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Volume 18, Number 3, 364-383, DOI: 10.1007/s10924-010-0222-z

Critical Review of Norms and Standards for Biodegradable Agricultural Plastics Part II: Composting

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Abstract

The critical review of norms and standards and corresponding tests to determine the compostability of biodegradable plastics, possibly applicable also to biodegradable agricultural plastics, shows that many norms concerning testing and labelling of compostable plastics have been established at the international level. Some of them are about plastic materials, some others are about products like packaging. The media and conditions of testing cover mainly the conditions designed for industrial composting facilities, and only a few concern home composting conditions. Considering that the end of life management of biodegradable agricultural plastic products will be done at the farm to reduce the management of the waste and also its cost, only a few of these norms are considered to be suitable for adaptation to cover also biodegradable agricultural plastic products. The biodegradability validation criteria under composting conditions, such as the threshold percentage of biodegradation and disintegration, the time and temperature, and the ecotoxicity, are presented for the main norms and standard testing methods. Based on these different norms and their content, a list of specs and technical requirements that could be adapted to meet farm composting conditions for agricultural compostable plastics is proposed. These requirements may be used as criteria for the establishment of a new integrative norm for agricultural compostable plastics.

Keywords Biodegradable agricultural plastics - Compostability at farm - Testing methods - Norms - Labelling



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J Polym Environ
 DOI 10.1007/s10924-010-0222-z

Critical Review of Norms and Standards for Biodegradable Agricultural Plastics Part II: Composting

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Abstract The critical review of norms and standards and corresponding tests to determine the compostability of biodegradable plastics, possibly applicable also to biodegradable agricultural plastics, shows that many norms concerning testing and labelling of compostable plastics have been established at the international level. Some of them are about plastic materials, some others are about products like packaging. The media and conditions of testing cover mainly the conditions designed for industrial composting facilities, and only a few concern home composting conditions. Considering that the end of life management of biodegradable agricultural plastic products will be done at the farm to reduce the management of the waste and also its cost, only a few of these norms are considered to be suitable for adaptation to cover also biodegradable agricultural plastic products. The biodegradability validation criteria under composting conditions, such as the threshold percentage of biodegradation and disintegration, the time and temperature, and the ecotoxicity, are presented

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Introduction

Biodegradable plastics are present today in various sectors of the economy; one of these sectors is agriculture. The global quantities of biodegradable plastics in use at the European Level in 2007 was about 30000 t, representing only 0.06% of the general plastics use of 47.5 Mt [1]. In France, for example, the corresponding figures are 6.7 Mt of plastic and 10000 t are biodegradable plastics, representing 0.15% of the use of plastics [2]. Biodegradable polymers are increasingly been used today as substitutes of plastics for several applications of conventional agricultural plastics [3–5], especially for developing agricultural films [6–8], but also plant pots, guide strings/clips for climbing plants, nets for agriculture and forestry (including animal net), compost bags etc. [9]. The use of biodegradable plastics for agricultural applications is not yet introduced widely in Europe, except for France where the biodegradable mulching film represents 3.6% of the mulching films in use [10].

The main reason for introducing biodegradable plastics in agricultural applications, even at a slow pace, is that the

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Published online: 29 June 2010



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