

Vegetative Filter

Vegetative Filters or Berms/Buffers

- Maintain a dense, vigorous stand of vegetation in the filtered areas.
- Adjust inlets to evenly spread runoff across the vegetated area.
- Inspect the vegetated filter after rainstorms.
- Repair areas of erosion or wheel tracks.
- Regularly test the soil. A well-planned fertility program is essential to maintaining vegetation.
- Harvest/mow the vegetation as needed to remove accumulated nutrients.
- The vegetated area may be hand-grazed, as long as any manure is removed. Too much grazing can damage the vegetation.



For more information on waste management:

- Rutgers Cooperative Extension
<http://njaes.rutgers.edu/animal-waste-management/>
- USDA-Natural Resources Conservation Service
<http://www.nj.nrcs.usda.gov>
- New Jersey Department of Agriculture
<http://www.state.nj.us/agriculture/divisions/anr/agriassist/animalwaste.html>

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



Development of Manure Storage Structure

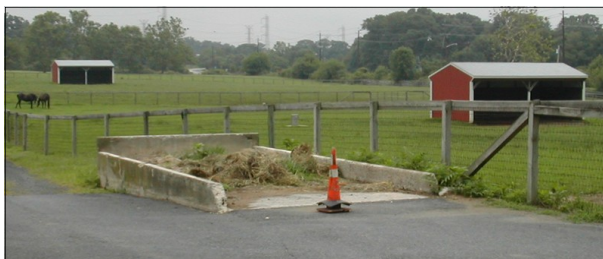


Introduction and Old Structure

Horse manure contains phosphorus (P), nitrogen (N), bacteria, and organic matter. Excess N can run off the soil and pollute streams, potentially killing fish; it can also leach through the soil into groundwater where it may become a human health risk. Excess P can also run off the soil and pollute streams, leading to accelerated vegetation growth and depressed dissolved oxygen levels. This can lead to bog odors, fish kills, more expensive water treatment, impact on recreation, and toxic organisms such as *paratuberculosis*. Bacteria from organic waste can cause human illness, and organic matter depletes aquatic dissolved oxygen and can lead to fish kills.

Proper manure storage is an essential link in a farm's waste management plan. A good storage area will serve as a buffer and reduce risks from surface runoff related to overspreading on farmland.

The old manure storage at this farm was small, did not drain properly, and resulted in the overflow running down the laneway, contaminating nearby pastures; it had also become an eyesore. The amount of manure that could be stored was so small that it had to be removed frequently. As the number of horses increased at the facility, it became necessary to replace the storage with a larger one.



Old storage facility

New Structure Design



New storage facility

In 2005, we began working closely with the USDA-Natural Resources Conservation Service to design and build the new structure. It measures 25 by 30 feet and has the capacity to hold manure and bedding from 17 horses kept in stalls for 24 hours a day for up to 45 days.

The new structure is located farther from the barn, allowing for a vegetative buffer to be fenced off from animals. This buffer, composed of cool-season grasses to control and filter drainage, is at the back of the storage area.



Drainage spaces in the back wall, along with the slope of the pit itself, allow runoff to proceed through the buffer. This will prevent contamination of horse laneways and waterways. The drainage holes prevent rainfall from pooling in the pit. The slight slope of the pit floor channels all water into the holes.

Considerations

Siting Manure Storage: Where?

Consider:

- Locating out of floodplains to minimize the potential for contamination of streams
- Proximity to wells
- Proximity to surface waters; no direct discharge to streams; at least 100 feet from streams or other surface waters
- Installing an impermeable base for all dry storages
- Using a vegetated filter area or filter strip
- Using a riparian forest buffer
- Locating away from slopes, neighbors, property lines, sinkholes
- Convenience and efficiency
- Aesthetics

Sizing Manure Storage: How Big?

Consider:

- Animal types, numbers, amount of waste generated
- Amount of feed
- Nutrient content of feed
- Amount and type of bedding used
- Barn wastewater and washwater
- Runoff from uncovered lots
- Rain falling directly into the manure storage
- Capacity for collection of a 25-year, 24-hour storm
- How often will the storage be emptied
- Diversion of clean water away from the manure storage