ENVIRONMENTAL DEFENSE FUND PERSPECTIVE ON DEGRADABLE POLYMERS

Environmental Defense Fund Perspective
May 2008

With respect to biodegradable polymers and biodegradable materials intended to replace conventional polymers, we are not convinced of their merits except in the narrowest of applications; indeed, in a number of settings and applications for which they are being developed, we feel they will do more harm than good.

While there *may* be some legitimate uses for materials manufactured to be biodegradable where they can be shown to degrade completely and safely in a manner and time frame compatible with the environment or waste management system in which they are placed, we do not support the development and use of such materials if they are used instead of, or they replace or compete with, recyclable alternatives.

Moreover, we view the claimed benefits of degradability with skepticism in the absence of convincing evidence of such benefits. Consider the various waste management options available to be used for such materials:

- Degradability offers no benefit and quite arguably is detrimental for products or materials disposed of in ***landfills***. Even if degradation were to occur at any appreciable rate (see next bullet), the effect would be only to increase production of landfill gases, including the potent greenhouse gas, methane, as well as landfill leachate, which can contaminate groundwater and creates an acidic landfill environment that enhances the leaching of toxic constituents (metals and organics) from other materials co-disposed along with the degradable materials.

- The argument that biodegradability can save ***landfill space*** is misfounded. Landfills are designed and operated in a manner -- through compaction and other measures taken to minimize penetration of water -- that slows the rate of degradation to an extent such that a landfill or landfill section is closed well before degradation of the landfilled waste would be sufficient to create "new" space for more waste. It is also arguable whether landfill *space* (as opposed to other impacts of landfills) is principally an environmental copncern, or more of a political and economic question.

- Degradability is irrelevant for materials that are ***incinerated***.

- Degradability is irrelevant at best and likely detrimental to ***recycling***. Claims that such degradable materials are recyclable as well as degradable must be evaluated very carefully: Are the materials recyclable only when collected in pure form? If the marketplace includes a mixture of the same type of product or package in conventional and degradable forms, what are the effects of the degradable form on the ability to recycle the conventional form? This is far from hypothetical: the manufacturers of starch-containing plastics touted as biodegradable argued that their products could be recycled if collected by themselves, but when used in products such as grocery sacks, they were wreaking havoc on efforts to recycle ordinary polyethylene bags with which they became mixed.

- With respect to products specifically intended for and best suited to ***composting*** (e.g., compostable yard waste bags), and products for which the best or only feasible means of disposal is through ***sewerage systems*** (e.g., tampon applicators), we can see some benefits to degradability characteristics. However, there is no environmental benefit we can see in seeking to expand the range of types of products that *could* be composted or disposed in sewerage systems, unless there are truly no viable alternatives that are now, or could be, made of materials that can be economically recovered and reused or recycled. [Note that Environmental Defense strongly advocates composting

of source-separated, non-recyclable organic materials and strongly opposes composting of mixed municipal solid waste (MSW). We have been careful to emphasize that only *non-recyclable* organic materials should be composted. We view recycling as a higher use as it directly conserves, and therefore reduces the need to replace, virgin materials, thereby conserving energy and material resources and reducing the environmental impacts arising from production of the virgin materials. In contrast, composting precludes recovery of a material in its original form even though it may yield a useful product. Thus, when a higher-grade recycling option exists, it should be chosen over composting, even for readily compostable materials. We are concerned that, as has frequently been the case with incinerators, degradable polymers and development of MSW (as opposed to source-separated) composting may be employed as "release valves" where recycling markets are weak. The availability of such options will only serve to reduce incentives to build and sustain markets, thereby impeding recycling.]

One final point relating to the question of the merits of manufactured degradable materials: the "lifecycle" impacts (including those related to energy requirements) of such materials must be considered and evaluated. For example, for starch-based biodegradable materials, the agricultural production processes used to grow the raw materials for such products are far from environmentally benign; in addition, the first-blush notion that they are somehow inherently preferable because they use "natural," renewable materials rather than fossil fuels must be fully scrutinized: what if the total energy requirements of producing (planting, fertilization, pest control, irrigation, harvesting, processing) and using such materials necessitated the use of more fossil fuels than production and use of their synthetic counterparts?

For these reasons, degradable materials should be used very selectively: in a limited range of products where composting and/or disposal in a sewerage system is the predominant (if not exclusive) mode of waste management; where there are no viable reuse or recycling/recyclable alternatives; where the materials can be shown to degrade completely and safely in a manner and time frame compatible with the environment or waste management system in which they are placed; and where it has been affirmatively demonstrated on a lifecycle basis that such materials are preferable to their non-degradable alternatives.