Cherry Carbon Footprint in Jerte Valley (Spain): identifying opportunites for its redution

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INTRODUCTION

Cherry production is one of the main drivers of the Jerte Valley's economy. The land is organized into smallholdings and crop management has a family scale and a long tradition in the area. The objective of this study is to evaluate the carbon footprint (CF), expressed in CO2 equivalents, of the Jerte cherry production process.

This work has allowed us to identify those critical points in the production process that could be improved to reduce the climate impact of the cherry. We are currently studying the C sequestration capacity of the soils under these crops in order to assess the possibilities of moving closer to climate-neutral agricultural production.

MATERIALS AND METHODS

The Life Cycle Assessment (LCA) used in this study follows the "cradle to gate" approach, considering all impacts related to materials, energy and equipment from production to use. The LCA is focuses on the three main phases of the production process: agricultural production of the fruit, handling and sorting in the cooperative, and production of the materials for cherry packaging. The **functional unit (FU)** chosen is **1 kg of cherry packed in a cardboard box with a plastic lid and strapped**.

The information was collected thanks the collaboration of 100 cherry growers, agricultural cooperatives and the Local Action Group. To calculate the CF we used the Open-LCA software and the Ecoinvent v3.2 database.

RESULTS

The CF shown that the main part of the GHG emissions (78%) was derived from the field production phase including all works on the farm (Table 1).

Table 1. GHG emissions linked to the three main phases of the production process

Phase	% of emissions/phase	Kg CO_2eq
Field production	78,0%	1,0015
Handling of the fruit	14,2%	0,1823
Cherry packaging	7,8%	0,1002
Carbon Footprint	100	1,2840

As it is shown in **Figure 1**, among the tasks of the field production phase, the greatest climate impact is due to the fertilizer production and trasnportation with the 27% of the CF responsability. The machinery used on farm for tillaging, weeding and products application was the second group of activities with greater climate impact (23%).

This is due both to the use of machinery dependent on fossil fuels for their application. The use of herbicides and phytosanitary products was the third main group in climate impact responsability (20% of the CF. In summary, it has been identified that in the cherry production process the tasks with the greatest climate impact are those linked to the use of mineral fertilizers, herbicides and phytosanitary products.

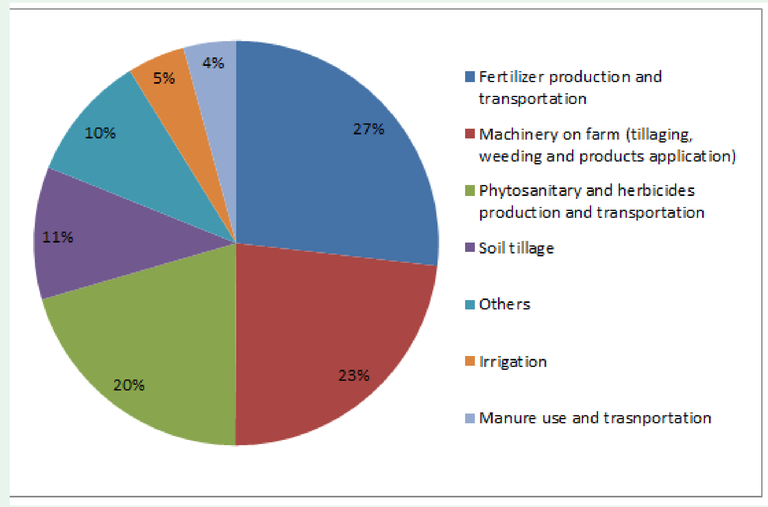
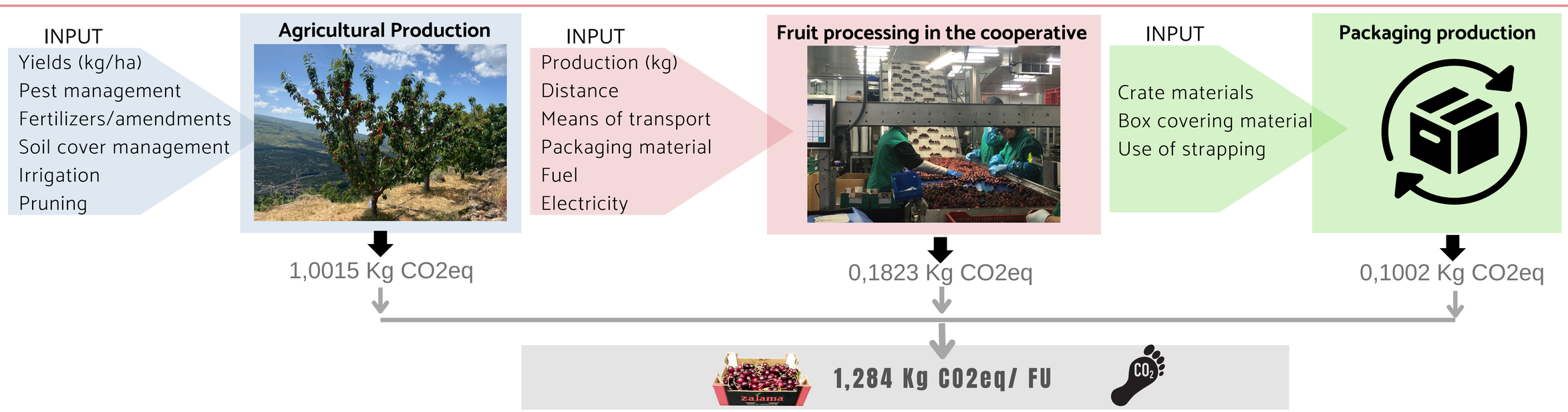


Fig. 1- Kg of CO2eq linked to the different agricultural tasks in the production of cherries.

This is due both to the machinery of the production and transportation process of these inputs and to the use of machinery dependent on fossil fuels for their application. In this sense, promoting organic fertilization practices, either from native materials or with the use of plant covers, appears as a priority to reduce the carbon footprint of cherries in the area.



CONCLUSION

This work has allowed us to identify those critical points in the production process that could be improved to reduce the climate impact of the cherry. In this sense, promoting organic fertilization practices, either from native materials or with the use of plant covers, appears as a priority to reduce the carbon footprint of cherries in the area.

We are currently studying the C sequestration capacity of the soils under these crops in order to assess the possibilities of moving closer to climate-neutral agricultural production.

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