

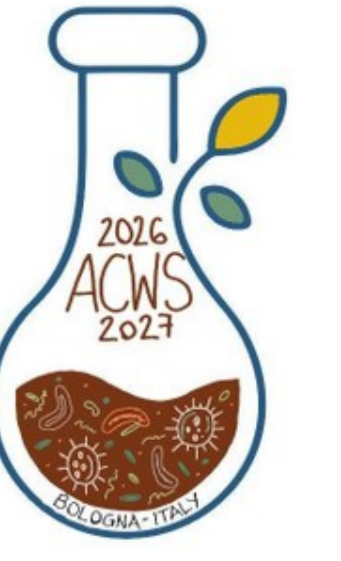


ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ACWS 2026

Soil-Plant-Microbiome functionality and adaptation to anthropogenic stress and climate change

Bologna, Italy • 2-5 February 2026



The European EARTHONE project

Agroforestry for Soil Health and Climate Resilience

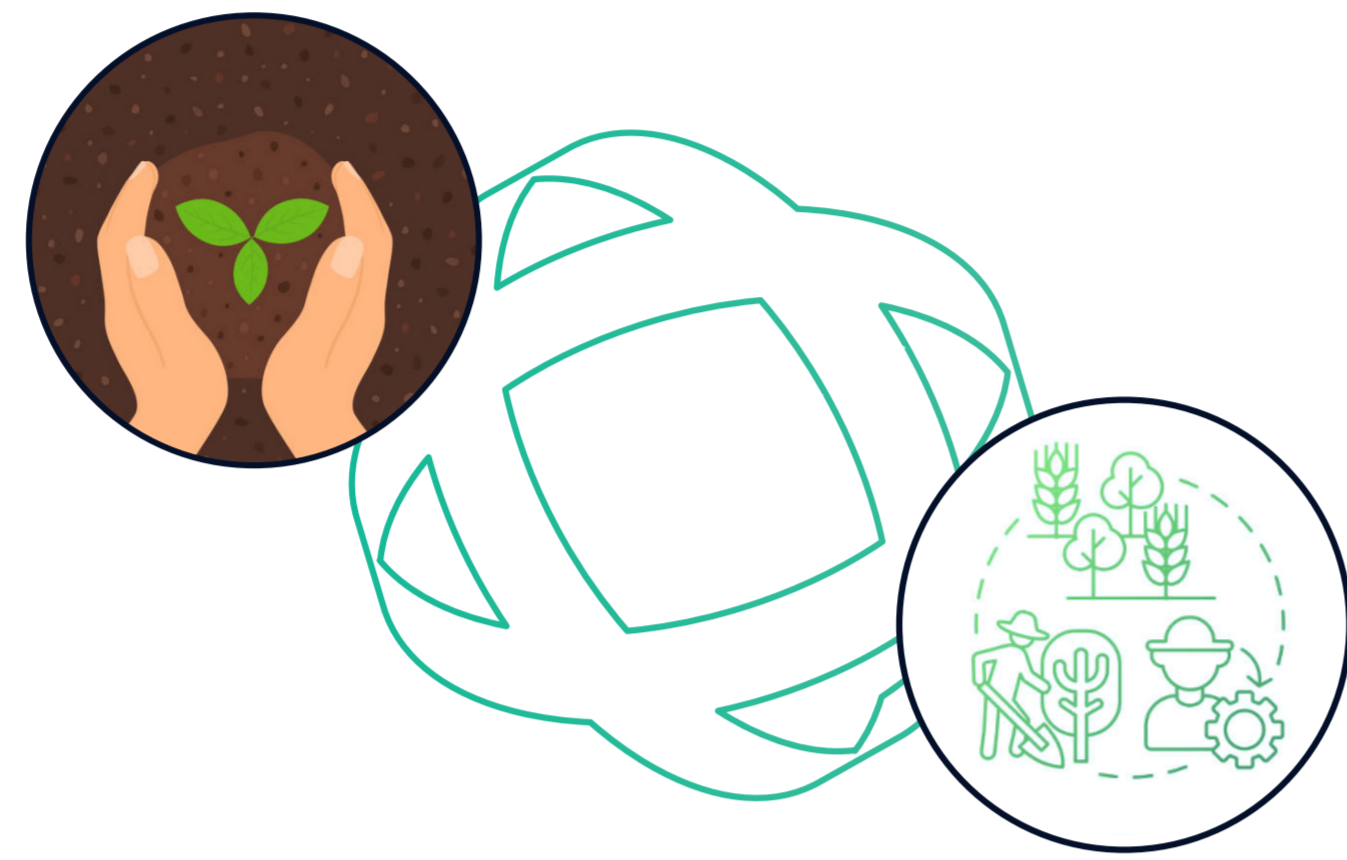
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According to the FAO, approximately 25% of the world's soils are severely degraded.

