A horizontal row of 15 small, solid-colored circles in various colors including brown, green, pink, purple, grey, yellow, and red.

LIFE Multibiosol: biobased and biodegradable films for the production of fruits and vegetables

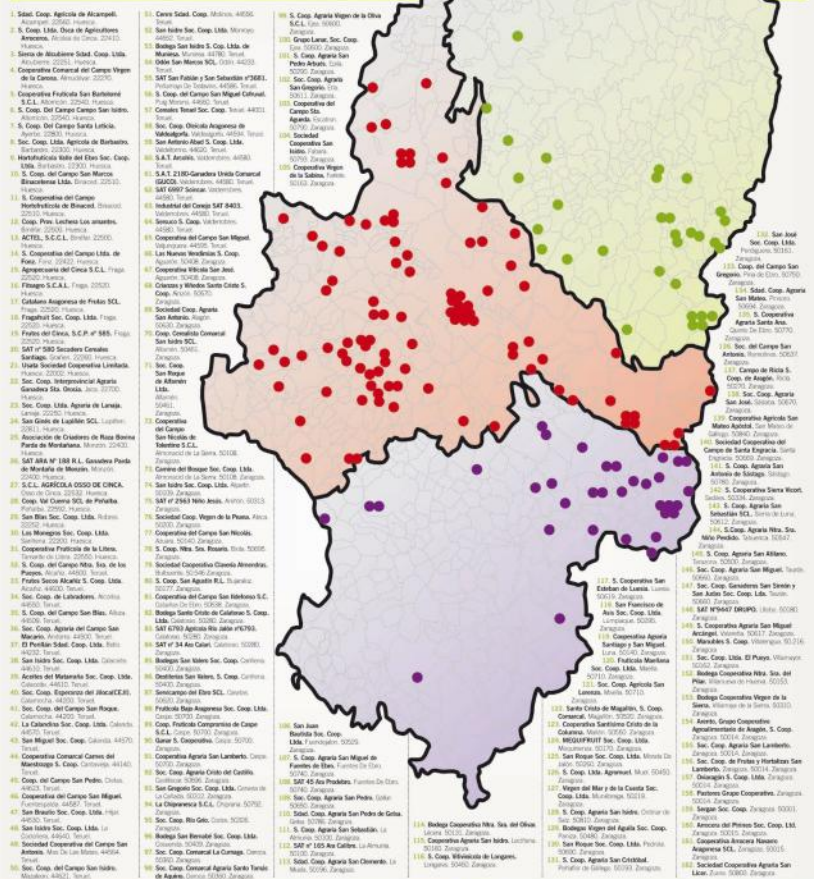
**Workshop of the European Commission, DG Agriculture and Rural Development
on**

**“The role of cooperatives and cooperation structures of primary producers for
mainstreaming the Bioeconomy”**

Jesús Abadias Ullod (Agro-food Aragón Cooperatives - Spain)
24 June 2019,
European Commission, Brussels



MAPA DE NUESTRAS COOPERATIVAS



DATOS DE INTERÉS CAA

162 COOPERATIVAS

45.580 SOCIOS

1.400.000.000€ VOLUMEN DE FACTURACIÓN

2.339 EMPLEOS GENERADOS

- SECTORES QUE INTEGRAN COOPERATIVAS AGROALIMENTARIAS ARAGÓN**
- ACEITE DE OLIVA Y ACEITUNA
 - ARROZ
 - CULTIVOS HERBÁCEOS (Cereales, Oleaginosos y Proteaginosos)
 - CLINICOLA
 - FORRAJES
 - FRUTICOLA
 - HORTICOLA
 - FRUTOS SECOS
 - LÁCTEO
 - OVINO-CAPRINO
 - PIENSOS
 - PORCINO
 - SUMINISTROS (Carbuncales, Semillas, Fertilizantes, Fitosanitarios)
 - MITANICOLA
 - VACUNO DE CARNE

Why bioeconomy through the Cooperatives and CAA?

