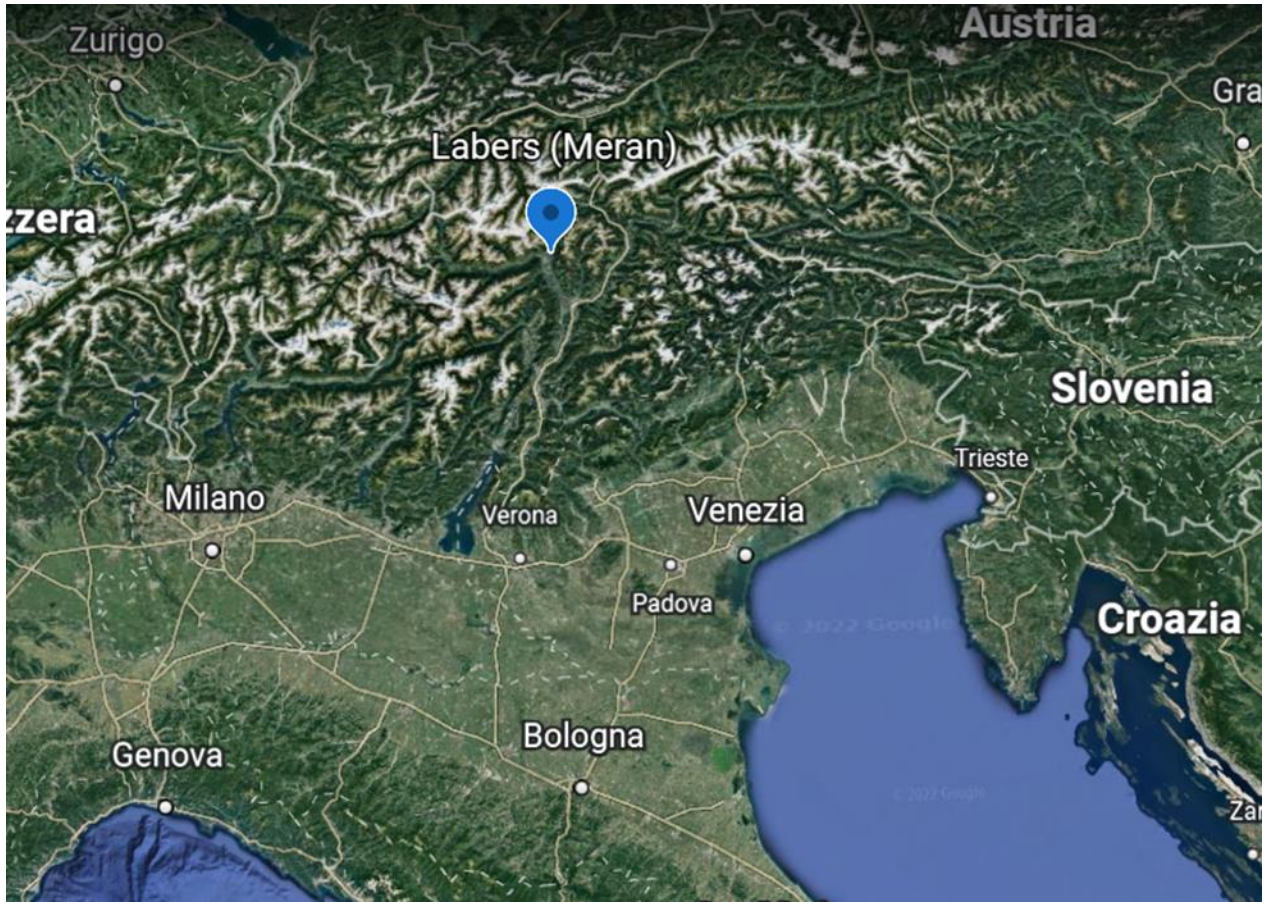
CHAR_GOAL
Labers (Merano, South Tyrol, Italy)

unibz
Fakultät für Naturwissenschaften und Technik
Facoltà di Scienze e Tecnologie
Faculty of Science and Technology

The CHAR_GOAL project focuses on the effects of biochar application (alone or in combination with compost) on **soil fertility** and grapevine growth performances under **vineyard** conditions. Moreover, the impact of biochar application on **soil GHG emissions** (CO_2, CH_4, N_2O) and on **nitrogen fluxes** are investigated.

