Bagged Ingredient Storage

Joseph P. Harner III
Extension Agricultural Engineer
Biological and Agricultural Engineering

Fred Fairchild
Extension Specialist, Feed Manufacturing
Grain Science and Industry

Department of Grain Science and Industry

On-farm feed manufacturers with portable grinder-mixers or stationary mills often handle microingredients in bagged form. Ingredients such as dical or calcium may be handled in bagged or bulk form depending on feed production per year. Due to the limited accuracy of the scales on a portable grinder-mixer, or other mobile mixers, producers need to purchase their microingredients as base or premix in bagged form. Ingredients should be purchased proportional to bags of ingredients per ton of feed per ration. In some rations, the bags may need to be 40 pounds, whereas another ration may require bag ingredients to be in 50-pound bags.

The Food and Drug Administration's (FDA) Good Manufacturing Practices (GMPs) specify that *"Adequate procedures shall be established and maintained for the identification, storage, and inventory control (receipt and use) of all Type A medicated articles and Type B medicated feeds."* The GMPs also require bagged ingredients be stored in their original, closed containers and storage practices assure the identity, strength, quality, and purity of these drug sources.

Bags are often stored in older buildings or machinery sheds. Occasionally, even discarded utility trucks or vans are used for storing bagged ingredients. These types of storage buildings are most often used for storing nonfeed items such as batteries, hydraulic fluid, or other types of petroleum-based products, as well as feed ingredients. Older buildings and machinery sheds are seldom rodent or bird proof. GMPs require bagged ingredients to be stored in buildings which are rodent- and bird-proof with no storage of petroleum-based products, or other products, such as batteries, within the bagged storage area. Multipurpose buildings do not lend themselves to maintaining feed production records or provide an environment for maintaining scale accuracy.

Figure 1 shows a single purpose building for storing bagged ingredients for use with a portable grinder-mixer or mobile mixer. The building width is limited to 20 foot, which provides access to all ingredients. The building length can be adjusted depending on the storage required for the bagged ingredients. Most standard pallets require a storage space of 4 foot by 4 foot. Ingredients can be stored along the exterior walls while maintaining an 8-foot walkway between the bags. Ingredients are unloaded into the building at the unloading dock at the end of the building. A 2-foot walkway is allowed between pallets and walls for access and rodent control. A fence is used to prevent incoming trucks from carrying diseases into the production area. The building should be located near the feed center (where grain and soybean meal are stored), but also such that delivery trucks do not have to drive through the production area.

A small office and bath are included in the plan shown in Figure 1. The office is for maintaining records of ingredient usage in particular medicated feeds. The bath provides an immediate area for worker protection and washing after cleaning a mixer. An area, preferably inside the building, should be designated for containing empty bags awaiting proper disposal.

The exterior concrete slab in Figure 1 has two main purposes. The first is for loading the mixer and cleaning up any spills created while filling. The second purpose is for cleaning the mixer and removing residues. The mixer's trap doors can be opened to allow any residues to spill onto the concrete slab which can be easily cleaned.

The building should have a concrete floor. Windows must be covered with $^{1}/_{8}$-inch wire mesh screens and doors should seal such that perimeter

openings are less than 1/8 inch. It is important to construct the building large enough to provide for expansion yet not so large that additional space is consumed by nonfeed items. Insulation should be installed below the roof to minimize moisture condensation problems. The building can be insulated and heated. However, insulation often provides a place for rodents to live. Construction precautions can be taken to prevent rodent entry into insulated walls. The exterior around the building should be void of vegetation (grass, trees, shrubs) a minimum of 2 foot out from the walls.

Standard pallets normally require manual labor during handling at the farm level, often provide products in the wrong quantities, or utilize more space than available. Some are using minipallets, which measure 12 inches by 24 inches or 15 inches by 24 inches. These wooden or plastic pallets can hold about 600 pounds of material by stacking ten to twelve 50-pound bags. For on-farm, these offer the advantage of less storage space required for bagged ingredients, maintenance of a fresher supply of ingredients or more frequent stock rotation, plastic minipallets can be recycled, and labor required to handle bags is reduced. Mini pallets cannot be stacked on top of each other and are limited to “one” high stacking. Fork lifts, if available, are not as efficient when handling mini pallets as compared to standard pallets.

Figure 2 shows a floor plan of a conventional shop or machine shed which has been remodelled to include a feed storage room for storage of mini pallets and weighing of base ingredients. For storage inside an existing machinery building, minipallets are recommended. The 2-foot space around the perimeter of the walls for rodent control can be maintained when using the mini pallets. A counter along one end of the wall can be used for record maintenance. The area beneath the counter should be open to provide space for clearly marked containers that are used to store open bags or medicated feeds from a mixer.

