BIOMULCH

Integrated solution for innovative biodegradation control of agricultural plastic mulches

Green solutions with black plastic.

Newsletter
3rd Issue
May 2018

Editorial

Dr. Alejandro Arribas Agüero
Project coordinator
CETEC

How BIOMULCH project will boost the strawberries production.

Currently, the strawberry production depends on of polymers like polyethylene too much. Despite this fact is like a standard, it is cause of some drawbacks relatives to the environment. The improved mechanical properties of this polymer lead to small thickness that make the product cheaper but also more difficult to recover and recyclate. In addition, the last restrictive environmental laws in Europe drive to substitute the polyethylene by other alternatives more ecofriendly. In this contest, BIOMULCH project tries to change the farner perception of biodegradable films, like expensive in opposition to polyethylene. BIOMULCH target is to obtain a complete biodegradable film in soil in less than three months. It will be got with help of microorganisms and enzymes that will be spreaded on films after the harvest have been finished. This kind of solution avoid the problem of the polyethylene recovery and it is a big step in the ecofriendly path to a more sustainable practise in agriculture. In addition, this solution will be economically efficient because save money from the recovery stage and farmer will not have to pay because of manage the used polyethylene like a residue.

Biomulch project provides a natural and sustainable solution to starwbeery production in Huelva area. The soil in this area is too poor in microorganisms due to its sandy nature, it is one of the most difficult situations to get the films biodegradation, so, the solution developed to this poor soil is expected that have a good performance in other kind of soils richer in microorganims.

Biomulch project is in its second year of work and much work remains to be done, including education, consultacy and technical service provided to end users to help them to discover an agriculture more sustainable and at the same time more productive.

Interviews
Page 2-6

BIOMULCH Activities
Page 7

Project
Page 8

Calendar
Page 9

Contact us
Page 10

"We expect to reach a compromise between biodegradability and mechanical properties that leed us to the final mulching film product."

Federico Mesa
Project technician
CETEC

Equipment of stress-cracking determination (source: CETEC)

How would you evaluate the laboratory tests of the BIOMULCH film?

The laboratory tests are absolutely decisionmaking. Through these test we guide our experiments and they help us to take decisions. In our case, the laboratory test are our tool to improve the mulching film properties. We use them to develop the film with better mechanical and better biodegradability properties. The CETEC's laboratory staff are really well trained and results are completely confident, so we work very sure making test in our lab.

We expect to reach a compromise between biodegradability and mechanical properties that leed us to the final mulching film product. The project is approaching to the final stage and we are fixing and ending all task. Biodegradability of films are now being tested to adjust its durability on fields and in the next few months the final film have to be scaled.

What are the current challenges of the project?

Currently we are working very hard in develop films with high biodegradability properties and at the same time with high mechanical properties and it is really difficult.

What to expect in the coming months?

The CETEC laboratory plastics and elstomers (source: CETEC)

Federico Mesa said: "We expect to reach a compromise between biodegradability and mechanical properties..."

"...FKuR will start the piloting and scaling-up of the optimized compounds..."

Nushin Behzadifar
Master of engineering
FKuR

How would you evaluate the latest period of the project?

Recent validations of field test have led to interesting findings and observations, which give us a better understanding of the achieved development results in this project. The performance and the degradation behavior of the mulch films made from the first developed formulations used for strawberry cultivation in real field condition were evaluated. At the beginning of the field test, the first signs of material damages on some mulch films (cracking and tearing) were observed. This deterioration could be considered as an early biodegradation as well as poor mechanical properties of the films. Against this background, the existing formulations must be optimized for the next mulch films taking into account their mulching efficiency and biodegradability to achieve superior performance of the BIOMULCH product in this project.

Extrusion equipment

What is your current task in the project?

After receiving feedback from the field test, we have taken a step back to lab scale in order to determine the best formulation with regard to high mechanical stability of the mulch film during the growth and harvesting period and fast degradation at the end of the growing season. Furthermore, some specific compound processing parameters will be adapted. We examine the different setting and key aspects in the compounding process, such as the effect of screw configuration in the new formulations and the effect of feeding location as well as the direct use of the black masterbatch in the compounding process.

Blown film by FKuR

What to expect in the coming months?

In the coming months, FKuR will start the piloting and scaling-up of the optimized compounds, then proceed to large-scale production of mulch film which will be carried out by MORERA, followed by a further for next field test validation.

FKuR compounding line

"We will also think of an easy-to-use commercial kit, to simplify the application of microorganism solution in field...."

Wang Jingjue
Researcher, biology, seed technology
TAHTCHTEC

Wang Jingjue said: "...it is very difficult to select the most effective microorganisms due to the variation of results."

What was the greatest challenge regarding the microorganisms-compound interaction study?

