

## Chapter 18 - MAXIMIZING THE VALUE OF LITTER

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### ***A. Introduction***

Proper handling and storage of poultry litter is needed to preserve its nutrient value and prevent contamination of surface and ground water particularly when the litter cannot be directly applied to land. Improper handling and storage of poultry litter can result in:

- Loss of fertilizer nutrients
- Contamination of surface and/or ground water
- Potential for spread of poultry diseases
- Odor and aesthetic problems

With a little advance planning and a minimal investment, these problems can be reduced or eliminated.

### ***B. Managing to reduce litter production***

A partial cleanout between flocks that removes only caked material will substantially reduce the volume of litter that has to be handled, compared to a complete cleanout each time. Once-a-year total cleanouts are adequate for good production and may allow timing close to when the litter can be used. However, in some cases, more frequent complete cleanouts may be necessary to deal with specific problems such as diseases. Good management of the drinking water system is the best way to reduce the amount of caked litter that must be removed between flocks. Closed system drinkers are the most efficient method of reducing cake production. Careful attention and regular nipple replacement will save water, improve production, and reduce ammonia and the amount of caked litter formed.

### ***C. Direct application to fields***

The most efficient method of handling poultry litter is to directly apply it to fields as it is being removed from the house. This reduces labor, expense and potential environmental problems. This requires cleanout when weather and crop conditions are favorable for

applying litter. For cropland, this time will be in the spring before the crop is planted, or in the fall after the crop has been harvested if a small grain or cover crop is to be planted. Application of poultry litter to cropland during the winter should be avoided because the efficient use of nutrients will be low and the potential for water contamination is increased.

Pasture and hay crops such as tall fescue and other grasses offer more times during the year for applying poultry litter. Grasses are efficient users of nitrogen and respond well to applications of poultry litter. In the case of fescue and other cool season grasses, poultry litter can be safely applied from March to November. However, it is recommended that no more than four tons per acre be used each year due to potential livestock problems. Summer annual grasses such as millet and sudangrass can benefit from applications of poultry litter about anytime between April and September. Poultry litter can also be used with wheat and other small grains either before planting in the fall or as spring topdressing.

#### ***D. Good litter management practices***

Apply poultry litter in amounts needed to supply the nutrient needs of the crop to be grown. Have soil samples from the fields that are to have litter applied tested to obtain lime and nutrient recommendations for the crops to be grown. Also, send a representative litter sample to a laboratory for analysis. See Extension publications AGR-146 for more details on how to calculate the amounts of litter that should be applied.

