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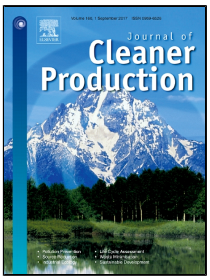

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Abstract

The food industry contributes disproportionately to many global-scale environmental problems. The winemaking process involves many different phases varying from the grape production, bottling and distribution. Many of these processes contribute to negative impacts on the environment and life cycle assessment can assist in identifying the possible strategies and opportunities to improve the environmental performance of products during their entire life cycle.

The purpose of this work is to assess the environmental impacts of the cultivation, management and disposal of an Italian vineyard during its entire life cycle. In particular, the aim of this work is to assess, on the basis of different properties of the soil, the most suitable vine spacing in order to reduce the environmental impacts. To assess the environmental impact, the analysis was conducted using the SimaPro 8.0.4 software and IMPACT 2002+ evaluation method. Data related to cultivation, management and disposal were directly collected from the producer or from Ecoinvent database while data related to the environmental emissions arising from the use of fertilizers and heavy metals, calculated following the criterion proposed by Ecoinvent, were reported to the functional unit. In this study, the grape sugar content, that is related to the wine quality, was considered as a coproduct. The results show that, taking into account the grapes quality, the damage is lower for the 3x0.8 planting pattern even if the vineyard lifetime is longer. LCA results show that the most critical issues are related to direct emissions of fertilizers and pesticides and to land occupation.

Highlights

1. Life cycle assessment of an Italian vineyard for the production of Lambrusco grapes.
2. A preliminary approach is proposed in order to define the environmental profile balancing the vineyard productivity and the grapes quality.
3. The most critical environmental burdens and the benefits related to the adoption of different planting patterns were assessed.

Keywords red wine, life cycle assessment, planting patterns, grape quality, environmental loads