

# Comparative analysis of the European and Greek legislative framework for Agricultural Plastic Wastes (APW) and its implementation in Greece

Konstantinos Liantzas<sup>1</sup>, Demetres Briassoulis<sup>1\*</sup>, Miltiadis Hiskakis<sup>1</sup>

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

\*Corresponding author: Email: [briassou@aua.gr](mailto:briassou@aua.gr), Tel: +30 210 529 4011, Fax: +302105294023

## Abstract

A comparative review of the European legal framework for agricultural plastic wastes (APW) has shown that none of the Member States has national strategy for managing specifically APW. Legislation on APW at the regional level exists only in a few of the regions where the problem is acute. Several Member States have focused attention at a national level on particular APW streams (pesticide packaging, silage films, etc). In Greece, the plastics in general (except for the materials mentioned in the law for packaging) and as a consequence APW are treated as solid waste following the corresponding laws. There is no national system of management of APW in Greece. Introducing a legal framework for APW at European level will facilitate the efficient management of APW throughout Europe, by promoting the exploitation of the waste by waste management enterprises, recyclers and facilities utilising the APW as alternative fuels for energy production.

*Keywords: Agricultural plastic wastes; labelling; legislation; management system; recycling.*

## 1. INTRODUCTION

Environmentally sound waste management requires establishing an overall coherent policy promoting the prevention and recycling of waste. Such a policy should take in account the current situation in the European Union (EU), including waste trends and existing measures, and should enjoy the contribution of the stakeholders and the support of the public decision makers. Despite the progress made in the European Community waste legislation, there are a number of gaps, like the lack of legislation for specific categories of wastes; among them, the agricultural plastic waste [1].

This paper presents a systematic comparative analysis of the European and national legal framework encompassing agricultural waste management. It also presents an analysis of the Greek legislative framework concerning agricultural waste management and its implementation in Greece.

## 2. ANALYSIS OF EUROPEAN LEGISLATION

A systematic review of the European legislation<sup>1</sup> showed no specific legal framework in Europe for the agricultural plastic wastes [2,3,4]. There are however some general European waste directives that encompass the agricultural plastic wastes as solid wastes. Also, some of the agricultural plastic waste (i.e. fertilizer bags, agrochemical sacs) are legislated, in some countries, under the packaging framework. More specifically the main provisions of each category of EC waste legislation applying directly or indirectly to Agricultural Plastic Wastes (APW) are described below:

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## **2.1 The Waste Frame Directive**

The Waste Frame Directive “WFD” (Directive 75/442/EEC) [5] of the EU states in summary, that integrated management systems should be established for all categories of waste at the national level and forbids the uncontrolled discarding of any waste stream. It also states that in accordance with the ‘polluter pays’ principle, the cost of disposing of waste must be borne by: a) the holder who has waste handled by a waste collector or by an undertaking contractor and/or b) the previous holders or the producer of the product from which the waste came.

## **2.2 Directive on Hazardous Waste**

Directive on Hazardous Waste (91/689/EEC) [6] defines the properties, which render wastes hazardous and states the way of their treatment. It also describes the procedure of obtaining permits for the management of hazardous wastes. Although most of the virgin agricultural plastics are not considered to be hazardous their contamination with agrochemicals or other chemicals can render them hazardous. A well organised disposal system of agricultural plastics has to define limits for the characterization of the agricultural plastic wastes as hazardous in accordance to this directive.

## **2.3 Waste Shipment Regulation**

Directive for the transportation of Waste (93/259/EC) [7] determines the criteria for the selection and the obligations of the responsible for the shipment of wastes (hazardous or not). It also states the permit procedures and the specifications for the trans-boundary shipment of waste. The future legislative framework for agricultural plastics has to take into consideration that solid waste (also agricultural plastic waste) clean from hazardous chemicals is allowed to be transported freely across Europe.

## **2.4 The Landfill Directive**

The Landfill Directive (Directive 99/31/EC) as amended by 2003/33/EC Council Decision of 19 December 2002 [8], forbids the uncontrolled burying of the waste, establishes criteria and procedures for the acceptance of waste at landfills and sets out a number of administrative requirements, including permit conditions, technical requirements and environmental standards applying to landfills accepting various categories of waste (inert, non-hazardous and hazardous waste)..

## **2.5 The Incineration Directive**

The Incineration Directive (Directive 2000/76/EC) [9] states that uncontrolled burning is prohibited and states the conditions for obtaining permit for waste incineration in an incinerator or a co-incinerator . It also determines the emission limit values for the incineration and co-incineration of waste, specifying the treatment of water discharges from the cleaning of exhaust gases and the residues resulting from the operation of the incineration or co-incineration plant. Finally, it clarifies special provisions for cement kilns (co)/ incinerating waste and special provisions for combustion plants (co)/incinerating waste.

## **2.6 IPPC Directive**

IPPC Directive (96/61/EC) [10] concerns integrated pollution prevention and control. Waste treatment operations fall within the scope of IPPC Directive. These are mainly waste recovery operations, the incineration of waste, with or without energy recovery, and certain waste disposal operations, including landfilling of waste. As part of the implementation of the IPPC directive, the Commission is developing a number of Best Available Technique Reference (BREF) documents. In practice, permits issued to waste treatment installations falling within the scope of the IPPC directive have to be based on Best Available Techniques (BAT).