Economies of scale - Territorial impact

Development with holistic and multisector vision

Confidence (cooperative - technician - farmer)

New business lines

Solution to joint problems, agrarian and agroindustrial

Improve profitability of existing projects and businesses

Improvement of the sector's image

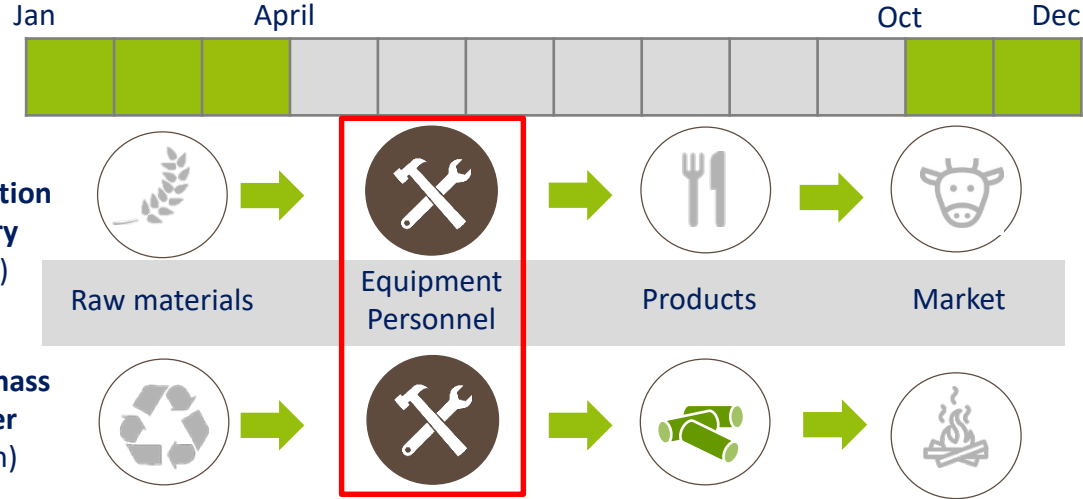
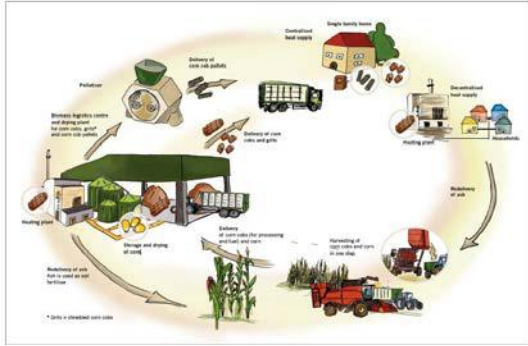




The Cooperatives of Aragon in Bioeconomy and social development



Coop. San Miguel Tauste



Europruning



New business models that without cooperatives would be difficult to implement





The Cooperatives of Aragón in Bioeconomy and social development



G.O. INSECT



Insect breeding

Food and agroindustrial residues



Flour and food manufacturing

LIFE Multibiosol



Development of biodegradable and biobased films for the fruits and vegetables production





Budget: 2.036.680 €
LIFE Grant: 1.222.002 €
(60%)
Duration:
01/09/2015 - 31/05/2019



Green Creatie



- **Technical assistance** in film production
- **Validation** in France and Belgium

ARCHA

- **Technical validation** of the solutions
- **Biodegradability test**



- **Technical assistance**
- **Validation** partners (horticulture and fruit trees)
- **Transfer**

- **Coordinator:** management
- **Manufacturing plastics**
- **Technical evaluation**



- **Crop tests** (soil, plant)
- **Environmental impact**

- **Quality and production protocol** (nutritional value, etc.) and **technical feasibility**
- **Analysis** of fruits and vegetables

- **Dissemination and communication**



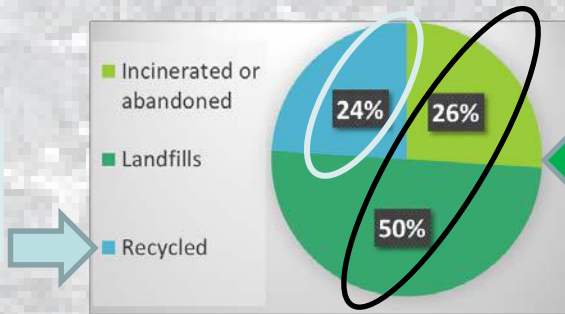
TRANSFER CONSULTANCY





Intensive agricultural practices require plastic film and paraffin paper and its management is complicated (Agriculture plastic waste: 5 % of total plastic waste)

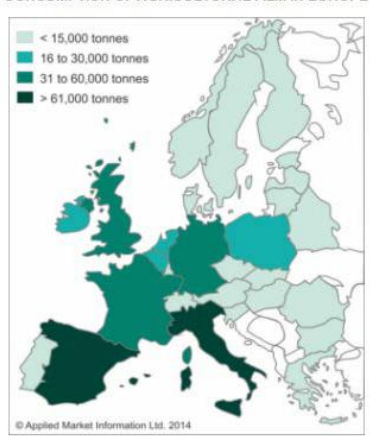
Thick films (200 µm):
Plastic tunnels, greenhouses...