SOC has decreased due deep tillage, intensive cropping, and insufficient carbon inputs.

Agroforestry systems play a crucial role in both climate change mitigation and sustainable land management.



Agroforestry

- improved fertility
- provides better physical, chemical, and biological soil properties;
- promotes biodiversity;
- contributes to carbon sequestration.

OUR AMBITION

EARTHONE aims:

- to evaluate carbon sequestration, greenhouse gas (GHG) fluxes, soil health and quality, and crop productivity parameters to mitigate the adverse impacts of climate change
- to improve the carbon footprint of agricultural systems and support the transition toward climate neutrality.

Set of indicators

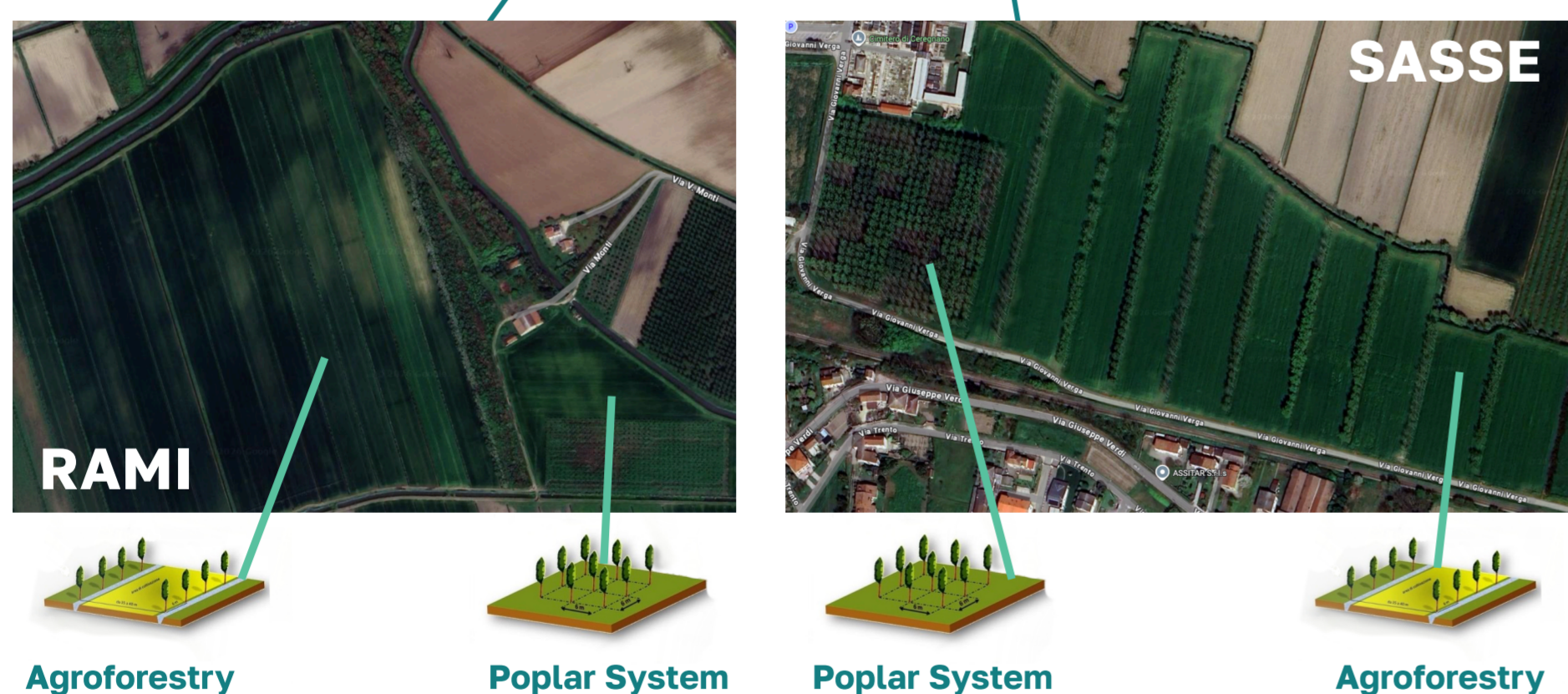
- Soil productivity;
- Soil organic carbon (SOC);
- Total nitrogen content;
- Soil physical properties;
- Soil nutrients content;
- Soil pH;
- Soil CEC.