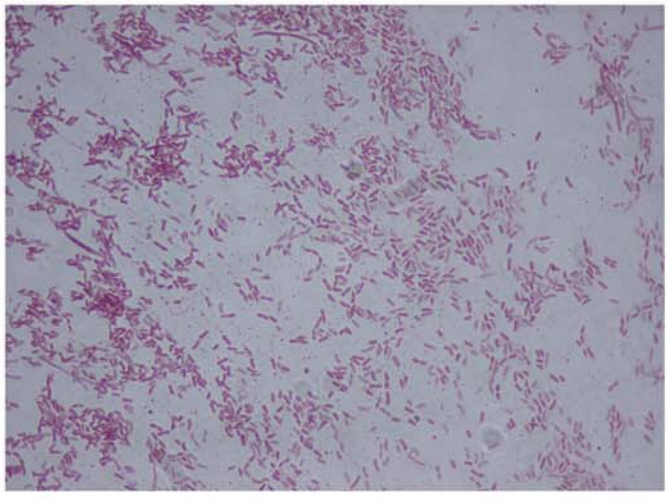
During our researches and experiments, we have the feeling that biodegradation is not only related to the formulation of plastic films, but also the structure of films. It means that the films do not always react to same microorganisms regarding to biodegradation. In this case, it is very difficult to select the most effective microorganisms due to the variation of results. Therefore, we have had to repeat the experiments few times to select some microorganisms which has consistent effect on most of the compound films . Another challenge is testing the selected microorganisms in a real scenario, the temperature, soil moisture, and soil type may affecting the biodegradability as well, so the results can be different as lab test.

What is your current task in the project?

We are now started the WP3, which is to scale-up microorganisms solutions, so we need to design the final commercial format of the product, scale-up production, and make protocols for manufacturing production and quality control. At the same time, selection of most effective microorganisms is still an important task at the moment, together with FKUR and CETEC, we are still searching the balance between good mechanical properties and effective biodegradation of plastic films. Therefore, we are still testing different plastic samples with microorganism solutions that we produced.

What to expect in the coming months?

In coming months, we will decide the final selection of microorganisms with new formulated films, then the microorganisms will be tested in the field of ADESVA at the end of May. Few microorganisms solutions will be tested, based on the testing results, the final formulation will be decided. At the same time, a scale-up production plan will be designed, and protocols for quality control and production will be made. We will also think of an easy-to-use commercial kit, to simplify the application of microorganism solution in field.



One of the used species by THATCHTEC

"The project is entering its final stages."

Manuel Jiménez Díaz
Plant manager
Morera & Vallejo

How would you evaluate the latest period of the project?

It has been a very intense period, which has included various field tests of different alternative film formulations (all of them extruded in our manufacturing site), in order to study their behaviour in real conditions.
For MORERA & VALLEJO INDUSTRIAL it is very important to check how any variety of the mulching film that it produces works. In this case it was to see the initial resistance of the product during the normal operation phase, in which any type of degradation is considered as a defect.

What is your present task?

Currently, candidate formulations for final product are being defined: film varieties that do not degrade during the regular operation phase, that is, while the crop is still in the bush. Subsequently and after adding the culture of microorganisms, the behaviour must be the opposite, i.e., a quick and effective biodegradation into the soil.

"...MORERA & VALLEJO will proceed to extrude at least two more varieties of mulching film for tests."

"Currently, candidate formulations for final product are being defined..."

In addition to the formulations already tested, it is intended to put in the field some other options, with different thickness and compositions, so MORERA & VALLEJO will proceed to extrude at least two more varieties of mulching film for tests. In addition, the first promotion and marketing activities are being developed.

What to expect in the coming months?

The project is entering its final stages.
In the coming months an intense promotion campaign will be developed to present the BIOMULCH product to the farmers of the province of Huelva (the first ones that will have it available) and subsequently at a national and international level. The marketing actions will also be developed after the summer, allowing farmers to receive samples of the product in order to test it under absolutely real conditions.
The farmer is very aware of the problems involved in the collection and subsequent treatment of used mulching plastics, so we expect the level of acceptance of the product to be very high, even taking into account the possible price increase and the need to incorporate a new agricultural task, as it will be the application of microorganisms.

"...new improved formulations will be tested in the field..."

Magdalena Torres
Senior Agricultural Engineer
ADESVA

What is the greatest challenge regarding the test of BIOMULCH film?

One of the biggest challenges with regard to the field test is to ensure that the BIOMULCH film be able to maintain its function throughout the entire strawberry season, comply to the following objectives:
- Isolate the plant from the exterior,
- Weed control,
- Precocity and performance increase,
- Better use of irrigation water,
- Maintenance of soil structure.

In turn the mulch have to be able to biodegrade in the soil before the beginning of the next crop cycle (90-100 days).

Testing of BIOMULCH biodegradation in soil

What is the current state of the tests?

