Poultry Waste Composting at Brey Egg Farm: Case Study

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Who Should Consider a System Like This?

- Farms with interest in and prior knowledge of composting.
- Farms which need to consider neighborhood relations when managing waste and controlling odor and flies.

Farm Information

Brey Egg Farm is a third-generation, family owned and operated egg farm in Jeffersonville (Sullivan County), NY. The farm has 200,000 laying hens that produce 60,000 pounds of manure daily. The overall reduction in farmland across the state and increased use of that land for second homes and tourism has made field spreading of manure more difficult. Due to the high cost of hauling, nuisance complaints, and Concentrated Animal Feeding Operations regulations farms are looking for feasible alternatives.

Why Composting?

Brey Egg Farm needed an effective and time/energy efficient method for managing chicken manure. Their goals are to produce a marketable commodity and to eliminate the need for chemical fly control. Brey started composting with under-house turning but knew they would need a more comprehensive plan. They have also been composting their mortality in a large, three-bin covered system for eight years. The farm was at a point where they needed to manage the entire organic waste stream.

Composting System

A compost operation was set up with funding from the New York State Energy Research and Development Authority (NYSERDA) and the Empire State Development Office of Recycling Market Development. Consultants from private, county and state agencies, as well as Cornell University, helped Brey Egg Farm develop their management strategy.

The farm developed the operation in stages and will make future changes as challenges arise. After deciding on an appropriate site, a compost pad was prepared by removing topsoil and compacting the exposed surface. A schematic diagram of the compost system is shown in Figure 1 below.

