

Plastic bags: Solution is in shoppers' hands

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Plastic bags have only been in common use for about 30 years, but they have become ubiquitous – UK shoppers use around 8bn bags every year, resulting in 100,000 tonnes of carrier bag waste, the same weight as 70,000 cars, according to Wrap, the government waste prevention programme.

But their days may be numbered. San Francisco passed a law in March banning plastic bags in the city's supermarkets and pharmacies.

The bags have also been banned in Bangladesh after it was found that millions of them were blocking drains and exacerbating the flooding that plagues the country. So many bags got caught in trees and fences in South Africa that it was joked that the "plastic bag tree" was the national plant. Single-use bags were banned in the country in 2003 and they have also been outlawed in Taiwan. In Ireland, a tax of €0.15 per bag led to a 90 per cent fall in the use of plastic bags within three months.

The problem is that plastic bags are made, ultimately, from oil, so they contribute to global warming and they hang around – each one takes around 100 years to rot away in a landfill site, says Wrap. In addition, according to environmental group Planet Ark, "in the marine environment plastic bag litter is lethal, killing at least 100,000 birds, whales, seals and turtles every year. After an animal is killed by plastic bags its body decomposes and the plastic is released back into the environment where it can kill again."

With all these problems, and in the light of bans or taxes in other countries, an agreement by UK retailers to reduce the overall environmental impact of their carrier bags by 25 per cent by the end of 2008 seems rather inadequate. However, Defra says that there are no plans to copy the Irish tax, which, it says, has not been a success. The Irish Department of Environment says that the tax will be going up to €0.22 because usage has started creeping up again.

The 25 per cent reduction target, agreed by six trade associations and 22 high street and supermarket chains, including Tesco, Next and Boots, which distribute 13bn carrier bags a year between them, could cut carbon dioxide emissions by up to 58,500 tonnes a year – equivalent to taking 18,000 cars off the road for a year.

There are a range of alternatives to plastic bags – Ecosac distributes biodegradable-compostable bags made from cornstarch polymer, while the similarly named Ecosack offers biodegradable paper sacks for collecting waste.

Italy's Novamont, one of the world's biggest producers of biopolymers, says that the market is set to boom as Italy bans throw-away bags this year and France follows suit. The company is opening a plant near Rome to make plastics from corn and sunflower oil, drastically reducing the fossil fuel content of its material. Some say the benefits are reduced, though, as a result of all the fossil fuel that goes into growing the crops, from transport to fertiliser.

But the multiplicity of approaches is reducing the effectiveness of each strategy, according to the British Retail Consortium.

For example, if recycled plastic bags get into the waste stream, they reduce its effectiveness, while environmental campaigners complain that Tesco's move to introduce degradable bags was "greenwash". "They are still plastic and they are still made from oil. When they are sent to landfill, they cannot break down because they need sunlight," says Friends of the Earth.

Paper carriers have been found to be six times heavier and take up around 10 times the storage volume. This has an environmental cost in transport, distribution and fuel usage, the BRC says.

Case study: Sarah Murray: Water-soluble plastics have raft of applications

With plastic waste accumulating across the globe, a number of companies and research organisations are coming up with biodegradable options that, using everything from cornstarch to nanotechnology as the basis for their products, dissolve in water. The products have applications everywhere from the home to hospitals and the high seas.

Plantic, a Melbourne-based company, has developed a bioplastic can be not only composted – it can also be disposed of in water. Using non-genetically modified high-amylose cornstarch, the material can be used in both rigid and flexible packaging and, crucially, is cost-effective – the confectionary trays that are part of its current product range each take cornstarch from the equivalent of one cob of corn.

The result is an organic package that is biodegradable and that begins to disintegrate upon contact with water. The company, which is also working on the development of plastic bags, is currently selling its trays to companies such as Cadbury Schweppes and Nestlé. It is also developing injection-moulded products using similar technology.

Meanwhile, the University of Southern Mississippi has been working on a new type of plastic that degrades in seawater, which could make it safe to throw the plastic waste accumulated on cruise liners, container ships and naval vessels overboard.

The research team developed the plastic from polyurethane that incorporates the same degradable polymer used in surgical applications. Once exposed to seawater, the material could be capable of degrading in as little as 20 days, leaving behind only non-toxic byproducts that, because they are more dense than salt water, tend to sink rather than wash up on beaches.

Other applications for soluble plastics are in the home. Consolidated Ecoprogress Technology, a Canadian environmental technology company, has used nanotechnology to produce nappies and feminine hygiene products that safely flush down toilets. Napkins and liners using the company's patented Flushaway technology break down as they come into contact with water, enabling them to be flushed easily. The material then biodegrades as it flows through the sewerage pipes, taking 71 days for the process to be completed.

The home is also where the water-soluble plastic of The Stanelco Group is being used. The British company – whose philosophy is to provide products that are more environmentally sustainable than the alternatives – sells a water-soluble embroidery film can be used as a backing while embroidering fabrics. When the job is done the film can be dissolved in water or by using steam.

And while the development of water-soluble plastics has been given impetus by the need to reduce waste, the technology has added advantages. Water-soluble products include laundry bags – offered by companies such as Stanelco and Australian company Solpak – that dissolve completely in the washing machine. The bags can be used in hospitals to reduce contamination and cross-infection between patients, staff and laundry workers.

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