At this time the field trial is at the peak of production, so the performance of the plants and

The BIOMULCH partners are looking the ongiong test at ADESVA facilities

At this time the field trial is at the peak of production, so the performance of the plants and the quality of the fruits are evaluated for each Biomulch foil compared to the conventional polyethylene mulch commonly used in strawberry plantations.
Of all the test mulches there are some that are having an agronomic behavior very similar to the conventional polyethylene, while others are showing a faster biodegradation than the expected.

What to expect in the coming months?

In the coming months, new improved formulations will be tested in the field, after the results obtained so far, where their behavior and biodegradation will be evaluated after their incorporation into soil.

PLASTICS ARE FUTURE

II International Seminar 2018

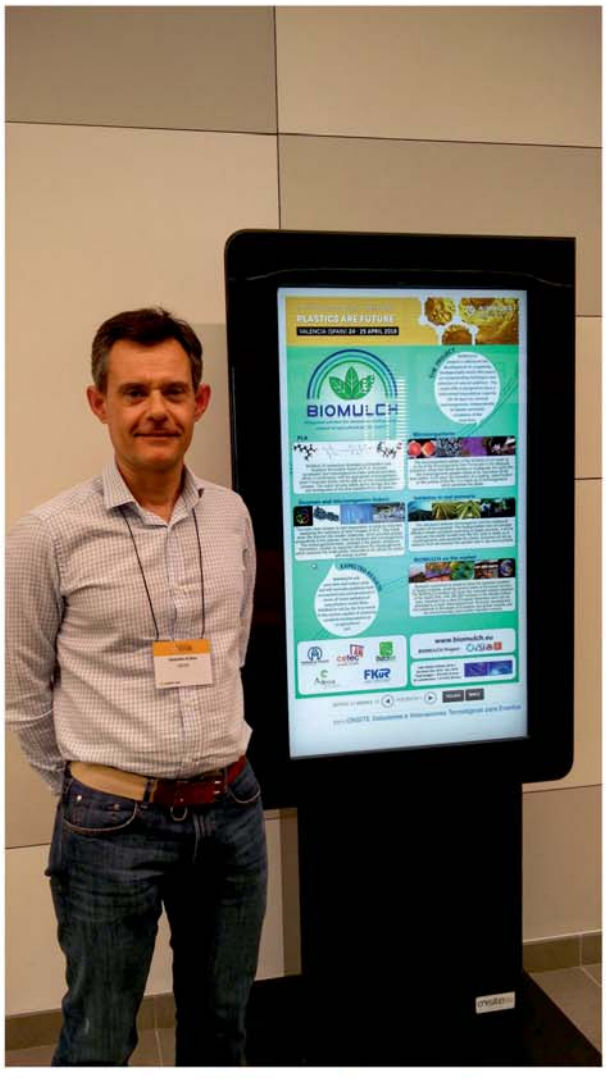
Valencia (Spain) 21-25 April 2018

Smart nanomaterials, sensors, supermaterials for extreme applications, new-generation foams, aerogels, shape-memory materials, biomaterials with active properties, new sustainable materials and an endless number of possibilities in polymers will be the protagonists of this event.

The 20th century has seen how plastics were born, how they have incredibly grown and how they have extended their application fields up to levels never expected. Nowadays, plastic materials are mostly in all the economic activity fields and we cannot understand the modern society without their presence.

But new generations of plastics come knocking. The 21st century is undoubtedly the plastics century; new challenges are raising and materials must be working for the needs of our society: the cars of the future, the new energy sources, the intelligent and high-protection packagings, the respect for environment, the curing of mortal diseases, the challenge of sustainable production, among others.

All this involves a constant and endless evolution of materials. From this forum we are intended to address, in a practical way, what is coming, those materials that soon are going to make our lives easier.



Alejandro Arribas (CETEC) at the Plastics are Future event

Partners

TECHNICAL SUPPORT AND PLASTIC VALIDATION. Project Coordinator.
CETEC – PLASTICS & FOOTWEAR TECHNOLOGY CENTRE OF MURCIA

COMPOUND FILM MANUFACTURER
FKUR KUNSTSTOFF GMBH

MICROORGANISMS SOLUTION MANUFACTURER
THATCHTEC

MULCH FILM MANUFACTURER. Technical Manager. Commercialisation & Exploitation Manager
MORERA & VALLEJO INDUSTRIAL, S.L.

VALIDATION OF BIOMULCH AT REAL FIELD. Dissemination and Communication Manager.
ADESVA – TECHNOLOGICAL CENTRE FOR AGRO-INDUSTRY

Project details

Call: H2020-FTIPilot-2016-1
Duration: Dec 2016 - Nov 2018
Total budget: 1 976 993,75 Euro
EU contribution: 1 613 667,50 Euro

Biomulch will:

- save time,
- reduce costs,
- make the waste handling easy,
- have competitiveness with the conventional mulch flims.

