

# **Contaminants In Compost: An Overview**

Nora Goldstein, BioCycle  
Dr. Sally Brown, University of Washington

## **Questions Asked To Address**

- **Fate of compost producers with tainted compost?**
- **What was done to track down the source?**
- **What has been done to help prevent this in the future?**
- **Steps composting facility should take if suspect or have tested and found contaminants?**
- **What has been learned from impacted composting sites?**
- **Any actions by EPA to address?**

## Initial Points

- **Lot of published resources to tap into**
- **Regulations for compost contaminants**
  - Pollutant limits, such as lead, typically follow USEPA Part 503 rules
  - Physical contaminants typically established by states
  - No composting regulations for contaminants such as persistent herbicides
  - Pesticides and herbicides are regulated by different agencies
- **Potential danger of contaminants to human health and environment — need to look at pathways**
- **Ubiquitous presence of many contaminants — level of exposure**
- **Because we can detect it, does that mean it is harmful?**

## Brownfields/urban soils:

- Will have contaminants
- Questions are
  - What are the contaminants and
  - How can they cause harm?



*Source: Brown, 11/2009, USEPA Brownfields Conf.*

# Lead as a focus

- Ubiquitous contaminant in urban soils
- Public concern
- Well researched re bioavailable versus total
- Bioavailability: Measure of portion of total contaminant that has potential to harm a living thing; bioavailable concentration of contaminant varies based on route of exposure and end receptor
  - Level of concentration in soils
  - Different pathways that can cause harm when exposed
  - Frequency of exposure by each pathway

*Source: Brown, 11/2009, USEPA Brownfields Conf.; "Urban Soil Contaminants and Remediation," BioCycle, 10/2009*

## Sources of Lead



*Source: Brown, 11/2009, USEPA Brownfields Conf.*

## Children primary focus

- Children
  - 6 months to 6 years
- Children have a very high adsorption efficiency and growing bones
- Behavior makes them more likely to be exposed



Source: Brown, 11/2009, USEPA Brownfields Conf.

But it is a whole different story when you eat food instead of dirt-



- Three factors
  - How much Pb will the plant take up?
  - How much of the Pb in the food will be absorbed in the stomach?
  - How much of the diet consists of home grown food?

Source: Brown, 11/2009, USEPA Brownfields Conf.

Plants don't take up very much lead

	Soil Pb	Plant Pb
	mg kg	
Truck farm	18.2	0.1
Superfund site	2900	3



Superfund site was grass  
 Truck farm was carrots  
 Different plants will take up different amounts  
 Lettuce, a known accumulator, at truck farm 0.6 ppm

*Source: Brown, 11/2009, USEPA Brownfields Conf.*

Urban soils tend to be compacted, low in organic matter, low in nutrients



Compost improves soils, improves yields, and dilutes contaminants

*Source: Brown, 11/2009, USEPA Brownfields Conf.*



- ✓ Reduce level of exposure
- ✓ Biosolids compost, pellets binds lead so not bioavailable

Source: Brown, 11/2009, USEPA Brownfields Conf.



Source: Brown, 11/2009, USEPA Brownfields Conf.

## Lead in City of Boston Compost

- Sampling data on incoming feedstocks?
- Sources of lead — primarily in soils
- Receipt of street sweepings, which can contain soil particles, which may have lead particles
- Definitely markets and end uses for compost with detected lead levels, e.g., where not human food chain pathway
- Urban soils need organic matter — follow known pathways regarding exposure
- Urban food/agriculture policy and practices
- Sampling protocols

## Fate of Compost Producers With Tainted Compost?

- One of original composting sites dealing with clopyralid in late 1990s changed management, but still operated
  - Lawsuit by City of Spokane, WA just settled in 2011 and reported this year. Article states city suffered \$4 million in damages — Dow gave City \$23,000 based on information released
- Typically, publicly-owned composting sites make reparations to impacted customers
- Rare that facilities actually shut down, but definitely do more public outreach/education on feedstocks accepted
- Do more sampling on front and back end