Thin films (25-15 µm)

- Plastic films generate approximately **80% of agricultural plastic waste**.
- Plastics for **single use**.
- **Recycling problems**. Plastic waste is highly contaminated with soil, sand and organic material (60-80%).
- **High plastic removal costs** (time and money).

CONSUMPTION OF AGRICULTURAL FILM IN EUROPE



Problems

1. **Atmospheric pollution by incineration**
2. **Soil contaminated by abandonment**. HDPE and LDPE can take between 100 and 500 years to degrade. It accumulates in the soil and loses fertility.





Biodegradable and Biobased Plastic

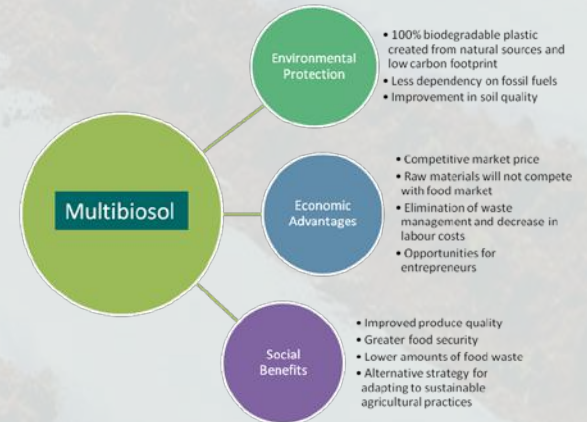
NO REMOVAL, NO LANDFILL, MANPOWER REDUCTION

At the end of the crop cycle biodegradable mulch film must not be removed, but should be worked into the soil, in order to properly biodegrade (through the mineralizing action of soil microorganisms) into CO₂, water and feedstock:

- Lower environmental impact in air, soil and in plastic manufacturing. Recovery of organic waste.
- Elimination of waste management (Lower economic **costs**, although the price of plastic is higher).
- Advanced value of products (quality and impact stamp).
- Improved quality of physical, chemical and biological soil resources



LIFE Multibiosol- Demonstration Character of the project





Demo Plan



Plastic raw material

- 100% biodegradable
- Polymers from renewable sources



Film production processes

- Design
- Innovation
- Manufacturing

ARCHA

Validation of plastics in the laboratory

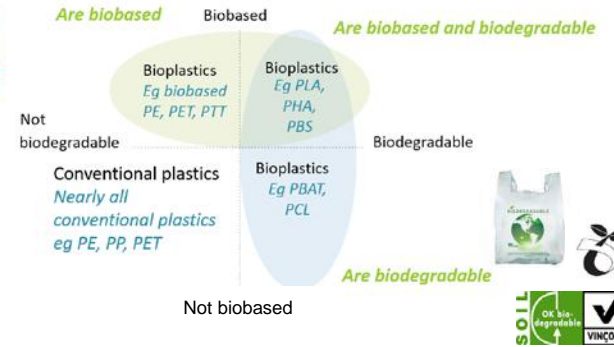
- Mechanical testing of materials
- OK BIODEGRADABLE SOIL certification

Validation of plastic products in fields

- Tomate (Spain and France), pepper and cucumber in Spain and sweet potato in Belgium
- Bags in apple and peach (Spain)

Agronomic quality validation

- Ground
- Planta (Pre-harvest)
- Product (Post-harvest)



