

ITALY

Greenhouse Gas & ammonia emissions

Location

Emilia-Romagna

Programming period

2014 – 2020

Priority

P5 Resource efficiency & climate

Measure

M16 - Cooperation

Funding (EUR)

Total budget 192 339.87

Project duration

2016 – 2020

Project promoter

Regione Emilia-Romagna

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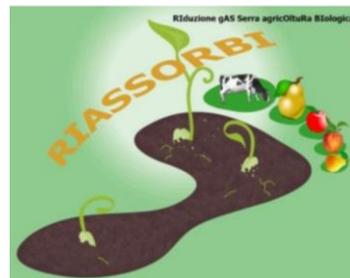
Website

<https://progetti.crvp.it/Home/ProjectDetail/32>

An EIP AGRI operational group was set up in Emilia Romagna to identify agronomic techniques that contribute to the reduction of Green House Gas (GHG) emissions in organic farming.

Summary

Modern agriculture, and organic farming in particular, offers great opportunities to contribute to the mitigation of the greenhouse effect through the reduction of greenhouse gas (GHG) emissions and the increase in the soil's capacity to absorb atmospheric carbon dioxide.



For this reason an EIP AGRI operational group was set up in the Emilia Romagna region of Italy, to help identify those production techniques which, with the same production yields and product quality, reduce the emissions of carbon dioxide (CO₂), nitrous oxide (N₂O) and methane (CH₄) in fruit crops and dairy farms producing certified organic milk.

Results

- Estimation of GHG emissions in organic orchards.
- Estimation of GHG emissions in organic dairy cattle farming
- Estimation of soil carbon sequestration.
- Evaluation of the estimates for the identification of good practices in emission mitigation.
- Identification of good practices for the mitigation of GHG emissions. These good practices will be disseminated and transferred to the organic fruit and livestock sectors.

Context

Organic farming is growing, and its increase is determined by global market demand for food products of high nutritional quality grown in a way that avoids, as much as possible, forms of pollution caused by the agricultural techniques. Paying attention to the ability of the agricultural production systems to reduce GHG emissions also creates the prerequisite for further "added value" of organic production. This added value could be used in new markets that are also focused on environmental protection.

Modern agriculture has the capacity to contribute to the mitigation of the greenhouse effect through two mechanisms: the reduction of GHG emissions and the increase in the absorption of atmospheric CO₂.

Objectives

The objective of this project is to highlight the existing best practices for mitigating greenhouse gas emissions in organic production systems. Above all, the project will show how their synergistic application can bring added value and guarantee the environmental quality of organic products.

Activities

The project's activities help identify those production techniques which, with the same production yields and product quality, reduce the emissions of CO₂, N₂O and CH₄ in fruit crops and dairy farms producing certified organic milk.

For this purpose, the project considered as a representative reference, the regional reality using the Life Cycle Assessment (LCA) methodology. The LCA allows the assessment of all climate-changing gas emissions by defining a parameter called 'Global Warming Potential' (GWP).

The phases of the planned activities were:

1. For the calculation of emissions:

- preparing ad-hoc sector-specific questionnaires for plant and livestock production, including questions on waste and co-products;
- gathering the information received from farms and also from a sample of other companies; and
- choosing the farms: at least three farms for each fruit species (peach, apple and pear), situated in similar pedo-climatic and lying conditions (by species), but using different cultivation techniques.

2. Data processing according to the above-mentioned methodology to quantify:

- estimation of GHG emissions produced in organic orchards;
- estimation of GHG emissions produced in organic dairy cattle farming; and
- estimation of carbon sequestration in the soil.

3. Results:

By determining the values for the soil and the different sectors of production, it will be possible to highlight, for the reference plant and animal products (peaches, pears, apples and fresh milk), the most effective practices for the mitigation of GHG emissions in the organic production systems.

Main results

The expected outcomes are described below:

1. Estimation of GHG emissions in organic orchards. For all the cases studied, the environmental indicator GWP (kg CO₂eq / kg product and hectare) will be provided with details for the main impact categories (plant, crop operations, irrigation, fertilisers, agro-pharmaceuticals, fertiliser emissions, transport and waste).
2. Estimation of GHG emissions in organic dairy cattle farming. The environmental impacts of the production of fresh cow's milk will be calculated in terms of GHG emissions (kg CO₂ eq – Global Warming Potential) divided into the main impact categories (enteric emissions, management of CH₄ debris, management of N₂O debris, emissions from fertilisers, energy for agricultural machinery, purchased food, technical means).
3. Estimation of carbon sequestration in the soil. Comparing the results of different calculation models in relation to the dynamics of the carbon in the soil (emission / sequestration), with the same input data, in a sample company. Calculation of the amount of stored carbon in the soil for three types of tree crops, according to the model selected as the most environmentally suitable for the production area. Validation of simulated data with measured data. Calculating soil carbon dynamics for different management scenarios of agricultural practices.
4. Evaluation of the results to identify good practices in emission mitigation.
5. Based on the results that will emerge during the project, the good mitigation practices will be disseminated and transferred to the organic fruit and livestock sectors.

Additional sources of information

http://agricoltura.regione.emilia-romagna.it/psr-2014-2020/doc/progetti-partnersariato-europeo-per-linnovazione-pei/p5d_riduzioni-emissioni-ammoniacale/progetti-presentati-in-risposta-al-bando-2017/tecniche-agronomiche-per-la-riduzione-delle-emissioni-di-gas-serra-in-aziende-agricole-a-conduzione-biologica-riassorbi/view