OXO-BIODEGRADABLE PLASTICS ASSOCIATION

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Q & A on HYDRO-BIODEGRADABLE PLASTIC

(Sometimes known as "bioplastic" "bio-based" "crop-based" or "compostable" plastic)

Q What is the purpose of this type of plastic?
A2. It is designed for carrying organic waste to an industrial composting or anaerobic digestion unit, and to biodegrade in the special conditions found in those industrial processes. It does not address the problem of plastic litter in the open environment.

Q Is it necessary to move away from oil-based plastics to plastics made from vegetable resources?
A. No. oil-based plastics do not cause fossil resource-depletion, because they are made from ethylene – a necessary by-product of oil-refining which used to be wasted. Oil is extracted from the ground to make fuels and lubricants, and the same amount would be extracted even if oil-based plastics did not exist. Therefore, until other fuels and lubricants are found for vehicles, ships, aircraft and factories, it makes sense to use this by-product instead of consuming large amounts of fossil fuel and using land and water resources in the agricultural production and polymerisation process of "crop-based" plastics.

Q Is "Compostable Plastic" really compostable?
A. No. When something is described as compostable an ordinary person would think that it can be converted into compost, but the Standards for this type of plastic (ASTM D6400, EN13432 etc.) require it to convert into CO_2 gas within six months – so it is deliberately wasted. You cannot therefore make compost from it – only greenhouse gas. This process contributes to climate-change but does nothing for the soil, and it cannot be described as organic recycling of plastic.

Q Is it really biodegradable?
No. It should not be described as "biodegradable" because although it will fragment in the open environment it is tested for biodegradation only in the special conditions found in industrial composting or anaerobic digestion.

Q Are bioplastics renewable?
No. They contain up to 70% oil-based polyester. Consider also the non-renewable fossil fuels consumed and CO_2 emitted by the machines used to clear the land, plough the land, harrow the land, sow the seed, make the fertilisers and pesticides and bring them to the farm, spray the crops, harvest the crops, take the crops to a polymerisation factory, and operate the autoclaves. See http://www.biodeg.org/Hydro-biodegradable%20Plastic%20Production%20Process.pdf

Q. Can bioplastics be recycled with ordinary plastics?
A. No. See http://www.biodeg.org/recycling.html for details. So, anyone who is in favour of recycling should be against them. Even if intended for industrial composting, some of this plastic will get into the oil-based plastic recycling stream.

Q How much do bioplastics cost?
A. They are too expensive for everyday use – costing up to 400% more than ordinary plastic. Even if this cost were substantially reduced in the future it is far too expensive for ordinary people and there is no justification for subsidising it out of taxpayers' money.

Q. Can bioplastics be made by existing plastics factories?
A. No. They cannot be made by plastics factories with their existing machinery and workforce, and any large-scale introduction of this type of plastic would lead to job-losses in the existing plastics industry.

Q. Are bioplastics safe?
A. No. Deep in landfill they can generate methane, which is explosive, and is a greenhouse gas much more powerful than CO_2. In compost, they can leave fragments of plastic which get into the food chain.

Q. Should we be using land and water resources to produce bioplastics?
A. No. Those resources should be used to produce food for the people in the world who do not have enough to eat. The European Parliament has resolved not to encourage the use of land and water resources for producing bio-fuels (and the same reasoning applies to bio-plastics). The UN issued a report to the same effect on 31st March 2014. Nestlé believes that allocating agricultural land and water to biofuel production will severely impact food and water security. In their view "Forecasts of food production suggest that significant challenges exist for the world to feed future generations…...Even a small percentage of energy from crop based biofuels has a devastating effect on the food market. Biofuels are often promoted as a strategy for reducing anthropogenic GHG emissions. However, according to the agricultural practices used, there may be no net GHG benefits from converting agricultural crops to biofuels, whilst the conversion of forests or land for biofuels may lead to emissions that are higher than fossil fuels (in addition to losses in biodiversity). The water intensity of biofuel crops will put additional stresses on surface and ground water supplies and act as competition to other water users, particularly the water needed to grow food."

Q. Are vegetable-based plastics suitable for shopper-bags?
A. No. Because they need to be strong and inexpensive, and to be capable of re-use many times before final disposal. In addition, there is not nearly enough arable land and water to grow crops to make enough crop-based plastic to replace ordinary plastic, even for shopping bags.

