

Food nets vanishing without a trace

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Scientists are creating compostable versions food nets to be used with compostable products to ensure that, at the end of their life, they serve the purpose of helping to grow food, thus closing their life cycle loop.

Potatoes, oranges, onions and shellfish; all are packaged in flexible and sometimes colourful nets. These are mainly made of [polyethylene](#), the most common plastic. The problem is its biodegradability is low. And they need to be separated from the [organic matter](#) at the end of their life. This is manual process, which is costly because nets have low weight but occupy rather large volume. Grinding these nets for recycling is also difficult, due to their structure. In practice these nets tend to ends in

dumping sites or [incinerators](#).

Now, an EU funded eco-innovation project called ECOBIONET is trying to find alternative material to produce them. "If affordable high-quality compostable nets were available, consumers could throw them away together with the [organic waste](#)", says project coordinator Chelo Escrig, chemist responsible at the department of extrusion of the Instituto Tecnológico del Plástico, AIMPLAS, in Valencia, Spain, and "perhaps these [packaging material](#) could become fertiliser for the same [food product](#) other nets will one day contain, thus closing the circle." Ultimately, the project aims at industrialising both the process and the technology for manufacturing biodegradable and compostable plastic nets for the [food industry](#). The project team is relying on conventional extruding techniques such as Extrusion Melt Spinning (EMS).

Scientists are using some of the prototype of bio-compounds for net packaging that were developed in a previous EU funded project, called PICUS, also co-ordinated by AIMPLAS. They are also using combinations of existing plastics. "We have obtained new compounds mixing commercial materials such as polylactic acid (PLA), made from natural sugar sources, and biopolyesters, such as PBS polybutylene succinate (PBS), made from petroleum-based feedstock," Escrig explains.

The project consortium is now compiling the results of the last validation tests and awaiting the final results on compostability so to eventually obtain a certification logo (EN 13432). Previous compostability tests appear to indicate that the bio-compound does not damage the compost and degrades over a period of six months. Tests results found that all heavy metals are below limit values whereas quality tests, including ecotoxicity tests, are still ongoing. "Ensuring [biodegradability](#) in [line with the degradation] timing standards and [the packaging] Directive indications seems [to be] the biggest challenge of such a proposal", says

Antoni Sánchez, chemical engineer, professor at the Universitat Autònoma de Barcelona (UAB), Spain, and co-ordinator of its waste composting research group.

Another key issue for these new materials is market competitiveness. Although cost analysis is not available yet, 1kg of the new nets' raw material costs twice as much as 1kg of polyethylene, Escrig admits. Yet, "our process is cheaper because biodegradable materials have lower processing temperature compared to polyethylene," Escrig tells youris.com. The process for the new material operates at 170 degrees, compared to the approximately 210 degrees needed for polyethylene melting; a 20% reduction in energy consumption. In addition, "[We] have [also] reduced the thickness of the films so as to reduce production costs", Escrig notes.

Further challenges may also lie ahead after the introduction of these nets in the market. "[This initiative] makes sense only provided that people are able to identify them as biodegradable plastic and actually throw them away in an organic container," notes Francesc Giró, deputy director of the Catalan Waste Agency (Agència de Residus de Catalunya), in Barcelona, Spain. "For this to happen, it is responsibility of us all but especially, according to what the European [packaging] Directives state, of the nets producers."

More information: eaci-projects.eu/eco/page/Page...ect_detail&prid=1969

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