CAMERA DI COMMERCIO INDUSTRIA ARTIGIANATO E AGRICOLTURA DI TORINO

ETF Working together for Learning for Life
European Training Foundation

The Twin Transition in Agri-food: challenges and opportunities

Polymer biocomposites based on agricultural waste residues: Piedmont Region R&D activities

Marta Zaccone - Proplast, Plastics Innovation Pole

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proplast is an Italian private no-profit cluster with R&D facilities whose members are the key players in the polymers and composites industry

proplast supports companies' growth from 1998
Our services: Cluster, R&D, Technical, Training and H&R

www.proplast.it

Alessandria - Italy

Proud of our numbers

- 44 employees: 5 in cluster team
- 3.0 M€ turnover
- More than 4000 contacts

OUR MEMBERS

- ✓ **157 companies, 78% of SMEs**
- ✓ **2 R&D centers**
- ✓ **12 Universities**
- ✓ **1 Foundation**
- ✓ **7 Trade associations**

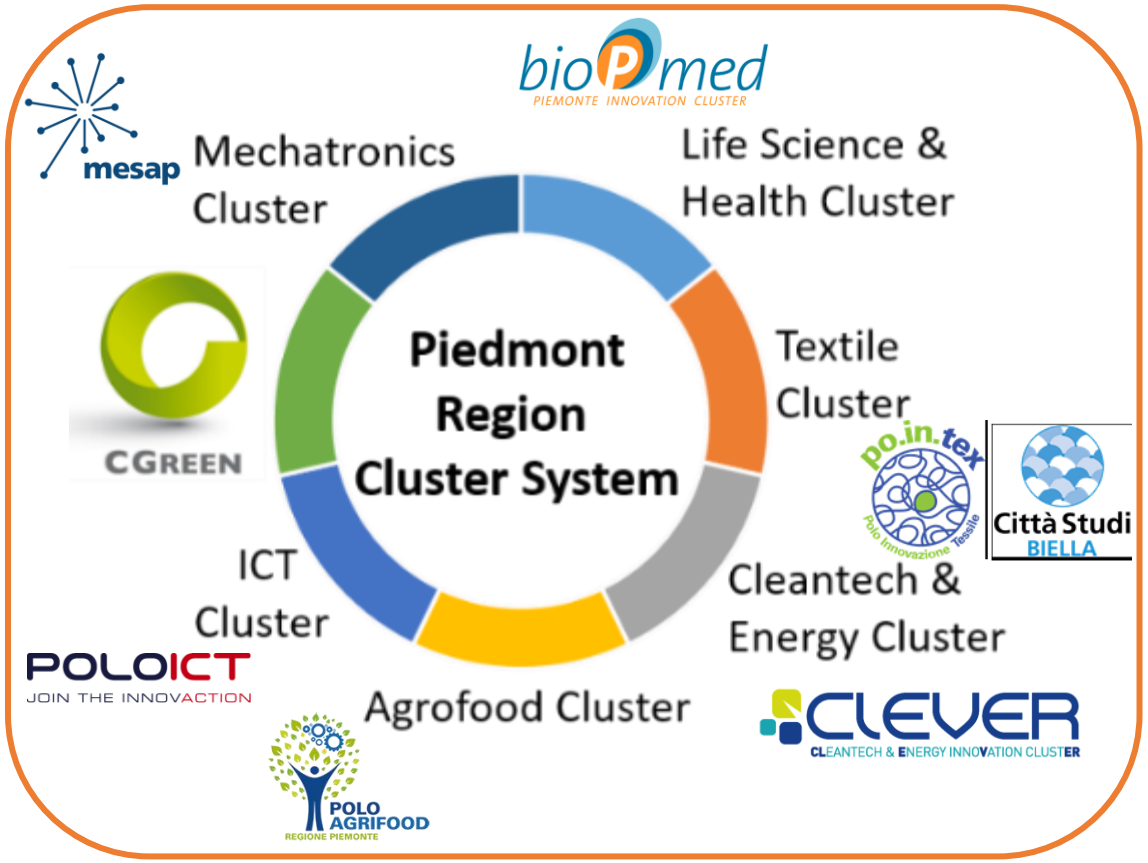
Put together our members across different industrial sectors