Remote sensing tools

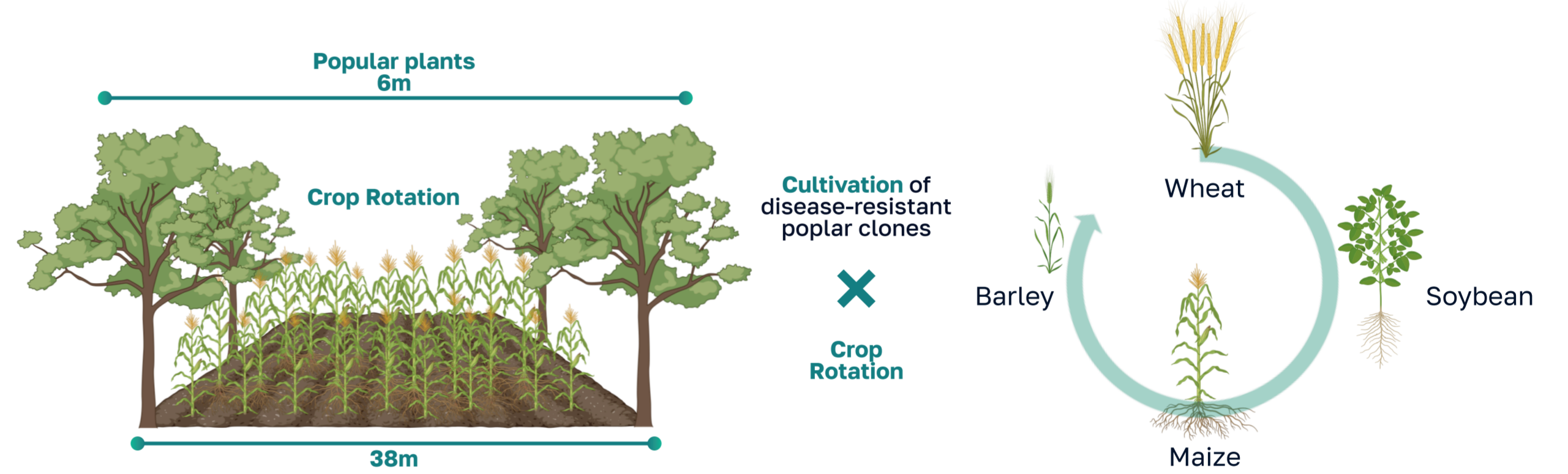
- present and past soil characteristics
- Historical Climate dataset;
- Soil Productivity (NDVI, crop production, tree production in quality and quantity aspect).

OUR PILOTS

The project involves six pilot sites across Europe, including agroforestry systems in Spain, Italy, and Greece, wetlands in Croatia, and agricultural and grazing systems in North Macedonia. In Italy, the experimental plots are located at the Sasse Rami farm in Rovigo, managed by the Venetian Agency for Innovation in Agriculture.



These plots build upon agroforestry trials started in 2009, based on:



