



AUBURN  
UNIVERSITY

BIOSYSTEMS ENGINEERING

INFORMATION RESEARCH & REFERENCE CITATION

BSEN 4300: Professional Practice

Rosia Rowe  
November 15th, 2018

## **Part II: Report Writing & Citing a Reference**

According to Cato (2007), composting is an aerobic process where organic material are biologically decomposed. The senior design project being conducted is a feasibility study assessing the practicality of maintaining an in-house composting program using raw materials from dining halls on the Auburn University campus, an in-vessel composting drum, and chicken litter from Roanoke, Alabama. The determination of the feasibility of this project on Auburn University's campus is based on the functionality of the composting recipe in conjunction with the provided in-vessel composting machinery, the environmental impact and not adding to the contamination of nearby closed wells, the collection, transportation, and storage of raw and composted materials, and the ability to distribute desired compost to different departments and projects around the greater Auburn University campus. Other universities have been able to accomplish various types of in-house composting departments. However, Cato (2007) describes limitations when using in-vessel composting for the completion of composting processes due to higher installation costs. Most departments will use in-vessel composting as a pre-treatment bioreactor before conventionally composting the materials (Cato, 2007).

Pathogen control is an integral part of this feasibility study. Due to the introduction of chicken litter to the in-vessel drum site, aquifer contamination is of concern. The goal of this composting project is to help repurpose food wastes on campus while keeping the water quality of the immediate area undisturbed. Rossiter, Wade, McDonough, and Stehman (1996) describe spread of pathogenic organisms via manure in three separate ways: spread via the exposure of substantial quantities of infectious materials (viruses, bacteria, and parasites), the multiplication of infectious materials while in the environment, and by pathogens surviving and replicating in pastures, crops, and their respective storage conditions. One of the primary concerns of this

feasibility study is looking at how raw organic material and processed composting materials would be stored. Pathogenicity and contamination control can be prevented largely by proper storage. According to Rossiter, Wade, McDonough, and Stehman (1996), the following factors (separately and together) have the ability to limit microbial survival: UV irradiation, % moisture/dryness (viral and bacterial), freeze/thaw cycles (viral and bacterial), freezing (bacteria and parasites), high temperatures (parasites, viruses, bacteria), pH (extremes inhibitory for bacteria and viruses), oxygen levels, and additional microbial compounds.

The distribution of the composted material is one of the final steps in the feasibility study. After its production and storage, when the composted materials are ready for their final use, it's important to understand what a user's intent is for the compost materials. Brown (1996), describes the importance of soil acidity in horticultural use. When materials are composted, they often have higher pH levels than plants thrive in. Often, the materials would be treated with sulfuric substances that would make the compost more acidic. The application of the sulfur, according to Brown (1996) should occur months before use, as the application too recently will kill plant life. This would mean that the application of sulfuric products would most likely have to occur at the storage site post-processing. As contamination is of concern, the feasibility of users wanting the composting materials for gardening and plant life could be limited if water quality control is of higher importance than organic material repurposing.

## References

- Brown, L.V. 1996. *Applied Principles of Horticultural Science*. Great Britain.: Reed Educational and Professional Publishing Ltd..
- Brymer, W., & Sibley, J. L. (2008). Assessment of composting methods for use in the green industry. Auburn, Ala.  
[https://etd.auburn.edu/bitstream/handle/10415/1475/Brymer\\_William\\_45.pdf?sequence=1&isAllowed=y](https://etd.auburn.edu/bitstream/handle/10415/1475/Brymer_William_45.pdf?sequence=1&isAllowed=y)
- Cato, M. A. 2007. *Environmental Research Trends*. Hauppauge, N.Y.: Nova Science Publishers, Inc..
- Stehman, S. M., Rossiter, C., McDonough, P., and Wade, S. 1996. *Animal Agriculture and the Environment: Nutrients, Pathogens, and Community Relations: Proceedings from the Animal Agriculture and the Environment North American Conference*. Rochester, N.Y.: Northeast Regional Agricultural Engineering Service.
- United States. (2000). Biosolids technology fact sheet: In-vessel composting of biosolids. Washington, D.C.: United States Environmental Protection Agency, Office of Water.  
<https://permanent.access.gpo.gov/websites/epagov/www.epa.gov/OWM/mtb/invessel.pdf>

**BSEN 4300: PROFESSIONAL PRACTICE FOR BIOSYSTEMS**  
**Assignment - Information Research and Reference Citation (100 pts)**

Name: Rosia Bowe Design Team: Team G

**PART I – Information resource retrieval and documentation (20 pts)**

- a. Each person identify and *check out* at least three library resource books from the University Library that will help you complete your design project. In addition, document three alternate books from each library book.
- b. Each person identify and list two relevant electronic information sources (must be an authored online electronic journal article, industry or conference paper, or scientific/technical/government report).