## **2.7 Sustainable Use of Pesticides and Current legislation on Fertilizers**

The European Community has developed a very comprehensive regulatory framework, Directive 91/414/EEC [11] defining strict rules for the authorisation of plant protection products (PPPs). The final disposal of agricultural plastic packaging of the pesticides is not a part of the current legislation. The legislation is limited to the right use of the pesticides and the appropriate labelling of their packaging. The control of the right treatment of their packaging, their labelling, the creation of a system of management of them may affect systems of management of agricultural plastics. These systems should also, take into account that the management of plastic fertilizer sacks and canisters are not part in the current legislation. Only their labelling and their market limits are legislated (Regulation 2003/2003 on fertilizers) [12]. The EU may consider the incorporation of the agricultural plastic wastes of fertilizers in the future legislation for agricultural plastic waste and for the sustainable use of fertilizers in European Community.

## **2.8 European Parliament and Council directive 94/62/EC of 20 December 1994 on packaging and packaging waste**

European Parliament and Council directive 94/62/EC of 20 December 1994 [13] on packaging and packaging waste is perhaps the best-known directive concerning a specific waste stream. It is certainly the one for which most practical experience exists. The directive sets quantitative targets for the recovery and recycling of various packaging materials (including plastics). These targets are currently being revised, with a view to their substantial increase. Commission has proposed differentiated recycling targets for each of the materials covered by the directive, taking into account the different environmental and economic costs/benefits of each material.

## **2.9 Major waste streams**

Finally, it is generally agreed that five major waste streams account for the overwhelming majority of waste generation [1]. These include manufacturing waste, Mining and Quarrying Waste, Construction and Demolition Waste, Municipal Solid Waste and Agricultural and forestry waste. Agricultural and forestry waste is estimated to be one of the largest waste streams, although little information is available about volumes or composition. Together, the former waste streams account for about 90% of waste generated across the EU. Agricultural wastes comprise firstly slurry, manure, straw, silage, silage effluent, vegetable and cereal residues, etc. and, secondly, waste such as scrap machinery, pesticides or waste oils, plastic wraps, tunnel and agricultural films etc. According to the EEA no overall estimations are available for total agricultural waste in the EU [1].

## **3. COMPARATIVE ANALYSIS OF THE LEGISLATIVE FRAMEWORK OF EUROPEAN MEMBER STATES FOR AGRICULTURAL PLASTIC WASTES (APW)**

A systematic comparative review of the European project LABELAGRIWASTE has shown that none of Member States has a comprehensive documented strategy at a national level, encompassing all agricultural plastic waste streams. The results of this review are described below analytically:

### **3.1 Analysis of national and regional legislation about agricultural plastics**

**National legislation:** Several Member States (Belgium, Germany, Ireland, the Netherlands, France, Finland, Italy and Norway), have focused attention at a national level on particular agricultural waste streams; namely pesticide packaging and silage and horticultural films. National pesticide packaging recovery schemes exist in Belgium, Germany, the Netherlands and France [2,4,14]. The comparison between these schemes shows that:

- all have been led by the national crop protection associations in response to, or the threat of, legislation or a tax;
- all are based on strong stakeholder partnerships, that is, between Government, manufacturers, distributors and farmers;

- apart from the Dutch scheme, all are financed via a product levy paid by pesticide manufacturers and passed on to distributors and users;
- all include a comprehensive farmer awareness and education programme to handle the containers.

National legislation on the recovery of silage and horticultural films exists in France, Ireland, The Netherlands and Norway requiring producers and importers to set up a collection and reprocessing system for waste plastic film. All parties (that are manufacturers, distributors and farmers) have to aim to reduce both the quantity of waste produced and its environmental impact.

In Italy, there is national legislation requiring producers and converters of polyethylene products to form a consortium for waste recovery. Under this legislation, farmers are obliged to transfer their waste films to the consortium (Polieco) [2,14].

**Regional level legislation on agricultural waste streams:** Legislation has been drafted in regional level in Belgium and Spain (Wallone, Andalusia), mandating farmers and industry to organize systems of management of agricultural plastic wastes.

All other countries have not drawn specific attention to agricultural plastic waste stream and they manage this stream with the provisions of the national legislation on solid waste [2,3,4].

**International level legislation on agricultural plastic waste:** Japan, N. Zealand, Australia, some regions of USA and Canada have incorporated agricultural plastics in their national or regional legislation imposing manufacturers and retailers participating in a recovery/ recycling system and planning for their management [4,14].

