The USDA Natural Resources Conservation Service (NRCS) is committed to working with farmers, communities and other individuals and groups to protect natural resources on private lands. You can begin the conservation experience today! Take a few moments to think about your land or operation. What are the conditions of the natural resources? NRCS experts can help you develop a conservation plan, assist you in evaluating your resources, provide technical recommendations and identify potential sources of funding to accomplish your conservation objectives.

Call or visit your local NRCS office:

In Kent County, call 302-741-2600 x 3

In New Castle County, call 302-832-3100 x 3

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Properly Managing Manure for Horses

DELAWARE

It all comes down to water quality. In Delaware and across the nation, the water that we drink starts as rainfall, then runs across the land and into the nearby streams and rivers or infiltrates deep into the ground. This rain water can take excess nutrients with it. By properly storing manure, we ensure that nutrients will stay within the structure or be absorbed by adjacent filter strips. Doing this helps protect our Delaware Bay and Chesapeake Bay watersheds.

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Plantings Around the Manure Storage Structure

Soil limitations and drainage are an important consideration when selecting plantings to screen a manure storage facility. Consider the amount of sun/shade where the plants will be located, as well as the height and breadth when they reach maturity. Note any overhead or underground power lines or road view needs. NRCS can provide you with recommendations of appropriate trees, shrubs, and grasses. Providing irrigation for the first two years until trees or shrubs become established will help ensure a good stand.

Windbreaks can remove dust and absorb orders.

Plantings Around the Manure Storage Structure

A grass filter strip or other vegetated area should surround the structure, as well as down slope from the manure storage structure. This will allow any stormwater runoff to be filtered, allowing nutrients and organic matter to be trapped by the vegetation.

Shrubs and trees planted around the storage area that screen it from view may also help block dust blowing from the pile and absorb odors. Using native vegetation is recommended as it is generally more adapted to the climate and requires little maintenance after plants are established. Native plants also provide habitat and will attract wild birds and beneficial insects. The trees and shrubs around a storage area not only benefit the environment, but will also improve the aesthetics of the site.

Grass filter strips surround structure to prevent excess runoff from seeping into the groundwater.

What Is Manure Storage?

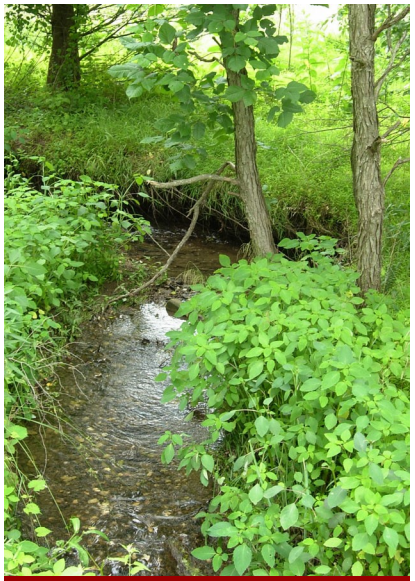
Manure storage is the temporary containment of waste which includes manure, urine, and bedding. This temporary storage prevents the loss of the nutrients and protects water quality until such time that the waste can be disposed of properly. Proper disposal includes composting, spreading on fields at optimum times during the year, or trucking off site. A complete manure management system involves collection (temporary or long-term), storage, and disposal or utilization.

Horse farm in New Castle County, Delaware with manure storage structure to the right.

Why Is Proper Storage Necessary?

The primary reasons to properly store manure are to protect water quality and to keep the manure contained until it can be correctly utilized.

When rainfall and storm water runoff come in contact with manure, they can carry nutrients, pathogens, salts and other contaminants to nearby streams—negatively impacting water quality and aquatic life.



Storage structures should be at least 100 feet away from all waterways.

If the landowner has cropland, adequate storage allows for the proper land application of manure to crops when the nutrients are best utilized. Many horse farms do not have the required amount of acreage to spread manure, so storage facilities allow them to properly store the manure until it can be removed for an alternative purpose—this may include the mushroom industry, nurseries, or other landowners with cropland.