**a. Library Resource**

#1. Title of book: Animal Agriculture & the Environment nutrients, pathogens, community relations; proceedings from the Annual Mtg of the Environment N. American conference

Location in library: 4<sup>th</sup> Floor

Call Number: S 589.355 .A55

Keyword(s) Search: pathogens agriculture

Year of Publication: 1996

List 3 related resources for possible future reference (as a minimum, provide title, author, and year):

- (1996; S.R. Smith) 1. Agricultural recycling of sewage sludge & the environment
- (2000; Reisman) 2. Handbook of Microbial Bioremediation
- (2000; Fleming) 3. Biological Safety: principles & practices ✓

Additional information or comments:

- How does this relate to air, water, pathogen/contamination control
- talk about manure & types of disposal & H<sub>2</sub>O quality
- microbiological safety management practices & how to handle pathogens

ch. 6  
Respiration? storage, standing in container  
Prod Systems  
2A) Bio-control  
F18

#2. Title of book: Applied Principles of Horticultural Science

Location in library: 4<sup>th</sup> Floor

Call Number: SR 318. B76

Keyword(s) Search: Storage structural compost

Year of Publication: 1996

List 3 related resources for possible future reference (as a minimum, provide title, author, and year):

- (2002; Braon, L.V.) 1. Applied Principles of Horticultural Science
- (2012; Randolph, J.) 2. Environmental land use planning & management
- (2013; Partridge) 3. Planning & Place in the City: Mapping Place Identity

Additional information or comments:

- Storage & structural planning ✓

#3. Title of book: Environmental Research Trends

Location in library: 4<sup>th</sup> Floor

Call Number: QH 545. A1 F587

Keyword(s) Search: In Vessel Composting

Year of Publication: 2007

List 3 related resources for possible future reference (as a minimum, provide title, author, and year):

- 1. Environmental Issues (2007; Transportation Research Board)
- 2. The BioCycle Guide to In-Vessel Composting (1480; Emmons)
- 3. Environmental Research Trends (2007; Cato, Main)

Additional information or comments:

- composting ✓  
- digg composting methods/mixtures

**b. E-Resource****#4. Title of electronic journal article, industry or conference paper, or scientific/technical/government report:**Biosolids Technology Fact Sheet In-Vessel Composting of BiosolidsKeyword(s) Search: In Vessel CompostYear of Publication: 2000Author(s): Environmental Protection Agency; Office of WaterJournal name (if journal article): EbookDOI of article or website of article/report publisher: pub.access.gpo.gov

## Additional information or comments:

- composting basics
- applicability
- environmental impacts
- max metal concentrations (safety)
- advantages vs. disadvantages of composting
- performance variables

**#5. Title of electronic journal article, industry or conference paper, or scientific/technical/government report:**Assessment of Composting Method for Use in the Green IndustryKeyword(s) Search: in vessel compostingYear of Publication: 2008Author(s): Byrner, W.; Sibley, J.L.Journal name (if journal article): ebook (Master's Thesis)DOI of article or website of article/report publisher: hdl.handle.net/10415/1475

## Additional information or comments:

- comparison of window composting ; in-vessel composting
- tracking ; quantifying biological organisms
- weed germination control study (do weeds grow in this compost)
- looking @ process (does pre-plant leeching have importance for plants that are pH sensitive)

## **PART II - Report Writing: Citing a reference (80 pts)**

Each person select three of the sources from your library search (Part I) and write three short paragraphs suitable for your project report using the three sources. You may use a combination of hard copy and/or electronic sources to complete the paragraphs. Each paragraph should be suitable for use in your proposal or final project report. You must cite the three sources at least once within the paragraphs. At the end of the three paragraphs, provide a References section that lists in alphabetical order (by author or editor and date) all five (#1-#5) resources retrieved, including the three cited in paragraphs. Citation instructions are provided, below.

Follow the ASABE Style Guide for References (2009) to cite references in text using the "name-year" system. The specific form will vary according to the construction of the sentence in which it occurs. See examples, below:

as described by Bowen (1994)  
 as described earlier (Bowen, 1994)  
 Bowen (1994) described this effect

For references with two authors, list both names in the citation:

as described by Bowen and Roberts (1997)  
 as described earlier (Bowen and Roberts, 1997)  
 Bowen and Roberts (1997) described this effect

For references with three or more authors, use the form Bowen et al. (1998). Note that "et al." is not italicized.

Arrange the reference list alphabetically by the name of the first author. For jointly authored references or multiple-authored articles, further arrange the list alphabetically by the names of the second author, third author, etc. Note in the example below that *ASAE Standards* receive unique treatment.

*ASAE Standards*. 1989. S352.1: Moisture measurement -- Grain and seeds. St. Joseph, Mich.: ASAE.

Addition information for listings in a Reference section (ASABE, 2009):

- List two or more references by the same author (or authors) chronologically from oldest to recent.
- Place single-author references before jointly authored references in which the same individual is the lead author.
- Place jointly authored references before multiple-authored articles in which the same individual is the lead author.
- Indicate two or more references by the same author(s) in the same year by adding letters after the year of publication. For example: 1987a, 1987b.

### **Electronic references**

Electronic references must be articles, papers, or reports with discrete title, author, date, and publisher, all of which should be listed in the reference section. DOI (digital object identifier) and/or web site of the publisher may be included as part of the reference. However, web links longer than one line of text are unacceptable as part of reference. See example reference at end of assignment for acceptable use of a web page citation.