

Bedding Project

A recent project at Rutgers University compared four horse bedding types: straw, a pelleted wheat straw product, a pelleted wood product, and wood shavings. Twelve Standardbred horses were stalled on the four bedding types (3 horses per bedding type) for 16 hours per day over a three week period of time. All bedding was collected daily and evaluated for amount of bedding used in the stalls, absorption, air quality, and composting characteristics.



Results

The project found that all four types were acceptable bedding sources.

- The pelleted straw product required the least amount of bedding to be used.
- Air quality had the most particulate matter (dust) with the pelleted wood product.
- All four bedding sources composted properly when mixed with stall waste.
- The pelleted wheat straw product composted very well and resulted in the greatest volume reduction of all of the bedding sources.

Demonstration Horse Farm

In 2005, a team of Rutgers researchers affiliated with the Equine Science Center and several state and federal agencies began a multi-year collaboration. They sought to develop a demonstration working horse farm on the George H. Cook Campus that would use agricultural Best Management Practices (BMPs) to provide solutions to many of the problems facing farm owners and stable managers today.

Our researchers have identified numerous environmental issues, such as preserving water quality, proper nutrient and waste management, farm and pasture management, weed control, fencing, pasture rotation, and soil enrichment. These are just a few of the many facets of farm management that the project will address.

Goals of the Project:

- To develop and maintain the facility as a Demonstration Horse Farm by implementing BMPs that address pasture management, stormwater, and manure issues.
- To conduct educational programs at the Demonstration Horse Farm that demonstrate the implementation of BMPs to enhance and maintain pasture and water quality.
- To utilize the farm site to conduct research on new forage varieties.
- To provide learning experiences and educational programs for the public.

For more information, visit <http://esc.rutgers.edu>.

The project was funded by:



Best Management Practice Demonstration Horse Farm



Manure Compost and Bedding Project



Introduction

Compost from horse farms can be used as a soil amendment providing organic matter and some nutrients. Composting manure on small horse farms can help better manage manure and reduce non-point sources of pollution (nitrogen, phosphorus, and pathogens) to drainage basins in New Jersey. Composting produces a stable, volume-reduced, and storable product with reduced pathogen levels that conserves some of the nutrients. Compost can be used on or off the farm when and where the nutrients are needed.

On-farm composting is only a solution when done correctly. If you do not have the time and interest to compost properly, then other methods of manure disposal might be a better option.

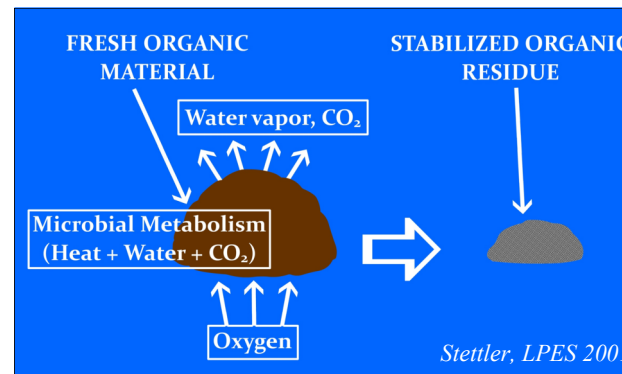


Straw before (above) and after (below) 90 days of composting



What is Composting?

Composting is a managed biological process that converts organic material into a fine particle humus. It is a natural aerobic process for stabilizing organic matter. A series of microorganisms decomposes and digests the organic material. Oxygen must be present, and heat is generated as the organic material decomposes. At the Demonstration Horse Farm, the organic material is horse manure.



The composting process

Properly composted manure:

- Is a more homogeneous product than raw manure.
- Is dry, making it easier to spread and manage.
- May have marketability (mushroom compost, organic compost, fertilizer).
- Does not have an unpleasant odor.
- Reduces pile volume by 25 to 50 percent.
- Has destroyed pathogens and weed seeds due to heat of composting. The inside of the pile must reach the optimum temperature of 131° F for 15 days to meet EPA guidelines for microbial degradation.

How to Compost

Managing moisture, particle size, and oxygen availability:

- **Water** is needed for the growth of microbes, transport of nutrients, waste product removal, and mobility of the microbes. Low moisture content slows the composting process.
- Bedding materials with low porosity (very fine with little structure) will compost poorly. Consider using bedding with greater **porosity**.
- Adequate porosity and moisture will allow for proper **aeration** (oxygen).
- Compost should be **turned** on a regular basis to ensure adequate aeration of the materials.

Carbon:Nitrogen (C/N) ratio:

- C/N ratios that are too high slow down microbial degradation, and ratios that are too low result in the release of ammonia, a source of unpleasant odors.
- Optimum C/N ratios at the beginning of the composting process should be between 20/1 and 30/1 but can deviate depending on the carbon source. For example, woody materials (wood shavings or sawdust where carbon is less accessible to microbes) with C/N ratios of 35/1 to 40/1 are considered optimum.

Carbon/Nitrogen (C/N) in various materials	
Horse feces and urine	19/1
Straw	40/1-100/1
Wood shavings	500/1-600/1
Sawdust	400/1
Horse manure	22/1-93/1
Dairy manure	20/1
Grass clippings	17/1

Temperature should be measured at least weekly. Proper temperatures help reduce pathogens and intestinal parasites present in horse manure.