



University of Zabol
Graduate school
Faculty of Agriculture
Department of Agronomy

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degree of Master of Science (M. Sc) in Thread, Agroecology

Title

**Assessing the environmental effects of melon production
through two methods of plastic mulching and seasonal
cultivation in Helmand by (LCA)**

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Abstract:

This study was carried out to investigate the environmental damages of melon crop in different subplastic and seasonal cultivation methods using Life Cycle Analysis (LCA) in Hirmand province in the year 2016-2017. This review criticizes the understanding of the environmental impacts of using plastic mulch and investigating the life cycle of plastic mulch and melon crops with direct and indirect consequences for long-term quality and ecosystem services. The studied unit for life cycle assessment in this study was considered one ton of melon crop. System boundaries from cradle to field were determined. Initial data were obtained through distribution of questionnaires to farmers and other information was collected from the Meteorological Organization and databases including Ecoinvent3.0. Sima Pro8.3 software was used for initial data analysis. In this study, six impact categories were evaluated. The results showed that the difference between subplastic and seasonal cultivation is due to differences in inputs of two fields. In most classes, the impact of machinery, electricity, plastic mulch and the amount of nitrogen fertilizer consumed was greater. In the same results of the two melon crop cultivars, the effect of drainage on water resources was high. The phthalate contamination load in subplastic culture in Hirmand city was $8596.08 \text{ mg / kg}^{-1}$ and the N_2O emissions were also significant. Results show that greenhouse gas emissions can be reduced by reducing fertilizer use in sub-plastic and agricultural machinery in seasonal cultivation.

Keywords: Greenhouse gases, Phthalic acid esters, Subplastic culture Seasonal Cultivation Discharge of water resources