#### ***E. When storage is necessary***

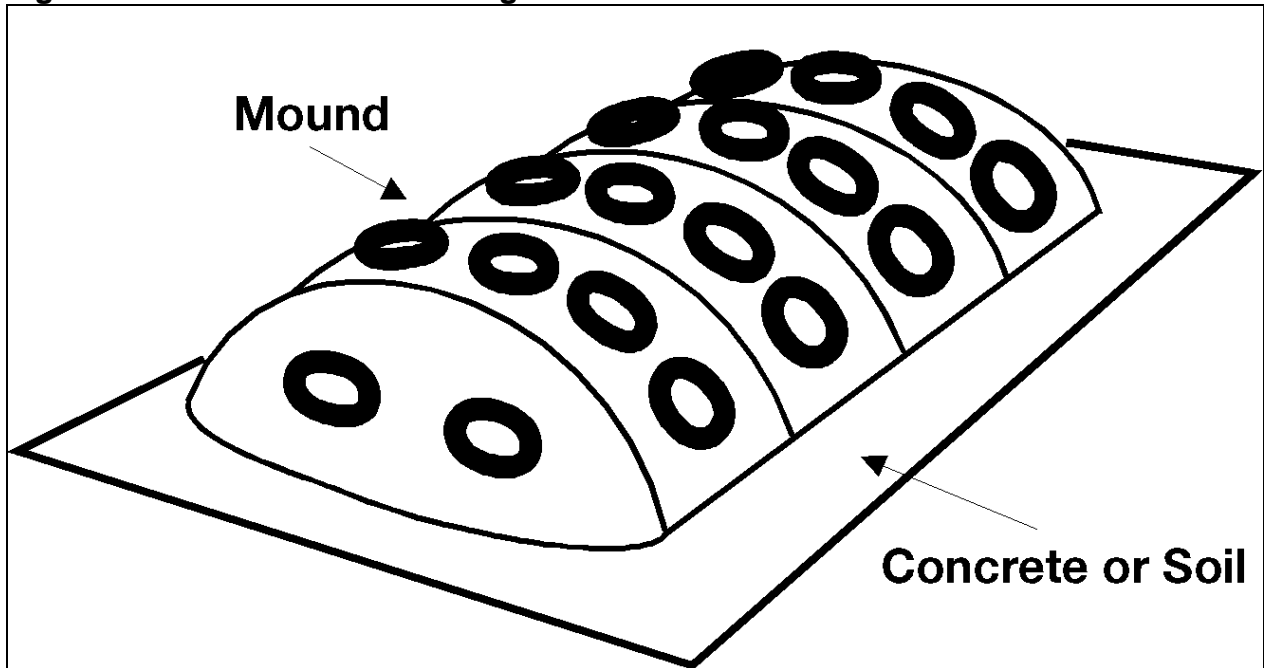
When litter is to be stored, there are several acceptable methods to consider. An easy, but *unacceptable*, method is simply just to pile it outside the house. These exposed piles can result in runoff, which causes nutrient loss and environmental problems. These problems can be prevented with just a little thought and effort, considering the following points.

**Stacking:** Proper stacking of poultry litter will minimize problems with nutrient loss and potential environmental contamination. Choose a well-drained site that will be convenient to get to, but will not drain directly into streams or other areas such as sinkholes where it might cause problems. Position the length of the stack up and down the slope to prevent water from collecting behind it. Stacks should be uniformly shaped with steep sides and a well-rounded top. Stacks formed in this manner will shed water and be less likely to lose nutrients and will provide sufficient heating to reduce potential disease-causing organisms.

**Plastic Covers:** Stacked litter can be further protected by covering it with plastic. It is not as important to compact the litter; however, the rounded top and steep sides of the stack are important. A windbreak of some sort near the stack could help prevent damage to the plastic. Use heavy-gauge (6 mil) plastic sheeting, anchor it to prevent wind damage and take care not to tear holes during application. Anchor the plastic at the edge of the

stack by placing it in a small trench and backfilling with soil. Old tires and rope placed over the plastic can be used to reduce wind damage. See Figure 18.1.

**Figure 18.1 – Stacked litter storage.**



**Concrete Slab Stack Pad:** Some producers may already have or wish to construct a concrete slab for use in stacking poultry litter. This can further reduce the chances of nutrient loss and water contamination. However, its greatest advantage may be in convenience to the producer. In constructing a concrete slab, plan on using six inches of concrete on top of a compacted layer of gravel or crushed rock that is at least six inches deep. Footers should be formed along the edges that are at least 12 inches deep to add strength. Wire mesh reinforcement will also add strength to the pad. A good gravel or crushed rock roadway leading to the pad will allow access when the ground is wet and soft.

The litter should be stacked as discussed previously. More litter can be stacked on the pad if it is well-compacted as the stack is built. If a plastic cover is to be used, heavy wooden boards or concrete blocks can be used to hold down the edges. See Figure 18.2.

**Concrete Bunkers:** Above- or below-ground concrete bunkers such as those used for making silage can be used for storage of poultry litter. The walls will allow a higher and more compact stack than can be achieved on a concrete slab. This results in a smaller surface of the litter being exposed to the air and weather, thus reducing the chance of nutrient losses. As with the other types of stacks, a plastic cover can be used to keep water out.

Figure 18.2 - Concrete slab for litter storage.