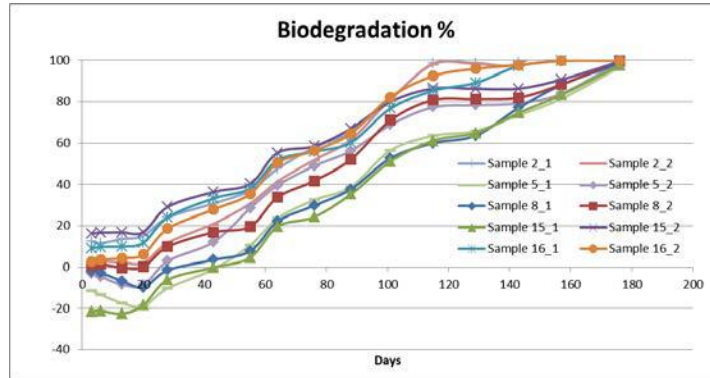
Expected results

- 100% reduction of plastic waste
- Less CO2 emitted during the production of plastics / No emissions by elimination
- Improvement of soil quality
- Improvement of the quality of the crops
- Certification OK SOIL BIODEGRADABLE



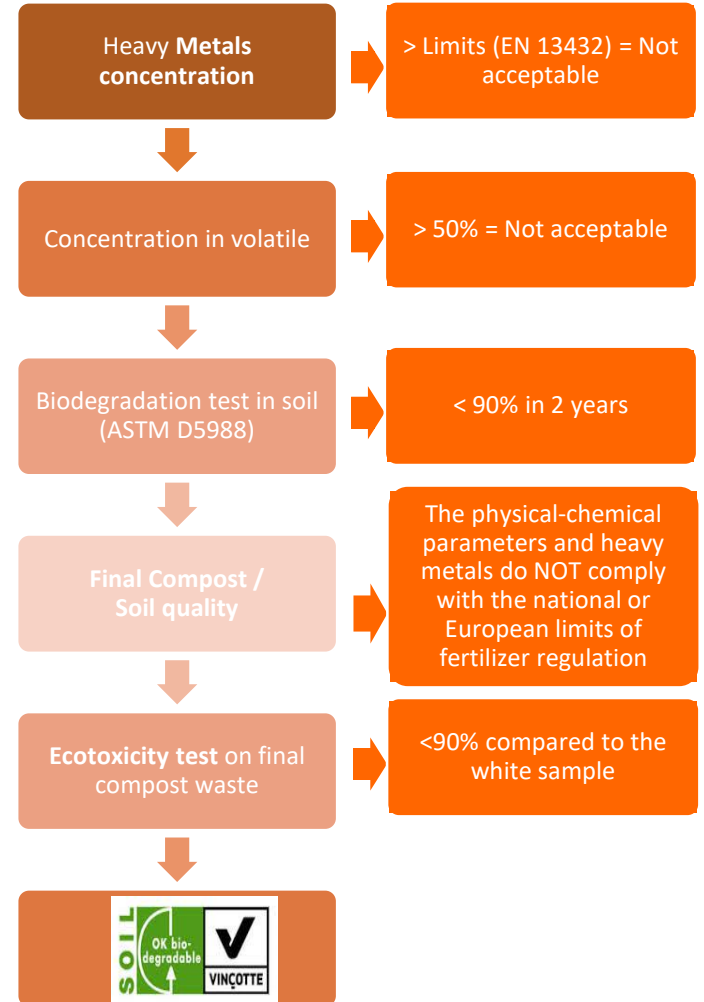


ARCHA



OK bio-degradable SOIL

- ✓ Is a certificate assigned to those materials resulting totally biodegradable in soil without any negative impact (toxicity) on the biodegradation substratum (soil).





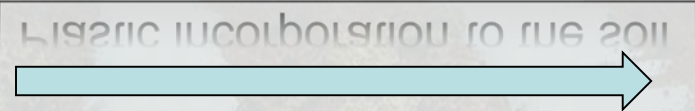
Demo fields



Producto	Fase 1 (2016)	Fase 2 (2017)	Fase 3 (2018)
Biomulching	648 m ²	2,664 m ²	2,016 m ²
Biobags	900	3,700	2,800
Bioclips	900	3,700	2,800



Plastic incorporation to the soil



Golden	Colour	% Additive	Biomaterial	Nº
Large Scale	White	2%	P92	M182
	Red	2%	P92	M183
Fuji	Colour	% Additive	Biomaterial	Nº
Large Scale	Red	2%	P92	M183
Peach	Colour	% Additive	Biomaterial	Nº
Large Scale	White	2%	P92	M182





Analíticas:

