

Produce Research Priorities Meeting
June 24, 2010
Compost & Amendments

Summary

Soil amendments, including commonly used animal manure containing soil amendments, increase soil tilth and fertility for production of fresh fruits and vegetables. It is well established that animal manures have the potential for containing enteric human pathogens such as *E. coli* O157:H7 and *Salmonella spp.* Composting plays an important role in enhancing the availability of nutrients essential to plant growth and reducing the presence of human pathogens in manure. This session explored the role of key variables that impact the reduction of human pathogens during the composting process as well as how risk can be further reduced during subsequent handling. Research topics explored in the session included agro-ecological considerations, development and measurement of key compost process metrics to ensure process efficacy and the role of organic standard/requirements.

Research Priorities

- I. Process control to ensure safety of mature compost
 - Updated validation studies in terms of times and temperatures are needed for target pathogens/emerging pathogens/most heat resistant organisms.
 - Process requirements based on the most resistant pathogens at levels reasonably likely to occur need to be established.
 - What is the impact of materials on current “standards?” Can feedstock/manure, raw materials, green waste, food waste, and other inputs be used to validate current standards?
 - Are C:N, moisture and temperature “enough” and appropriate for validation? Do we need to include other parameters such as particle size, bulking agent addition, and aeration?
 - How are kill times impacted by factors such as ammonium, pH, raw materials, natural microflora (microbial community) of manure, age of manure and temperature/moisture gradation?
 - How does the curing period—times, temperatures, competitive exclusion (biocontrol)—influence process control?
 - What additional treatments are needed for “highly contaminated” incoming material?
 - What are the influences of covering compost piles/windrows, aeration, weather, and agro-ecological region?
 - How can management of microbial communities during process control be optimized?
 - What is the potential for re-growth/re-contamination/cross-contamination of pathogens?
 - Can bio-solids be safely used?

II. End-product microbial criteria and testing standards

- In addition to the use of *E. coli*/fecal coliforms as indicators, are there other detection and microbial/ecological indicators for process verification (e.g., weed seed)?
- Is there a role for soluble carbon levels?
- What are the best recovery methods for stress-adapted pathogens?

III. Application prior to harvest

- What is the fate of pathogens in the field regarding compost use?
- How does soil microflora/communities and soluble carbon specifically influence the fate of pathogens?
- What are the mechanisms for pathogen transfer from compost to crops in the field (other than root uptake)?
- Can abiotic/biotic metrics be developed for these processes?

Discussion

- Is there a need for a national commercial standard for compost used in fresh fruit and vegetable production?
- If a risk ranking approach was adapted, would it be by use (type of crop), starting material, agro-economical region, and/or other parameters?
- Should a HACCP approach be adapted for compost and amendments?