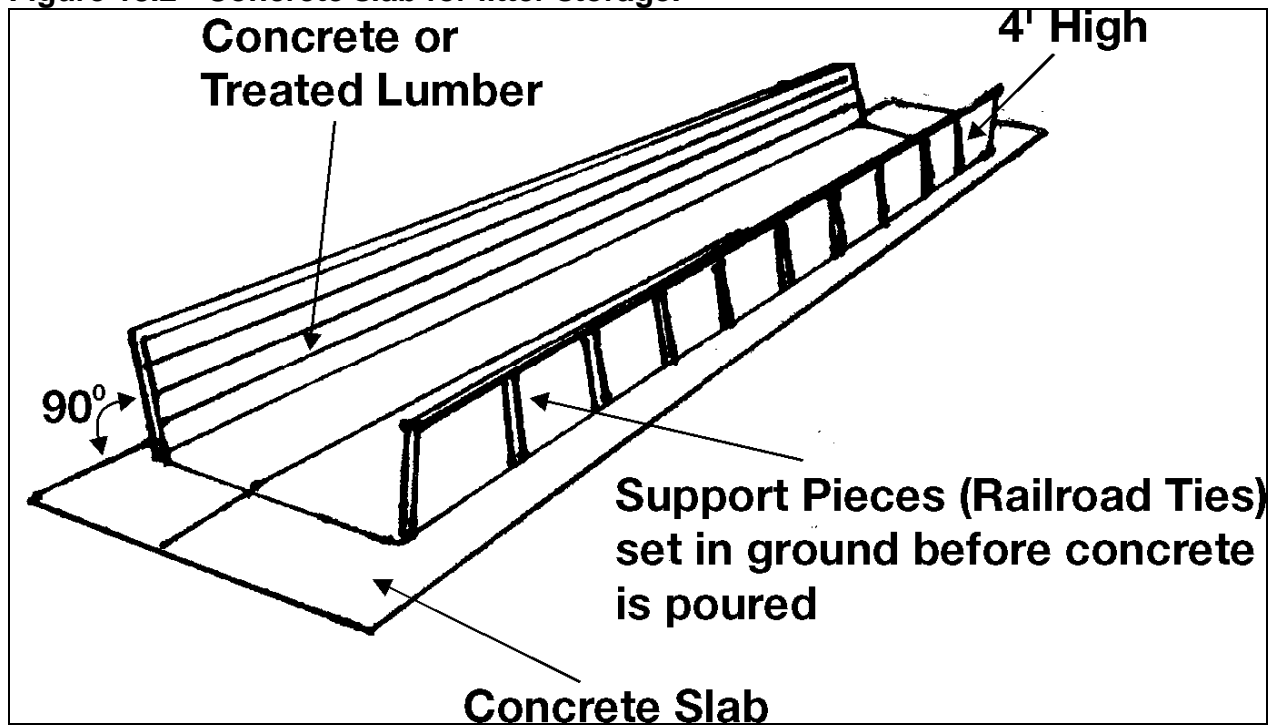
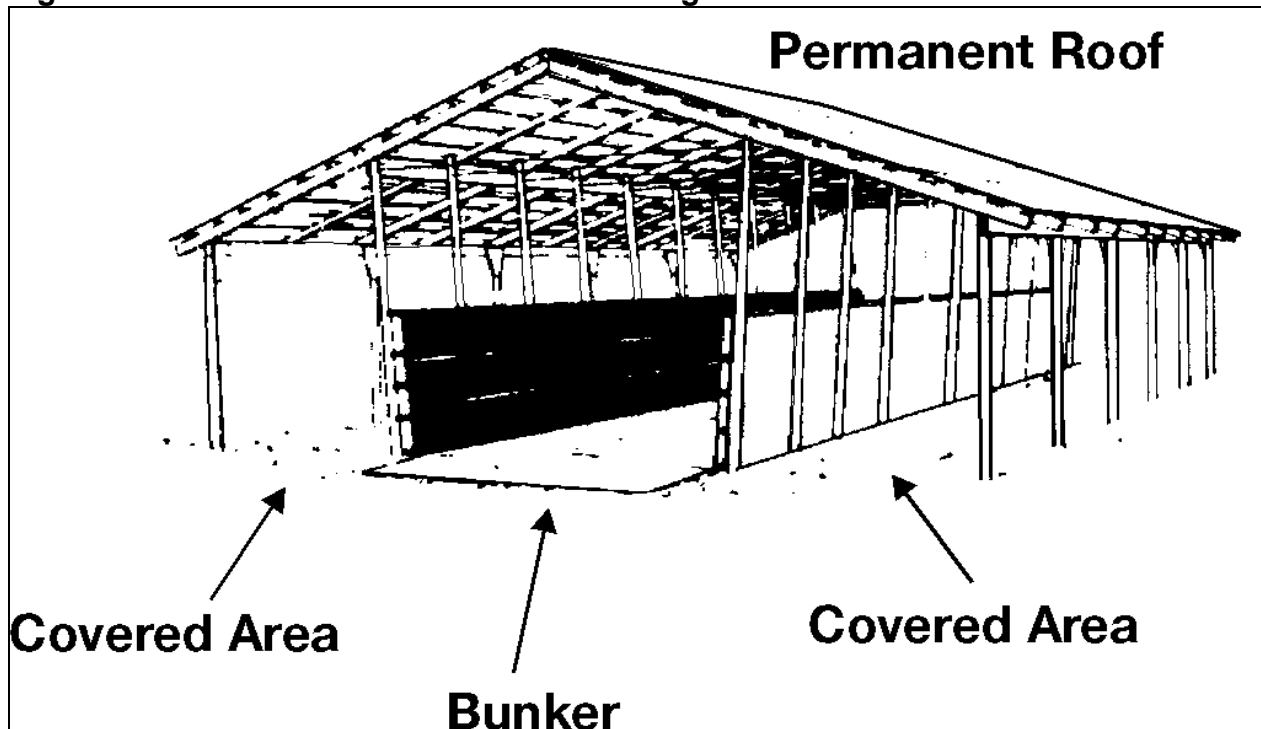