1. - Quality Analysis

1. Physical-Chemical parameters
2. Postharvest diseases and disorders
3. Pesticide residues analysis

2. Nutritional Compounds

1. Antioxidants
2. Vitamins
3. Pigments



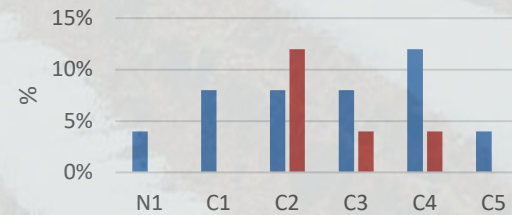
Pesticide residues
Improve crops and
environment

Nutritional composition

MUESTRA	FENOLES (mg eq ácido galico/100g)		CAP. ANTIOXIDANTE (mg Trolox/kg)		licopeno (mg/g)	
	promedio	desv.est.	promedio	desv.est.	promedio	desv.est.
N1	34,53	7,96	39,62	4,86	82,41bc	19,87
C1	35,51	10,62	37,85	3,19	53,21a	11,63
C2	38,74	4,36	39,89	2,64	55,05ab	15,67
C3	36,72	3,72	38,56	4,75	53,24a	10,39
C4	34,95	2,68	48,52	3,54	80,41abc	14,51
C5	32,12	3,23	40,84	5,90	83,00 c	4,82
Sign.	n.s.		n.s.		0,026	

Diseases & Disorders

Damages fruits



cracked



dried



Effect of bagging in peach

CONTROL

0% TiO₂



BIOFILM

3%TiO₂





Trust

Innovation
capacity

Transfer

Training

Synergies partner and
cooperative structure



Synergies technologies
and installation





Technical

- Multibiosol products **improve the nutritional quality** of the soil and the fruits/vegetables cultivated.
- Bio materials are more expensive.**
- Multibiosol final products are more sustainable.** Eliminates cost (economic and time) of plastic waste management, eliminates the impact of transporting waste, and reduces plastic waste to landfills or incineration.

Socio - economic

- The cost of the bio material is 500 - 600 euros more expensive than conventional plastic.**
- The socio-economic analysis would be balanced** if the waste was not abandoned and properly managed in conventional plastics. **Biodegradable films require less management.**
- 25% of the material costs are subsidized** in Spain through POFV. **Cooperatives**





- Aragón is not a cooperative zone in horticulture, so the implantation of bioplastic is more expensive - **Capillarity of cooperatives.**
- The 50% of farmers who used plastics films do not know the final destination of the waste: BAD WASTE MANAGEMENT. **Training is needed through cooperatives .**
- More information is needed for farmers and suppliers companies for farmers to show the differences between materials and how is the correct use for a good disintegration of these materials. **Cooperatives technical personnel can help it.**





- European, national and regional legislative framework that supports the implementation of bioplastics.
- Aid for economies of scale in the development of bioplastics - Reduction of material cost and aid in its implementation. Increase the provision of POFV aids. **Through cooperatives in the new CAP.**
- Promote the transfer and training in cooperatives.** Increase implementation bioplastics thanks to its capillarity and trust.
- Most of the farmers willing to pay more for a biodegradable plastic in order to avoid its removal from the field and management with the associated costs.
- Improves the life`s quality of farmers – less management waste, less work.
- Opportunities for added value products/ organic agriculture. More sustainable agriculture.





Fundamental aspects for the implementation of the bioeconomy through cooperatives

- ✓ Cooperatives have the need to work for mitigation and adaptation to climate change, and generate economic and social value in rural areas, all for their future and that of their partners.
- ✓ Cooperatives are fundamental for the reach of R & D and the transfer of knowledge to the sector (Capillarity). Individually the sector would not advance in the same way.
- ✓ The trust and closeness of the cooperative and its technicians is fundamental when it comes to launching new tools and technologies in the sector.
- ✓ In most projects, the technologies and businesses related to the bioeconomy are economically, socially and environmentally sustainable.
- ✓ **To promote the circular and sustainable Bioeconomy in the business model of the cooperative, it is essential to take advantage of the material and immaterial strengths of the cooperative itself and to solve the cooperative's challenges (added value).**





cooperativas
agro-alimentarias
Aragón

El futuro de la alimentación está en nuestra mesa

