Plastic, Microplastic and Compost
Healthiest Waste Management Solutions

Permitting, and promoting persistent plastics in compost:

- **is unnecessary - not key to achieving waste objectives, and**
- **will degrade soil and ecosystem health**

There are better options – exhaust them first

Objectives:

- Increase diversion of compostable waste to the Green Bin
- Maintain or improve the quality of compost (addition of plastic and dog waste degrades compost from highest quality AA, to "beneficial use" requiring labelling, only to be used for non-food growing
- NOT for compost to be a vector of persistent plastics pollution, degrading the earth and biota

Missing? – Promotion! Ottawa spends much less than top cities for Waste Diversion

Persistent Plastics

Context: Persistent microplastics in Ottawa's biosolids are already spread on agricultural land

Will Ottawa add unnecessarily to persistent pollution, via Orgaworld?

Plastic is shredded and some is screened out (significant contamination remains)

In the environment:

- non-compostable plastics break up physically, but do not break down chemically
- compostable plastics break down eventually but Orgaworld process is briefer than ideal

Then what, for dirty, recovered plastic mix (compostable and non-compostable)?

Landfill, or burning? Plasco never worked, and stalled all waste planning. Incinerators are single-sized, polluting technologies that must continually be "fed," so undermine important reduction.

Resources, References

City of Ottawa Greenbin Youtube Channel. Kitchen Bin Liner from Newspaper instruction. (City site link no longer works) https://www.youtube.com/user/GreenBinOttawa/feed

Waste Watch Ottawa. Improving the City of Ottawa's Waste Diversion Performance: Recommendations for Action. Sept 2017. https://ecologyottawa3.files.wordpress.com/2017/09/wwo-ottawa-waste-diversion-performance-sept-15-2017.pdf

Cao, D et al.. "Effects of Polystyrene Microplastics on the Fitness of Earthworms in an Agricultural Soil." *IOP Conference Series: Earth and Environmental Science* 61 (April 2017): 012148. https://doi.org/10.1088/1755-1315/61/1/012148.

Rillig, MC et al. "Microplastic Transport in Soil by Earthworms." *Scientific Reports* 7, no. 1 (May 2, 2017): 1362. https://doi.org/10.1038/s41598-017-01594-7.

Browne, MA et al.. "Microplastic Moves Pollutants and Additives to Worms, Reducing Functions Linked to Health and Biodiversity." *Current Biology* 23, no. 23 (December 2, 2013): 2388–92. https://doi.org/10.1016/j.cub.2013.10.012.

Weithmann N et al. "Organic Fertilizer as a Vehicle for the Entry of Microplastic into the Environment." *Science Advances* 4, no. 4 (April 1, 2018): eaap8060. https://doi.org/10.1126/sciadv.aap8060. *organic fertilizers from biowaste fermentation and composting, as applied in agriculture and gardening worldwide, are a neglected source of microplastic in the environment.*

Lwanga et al. "Microplastics in the Terrestrial Ecosystem: Implications for Lumbricus Terrestris (Oligochaeta, Lumbricidae)." Environmental Science & Technology 50, no. 5 (March 2016): 2685–91. https://doi.org/10.1021/acs.est.5b05478 *Earthworms failed to thrive and died with higher levels of microplastics in soil. Plastic was broken into smaller pieces.*

Alimi et al. "Microplastics and Nanoplastics in Aquatic Environments: Aggregation, Deposition, and Enhanced Contaminant Transport." *Environmental Science & Technology* 52, no. 4 (February 20, 2018): 1704–24. https://doi.org/10.1021/acs.est.7b05559. *Review of terrestrial loads and fates of micro- and nanoplastics. Polyethylene particularly important for contaminant sorption*

Plastics Decoded

Plastics should be a last resort. Re-usable is far better for waste reduction, sustainability and GHG reduction.

Numbers 1, 2, 4 and 5 are readily recycled - *ask for others to be substituted.*

Eliminate PVC, PS and "other" from commerce, and thereby manufacturing and waste streams.

	***Polyethylene terephthalate (PETE)*** is a clear, hard plastic that is often in disposable food and drink containers. PETE is easy to recycle and is usually accepted by Canadian municipal recycling programs. Look for products containing recycled PETE such as containers, furniture, carpet, and polar fleece.
	***High density polyethylene (HDPE)*** is a hard plastic that is not transparent, found in containers and bottles (e.g. for shampoo or yogurt). HDPE is easy to recycle and is usually accepted by recycling programs in Canada. Look for products with recycled HDPE such as pens, containers, bottles for non-food uses, drainage pipe and fencing.
	***Polyvinyl chloride (PVC)*** is used in a wide range of products, from bottles, medical devices, shower curtains and toys, to clear packaging. Many concerns include that: • PVC is toxic plastic to produce; • vinyl chloride vapours may cause cancer (e.g., "new shower curtain smell); • PVC requires the most additives such as hormone-disrupting phthalates to soften it and heavy metals to stabilize it; • PVC is difficult to recycle; • burning PVC produces dioxins (very toxic contaminants); and • PVC is persistent in the environment *Look for PVC-free products, ask stores and manufacturers to ban, reduce and substitute PVC wherever possible.*
	***Low density polyethylene (LDPE)*** is a soft, flexible plastic that is found in a variety of plastic bags. It is a lower risk plastic. LDPE is collected at some stores.
	***Polypropylene (PP)*** is in food containers, bottles and many items such as toys. It is a lower risk plastic. Look for recycled PP in miscellaneous plastic products. PP from "fleece" clothing forms microfibers that pollute waterways.
	***Polystyrene (PS)***, commonly known as Styrofoam, may be found in disposable cups, meat trays and take-out food containers. PS contains styrene, a known carcinogen. PS is not accepted by Ottawa's recycling program, although it is sometimes recycled to make insulation. *Look for PS-free products, and ask stores and manufacturers to do without, or to use better materials. Alternatives are seen in some Ottawa grocery stores.*
	"***other plastics***" could be anything though it is often polycarbonate (PC). PC and some substitutes leach chemicals that interfere with hormones. "Other plastics" are usually not accepted in municipal recycling programs.

Hallmarks of hard-to-recycle plastics:

- **X** non-recyclable
- multiple materials
- non-compatible labels
- lots of ink

www.wastewatchottawa.ca
www.preventcancernow.ca

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