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### Environment & Nature News - Composting plastic - 05/02/2002

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## Composting plastic

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An Australian development means there will be one less thing to feel guilty about when you indulge in biscuits or chocolate — you will be able to put the packaging in the compost.

Bioplastic, made from corn starch, has been developed by the [CRC for International Food Manufacture and Packaging Science](#) over the past six years.

They say it looks, feels, and performs like plastic, and is cost-competitive with current plastics.

"The CRC researchers knew that biodegradable plastics was going to be the next big thing if someone could crack the price problem," explained Mr Mark Fink from the [TSL Group](#), the company assisting the commercialisation of the technology.

The material will be mainly used for dry foods packaging, such as the trays in biscuit packets or chocolates. Micro-organisms can break it down by burning the constituent sugars, resulting in carbon dioxide and water.

The challenge for the researchers was to create it using standard two-step plastic extrusion equipment.

"You start with dry powders, mix them up, and put them in an extruder — high shear force, high temperature, high pressure," said Mr Fink.

This forms a 'melt' which is forced out a nozzle. The material can be pushed out as small pellets, to be blown into plastic bags, or form sheets which are then pushed into moulds to form biscuit trays or the like.

The corn used to produce the plastic is left to die on the plant, and harvested when it is dry.

"It's a pretty efficient way of making polymer because so much of the corn's energy goes into making the starch," said Mr Fink. "Starch yield from corn is about 80 per cent."



Safe plastic: some of the products that can be made from the biodegradable plastic. (Pic: Plantic Technologies)

A five-gram tray containing four grams of starch would use less than a cob's worth of corn, he said.

The packaging for each product is designed to last only as long as the particular product requires. Some bioplastics dissolve very rapidly; others are designed to last four to five months. The difference lies in the proportion of corn to the other organic ingredients which help with the binding during extrusion.

"The rapidly dissolving one has a 90 per cent dry weight of corn and 80 per cent wet weight," estimated Mr Fink. The longer-lasting bioplastics have between 30 and 50 per cent corn.

The trick is to get the starch content as high as possible, he said, because starch is the main barrier to water and the cheapest ingredient.

The researchers have also made very waterproof, long-lasting plastics, but have not yet released those onto the market.

"Basically, our price-competitiveness decreases the tougher the application as far as water is concerned," Mr Fink explained.

The bioplastic will break down readily at any temperature, provided micro-organisms are present — hence the attraction of compost.

A full life-cycle analysis has not yet been done, but the researchers are confident that the product is sustainable because it comes from a high-yielding source, and because the package, biodegrades fairly quickly.

The research was conducted by the department of Chemical Engineering at the [University of Queensland](#), the [Centre for Colloid and Biocolloid Applied Science](#) at Swinburne University of Technology, and [CSIRO Manufacturing Science and Technology](#).

Danny Kingsley – ABC Science Online

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