Cluster activities

- networking
- dissemination members' activities
- funding R&D opportunities
- events/seminaries/workshops/round tables
- participation in EU-funded cluster projects and platforms

promote smart, sustainable and inclusive growth in Piedmont

sistema poli innovazione Piemonte



development of **technological roadmaps** and definition of technological and application domains

strengthening the presence of **regional innovation and research system** with initiatives, networks and platforms, at national and international levels

promote **internationalization** in collaboration with EU projects co-financed by the European Commission

animation, dissemination and networking of the regional innovation and research system

match **training supply and demand**

labelling, follow-up, dissemination and exploitation of project results

prize and partnerships

SILVER Cluster Management Excellence
DEDICATED TO CLUSTER EXCELLENCE

enterprise europe network

AIM

IPPR

The research framework

Starting from a linear economy view…

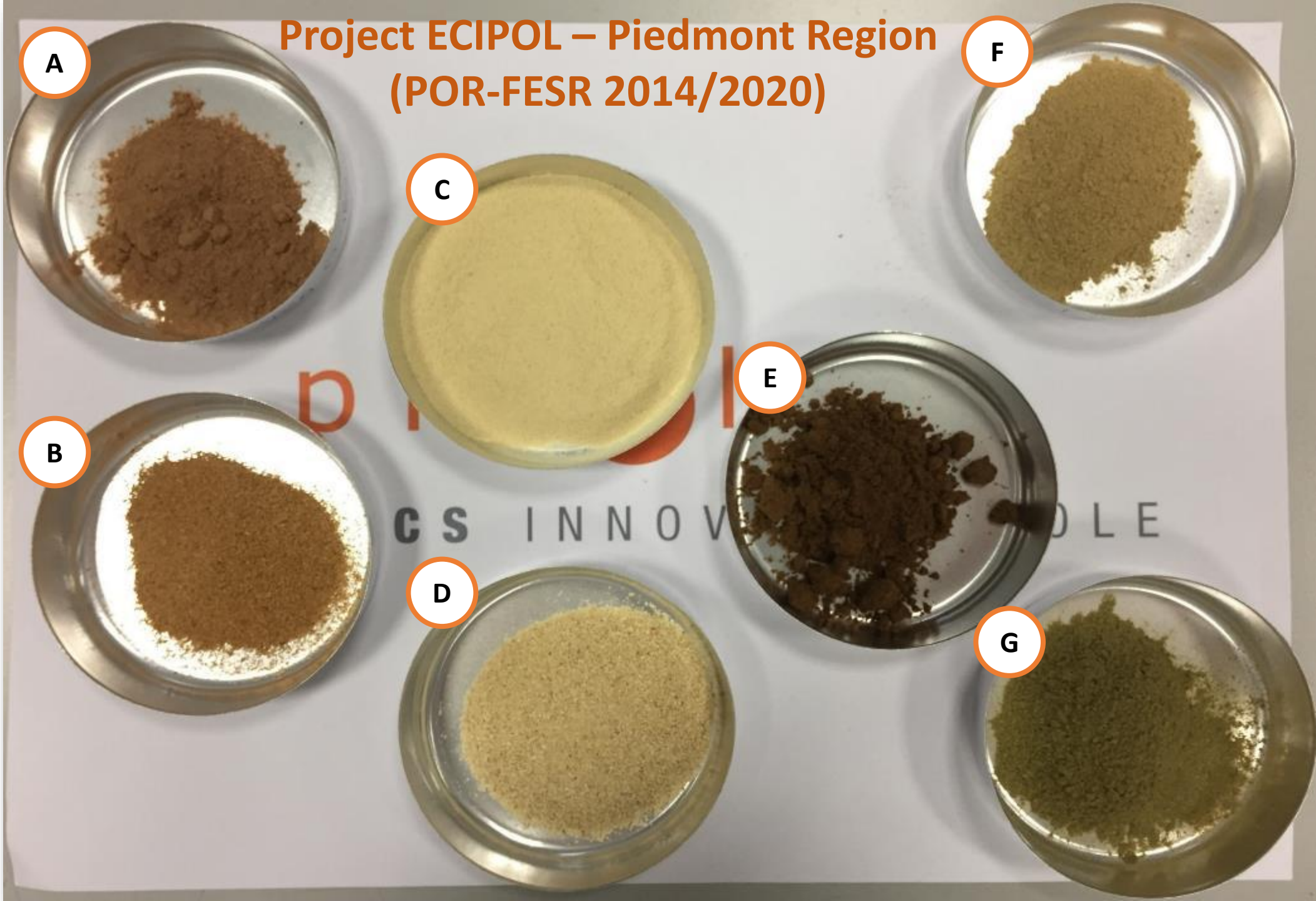
…and passing to a circular economy vision…

