Water Quality Enhancement Activity – WQL22 – On-farm composting of farm organic waste

Enhancement Description
This enhancement consists of composting organic waste generated from the agricultural operation(s) on-farm. This includes animal manures, livestock mortality (where state or local laws allow), and waste from on-farm processing of agricultural products (e.g., slaughter by-products or vegetable culls removed from the field during harvest). It does not include any hazardous household waste, any general hazardous waste products or bio-hazard waste products. Yard waste such as grass clippings and leaves can be included but are not required. Composted products must be used in compliance with all federal, state and local laws, rules and regulations.

Land Use Applicability
Cropland, Pastureland

Benefits
Composting is a resource management process that promotes an ecological farming system with focused nutrient and organic carbon cycling within an agricultural operation. Composting reduces the volume of waste, kills pathogens and reduces odors. The reuse of the compost products on the farm where they were produced improves soil quality and reduces the need to bring in additional nutrients from off-farm sources. On farms with a net import of nutrients (e.g., feed grain nutrient content exceeds nutrient content of farm products sold), the export of surplus nutrients in the form of compost turns a potential water quality concern into a beneficial product available to a wider area. The use of surplus compost by other growers has the potential to improve soil quality on their farm.

Conditions Where Enhancement Applies
This enhancement applies to farms that produce livestock manure, vegetable waste and/or other organic waste from on-farm processing facilities.

Criteria
1. **All** waste products produced on the farm that are suitable for composting may be composted. The composted products must include 75% of the animal manures produced from confinement areas, if applicable, and may also include:
   a. Livestock mortality (where state or local laws allow)
   b. Slaughter by-products

   c. Vegetable culls
   d. Waste from on farm processing of agricultural products
   e. Spoiled hay or forages

   Note: where liquid animal manure systems are used, the 75% requirement applies to the materials from a solid/liquid separation system.

The following materials shall not be included in the composting operation and plan:

   a. Poultry litter recycled to be used again as poultry litter,
   b. Composted bedded packs used for housing livestock,
   c. Hazardous household waste,
   d. General hazardous waste products,
   e. Bio-hazard waste products, and
   f. Crop residues not intended for harvest.

2. Follow a composting plan that includes:
   a. Identification of the intended use of the compost and of the required level of pathogen destruction for that use.
   b. Mixing/turning, compost time and temperature requirements to achieve pathogen destruction consistent with the intended use of the compost.
   c. Monitoring and management of composting temperatures and compost moisture levels
   d. Balancing Carbon/Nitrogen (C:N) ratio of compost feedstock, based on materials being composted
   e. Compliance with all federal, state and local laws, rules and regulations
   f. Time and temperature requirements of green waste to achieve egg destruction of any invasive pest species (ex.Coqui Frog eggs).
3. Compost site and environmental considerations
   a. Size the composting area according to the organic material being generated
   b. Divert runoff away from the composting pad
   c. Runoff from compost pad must be directed through a grass filter strip or other means to prevent water quality impartment
   d. Select a method of aerobic composting (i.e., bin, windrow or forced air composting) that is compatible with the waste product.
   e. Runoff management from the raw materials storage area, composting area and compost storage area must comply with all federal, state and local laws, rules and regulations.
4. Compost facility operation must be in accordance with NRCS Conservation Practice Standards *Composting Facility Code 317* and *Animal Mortality Facility Code 316,* as appropriate.
5. Follow Conservation Practice Standard *Nutrient Management* Code 590 for land application of composts as well as all federal, state and local laws, rules and regulations.

Adoption Requirements

This enhancement is considered adopted when the participant has established composting facilities with sufficient capacity for their composting needs and finished compost has been produced.

Documentation Requirements

1. An inventory of waste products produced on the farm,
2. An estimate of the annual quantities of compost to be produced,
3. Nutrient analysis of finished compost (by batch),
4. A location map showing the location of the composting facility(s),
5. A nutrient management plan for the land application of the compost,
6. A composting plan that identified the quantities needed, the intended use of the compost, and the composting process consistent with the intended use,
7. Farm nutrient flows and balances (including nutrients imported, nutrients exported, and nutrients recycled), and
8. Photographs of the composting facility.

References

International Plant Nutrition Institute (IPNI). 2012. 4R Plant Nutrition – A Manual for Improving the Management of Plant Nutrition (North American Version). IPNI, Norcross, GA.

NRAES-54. 1992. On-Farm Composting Handbook, Ithaca, NY.

USDA-NRCS. 1992. National Engineering Handbook, Part 651, Agricultural Waste Management Field Handbook. Washington, D.C.

USDA-NRCS. 2000. National Engineering Handbook, Part 637, Chapter 2, Composting, Washington, D.C.

United States Department of Agriculture
Natural Resources Conservation Service

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Additional guidance for on-farm composting:

All suitable waste produced on the farm will be composted, not to include any hazardous or household waste. Yard waste may be used. At least 75% of animal manures produced on farm should be composted. A composting plan should include the following information:

- Inventory of composting materials, including types of waste products and season of availability
- Target C:N ratio and the recipe needed to achieve this, based on the inventory above
- Target moisture content and temperature, and how the compost will be managed to achieve this target
- Odor management, if needed
- Leachate management for water quality protection, if needed
- Treatment needed for any runoff from compost pad
- Maintain records on how much compost is produced and where it is applied – a nutrient management plan should be used, and the compost should be sampled for nutrient content before application.

If the compost will be used on a certified organic system, records should be kept to document that the compost meets all NOP requirements.

Compost calculators available on the web or for free download (no endorsements implied):

http://klickitatcounty.org/SolidWaste/fileshtml/organics/compostCalcAbout.htm

http://www.compostingtechnology.com/probesandsoftware/compostcalc/

For additional information on composting, refer to the following:

Cornell University, *On-Farm composting handbook.*
http://compost.css.cornell.edu/OnFarmHandbook/onfarm_TOC.html

Michigan State University, *Composting animal tissue to recycle nutrients.* http://www.msu.edu/%7erozeboom/catrn.html

Utah State University Extension, *The composting process*. AG-WM 01, 1995. http://extension.usu.edu/waterquality/files/uploads/PDF/agwm01.pdf

Washington State University, *On-Farm Compost Systems*. http://organic.tfrec.wsu.edu/compost/ImagesWeb/CompSys.html

Washington State University, *On-Farm Composting* http://whatcom.wsu.edu/ag/compost/mrconfarm.htm

This activity may NOT be used with the following enhancements: AIR08, ANM21

Potential Duplicate Practices:
316 – Animal Mortality Facility, 317 – Composting Facility