## What Was Done To Track Down The Source?

- **In instances BioCycle covered, shows up on impacted plants and crops**
  - In Spokane, greenhouse grower contacted WSDA; determined damage not due to cultural practices, so sampled compost, etc.
  - At Washington State University, compost used in community gardens. Tracked it back to WSU's facility, and testing began
    - Subsequent year, tested soil to evaluate continued contamination
- **In case of synthetic pyrethroid pesticide bifenthrin, showed up in routine inspection practices by organic regulators randomly testing wheat grass pulled from supermarket shelves. Ultimately traced to certified-organic yard trimmings compost used by grower**

## What Has Been Done To Help Prevent This In The Future?

- **State agriculture department regulations prohibiting use of clopyralid on commercial and residential lawns. Was allowed on golf courses that composted their own landscape trimmings**
- **Producers say they meet letter of the law by putting warnings on labels. That is being challenged now**
- **With Imprelis, EPA ordered Dupont in August 2011 to "immediately halt the sale, use or distribution" of the herbicide**
- **Major discussions going on now with EPA Office of Pesticides, State Pesticide Control Officials**
- **States, e.g., CA, have requests to register these products; important they be educated**

## **Steps Composting Facility Should Take If Suspect Or Have Tested And Found Contaminants?**

- **Temporarily stop distribution of compost to end user markets impacted**
- **Sample and test**
- **Offer compensation to impacted end users**
- **Track source of contaminant and work to set up protocols to prevent it coming in with feedstocks**
- **Collaborate on growth trials and other testing programs with independent third party, e.g., university**
- **Be transparent**
- **Don't throw baby out with the bathwater — need compost**
- **Continued education and outreach, both with community, landscapers regulators, industry — and industry associations**
  - **Survey local landscapers and others about products they are using**
  - **If receiving manure, know potential sources of contaminants**

## **What Have We Learned From Impacted Composting Sites?**

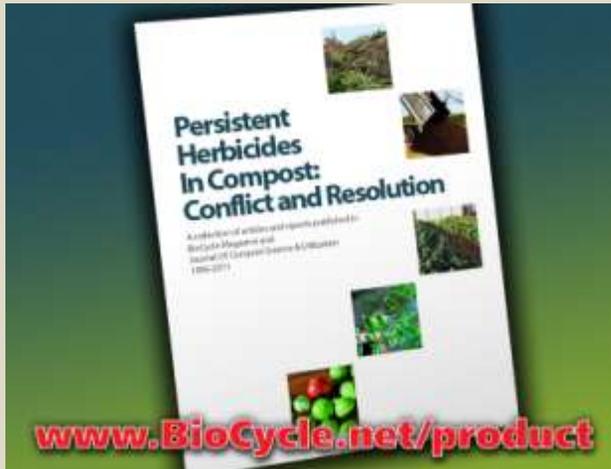
- **Act immediately**
- **Establish good relationships with end users so they report impacts to composting facility**
- **Have rainy day fund to enable compensation of impacted end users, as well as do testing**
- **Establish small fee on end product sales to help fund testing, sampling on regular basis.**
- **Challenge the “establishment,” in this case the producers and to a certain extent, USEPA — labels to “not compost” are NOT SUFFICIENT!!**

## **Any Actions By EPA To Address?**

- **In discussions with chemical companies, composting association, state regulators and impacted composters about how to address current situation**
  - Recognition that EPA pesticide lab may not be using correct test methods to detect clopyralid and similar herbicides in compost
- **USEPA Brownfields Office actively engaged in urban soil remediation, urban agriculture**
  - Municipal brownfields agencies also very engaged

## **Final Thoughts**

- **Use science!!!**
- **Composting of municipal, commercial, agricultural and industrial organics must continue**
  - Contaminant issues have caused setbacks, but not closures
- **Healthy soils are huge asset**
- **Extended producer responsibility**
  - Producer labels are inadequate!!



[noragold@jgpress.com](mailto:noragold@jgpress.com)  
[slb@u.washington.edu](mailto:slb@u.washington.edu)