…leads to apply an **eco-design approach.** In this framework, the valorization of **agricultural residual waste** in specific polymeric matrices can be considered to produce and charcaterize **biocomposites.**

Project ECIPOL – Piedmont Region (POR-FESR 2014/2020)

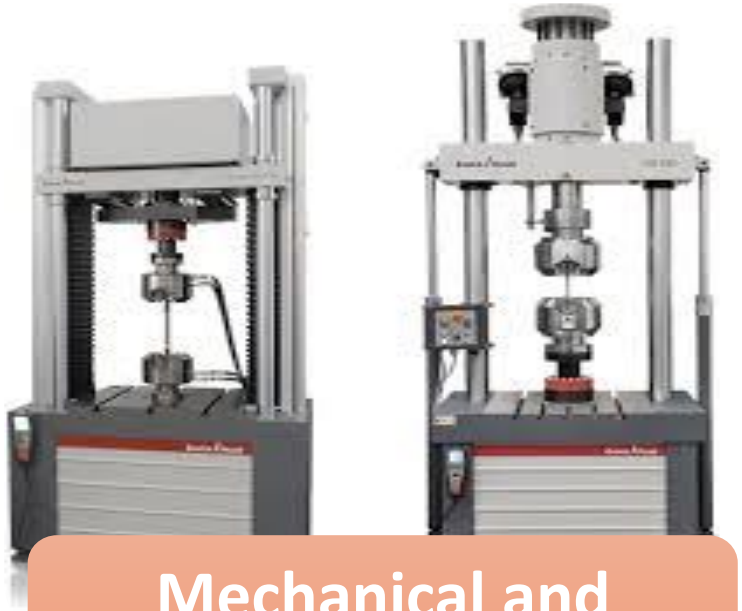
Agricultural waste residues

- A Almond granules
- B
- C Corn cob
- D
- E Grape skin
- F Hay
- G Alfalfa



Preparation of compounds with a twin screw extruder

Injection moulding of specimens for characterization tests



