

Braccessa

Tuscany (Italy)

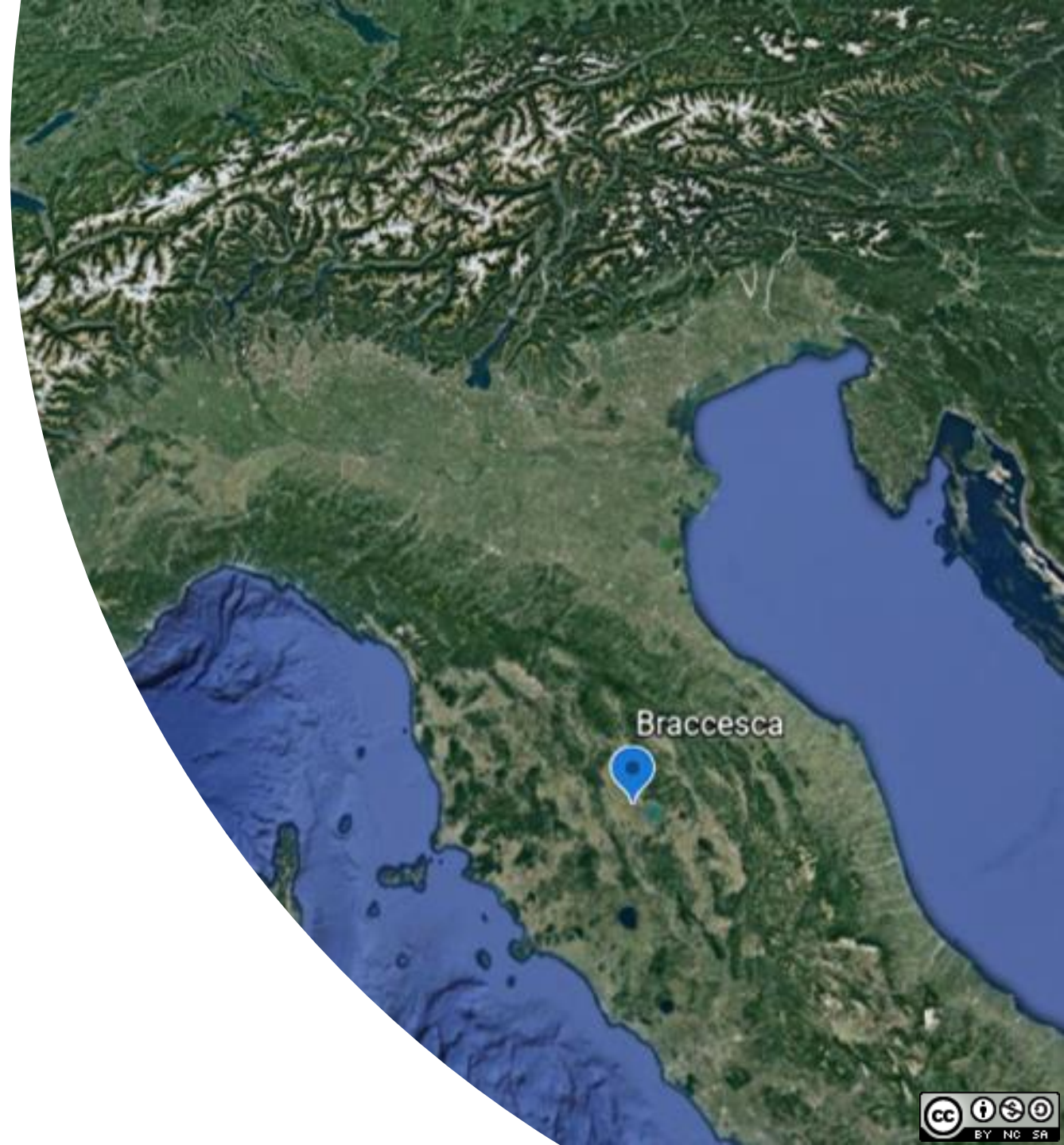
EXPERIMENT GOALS

To assess in a long-term perspective the effectiveness of the biochar soil amendment in a vineyard, in terms of:

- soil carbon sequestration and soil fertility;
- increasing soil water retention;
- vineyard ecophysiological parameters and productivity;
- - pattern of polycyclic aromatic hydrocarbons in soil.

DURATION OF THE EXPERIMENT

- Started on 2009 - ongoing



SITE DESCRIPTION

The field experiment was done in a vineyard at the “Marchesi Antinori – La Braccasca Estate” (Lat. 43°10'15"N; Long. 11°57' 43"E; 290 m a.s.l.), planted in 1995 (cv. Merlot, clone 181; rootstock 3309 Couderc). The trellis system is a single curtain with plant-row spacing of 0.8 m and 2.5 m; rows orientation is East–West. The vineyard is not irrigated. The soil is a shallow acids sandy-clay-loam (USDA, 2005) textured. A randomized plot experiment, with three treatments and five replicates was setup in 2009. Each plot, 15 in total, had a surface area of 225 m² (7.5 m in width and 30 m in length) including 4 vineyard rows and 3 inter-rows. The treatments were: a single biochar application at a rate of 22 ton ha⁻¹ in 2009 (B); two biochar applications at a rate of 22 ton ha⁻¹ each, in 2009 and 2010 (BB); and a control (C). Biochar was applied in the inter-row space of the vineyard using a spreader and it was incorporated into the soil using a chisel plow tiller to 0.3 m depth.

BIOCHAR AND ITS APPLICATION IN THE FIELD

The biochar applied was a commercial charcoal provided by “Romagna Carbone s.n.c.” (Italy) obtained from orchard pruning biomass through a slow pyrolysis process at temperature of 500°C. The biochar at the end of the pyrolysis was crushed into particles smaller than 5 cm of diameter before the soil application. Biochar porosity and pore size distribution, BET, biochar water retention and the biochar bulk density have been determined.



MEASURED PARAMETERS

Field conditions: meteorological data

Soil analysis and interactions with biochar: periodic soil analysis, pH, water retention, soil biological index

Biochar dynamics and matrices: soil carbon content

Production data: quality and quantity of grape yield

Plant-soil dynamics and interactions: carbon and nitrogen soil-plant dynamics

PLANNED ACTIVITIES OR POTENTIAL EXPERIMENTAL ACTIVITIES

The long term field experiment of Braccasca will be designed to represent an opportunity for the scientific community to test and verify the long-term effects of adding biochar to soil.



PRESENTATION OF THE WORKING GROUP

The Braccessa field experiment was planned and done by the Biochar Group of the IBE-CNR in collaboration with the Universities of Bologna, Firenze, Insubria, Napoli and Padova with a participation of the Antinori.

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