The CHAR_GOAL project is a follow up of a former EFRE-FESR project (**WOOD-UP project, 2017 - 2020**) and is expected to provide scientific information about the effects of biochar application **over a period of at least 7 years**.



SITE DESCRIPTION

- Location: Labers (Meran, Bolzano Province, Italy)
- Elevation: around 600 m asl
- Plantation year 2007
- Cultivar Müller Thurgau grafted on SO4
- Planting density: 5,550 vines/hectare; training system: vertical positioned trellis; grass covering in the alleys (between rows)
- Drip irrigation system
- Soil is sandy loam (64% sand, 24% silt, and 7% clay) rich in skeleton; soil pH: 6.4
- The soil organic C content is 24±8 g kg^{-1} ; δ13C = − 27.8 ± 0.8‰

BIOCHAR AND ITS APPLICATION IN THE FIELD

- Biochar: produced from conifer wood (woodchips) at a temperature of about 500 °C by fast pyrolysisand matrices
- Experimental treatments: 1) control (no amendment); 2) biochar 25 t ha^{-1}; 3) biochar 50 t ha^{-1}; 4) compost 45 t ha^{-1}; 5) biochar 25 t ha^{-1} + compost; 6) biochar 50 t ha^{-1} + compost
- Applications performed once in year 2007 with tillage at 0.15 m depth
- Randomized block design with 4 blocks and 24 experimental plots of 80 m^2 (20 vines)

MEASURED PARAMETERS

- Seasonal weather conditions
- Soil analysis, soil bulk density, soil C content and C stock (at T0 and periodical)
- Continuous measures of soil water potential and soil temperature (0.10 m)
- Grapevine water status and physiological performances (periodical measures of stem water potential, leaf gas exchanges and chlorophyll florescence)
- Grapevine yield and pruning residues weight
- Periodical measurements of soil greenhouse gas emission (CO_2, CH_4, N_2O)
- Monitoring of nitrogen fluxes (vine N uptake and storage, N leaching)

PLANNED ACTIVITIES

- Project activities foreseen for period 2022-2024
- Overall monitored period 2017-2024

WORKING GROUP

Current activities are performed within the CHAR_GOAL project, a collaboration between the Free University of Bozen-Bolzano (coordination) and the **Laimburg Research Centre**. Vineyard management is conducted by the "Agenzia Demanio Provincia di Bolzano" under the Laimburg supervision. The CHAR_GOAL project is financed by **unibz** (CRC 2021, TN202H)

The site was established within the **Wood-Up project** (Optimization of WOOD gasification chain in South Tyrol to produce bioenergy and other high-value green products to enhance soil fertility and mitigate climate change, EFRE-FESR 2014–2020, project number 1028), funded by the European Regional Development Fund of the European Union and the Autonomous Province of Bolzano/Bozen.

BIBLIOGRAPHY

- Tonon, G. (Editor), 2020. WOOD-UP: Valorizzazione della filiera di gassificazione di biomasse legnose per l'energia, la fertilità del suolo e la mitigazione dei cambiamenti climatici (p. 242). bu, Press.
- Criscuoli, I., Ventura, M., Sperotto, A., Panzacchi, P., Tonon, G., 2019. Effect of woodchips biochar on sensitivity to temperature of soil greenhouse gases emissions. Forests 10.
- Criscuoli, I., Ventura, M., Wiedner, K., Glaser, B., Panzacchi, P., Ceccon, C., Loesch, M., Raifer, B., Tonon, G., 2021. Stability of Woodchips Biochar and Impact on Soil Carbon Stocks: Results from a Two-Year Field Experiment. Forests 12, 1350.
- Petrillo, M., Zanotelli, D., Lucchetta, V., Aguzzoni, A., Tagliavini, M. and Andreotti, C., 2020. The use of biochar as soil amendment: effects on nitrogen and water availability for potted grapevines. Italus hortus, 27(2), pp.28-40.

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