Udine
Friuli-Venezia Giulia (Italy)

EXPERIMENT GOALS
The project FERTIPLUS aimed to identify innovative organic waste treatment technologies to recycle urban and agricultural wastes into valuable and safe products for use in agriculture. In particular, FERTIPLUS focused on the production and agricultural application of biochar, compost, and a mixture of both materials (biochar-blended compost) to evaluate their potential for closing the cycle of nutrients in different climatic regions and crops across Europe.

Three-year experiment

SITE DESCRIPTION

The experiment was carried out in three different old vineyards (> 20 years) located in NE Italy, characterized by soils with alkaline pH (8.0–8.1), silty clay loam/silty loam texture, 5.1–6.9% $CaCO_3$ and 1.1–2.1% TOC. Agroclimatic conditions were characterized by warm temperate climate, 1450 mm total annual rainfall, 15.4 °C mean daily temperature, and 77.7% mean air humidity.

BIOCHAR AND ITS APPLICATION IN THE FIELD

The applied biochar was produced by PROININSO (Málaga, Spain) from the pyrolysis of oak (650 °C pyrolysis temperature, 12–18 h residence time in kiln, 0% Oxygen content).

The treatments performed in each site were: i) biochar (10.9 t C ha^{-1}), ii) biowaste and green waste compost (10.9 t C ha^{-1}), iii) biochar blended with biowaste and green waste compost, 10:90 w:w (10.9 t C ha^{-1}), iv) slow N release fertilizer (32.5 kg N ha^{-1}), v) organo-mineral fertilizer (32.5 kg N ha^{-1}), vi) control (no fertilization).

The 3 amendments were applied on the entire area of the plot. The 2 fertilizers were distributed manually and incorporated about 25 cm from the strains on both sides of the row at the beginning of the growing season. Organic amendments were applied only in the first year of the trial, while organo-mineral and slow-release fertilizers were applied each year.

Measured parameters

Field conditions: soil water content

Soil fertility parameters: total organic C, extractable organic C, extractable N, NO_3^- ,available P, available K, microbial biomass, enzymatic activities

Crop production: yield, yield per vine, number of bunches per vine and bunches weight

Crop status evaluation: NDVI (Normalised Difference Vegetation Index)

Crop quality: must pH, total N, acidity and total soluble solids

Planned activities or potential experimental activities

Production and agricultural application of biochar, compost, and a mixture of both materials (biochar-blended compost) to evaluate their potential for closing the cycle of nutrients in different agro-climatic regions across Europe

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Presentation of the working group

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