solid manure or 20 m<sup>3</sup>/ha digestate from own and neighbour farm.

No irrigation is carried out; the rice field is flooded with water from the water management consortium during the growing season.

Minimum tillage is preferred. Subsoiling, harrowing (disc and spring), and the use of a rotary harrow for seedbed preparation for rice.

Weed management: Use of a tine harrow for annual species when the season allows to use it, crop rotations, and the application of green mulching techniques for rice fields. No phytosanitary treatments. Sowing and harvesting: Winter cereals: from November to July; rice: from May to October; legumes: from March to August; sunflower: from March to August.

Photos: © Tenuta San Carlo Farm

## Machinery

### Tractors

2 Massey Ferguson tractors  
1 old Fiat tractor  
1 Valtra

### Power HP

130 and 270  
90  
135

## Equipment

Subsoiler  
Spring-tooth harrow  
Disc harrow  
Cultivator  
Ditch digger  
Seeder  
Fertiliser spreader  
Plough

## Additional information

### Rainfall and average temperatures in Marina di Grosseto

	January	February	March	April	May	June	July	August	September	October	November	December
Mean temperature (°C)	8.4	8.6	10.9	13.8	17.6	21.9	24.6	24.8	21.1	17.5	13.3	9.8
Minimum temperature (°C)	5.8	5.8	7.7	10.4	14	18.1	20.8	21.3	18.1	15	11	7.4
Maximum temperature (°C)	11.1	11.6	14.1	17	20.8	25.2	28	28.2	24.2	20.3	15.7	12.3
Rainfall (mm)	62	62	56	60	44	28	16	22	78	109	129	83
Humidity (%)	77%	74%	74%	75%	74%	71%	67%	68%	71%	77%	78%	77%
Rainy days (d)	6	6	6	7	5	3	2	3	6	8	9	8
Sunshine hours (hrs)	6.0	7.0	8.3	10.1	11.5	12.6	12.6	11.5	9.6	7.4	6.3	5.9

Sant'Anna School of Advanced Studies, EcorNaturaSì, University of Pisa, Tenuta San Carlo Farm, 06/2026