Figure 18.3 - Roofed structure for litter storage.



**Roofed Structures:** Structures with permanent roofs can be used for storing poultry litter and are very effective in protecting it from the elements. However, they have several disadvantages. First, they are more expensive to build and maintain as compared to the other alternatives. Any metal parts, such as roofs, are subject to rapid corrosion. The roof may limit access by equipment and limit compaction of the litter as it is stacked. A covered structure will likely be used by wild birds that may transmit avian diseases.

In building a roofed structure, the floor and walls that will be in contact with poultry litter should be constructed of concrete. When litter comes in contact with wood or other combustible material, a fire is possible as the litter heats soon after stacking. Be sure the roof is high enough to allow access by equipment for stacking and loading. If the roof is 12 feet or higher, walls may be needed to prevent rain from blowing in. See Figure 18.3.

**Caution:** Poultry litter heats through microbial activity during the first few weeks after it is stacked. Temperatures of 150° to 200°F are not unusual. When manure or litter from different sources and/or moisture contents are stored together, or if the moisture content is over 25 to 30%, temperatures can go higher, and spontaneous combustion may occur. Do not stack wet litter in contact with dry litter. Monitor temperatures of stacked litter daily for a week or two after stacking to detect overheating. Stacked litter should not be applied to growing crops until the internal stack temperature is 100°F or less. Nutrient content of stacked litter is usually quite different from fresh litter. Stacked litter should be sampled and tested at least two weeks after stacking and as close to the time of application as possible.

**Summary:** With prior planning and good management, the nutrient value of litter can be preserved and contamination of surface and ground water can be prevented with a minimum of added expense. More elaborate systems are available that are effective and convenient as well as more expensive. Producers should choose what fits best in their situation and protects the environment.