Sizing and Design of Manure Storage Facilities

Bunker style structures are not roofed and are typically for small numbers of horses or short-term storage of manure for off-site use. The site for bunker storage must be carefully evaluated and filterstrips are critcal.

Roofed storage structure designed with pressure-treated wood and metal fasteners of galvanized steel.

Bunker style storage structure with concrete floor.

Sizing and Design of Manure Storage Facilities

When planning a design for a manure storage facility, size and/or capacity needs to be determined. The number of horses, days of storage desired, and the type and amount of bedding will dictate the size and type of storage needed for a facility. If manure is spread on crops, the storage area should be large enough to hold the manure when the fields are inaccessible. If manure is removed for alternative uses, the size will be determined by the storage space requirements between removal periods.

The average 1,000-lb horse excretes 0.8 cubic/feet of manure per day. In addition, bedding will need to be removed. On average, 3 cu/ft of sawdust bedding and 4 cu/ft of straw bedding should be removed daily. This bedding will be added to the generated manure to compute the total storage needed in the storage structure. Your local USDA Natural Resources Conservation Service (NRCS) or Conservation District professional can determine the correct size and provide a design for your facility.

Roofed manure storage structures are typically constructed on-site and have three walls with an open front. The primary materials used in constructing structures for manure storage will be pressure-treated wood and reinforced concrete. Metal fasteners should be made of galvanized steel to reduce corrosion problems. These materials are suitable for long-term exposure to animal waste with minimum deterioration.

Why Is Proper Storage Necessary?

As a general rule, manure storage sites should be located at least 100 feet, depending on site conditions, from any stream or drainage course. Waste storage structures shall not be located in a 100-year flood plain, closer than 300 feet from a public water well, or 200 feet from a domestic water well.

Wide view of farm shows waste storage structure is not located within close proximity to any streams or drainage courses.

Location and Site Considerations

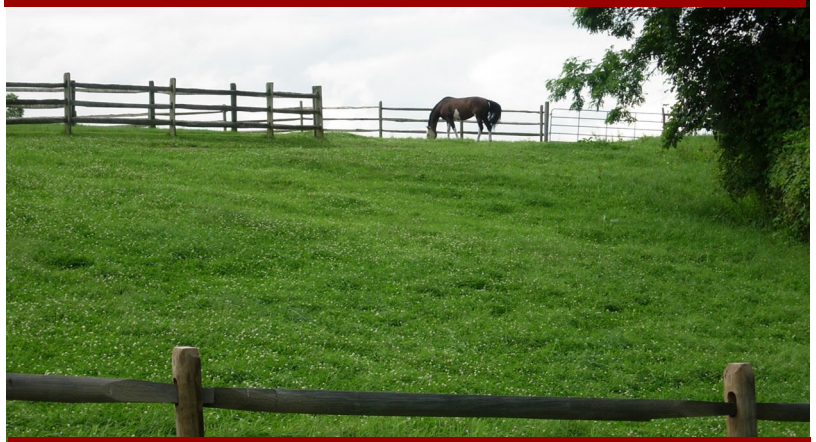
The following factors should be considered when determining the proper location for the storage site: access by equipment, site drainage and slope. The manure storage area should be located on a nearly flat surface that is conveniently located, accessible year-round, and not subject to flooding or ponding.

The manure storage structure floor should be a base of compacted clay soil or impervious material such as concrete. The base should be slightly higher than the surrounding area and graded so rainwater will move away from this area.

Anticipate some odor from the manure storage facility since fresh manure is added daily. If possible, place the structure downwind of the stable facility and residential areas to minimize odors. Summer breezes are the main concern, when neighbors are less tolerant because they are outdoors and may have open windows.

Location and Site Considerations

Manure storage structure built with a concrete floor helps prevent leaching of excess nutrients.



Structures located downwind of residential areas can help minimize odors.