



The facts about biobased plastics

Fossil resources are limited, but the demand of plastic packaging is not decreasing. This is one of the reasons to take the development around biobased plastics seriously. Since there are still many questions about biobased plastics, the Ministry of Economic Affairs and RVO.nl asked Wageningen University to conduct a study on biobased plastics. These are the highlights of the results of the report 'biobased and biodegradable Plastics – Facts and Figures', April 2017.

1

Price

In general, the price of biobased plastics is more stable than the price of fossil plastics. If the price of oil is high, then a plastic like PS is more expensive than PLA. It is expected that the price of biobased plastics will go down in the future.



2

Usage benefit



PLA packaging can increase the shelf life of lettuce with two days. About 30% of the food produced is wasted, including the part at the retailer. Biobased plastics can decrease food losses by increasing the shelf life. And if the food must be disposed it can go into industrial composting without additional handling since PLA is compostable. PLA film has a high water transmission rate which makes it suitable to pack fresh products like fruits and warm bread coming out of the oven.

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3

Environmental benefits

The production of biobased plastics and fossil plastics show different contributions to the different impact categories. In general, the production of biobased plastics uses less fossil energy and emits less greenhouse gasses. Since many biobased plastics are based on agricultural products the production needs land, water and fertilizers.



4

Industrial compostable

Biodegradable/compostable plastics can provide benefits over fossil plastics in the end of life phase if they are mixed with organic kitchen and garden waste. As an example, in the use of tea bags. To seal the tea bags, today most tea bags consist of 20-30% of the fossil plastic PP. These bags often end up in the composting bin, while they are not compostable. By replacing the PP with PLA the complete bag is compostable.

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Food

Today, most biobased plastics are made from starch or sugar. However, there are quite some research programs investigating alternative raw materials such as beet pulp and other waste streams.



6

Recycling

How do the different types of biobased and fossil based plastics interfere during recycling? A study showed that there is no evidence that PLA disturbs plastic recycling, while there are concerns about the effects of PVC and EVOH.

7

Nice to know

- The percentage of bioplastics compared to fossil plastics is increasing.
- Drop-in biobased plastics are chemical identical to their fossil counterparts and can be used in the same applications
- Mars has developed a new packaging material for their bars based on starch present in the waste water of the potato industry.



Properties

Like fossil plastics, there are many different biobased and biodegradable plastics that can be used in a wide range of applications.

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Property	Fossil plastic	Biobased plastic
Flexibility and water transmission	PE	Bio-PE
Flexibility	PE	Blends of starch and biodegradable polyesters
Transparency, stiffness, barrier properties	PET foil of multilayer oxygen scavengers	PLA with SiOx
Transparency, stiffness	PS, PET, PP	PLA
Stiffness	PS, PET	PLA, starch blends, paper foam

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Labels

To make clear what needs to happen with bioplastics after use various labels are developed.

