

## Biochar and new forest surfaces: winning pair for the conservation and sequestration of carbon in the soil

### Riferimenti

Tipo di progetto

Gruppo Operativo

Acronimo

CARTER

Tematica

Impronta carbonica

Information

Time frame

2019 - 2022

Durata

36 months

Partners (no.)

18

Regione

Veneto

Comparto

Forestale

Localizzazione

ITH36 - Padova

ITH37 - Rovigo

Costo totale

€607.675,68

Fonte di finanziamento principale

Programma di sviluppo rurale

Programma di sviluppo rurale

2014IT06RDRP014: Italy - Rural Development

Programme (Regional) - Veneto

Parole chiave

Fertilisation and nutrients management

Waste, by-products and residues management

Farming practice

Sito web

<https://www.progettocarter.it/>

Project status

completed



### Objectives

The project addresses two main issues:

- the downfall of poplar cultivation;
- the loss of organic matter.

The main objective of the project is to increase the area in poplar cultivations on agricultural soils, trying to combine the production of high added value assortments with carbon storage in the soil. This is possible through the use of the biochar as organic soil improver, which is produced through the use of wastes generated in the cultivations.

There are three main innovative aspects:

- 1 the increase in the use of better environmental sustainability poplar clones;
- 2 the use of poplar farming waste and pruning residues for biochar production;
- 3 the use of biochar as organic soil conditioner.

### Activities

Project activities are:

- Creation of a prototype plant for producing biochar: implementation and study of the results of the prototype plant
- Carbon sequestration study: Parameterization of carbon absorption linked to the species used; Measurement of effective absorption of tree crops and interaction in the total carbon balance
- Study on carbon conservation by using of biochar in field: Characterization of the biochar produced, Measurement of the increase of organic matter in the soil
- Study of the economics of the project: Study on economic convenience of biochar and income contribution, Market research on better environmental

### sustainability poplar clones

#### Context

Agricultural sector in climate strategies is very important: the European Union said that it is "multifunctional". About mitigations, this sector presents updates to reduce greenhouse gas emissions, as well as to enhance of the temporal fixation capacity of carbon in soils, in plant and tree production, in forest biomass and as a soil conditioner.

For plantations, the absorption capacity is limited in time, being temporary crops: it can be estimated on average equal to 1.81 ton C / ha year for poplar. Italian poplar cultivation covers less than half of the needs: Italy is the first European country for the import of poplar wood, with about 457,000 cubic meters. Some more recent estimates identify the current poplar area at 48,000 hectares. A possible aid can derive from agroforestry: it is the voluntary interaction between the wood with crops and/or husbandry, with ecological and economic benefits.

Biochar has positive effects on soil chemical-physical structure, soil biotic component, transformations of nutrients in the soil, nutrient leaching and soil enzymatic activity. Also, it stimulates the lives of various useful soil organs and can positively influence its microbiological properties. The presence and distribution of pore sizes in biochar are factors that constitute a suitable habitat for many microorganisms, where they can cope with their different needs.

#### Partenariato

| Role    | Azienda                  | Address                                                    | Telephone   | E-mail                 |
|---------|--------------------------|------------------------------------------------------------|-------------|------------------------|
| Leader  | Confagricoltura Rovigo   | Piazza Duomo, 2<br>45100 Rovigo RO<br>Italy                | 0425 204428 | economico@agroso.eu    |
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<https://www.innovarurale.it/pei-agri/gruppi-operativi/bancadati-go-pei/biochar-e-nuove-superfici-forestali-binomio-vincente-la>

| Role    | Azienda                                             | Address                                                          | Telephone   | E-mail                           |
|---------|-----------------------------------------------------|------------------------------------------------------------------|-------------|----------------------------------|
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| Partner | Bertin Gianluca                                     | Via Pesare, 1/Bis (PD)<br>35036 Montegrotto<br>Terme PD<br>Italy | 349 1609989 | gianlucabertin@alice.it          |
| Partner | Azienda Agricola<br>Colombara s.s.                  | Via G Puccini, 561/B<br>45036 Ficarolo RO<br>Italy               | 340 6555142 | pierp.63@libero.it               |
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| Partner | Il Frutteto di San Martino<br>s.s. Di Reato Tommaso | Via Marconi, 752<br>45030 San Martino di<br>Venezze RO<br>Italy  | 340 2680346 | ilfruttetodisanmartino@gmail.com |

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| Role    | Azienda                                                                                   | Address                                                              | Telephone   | E-mail                             |
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| Partner | CREA - FL Foreste e Legno                                                                 | Viale Santa Margherita,<br>80<br>52100 Arezzo AR<br>Italy            | 0142 330900 | piermario.chiarabaglio@crea.gov.it |
| Partner | PEFC Italia                                                                               | Via Pietro Cestellini, 17<br>06135 Ponte San<br>Giovanni PG<br>Italy | 075 7824825 | info@pefc.it                       |
| Partner | Università degli Studi della Tuscia - Dipartimento di Scienze Agrarie e Forestali (DAFNE) | Via San Camillo de<br>Lellis snc<br>01100 Viterbo VT<br>Italy        | 0761 3571   | direzione.dafne@unitus.it          |
| Partner | CNR - Istituto di Ricerca sugli Ecosistemi Terrestri (IRET) - Roma                        | Piazzale Aldo Moro, 10<br>00185 Roma RM<br>Italy                     | 0763 374928 | pierluigi.paris@cnr.it             |

### Pratiche abstract

#### Description

Realization of a prototype demonstration plant for the production of biochar:

The goal of this macro-activity is the realization of the prototype of the biochar production plant and the subsequent evaluation of both the production process and the product.

#### Description

Analysis of the potential for carbon sequestration:

For a correct promotion of carbon sequestration from the atmosphere by increasing forest surfaces on agricultural and non-agricultural land, it is necessary to know the absorption of CO<sub>2</sub> by the new ecosystem. The research phases will follow 3 strands: the absorption parameterization linked to the species / clones used; the effective absorption of tree crops; the tree / ecosystem interaction in the overall carbon balance

#### Description

Analysis on the conservation of carbon through the use of biochar in the agricultural field:

For a correct promotion of the storage and conservation of carbon in agricultural and non-agricultural land, it is necessary to

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know the characteristics of the biochar produced and its interactions with the soil. Only through careful analysis and study of biochar and its appropriate uses will it be possible to make a concrete contribution to the development of a generation of products in line with the priorities of the Green Economy. We will therefore optimize, qualify and standardize the production of biochar obtained from agro-forestry and agricultural systems and develop and characterize at least 3 types of biochar specifically designed for use in sectors represented in the local and regional production fabric

### Description

Economic and productive investigation on the effects of the project:

For a correct promotion for economic purposes of the project, in order to combine environmental / production aspects, we will proceed to explore the elements characterizing the economic sustainability of the various interventions carried out.

### Link utili

| Titolo/Descrizione               | Url                                                                                                                                                                                 | Tipologia                                                 |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Sito web del progetto            | <a href="https://www.progettocarter.it/">https://www.progettocarter.it/</a>                                                                                                         | Sito web                                                  |
| Relazione finale                 | <a href="https://www.progettocarter.it/wp-content/uploads/2022/08/Brochure-Carter-finale...">https://www.progettocarter.it/wp-content/uploads/2022/08/Brochure-Carter-finale...</a> | Materiali utili                                           |
| Italian Agroforestry Association | <a href="https://www.agroforestry.it/progetti-agroforestali/">https://www.agroforestry.it/progetti-agroforestali/</a>                                                               | Link ad altri siti che ospitano informazioni del progetto |