Upcoming Events

AGRICULTURE, PLASTICS & ENVIRONMENT

Every three years, the CIPA organize its congress in a different country. Experience sharing, increase knowledge and dissemination is the purpose of the congress for the plasticulture community: scientist, researchers, converters, distributors, growers and farmers.

29-31 May, 2018 Bordeaux-Arcachon-France

7th World Congress on Biopolymers and Polymer Chemistry

Theme: Present situation and future perspective of Biopolymers and polymer chemistry. This session presents the Biodegradable plastics (Bio plastics) are one of the important issues in plastic industry. These are natural biopolymers that are synthesized and catabolized by various organisms.

June 4-6, 2018 Osaka, Japan

Compounding World Expo

The exhibition will feature an international array of suppliers of polymer additives and compounding machinery, and equipment, as well as providers of related services. Join your compounding colleagues from all sectors of the polymer industry including polyolefins, PVC, engineering plastics, TPEs, masterbatch, and recycling.

27-28 June 2018, Essen, Germany

8th World Congress on Biopolymers

Theme: Biopolymers - A drug to heal the nature Biopolymers are chain-like molecules made up of repeating chemical blocks and can be very long in length. Depending on the nature of the repeating unit they are made of polysaccharides, proteins of amino acids, and nucleic acids of nucleotides. The studies are more concerned to Green Composites, Biopolymer Feed Stock Challenges, Biofibers & Microbial Cellulose, Biomaterials and Bioplastics. Advanced studies are being made to improvise developments in Biopolymer Technology, Waste Management, pharmaceutical and biomedical applications, Biodegradability, and many more.

June 28-30, 2018 Berlin, Germany

Global Summit on Agriculture & Horticulture

Agricultural Engineering conference is advanced to create improvements in sustainable agriculture which is totally eco-friendly.

09-10 July, 2018 Sydney, Australia

10th International Conference on Sustainable Development and Planning

Sustainable Development and Planning 2018 will bring together academics, policy makers, practitioners and other stakeholders from across the globe to discuss the latest advances in the field.

4 - 6 September, 2018, Siena, Italy

Agricultural Film 2018

Following the success of AMI's 10th Agricultural Film 2017 conference which gathered 200 delegates from over 40 countries around the world, the Agricultural Film 2018 is a must attend eventnot to be missed. It will bring together agricultural and horticultural cover specifiers, raw material and film manufacturers, professional researchers and educational institutions, cooperatives, growers and associations and public and private bodies involved in agriculture to provide a forum and a networking platform with professionals active in this challenging industry and global food supply in general.

17-19 September 2018, Melia Castilla, Madrid, Spain

8th International Conference and Exhibition on Biopolymers and Bioplastics

Theme: Applications and Characterization of Biopolymers Vs Polymers: A Global Debate

15-16 October 2018 Las Vegas, Nevada, USA

The Global Plastics Industry Seminar

For over ten years companies and individuals involved in the global plastics industry have come to reply on the concise, accurate and informative analysis provided by the Global Plastics Industry Seminar. The better information and focused insight provided by the one day briefing has enabled companies to make better decisions and position themselves for success for this competitive and fast changing segment. Business Publishing International provides interactive training and insights services concerning the development and opportunities in the global plastics industry.

13 November 2018, Marriott Downtown Abu Dhabi, Abu Dhabi, United Arab Emirates

Compounding World Forum 2018

Organized by AMI & Compounding World magazine, this exciting conference explores many of Compounding World's most popular themes in a live event. It covers business strategies and new materials technologies, and provides practical advice on getting the most from compounding lines. The primary focus is on the production of technical compounds based on engineering thermoplastics, performance polyolefins and thermoplastic elastomers. In the past 5 years Compounding World Forum strengthened its position as the leading meeting place for the international plastics compounding industry, attracting a total of over 910 attendees, and 200+ exhibitors.

4 - 6 December 2018, Ft. Lauderdale Marriott Coral Springs, Coral Springs, FL, United States

Contact us

Project coordinator

Dr. Alejandro Arribas Agüero
CETEC Centro Tecnológico del Calzado
y del Plástico (Alhama de Murcia, Spain)
R&D Department
Phone: +34968632200
Fax: +34968632266
a.arribas@ctcalzado.org

Communication partner

László Halmos
Adesva Centro Tecnológico de la
Agroindustria (Lepe, Spain)
R&D Departament
Phone: +34 902 90 80 53
Fax: +34 959 649 060

Project partners

Join us on social media

BIOMULCH Project

www.biomulch.eu

Call: H2020-FTIPilot-2016-1
Duration: Dec 2016 - Nov 2018
Total budget: 1 976 993,75 Euro
EU contribution: 1 613 667,50 Euro