Mechanical and thermal characterization

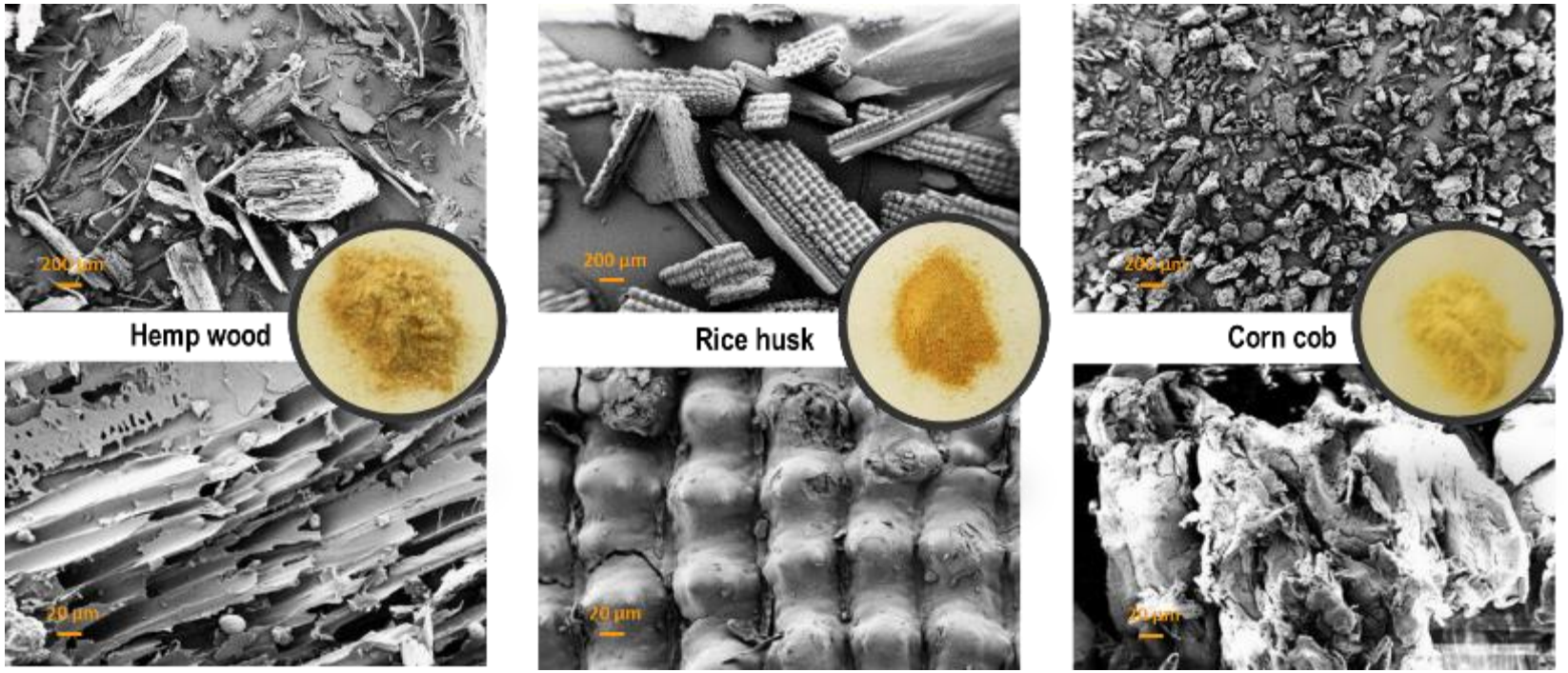
HDPE + Grape skin

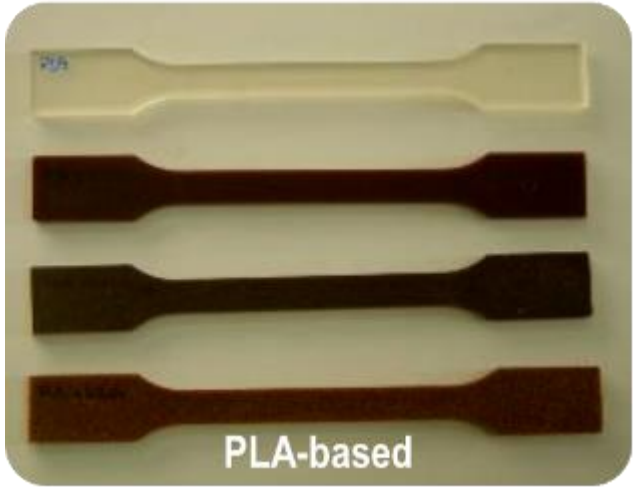
Source:

RAMAPLAST

100% PACKAGING MADE IN ITALY

Regional Project Materia 2 (Innovation Pole – New sustainable materials)
Development of biocomposite materials starting from food and no-food agricultural waste





National Project Biopack (Industria 2015 – Made in Italy)
Development of bio-based and biocomposite solutions for food packaging applications

