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Environmental analysis of the construction of a “tendone system” for table grapes

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Objectives

Italy is in third place in the world ranking for the production of table grapes with 1.4 million tons. The Puglia region produces about 70% of this amount through the cultivation of 35,000 hectares. This production takes place with the aid of the "tendone system" which is a structure consisting of wooden or concrete piles, and steel cables. This structure supports the plastic covering materials that can be fixed anti-hail nets and / or mobile rolling films. The "tendone systems" utilize plastic coverings material in order to obtain anticipated (transparent film), conventional (anti-hail plastic net), postponed productions (plastic net and plastic film). The knowledge of environmental loads generated by the table grape production is interesting because, in addition to normal agricultural practices, involves the use of other materials from the technosphere and specific installation practices. The aim of this work is the analysis of the environmental profile of the orchard construction phase for table grapes by means LCA (Life Cycle Assessment). A research project that involved 26 farms producing table grapes, allowed collecting relevant data concerning the production cycles, the technique of construction, the materials used for “tendone systems”.

Methods

This study uses the Life Cycle Assessment (LCA) methodology to determine the environmental impact of a table grapes production with the use of “tendone-systems”, carried out according to standard UNI EN ISO 14040-44. Life Cycle Assessment can be a decision making tool for government officials, industries or society to evaluate a product's environmental impact. Interview in farms have supplied the primary data for the inventory of this production. The Gabi7 software and Ecoinvent 3.1 database were used for inventory and processing of collected data. The analysis covered only the phase of installation of the tendone-system (from cradle to installation analysis). The adopted functional unit was 1.0 ha of prepared agricultural surface for growing table grapes, covered with a tendone-system.

Results

The method of evaluation of environmental burdens was CML2001 (Centre of Environmental Science, Leiden, Netherlands). The results have provided the environmental burdens produced by the construction and installation of the tendone-system. A comparison between the tendone-system for the conventional production (plastic nets), anticipated (transparent film), and postponed (plastic net and plastic film) productions was also realized. The increased amount of plastic used for the cover and the relative disposal causes greater environmental burdens. The carried out analysis is the first step in the overall evaluation of the production of table grapes by means of tendone-system.