### **3.2 Problems of implementation of European legislation at national level**

The latter provisions of European legal framework (described in section 2) about solid waste treatment (the last is also extended to cover plastic and agricultural plastic waste in the majority of countries) have not been fully implemented by Member States, or they are implemented to a degree that varies from state to state, for many reasons, which include:

1. Weak enforcement by the some national and local / regional authorities.
2. Lack of an integrated national agricultural plastic waste management plan with specific actions for each actor of the plan.
3. Lack of efficient control and penalties imposed by the authorized organisations of solid waste treatment in most countries.
4. The principles “polluter pays” and “producer’s responsibility” are not enforced in practice, or they are weakly enforced, in several states.
5. Lack of commitment and responsibility by actors involved in a given management system (individuals, authorities, industry etc.) (due to 1-4 above) in several countries
6. Inadequate information and awareness programmes for the citizens in many cases
7. High cost for the creation of infrastructures for agricultural plastic waste management

## **4. THE LEGAL FRAMEWORK AND ITS IMPLEMENTATION IN GREECE**

Greek legal framework for solid waste treatment has incorporated the proper European Directives on waste treatment in general. There is no specific national legislation about the management of agricultural plastic wastes. The only law, which includes an open list of waste-materials and in the future could also incorporate the agricultural plastic wastes is law 2939/2001 (OJG 179A/2001) [15], for ‘Packages and the Alternative Management of Packaging and other Materials’<sup>2</sup>. However,

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<sup>2</sup> *Other Materials: Tyres, End of life Vehicles, Batteries and Accumulators, Electrical and Electronic wastes and other materials, which are subject to reuse and recovery operations after their use (being wastes) due to current Greek Legislation.*

agricultural plastic waste may not be included easily in the provisions of this law due to the diversity of this waste stream, the many different actors involved and the open technical questions in the waste chain management.

The plastics in general (except for the specific materials mentioned in the law for packaging) and as a consequence agricultural plastics are treated as solid waste following the corresponding legal framework of Greece for solid wastes.

#### **4.1 Agricultural plastic wastes' treatment in Greece**

There is no comprehensive national system of collection and transportation of APW through Greece, despite the fact that the law 2939/2001 indicates the creation of regional systems of management of packaging and "other materials". It should be noticed that the removal of the agricultural plastic waste from the field is seasonal, depending on the cultivation and the geographic location. The removal of the agricultural plastic films usually takes place during a short period of one or two weeks. The removal of the plastic is carried out mostly manually. Usually the plastics are burned in the fields or, in the case of the mulching films they are roto-tilled into the soil.

In the absence of a specific legislative framework, only the private initiative of a plastic industry has resulted in the creation of a system of management of APW in Crete with the recycling of greenhouse films. A couple of special collection areas have been established in Crete in collaboration with local municipalities. The transportation process from the farms to the collection areas is organised in most cases by the farmers. The average load a farmer transports to the collection station varies widely. The average distance from the farm to the collection area is estimated between 10 and 15 kilometres. In only one case the municipality provides the means for collecting greenhouse film and used pipes from the farms to the collection area. In all cases, the collected waste is baled at the collection area and the bales are transported to the recycling facility at the expense of the recycling industry. The cooperating farmers receive a rebate against the purchase of new films. There is no collection station or recycler in Greece accepting mulching or low tunnel films while many other used agricultural plastics are not collected at all [conclusions derived from the research in the framework of Labelagriwaste ].

#### **4.2 Problems of implementation in Greece**

This situation in Greece is the result of the following facts:

1. There is no enforcement of the law and incentives available concerning the prevention of burning or burying or disposal at landfills of the agricultural plastic waste.
2. The farmers have no knowledge about the proper handling of the agricultural plastic wastes and no guidelines are available to them for the collection and transportation of plastic wastes.
3. There are no traceability schemes available for agricultural plastics chain available in Greece.

### **5. NEED FOR THE CREATION OF A LEGAL BASIS CONCERNING AGRICULTURAL PLASTIC WASTES**

Introducing a legal framework is of high importance for the environmental friendly management of APW. Efficient application of the new legislation along with the existing general legal framework however is only possible if farmers, producers, local authorities and governments understand their legal obligations and work together to develop a proper way for their implementation.

The implementation of the future legislation requires the proper enforcement of the law, new infrastructures, awareness programs and campaigns, mechanisms of control and of economic management

The general waste management legislative principles in force in the majority of the Member States for plastic waste (including APW) are as follows:

- Uncontrolled burning of plastic waste on farms or on another specific place is prohibited.
- The use of unauthorized landfills is prohibited.
- The on farm disposal (landfill and incineration) is banned

It has been shown through the systematic analytical review of the current practices concerning the disposal of APW in most of the Member States in Europe that these general legislative principles are not adequate. There is a strong need for the development of a complete and highly specific legislation scheme that is a labelling scheme for the efficient management of APW throughout Europe, by promoting the exploitation of the waste by waste management enterprises, recyclers and facilities utilising the APW as alternative fuels for energy production.

## 6. CONCLUSIONS

There is a rather confusing situation with regard to the applicability of existing European and national legislation to agricultural plastic wastes. So far, there is no specific legal framework in Europe to ensure an environmentally friendly, economically feasible and socially accepted disposal system for the agricultural plastic wastes. Pre-normative research is under way in the framework of a European research project aiming at developing a labelling scheme for APW at European level. It is up to the European legislative bodies (DG Environment) to adopt the proposal for improvement of the European Legislation on solid waste in a way of incorporating the labelling scheme under development for agricultural plastic waste.

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