«Paving the Way for Advanced Solutions in Agro Food in Greece and China»

> AGRICULTURAL UNIVERSITY OF ATHENS Department of Natural Resources and Agricultural Engineering STRUCTURES AND MATERIALS RESEARCH GROUP

Conventional and biodegradable bio-based plastics supporting sustainable innovative growth of the Agro-food sector



COMPUTATIONAL AND STRUCTURAL ENGINEERING & MATERIALS TECHNOLOGY HIGHLIGHTS OF RESEARCH ACTIVITIES

Agricultural plastics – greenhouse films



Greenhouse film, mulch film, seed trays, drip tape, water pipes, tunnel covers, twine, agrochemicals containers, fertilizer bags,

The problem of agricultural plastic waste





Plastic has many useful functions for farmers, but how can the material's vast environmental impact be mitigated?

Agricultural plastic wastes



LABELAGRIWASTE, "Labelling agricultural plastic waste for valorising the waste stream', Collective research, FP6, 2006-2009

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LABELAGRIWASTE, "Labelling agricultural plastic waste for valorising the waste stream", Collective research, FP6, 2006-2009

Agrochemicals Plastic Packaging Waste



AGROCHEPACK, Design of a European Agrochemical Plastic Packaging Waste Management Scheme Pilot Implementation in Greece, STC Programme MED

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Sorting Traceability Storage Filling the sprayers,Triple rinsingdecontamination

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Mulching films



143,000 t of plastic mulch was disposed of in the US in 2004, either in landfills or burned on site. Similar quantities of plastic mulching film waste were generated in Europe. Burning or burying polyethylene mulch i fields is associated with undesirable environmental and public health impacts (e.g. release of airborne toxic substances, including dioxins, and irreversible soil contamination) and is illegal in both EU and the US

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Biodegradable bio-based mulching films



BIOPLASTICS, 'New Biodegradable Plastics for Mulching And Low-Tunnel Cultivation', QLRT-Programme, FP5, 2003-2007 > success story by EU evaluation

Biodegradable materials: biodegradation



BIODESOPO,' Mechanisms of the biodegradation in soil of biodegradable polymers designed for agricultural applications', Structuring the European Research Area", MC, FP6 2007-2009

Biodegradable materials: design, processing and testing



BIOSTAR, 'Biodegradable drip irrigation system", General
Secretariat for Research and Technology, Greece, 2004-2008
The first experimental biodegradable drip irrigation system in the world

Development of innovative bio-based biodegradable EMAP for horticultural produce



http://www.hortibiopack.aua.gr/







HORTIBIOPACK "Development of innovative biodegradable packaging system to improve shelf life, quality and safety of high-value sensitive horticultural fresh produce", Research for SMEs: 232551, 2009-2011

Marine biodegradation of bio-based materials

- Marine environmental pollution by plastics is a major problem of concern as it has been estimated that up to 10% of produced plastics end up in the ocean
- Since most plastics **do not biodegrade**, they accumulate over time
- Plastic items are consistently among the most abundant types of marine debris
- Due to its abundance, and its persistence in the environment, plastics are of particular concern



Open-Bio: Opening bio-based markets via standards, labelling and procurement KBBE/FP7EN/613677

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Contact:

Prof. Demetres Briassoulis AGRICULTURAL UNIVERSITY OF ATHENS, AGRICULTURAL ENGINEERING DEPARTMENT 75, IERA ODOS Str., 11855 ATHENS, GREECE TEL.: +30.210.5294011, FAX: +30.210.5294023 Mobile: 0030-6947561933 E-mail address: briassou@aua.gr

Web: http://www.smrg.aua.gr/