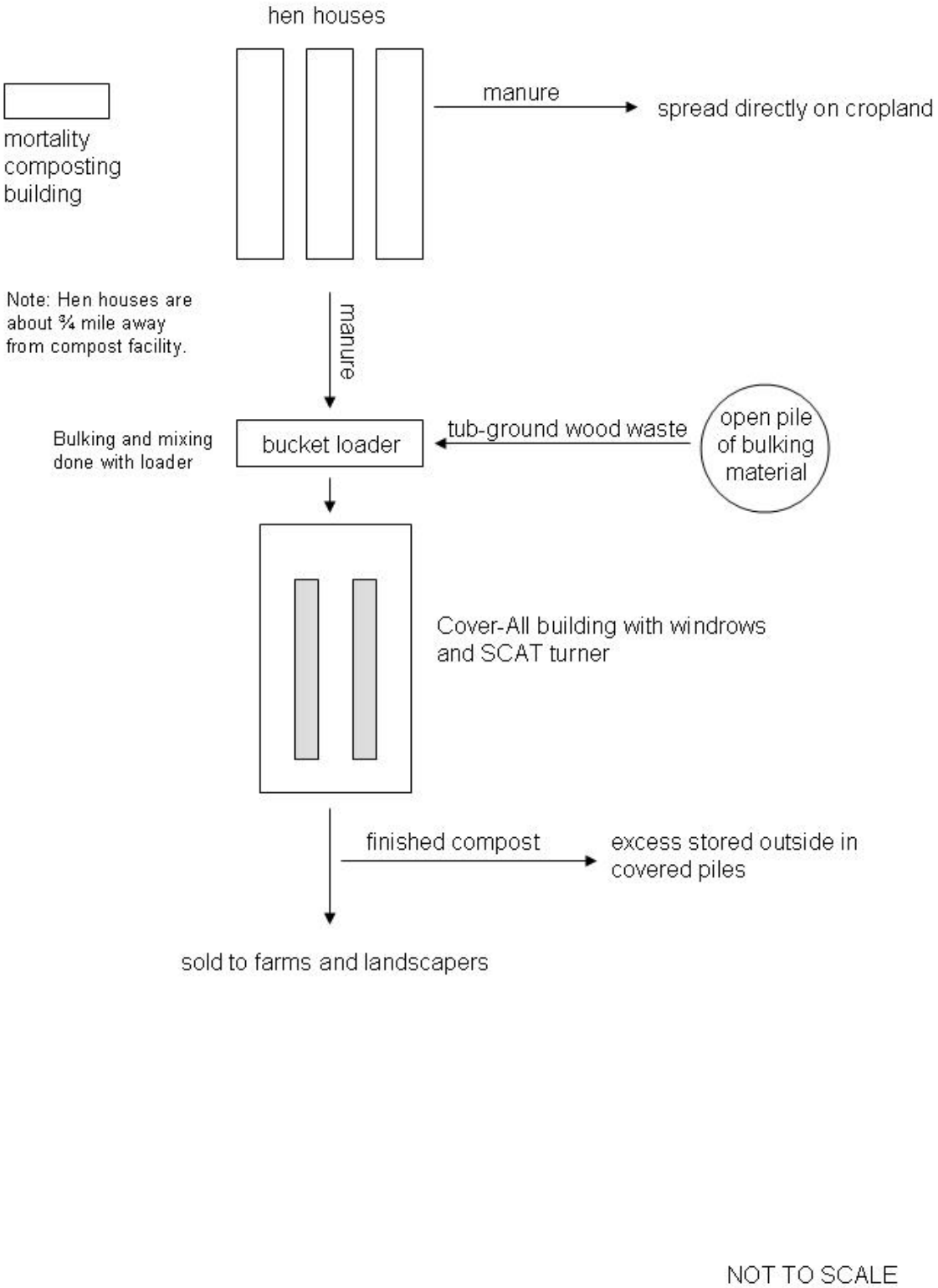

Figure 1. Schematic of the composting system at Brey Egg Farm.

The Sandberger Compost Turner, a tractor-pulled and PTO-driven turner, utilizes a drum that is designed to turn at a low RPM while preserving the humus particle structure. The water manifold and inoculants tank pulled behind the turner can provide a unique moisture control strategy while delivering aerobic microorganisms. This system was replaced by a SCAT–brand turner, since the first turner was not sized properly for the type and amount of material that needed to be processed. Pile height was also too short to keep critical heat in piles during cold weather conditions.

Temperature, moisture, oxygen, carbon dioxide, pH, sulfide, nitrate, nitrite, and ammonium were monitored and entered into the Pike Agri Labs software program to assist in windrow management.

In late 2003, the farm also added a Cover-All structure to cover the actively composting material with funding from Empire State Development. This facility is processing 40% of their manure.

Environmental Benefits

Previously, Brey Egg Farm used continuously operating 48-inch electric fans to reduce the manure moisture content. The new system, strategically located on a windy knoll, utilizes passive, low-energy drying techniques. At an estimated expenditure of $38/day/coop for the six-month period when fans are required, the farm saved approximately $27,000. This system will also reduce and eventually eliminate the pesticide treatments necessary for fly control.

Manure management is most challenging during the off-season when frozen ground restricts field spreading due to the potential for nutrient leaching and runoff. Nutrients will become stable and bio-available through composting. This product can be more easily marketed and sold off the farm, moving nutrients to locations where they are needed. The loss of nitrogen as free ammonia from evaporation in the coops and field spreading for the combined total manure produced totals an estimated 22,000 lbs of actual nitrogen. With a per unit value of $0.18 to $0.24, this project captures nitrogen valued at $4,500.

Advantages and Disadvantages

Advantages	Disadvantages
- Energy Savings - Marketable Commodity - Chemical-Free Fly Control - Odor Reduction - Runoff Containment	- Harder to manage in freezing weather conditions

Lessons Learned

The ability of farm operators to effectively manage the compost facility after construction was completed was restricted due to a particularly severe winter. The farm owner, Dan Brey, estimated that the site was unmanageable approximately 75% of the year. The covered facility provides a regulated environment for the decomposition of the materials. This includes parameters such as excessive moisture in the windrows from rainwater and excessive drying from sun and wind. This is vital to maintaining aerobic decomposition. The compost cover fabric

also provides thermal balance for the windrows thus maintaining the temperature in the desired range for microbial breakdown. This coverage method is a cost-effective alternative to building construction. Inclement weather should be less of an issue in the future. Brey also found a source of good chunky woodchips that, when mixed with manure, will allow him to turn less frequently. The current windrow turner produces larger piles, and in turn will allow higher temperatures to be maintained during the winter months.

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