**Complete biodegradability considerations:**

A number of polymers in the market are designed to degradable i.e. they fragment into smaller pieces and may degrade to residues invisible to the naked eye. While it is assumed that the breakdown products will eventually biodegrade there is no data to document complete biodegradability within a reasonably short time period (e.g. a single growing season/one year). Hence hydrophobic, high surface area plastic residues may migrate into water and other compartments of the ecosystem.[1]

In a recent Science article Thompson et al. (2004) reported that plastic debris around the globe can erode (degrade) away and end up as microscopic granular or fiber-like fragments, and these fragments have been steadily accumulating in the oceans. Their experiments show that marine animals consume microscopic bits of plastic, as seen in the digestive tract of an amphipod.
The Algalita Marine Research Foundation[2] report that degraded plastic residues can attract and hold hydrophobic elements like PCB and DDT up to one million times background levels. The PCB's and DDT's are at background levels in soil and diluted our so as to not pose significant risk. However, degradable plastic residues with these high surface areas concentrate these chemicals, resulting in a toxic legacy in a form that may pose risks to the environment.

Therefore, designing degradable plastics without ensuring that the degraded fragments are completely assimilated by the microbial populations in the disposal infrastructure in a short time period has the potential to harm the environment more that if it was not made to degrade.

[1] Ibid.
[2] See www.algalita.org/pelagic_plastic.html.