European NEWPACK project (BBI - H2020) aimed at producing new **bio-based and biodegradable** solutions for **food packaging applications**. Formulations, based on **PLA and PHB** blends and nano-additives, have been prepared by Proplast through melt-mixing process on a **pilot scale equipment.**

NewPack
New BioBased Film for Packaging

HORIZON 2020

2017-2021

Bio Base Europe
Pilot Plant

Starting feedstocks for the production of experimental PHB were:

CORN

POTATO PEELS

BBI JU
Bio-based Industries Consortium

FOR MORE INFORMATION, PLEASE VISIT:
www.newpack-h2020.eu

NewPack
New BioBased Film for Packaging

2017-2021

Tecnopackaging has processed these blends through industrial **film blown extruders** and the obtained films have been validated for **food packaging applications** by the end-users (testing their **barrier** – oxygen, water vapour and CO_2 – and **anti-microbial properties**).

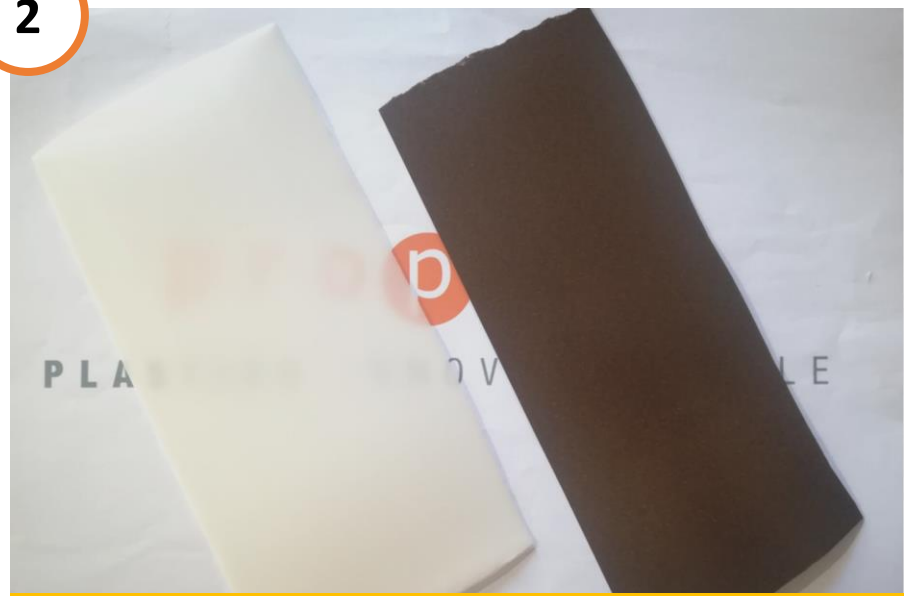
Internal research activities: evaluation of properties and processability of a waste natural fillers in bio-based and biodegradable polymeric matrices for **food packaging applications**

1. Preparation of biocomposites through melt-mixing process
2. Cast film extrusion
3. Thermoforming of the obtained sheets

1

Compounded granules: neat polymer and biocomposites

2



Cast extruded specimens: neat polymer and biocomposites

3

Thermoformed samples

Source: https://makerfairerome.eu/it/vegea-il-tessuto-che-viene-dal-vino/

Internal research activities: feasibility study to evaluate the use of grape skin as additive and colourant for elastomeric matrices for **fashion applications**

1. Characterization of the colourant additives

2. Commercial research of suitable polymeric matrices for this kind of application

3. Benchmarking analysis of products already present in the market

Final considerations

- The use and valorization of agricultural food and no-food waste in biopolymeric matrices is **not only possible but also desirable**
- Their **processability** with typical plastic transformation techniques has been **tested and evaluated**.
- Their feasibility can be extended to **several industrial sectors**: food packaging, cosmetic packaging, automotive, fashion and so on.
- The **strict collaboration of all the involved actors** in the supply chain (from the farmers to the final end-users, passing through materials producers, compounders, transformers, but also research centers, academics, policy makers and stakeholders), can **actually create a strong value chain** in the perspective of circular economy approach.

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thank you