



Bioplastics and their management

Introduction

According to the [Ellen MacArthur Foundation](#), bioplastics are a means of addressing the problem of [single-use plastics](#). They can be incorporated into composting infrastructure and, if leaked into the environment, have a less harmful impact than petroleum-based plastics.

The terminology

‘Bioplastics’ loosely refers to plastics that are bio-based, biodegradable or both.

‘Bio-based’ refers to the material’s origin: bio-based products are manufactured from natural polymers such as corn/maize starch and sugarcane. Bio-based plastics are not necessarily compostable.

The term ‘compostable’ describes what can be done with the material after its use; compostable materials can be home composted or industrially composted.

‘Biodegradable’ is a broader concept describing a material that can biodegrade into natural elements with the help of micro-organisms.

World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company,
The New Plastics Economy — Rethinking the future of plastics, 2016

Concerns for their use

There are several concerns about the use of bioplastics as an alternative to single-use plastic items and packaging. Some main concerns include:

- Impacts on the environment and communities in which they are grown
- Consumers understanding of bioplastics
- Composting facility conditions

The land used to grow bio-based plastics is often in competition with land used for food crops needed to feed communities in developing countries where most of these materials are



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cultivated. They also tend to require large amounts of pesticides, fertilizers and other resources to maintain growth. The toxic effects of these chemicals have negative consequences for nature and people. The demand for these materials has also created pressures on growing regions that have resulted in low wages and poverty. As the pressure to increase production mounts, regions risk experiencing water shortages, species extinction, desertification and the loss of natural habitat land.

Next, the general lack of consumer understanding of what a bioplastic is presents a challenge for municipalities dealing with these products. Residents are often likely to confuse them as recyclables and place the bioplastic packaging material in Blue Box recycling programs. Unfortunately, these plastics are not compatible with other plastic resins and cannot be recycled.

Finally, claims that these products are being composted in commercial facilities may not always be true. Some facilities:

- are unable to create the conditions where the bioplastic is 90 per cent degraded after 12 weeks at 60 degrees Celsius (a required condition for a product to be biodegradable);
- reject the products before they even enter the processing phase as they are suspected of being petroleum-based plastic.

Barriers to management

Barriers to the effective management of bioplastics include:

- The non-alignment between compostable packaging design and what is accepted at composting facilities across Canada
- The rate of innovation in packaging materials, which is often faster than the time it takes to upgrade processing technology
- Public confusion due to the variation in what types of bioplastics are accepted at the different facilities across Canada
- Inconsistency in labelling on the products
- Lack of centralized collection systems for food waste, particularly in multi-residential buildings
- Odour issues associated with facilities accepting these products that can prevent the creation of new facilities
- Bioplastic packaging is often more expensive to develop than conventional petroleum-based plastic packaging



What is being done by the federal and provincial governments?

In July 2019 Natural Resources Canada and Agriculture and Agri-Food Canada announced a \$300,000 investment in the first phase of a [Bioplastics Challenge](#). The recipients of this award are implementing projects that have the potential to reduce pollution by improving the compostability of bioplastics. In addition, through the Canadian Council of Ministers of the Environment's Canada-wide [Strategy on Zero Plastic Waste](#), a "Plastics Challenge" was announced that provided funding for seven innovation challenges related to food packaging and the improved compostability of bioplastics.

The need to address the management of compostable products and packaging has also been acknowledged by the Government of Ontario. Compostable packaging and products will be addressed according to the Ontario Government's November 2018 discussion paper, [Made-in-Ontario Environment Plan](#). Solutions considered in the paper include:

- Working with municipalities and private composting facilities to build a consensus around requirements for emerging compostable materials to ensure new compostable packaging is accepted by green bin programs across the Province.
- Considering making producers responsible for the end-of-life management of their products and packaging.

Ontario's Minister of Environment, Conservation and Parks, announced in June 2019 that the Ministry was creating a "[Compostable Products Technical Working Group](#)" made up of experts from municipalities, industry and the waste management sector to establish "clear rules for compostable packaging materials in Ontario and to ensure these materials are accepted by existing and emerging green bin programs across the province."

Relevance to Solid Waste Master Plan

If bioplastics are to become an effective alternative to petroleum-based plastic packaging, waste management systems need to be able to incorporate these products. Municipalities have a role to play in ensuring waste management systems are effective at controlling the flow of these materials. As the Solid Waste Master Plan is developed discussions will take place that explore what is being done at the federal and provincial levels and what municipalities can do to compliment or add to these actions. Conversations will include consideration of:

- Implementing and improving education programs aimed at increasing public understanding of bioplastics and the waste streams where these products should be placed.



Solid Waste Master Plan

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- Working with municipalities, and other partners, across the Province to help ensure methods are standardized and consistent, making the system easier to understand and use.
- Ensuring every home has access to an organics waste stream.