SASSE AREA

Treatment	m.u.	Conventional	Conventional	Agroforestry	Agroforestry	Popolar System	Popolar System
Depth		0-30	30-60	0-30	30-60	0-30	30-60
Texture Class: Sandy clay loam							
pH H ₂ O		7.9 ± 0.06	7.99 ± 0.03	7.87 ± 0.30	7.86 ± 0.17	7.68 ± 0.12	7.75 ± 0.11
pH KCl		7.34 ± 0.02	7.34 ± 0.02	7.16 ± 0.15	7.16 ± 0.16	7.27 ± 0.03	7.27 ± 0.03
EC	µS/cm	247.83 ± 16.30	237.17 ± 12.19	280.61 ± 28.17	261.06 ± 30.30	254.22 ± 19.60	219.88 ± 17.81
N _{tot}	%	0.17 ± 0.01	0.14 ± 0.01	0.15 ± 0.04	0.13 ± 0.03	0.19 ± 0.02	0.16 ± 0.01
C _{tot}	%	2.51 ± 0.25	2.30 ± 0.24	1.86 ± 0.34	1.77 ± 0.33	1.44 ± 0.19	1.23 ± 0.19
C _{org}	%	0.85 ± 0.07	0.70 ± 0.06	1.01 ± 0.07	0.89 ± 0.10	0.95 ± 0.09	0.74 ± 0.07
P TQ	mg/kg	17.54 ± 4.25	18.06 ± 7.98	26.34 ± 26.67	28.09 ± 32.70	33.91 ± 11.43	36.33 ± 15.02
Ca TQ	mg/kg	3122.15 ± 224.57	3162.01 ± 178.14	3907.57 ± 662.04	4006.02 ± 680.24	2985.45 ± 154.36	3026.72 ± 177.90
K TQ	mg/kg	81.86 ± 10.32	74.15 ± 8.54	323.17 ± 110.65	259.15 ± 125.28	177.77 ± 37.89	115.25 ± 23.75
Mg TQ	mg/kg	283.27 ± 33.49	290.96 ± 27.66	195.66 ± 58.22	216.81 ± 30.85	196.89 ± 17.02	196.30 ± 18.21
Na TQ	mg/kg	208.39 ± 474.32	9.36 ± 2.04	68.44 ± 50.94	73.62 ± 56.15	122.33 ± 108.38	104.24 ± 110.92

RAMI AREA

Treatment	m.u.	Conventional	Conventional	Agroforestry	Agroforestry	Popolar System	Popolar System
Depth		0-30	30-60	0-30	30-60	0-30	30-60
Texture Class: Sandy loam							
pH H ₂ O		8.07 ± 0.16	8.03 ± 0.07	8.00 ± 0.11	8.06 ± 0.11	7.93 ± 0.17	7.94 ± 0.09
pH KCl		7.16 ± 0.09	7.25 ± 0.08	7.13 ± 0.08	7.17 ± 0.08	7.08 ± 0.05	7.08 ± 0.07
EC	µS/cm	288.00 ± 0.93	2.77 ± 0.45	2.81 ± 1.02	3.56 ± 0.92	2.78 ± 0.36	2.51 ± 0.18
N _{tot}	%	0.07 ± 0.01	0.08 ± 0.01	0.11 ± 0.03	0.09 ± 0.02	0.12 ± 0.02	0.10 ± 0.02
C _{tot}	%	2.52 ± 0.06	2.66 ± 0.08	3.02 ± 0.39	2.90 ± 0.30	2.82 ± 0.20	2.70 ± 0.15
C _{org}	%	0.61 ± 0.07	0.67 ± 0.10	1.10 ± 0.30	0.98 ± 0.30	1.14 ± 0.20	0.84 ± 0.15
P TQ	mg/kg	8.53 ± 2.09	9.58 ± 1.87	4.30 ± 2.92	2.76 ± 1.31	3.93 ± 1.29	3.65 ± 0.60
Ca TQ	mg/kg	2062.75 ± 185.73	2105.00 ± 154.78	3959.80 ± 605.89	4130.00 ± 732.88	4826.50 ± 628.52	4581.25 ± 743.32
K TQ	mg/kg	224.00 ± 32.03	200.50 ± 24.52	219.40 ± 73.55	173.80 ± 26.70	253.50 ± 69.03	205.75 ± 36.06
Mg TQ	mg/kg	120.00 ± 3.46	103.75 ± 1.89	224.40 ± 64.83	247.80 ± 81.63	253.25 ± 59.73	205.25 ± 44.06
Na TQ	mg/kg	77.73 ± 8.08	80.15 ± 11.89	91.84 ± 16.60	116.72 ± 41.32	118.75 ± 6.65	114.75 ± 49.18

OUR CHALLENGES

The database generated through the Earthone project will support the improvement of business models by creating added value for products and practices related to carbon sequestration, climate change mitigation, sustainable resource use, biodiversity conservation, and the enhancement of ecosystem services.



Go Beyond



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