Q. Is it true that the crops being grown to make crop-based plastics absorb CO_2?
A. Yes, but that would be true of the vegetation that was there before.

Q. Are vegetable-based plastics suitable for agricultural mulch films?
A. No, because (unlike oxo-biodegradable plastic) the degradation time cannot be controlled in line with the growing cycle. Farmers do not want the plastic to start biodegrading immediately.

Q. Have Life-cycle Assessments been done?
A. Yes. An LCA by Intertek, published by the UK Government in 2011 and a further LCA by Intertek in 2012 found that ordinary plastic and oxo-bio plastic has a better LCA than crop-based plastic or paper bags. Vegetable-based plastic is thicker and heavier for the same strength, so it needs more trucks to transport it, using more road space, consuming more fuel, and emitting more CO_2 and other forms of pollution to atmosphere. See http://www.biodeg.org/lifecycleassessments.html

Q. Have NGO's expressed a view about vegetable-based plastics?
A. A consortium comprising Friends of the Earth, Surfrider Foundation, Zero Waste Europe, Ecos, and the European Environmental Bureau published a paper in 2017 in which they say "The bioplastics industry use their green-sounding credentials to position themselves as helping to speed the reduction in fossil fuel use and solving the ever-growing plastic pollution and marine litter issues. However, there is clear evidence that bioplastics do not solve many of these problems and in fact may create new ones."

See also "Bad news for compostable plastics from German Courts"
http://www.biodeg.org/Bad%20news%20for%20compostable%20plastics%20from%20German%20Courts%20-%20%20%203-10-14.pdf

Germans Reject "compostable" plastic and say EN13432 and ASTMD-6400 are "defective and irrelevant
https://woodsend.org/2014/03/european-soil-industry-visits-controversy-biodegradable-plastics/

Facts about biodegradable Plastics
http://www.biodeg.org/EU%20Plastics%20industry%20advises%20against%20bio-based%20plastic.pdf

Q. Is vegetable-based plastic suitable for home-composting?
A. No. There is no Standard for this and it would be dangerous to try to create one. Composting has to be carefully managed to create and maintain the correct conditions and this cannot be expected from home composters, most of whom will not even read the Standard. The result will be that fragments of plastic will get into the compost and into the food-chain. Home composting has been used for grass and other garden wastes for many years but it is not suitable for kitchen waste, because temperatures are not likely to be high enough to kill the pathogens, and an incorrectly managed composting unit will attract rats, foxes, and other vermin. There is in any event no need for an expensive plastic bag for conveying organic waste to the bottom of the garden when a bucket would serve the purpose equally well. As mentioned above "compostable plastic" does not convert into compost.

Q Is it legal to use vegetable-based plastic?
A. It does not comply with the laws of the United Arab Emirates, Pakistan, Saudi Arabia, and other countries which require all short-life plastic goods and packaging exported to those countries to be oxo-biodegradable.

In the USA, the Federal Trade Commission said in its 2012 Green Guide that "It is deceptive to misrepresent, directly or by implication, that a product or package is compostable." They also said that it is not sufficient to show that a test item had complied with ASTM D6400 (the US equivalent of EN 13432), because those standards "likely do not typify compost facility operations nationwide. Rather they reflect "optimum [operating] conditions and ignore wide variation in actual facility operations. Because of these variations, the ASTM protocols likely do not replicate typical compost facility environments."

In addition, it is unlikely that a plastic marketed as complying with ASTM D6400 (or EN13432) would break down into or otherwise become part of usable compost. This is because these standards require the plastic to break down substantially into CO2 gas within 180 days. The gas is typically released to atmosphere where it contributes to climate-change but it does not become part of usable compost.

These plastics should not therefore be described as "compostable" and marketers may risk prosecution in the USA if they are so described.

In Europe - the EU Commission has said that advertising a packaging product as biodegradable when in fact it will not readily biodegrade in natural conditions can be misleading for the consumer. Products marketed as compliant with EN13432 or their equivalents are only tested to biodegrade in industrial composting facilities in controlled conditions, and they should not therefore be described as "biodegradable."