

RECYCLING SPECS FOR AGRICULTURAL PLASTIC WASTE (APW) – A PILOT TEST IN GREECE AND IN ITALY

Miltiadis Hiskakis¹, Epifania Babou¹, Demetres Briassoulis^{1*}, Alessandro Marseglia², Zoe Godosi², Konstantinos Liantzas¹

¹Department of Natural Resources and Agricultural Engineering, Agricultural University of Athens, Iera Odos 75, 11855, Athens, Greece

² ALFA EDILE srl Via A. Nobel 16, 72100, Brindisi, Italy

*Corresponding author: Email: briassou@aua.gr, Tel: +30 210 529 4011, Fax: +302105294023

Scope of Labelagriwaste project

Every year tons of agricultural plastic waste are burnt or uncontrollably disposed to the environment. The uncontrollable burning releases harmful substances that cause pollution while the accumulation of plastics in the agricultural land results in its irreversible contamination and physical degradation.

The serious environmental problems related to the management of APW at European level, led to a European research project LABELAGRIWASTE¹, aimed at developing a viable scheme for the collection and valorization of the agricultural plastic waste destined for recycling or energy recovery. After completing a study of existing schemes (for APW and for other waste streams) and a study of the existing legal framework and the legal tendencies, a first scheme was designed, tested and improved in a pilot test. The results of the tests are described in a series of publications. The part of collection and consolidation of the APW is described in [1], while the energy recovery from APW is described in [2]. This paper describes the mechanical recycling of APW.

Recycling Specifications for APW

The mechanical recycling processes has been grouped into two categories according to the final product and correspondingly to the specifications of the agricultural plastic waste that can be processed. The first category comprises the processes that produce plastic lumber and can accept unwashed shredded plastic waste. This process is suitable for both, high and low quality agricultural plastic waste. The waste goes through the extruder that produces thick profiles. The second category aims at the production of pellets to be used for manufacturing films or other products. The processes required in this case are more refined as they include washing of the shredded plastic waste, drying it and then processing it through one or more extruders with filters to capture the remaining impurities. The final product is pellets. The specs for the waste to be recycled into pellets is stricter than the waste to be recycled to profiles and so only good quality agricultural plastic wastes may be recycled into pellets.

The recycling industry is very empirical and operates without established specs. Despite this fact, in this work a series of universal specifications is established to determine the recyclability of the APW improving their marketability. Through a literature survey and a series of interviews, visits and pilot tests, two sets of specifications are established: one for acceptable APW to be recycled into plastic lumber and another to be recycled into pellets. The limiting factors of the recycling process are detailed to support the established specs.

Pilot Test in Greece and Italy

A pilot test was carried out in Greece to collect agricultural plastic waste and test how the original composition, use, removal, sorting, consolidation and storage affect their ability to meet the established recycling specifications [3]. A quantity of the APW collected, tested and labelled in Greece was transported to Italy in accordance to trans-boundary legislation procedures. A series of pilot tests on the recyclability of the labelled APW into plastic lumber was conducted in Italy and the results are presented in this work.

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Conclusions

A series of universal specifications for recycling APW has been established and is the first attempt towards establishing the scientific base for the recycling industry concerning APW.

The APW recycling logistics have been evaluated through a pilot test and the major parameters have been quantified.

References

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3. Briassoulis D., Babou E. and Hiskakis M., 'Correlation of key agricultural plastic waste parameters with the quality of the resulting waste stream', Proceedings of the international conference GreenSys2007 - High Technology for Greenhouse system Management, Naples, Italy, October 4-6, 2007.