THE DIFFERENCE BETWEEN DEGRADABLE, BIODEGRADABLE, AND COMPOSTABLE

by Green Plastics

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There are three terms that get thrown around a lot when people talk about plastics, so it is worth spending a moment to clear up how they are related to one another, and how they are different.

Degradable Plastic. The word "degradable" just means that something breaks down. Technically, all plastic is degradable plastic. You can break it with a hammer. You can grind it into a fine powder. This all counts as "breaking down" the plastic, and therefore (technically) "degrading" the plastic.

This creates a little bit of confusion, because some plastics will add chemicals that will make the plastic break down faster under certain conditions. For example, you can add an additive to normal, petroleum-based plastic that will make it become brittle and crumble in sunlight: this is referred to as making "photodegradable" plastic. Other additives can be put into plastic that will make plastic break down by oxidation: this is referred to as making "oxo-degradable plastic."

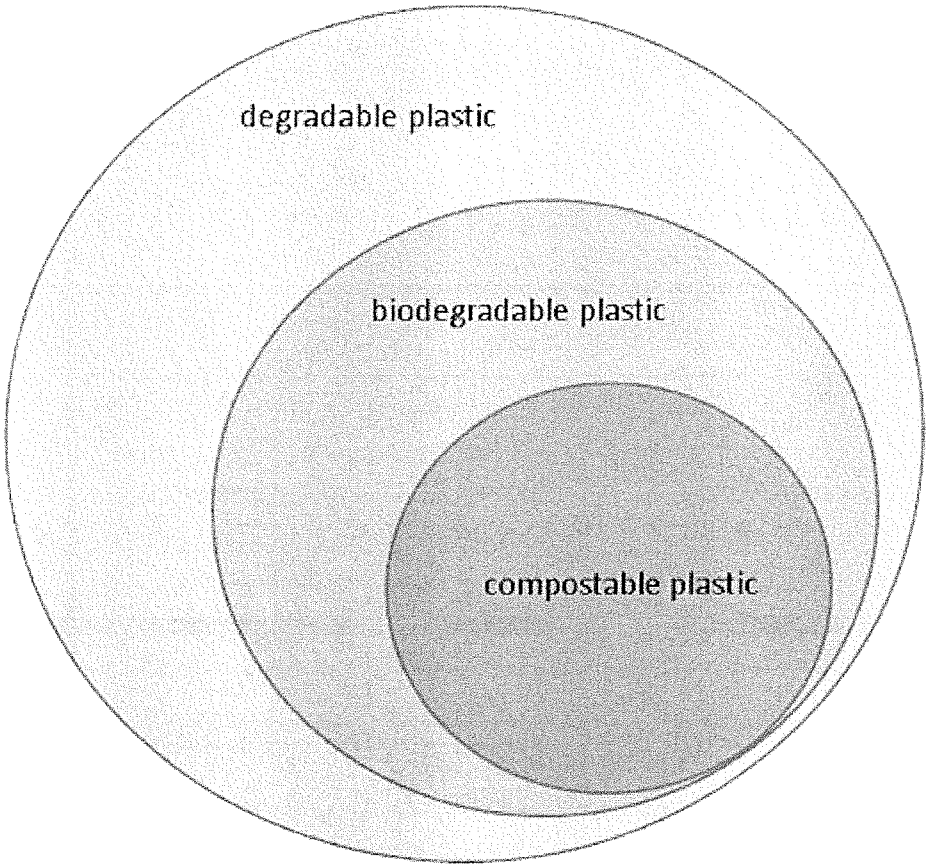
These methods will make the bulk of the plastic appear to disappear; however, the small pieces (or even find "sand") that is produced by this effect is still small pieces of plastic. Nothing has changed. Over a matter of years, it is possible for the pieces to become small enough to be assimilated by microorganisms, but there is still a lot of research that needs to be done to verify how long this might take. In the mean time, they are just very small pieces of plastic.

So be cautious when you see a plastic product that advertises that it is "degradable" but not "biodegradable" or "compostable," because this is nothing special. The plastic material does not "return to the earth" in any real way. It just gets really, really small. (You can read more about why this is different from biodegradation in our article: Degrading Dialogue (Achilles and the Tortoise).)

Biodegradable Plastic. When something is biodegradable, it means it is degradable, but it also means something more: it means that it can be broken down by the metabolism by micro-organisms. When a plastic is biodegradable, it can be digested, so that the carbon atoms in the chains of the polymer are broken apart and can actually participate in the creation of other organic molecules. They can be processed by, and become part of, organic living things. This returns them to nature in a very real sense: they become part of the carbon cycle of the ecology of the earth.

Only bioplastics will biodegrade within any reasonable timescale. Petroleum-based plastic that simply breaks down into a fine sand or small pieces still cannot be digested by microorganisms. Perhaps over the time-span of many years, the pieces may get so small that they can be digested by microorganisms. This is currently the focus of a great deal of research and debate, as different groups try to establish how quickly oxo-degradable plastics can be reduced to a form where they are actually biodegradable.

It is also important to note that even some plastics that are made from renewable resources are processed in a way that makes them non-biodegradable. They are still "degradable" but they do not return to the earth, and cannot be processed by microorganisms. That is why the difference between biodegradable plastics, and non-biodegradable plastics, is so important.



Compostable Plastic. When something is compostable, it means that it biodegrades, but it also means something more: it will degrade within a certain amount of time, under certain conditions. For many types of bioplastic, it's possible to say that it will break down "eventually", but if you seal it in an air-tight room, it could take thousands of years. The standards organizations that regulate materials have come up with a series of tests and benchmarks, saying that if a biodegradable plastic will completely biodegrade fast enough in a certain type of environment, then it can be labelled "compostable." For more details about what these limits are and how they are measured, check out our article: "Bioplastics Standards 101".

So these three terms aren't really different "classes" of plastic, in the sense of being separate sets. They are subsets of one another: all compostable plastics are biodegradable, and all biodegradable plastics are degradable. But be wary of people who make claims about the "degradability" of their product: because ***not*** all degradable plastics are biodegradable, or compostable.