Proper Manure Storage

North Dakota winters are tough on animals and people, making everyday chores more difficult. Working with livestock poses additional challenges when it comes to manure clean-up and storage.

Spreading manure on cropland can be an economical method for disposal and an excellent source of nutrients for crops. However, proper manure storage is important in preventing pollution from entering surface and ground waters.

In 2007, the North Dakota Department of Health (NDDoH) published guidelines for proper manure stockpiling and storage.

Duration
There are two time periods for storing manure, and specific requirements apply to each.
Short-term Stockpiles
Manure is not to be stored for more than nine months. The size of the stockpile is limited to the amount of nutrients needed for the crop to be grown in a field.

Permanent Stockpiles
Manure is stockpiled for more than nine months. It must be stored in a containment structure that prevents runoff to surface waters and leaching to ground waters.

Short-term stockpiling prior to spreading. (University of Minnesota Extension)

Permanent stockpile facility with concrete pad and runoff pond. (NDDoH)

Location
In general, manure stockpiles may not be located:
- in gravel pits or excavated areas
- along streams or lakes
- within a floodplain
- within 50 feet of a private well or 100 feet of a public water supply well

Specifically, short-term stockpiles may not be placed in the same location each year. Vegetation must be established for one full growing season before the location can be used again. Short-term stockpiles may not be located:
- within 100 feet of any down gradient surface water or conduit to surface water
- on slopes of greater than 6 percent
- on slopes from 2 to 6 percent unless clean-water diversions and erosion control practices are installed
- on land where the soil texture is more coarse than sandy loam to a depth of 5 inches (Natural Resources Conservation Service).
- on soils where the depth to the seasonal high water table is less than 2 feet.

As previously stated, permanent stockpiles must be stored within a containment area. Prior to the development of a permanent location, a soil investigation must be completed that is specific to the size and location of the permanent stockpile.

Practices to prevent runoff to surface waters include clean-water diversions and containment dikes. Leaching of pollutants is prevented using natural soils, constructed earthen pads, manufactured liners or structures. Please consult the guidelines for specifications regarding each method.
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Agricultural Use

Increasingly, manure is being utilized as a replacement for commercial fertilizers and as an amendment to build soil health. Manure is stockpiled in fields until it is applied, many times after fall harvest. The problem is stockpiles are typically placed on the headlands next to road ditches. Runoff from precipitation events may carry nutrients into the ditch and eventually end up in a surface water.

If you are a grower that is using or is going to use manure, following proper storage practices is strongly encouraged. Maintain a vegetative buffer strip around the stockpile. Avoid stockpiling manure within 100 feet of any down-gradient surface water or conduit to surface water, aka road ditches. Spread the manure at agronomic rates, and incorporate as soon as possible. Implementing these practices will help keep the valuable nutrients in the field and out of streams, rivers and lakes.

For more information about proper manure storage, please contact the NDDoH - Division of Water Quality at 701-328-5210.

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Caring for Your Tree Rows

Windbreaks are as important today as they were found to be back in the Dirty Thirties. Even with residue left on the fields, North Dakota's winds can move an amazing amount of dirt in a very short time—dirt that will take generations or even centuries to rebuild. Windbreaks help to protect a precious resource and preserve it for future generations.

Tree plantings do require some care. Young trees are more susceptible to damage than older, established trees, so the first few years tend to be critical to their survival.

It is recommended that newly planted seedlings should receive 1" of rain or 5 gallons of water per week during the first growing season, and 10 gallons every other week for the following 2 years. A good rule of thumb is to water your trees every 10 days if it hasn't rained, continuing until the ground freezes in the fall.

It's also important to try to minimize competition from weeds. There are several options for doing this. If you want to stick with tillage, you'll need to do it regularly and keep in mind that you should go no more than 1 to 3 inches deep, and no closer than 2 feet from the seedlings, or you'll be damaging the roots. Within 2 feet of the trees you'll need to use hand tools or pull the weeds. Make sure that in the process of tilling or mowing between rows, you aren't catching the fabric and pulling it up, or throwing dirt and clippings on top of the fabric that will allow weeds to establish.

We often use weed barrier fabric to reduce weed competition. This is a good method, and can also help to conserve water, but it does require some maintenance. Weeding still needs to be done in the opening for the tree, and the holes need to be checked and enlarged every few years to make sure that they aren't tight around the tree's stem, or they could girdle it. A cutter or knife attached to the end of a pole can make this process easier.

Another method of controlling weeds between the trees rows is to establish short warm-season grasses like blue grama that will keep weeds down, but don't compete much for water when the trees need it most. Herbicides are another option for weed control, but care must be taken not to damage the trees. The district still provides fall Casoron application for weed control in tree rows the following spring, and we now have a small planter that we can use to seed a recommended grass mix between tree rows. Please contact the SCD if you are interested in assistance with either of these.

For seedlings that will become tall deciduous trees, tree shelters can also be a good idea. These provide a "mini-greenhouse" environment that protects them from the wind and helps them conserve moisture. In addition, they offer the young trees some protection from grazing by animals and spray drift.

Although windbreaks do not require pruning the way that ornamental trees do, they should still be checked so that damage or growth forms that weaken the tree can be removed, and watched for insect and disease problems. And of course, for the windbreak to be effective, gaps will need to be filled in with new trees.