





Waste Management

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Experimental investigation of the quality characteristics of agricultural plastic wastes regarding their recycling and energy recovery potential

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Abstract

A holistic environmentally sound waste management scheme that transforms agricultural plastic waste (APW) streams into labelled guaranteed quality commodities freely traded in open market has been developed by the European research project *LabelAgriWaste*. The APW quality is defined by the APW material requirements, translated to technical specifications, for recycling or energy recovery. The present work investigates the characteristics of the APW quality and the key factors affecting it from the introduction of the virgin product to the market to the APW stream reaching the disposer. Samples of APW from different countries were traced from their application to the field through their storage phase and transportation to the final destination. The test results showed that the majority of APW retained their mechanical properties after their use preserving a “very good quality” for recycling in terms of degradation. The degree of soil contamination concerning the APW recycling and energy recovery potential fluctuates depending on the agricultural plastic category and application. The chlorine and heavy metal content of the tested APW materials was much lower than the maximum acceptable limits for their potential use in cement industries.

Highlights

► Definition of parameters characterising agricultural plastic waste (APW) quality. ► Analysis of samples to determine APW quality for recycling or energy recovery. ► Majority of APW samples from various countries have very good quality for recycling. ► Upper limit of 50% w/w soil contamination in APW acceptable for energy recovery. ► Chlorine and heavy metals content in APW below the lowest limit for energy recovery.

Keywords

- Agricultural plastic;
- Agricultural plastic waste;
- Waste quality;
- Recycling;
- Energy recovery

<http://0-www.sciencedirect.com/precise.petronas.com.my/science/article/pii/S0956053X12000323>