

Life Cycle Assessment of common used plastic products in the EU

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Keywords: Agriculture Plastic Waste (APW), Life Cycle Assessment, mulch films, pipes, greenhouse films

Abstract

Agriculture Plastic Waste (APW) generates about 615.000 tons of waste per year in Europe. This presents a serious challenge concerning the production of the plastic as well as the disposal or recycling of the materials.

For addressing especially the specific issues of APW the European Commission funds a project called LABELAGRIWASTE, labelling agricultural plastic waste for valorising the waste stream. In the consortium partners from Belgium, Cyprus, Finland, France, Germany, Greece, Italy, and Spain are working together on developing a labelling scheme for European APW.

In order to identify the environmental impact of the main agricultural plastic products, a Life Cycle Assessment (LCA) is performed. The LCA is done before the development of a labelling scheme starts to examine the different life cycles of the most commonly used products in agriculture in Europe. The study includes the LCA of mulch films, pipes, and greenhouse films, each with two different plastics and different End-of-Life options. Also differences in four countries and the European Union in total are investigated. Furthermore, the LCA includes the production of the plastics and the following different End-of-Life scenarios: mechanical recycling, landfill and incineration. As a result the environmental profiles of different materials with various End-of-Life options are generated. The environmental categories Global Warming Potential (GWP), Acidification Potential (AP), Eutrophication Potential (EP), Photochemical Ozone Creation Potential (POCP) and additionally the Primary Energy use are shown. The results are varying depending on the End-of-Life option, the country and of course the material studied. Often an incineration as End-of-Life option benefits the whole Life Cycle because it recovers energy that can be used and gives benefits in some environmental categories.

The paper presents key results of the study and gives an impression of the environmental profiles of different options of materials in agriculture, providing a clear picture of the country-specific current situation as well as giving basis for the development of the project.