10 Minute Supervisor Trainings

April 2023

Composting Facility

This practice is considered a high priority practice for the Kentucky Soil Erosion and Water Quality Cost Share program (State Cost Share), based on criteria outlined in 401 KAR 1:010. This includes a structure or device to contain and facilitate an aerobic microbial ecosystem for the decomposition of manure, other organic material, or both, into a final product sufficiently stable for storage, on-farm use, and application to land as a soil amendment. This practice is designed to compost manure, bedding, and other agricultural organic waste. A nutrient management plan (NMP) is required before submitting an application containing this practice for funding. This practice can include a facility with a concrete, gravel, or compacted earthen floor and treated wood or concrete walls. This practice is strictly designed to properly dispose of organic waste according to approved engineering plans and Kentucky state law requirements.

Benefit of a Composting Facility

This is an important practice to consider to control and reduce pollution impacts to surface water and groundwater resources, reduce the impact of odors, conserve energy by reducing mass and improving handling characteristics of organic waste solids, and reuse of organic waste as animal bedding. It also allows for the transformation of organic waste into a soil amendment that improves soil health, provides slow-release plant-available nutrients, and suppresses plant disease. Site location is also an important consideration for the beneficial effects on water quality.

Producers Who May Be Interested

Producers who have livestock and poultry operations where routine animal waste storage, treatment, and/or disposal is needed.

This practice does not apply to the routine handling of livestock and poultry carcasses. Use Kentucky NRCS CPS Animal Mortality Facility (316) for carcass composting facility design.

This practice applies construction of a structure or device to contain and facilitate the composting process. Use Kentucky NRCS Conservation Practice Standard (CPS) Nutrient Management (590) for producer land application of finished compost to provide nutrients or as a soil amendment.

Items the Producer and Planner Should Consider:

- Plan view including, location map, all system components, material and construction specifications
- Type of Nutrient Management Plan needed
- Construction drawings, site build document, and component details
- Structure sizing computations
- Structure and component design and details
- Area grading plan
- List of required permits to be obtained by the client
- Environmental considerations (e.g., odors, water quality, distance from wells and other water sources).
- Biosecurity
- Operation and maintenance plan.

If a roof is needed, it should be designed using Kentucky NRCS CPS Roofs and Covers. Use Kentucky NRCS CPS Roof Runoff Structure when designing the collection, control, and conveyance of runoff from a roof that could pose a resource concern.

Composting Basics the Producer Should Consider

- **Feed Stock and Nutrient Balance** - Composting, or controlled decomposition, requires a proper balance of "green" organic materials and "brown" organic materials. "Green" organic material may include materials like grass clippings, food scraps, and manure, which contain large amounts of nitrogen. "Brown" organic material may include dry leaves, sawdust, wood chips, and/or branches, which contain large amounts of carbon but little nitrogen. Obtaining the right nutrient mix requires experimentation and patience. It is part of the art and science of composting.
- **Particle size-** Grinding, chipping, and shredding materials increases the surface area on which microorganisms can feed. Smaller particles also produce a more homogeneous compost mixture and improve pile insulation to help maintain optimum temperatures (see below). If the particles are too small, however, they might prevent air from flowing freely through the pile.
- **Moisture Content-** Microorganisms living in a compost pile need enough moisture to survive. Water is the key element that helps transports substances within the compost pile and makes the nutrients in organic material accessible to the microbes. Organic material contains some moisture in varying amounts, but moisture also might come in the form of rainfall or intentional watering.
- **Oxygen Flow-** Turning the pile, placing the pile on a series of pipes, or including bulking agents such as wood chips and shredded newspaper all help aerate the pile. Aerating the pile allows decomposition to occur at a faster rate than anaerobic conditions. Care must be taken, however, not to provide too much oxygen, which can dry out the pile and impede the composting process.
- **Temperature-** Microorganisms require a certain temperature range for optimal activity. Certain temperatures promote rapid composting and destroy pathogens and weed seeds. Microbial activity can raise the temperature of the pile's core to at least 140° F. If the temperature does not increase, anaerobic conditions (i.e., rotting) occur. Controlling the previous four factors can bring about the proper temperature.

How to Reach Producers:

Consider using flyers and advertising at agriculture buildings, stockyards, and farm supply stores. The district could also advertise on radio and in the newspaper. Extension and producer meetings are a great way to reach the people who might be interested in establishing filter strips in their current operations.

Social media is another way to reach producers in your area. If your district does not already have a Facebook page, consider starting one. You can advertise your events and programs and can use pictures and video to show how the district can help with a producer's problems.

More information online:

List of all Kentucky Ag Water Quality Authority BMPs: https://eec.ky.gov/Natural-Resources/Conservation/Pages/Best-Management-Practices.aspx
BMP 5: Manure Management Systems
BMP 11: Nutrient Management
Kentucky Cooperative Extension's Agriculture and Natural Resources publications: https://anr.ca.uky.edu/anr-publications
On Farm Composting of Animal Mortalities: http://www2.ca.uky.edu/agcomm/pubs/id/id166/id166.pdf
NRCS's Field Office Technical Guide: https://efotg.sc.egov.usda.gov/#/

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