Feed processing centers with a stationary mill and mixer also need adequate facilities for storing bagged microingredients. Often, more floor space is needed for storing bags with a stationary mill since each individual ingredient, such as the different vitamins, is handled in bagged form. The same storage principles apply as previously discussed with a portable grinder-mixer system. Bags should be stored near the weighing or proportioning center to minimize handling. An unloading dock for semitrailers may be required for mills handling bags.

There are four common problems with bag storage areas:

1. Rotation of stocks,
2. Excessive moisture,
3. Torn bags, and
4. Rodent control.

Often bags placed near an exterior wall are not used unless a shipment is delayed or supplies are running low. When a new shipment of bagged ingredients is scheduled to arrive, the on-site ingredients need to remain separated and used first. This may require two separate storage areas, or moving existing ingredients and placing the new ingredients to the rear. Excessive moisture causes the product to set up or cake in the bags. Bags that are not used within a week should be placed in clearly marked containers such a plastic trash can which limits moisture access. Problems with torn bags often occur during unloading and handling. This can best be prevented through proper bag handling and good management techniques. Rodents can best be controlled through proper housekeeping and sanitation practices as discussed in other sections of this manual. Leaving a 2-foot walkway between the bags or pallets and the wall helps allowing accessibility to the area for rodent control practices. Cleanliness outside the room, inside the building, or outside the building, is an important step in rodent control.

Summary

Bagged ingredients should be stored in a dedicated building or room. These areas should be free of batteries, petroleum products, or other nonfeed items. Good manufacturing procedures require bags to store in bird- and rodent-proof areas. Feed manufactures need to establish procedures for maintaining the identity, usage, and quality of bag ingredients in accordance with FDA guidelines.

***Figure 1**. Commodity shed for on-farm feed manufacturer's using portable grinder-mixers*

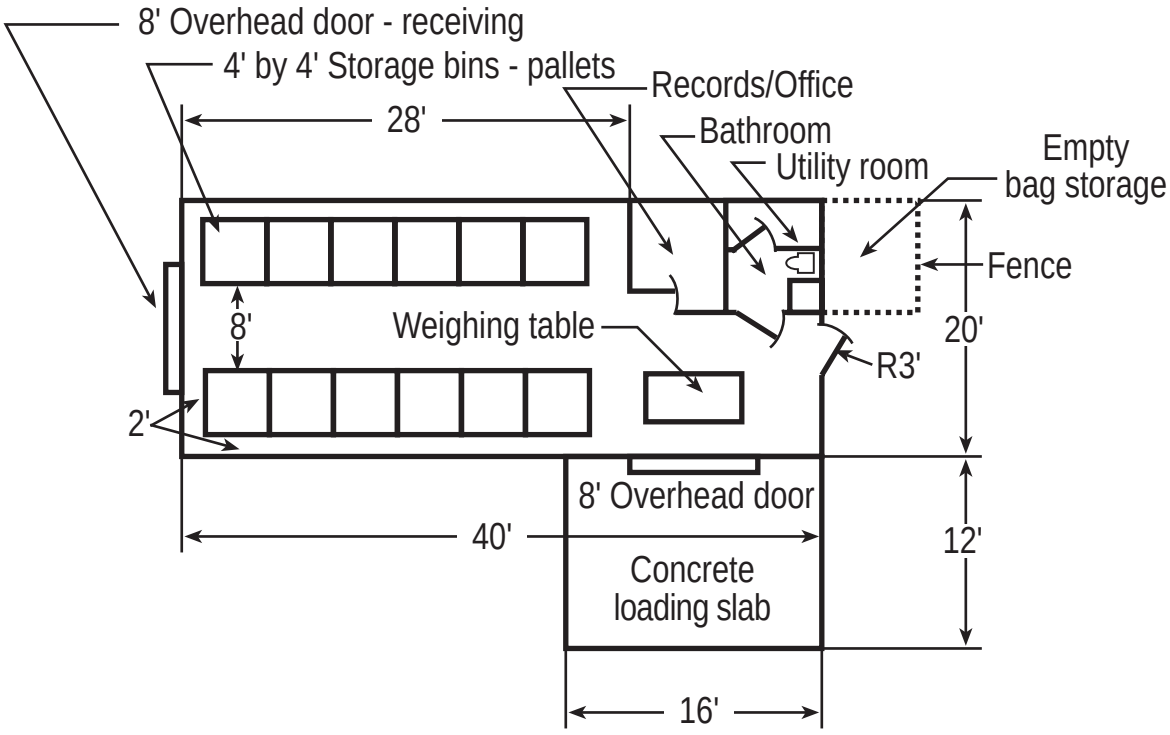
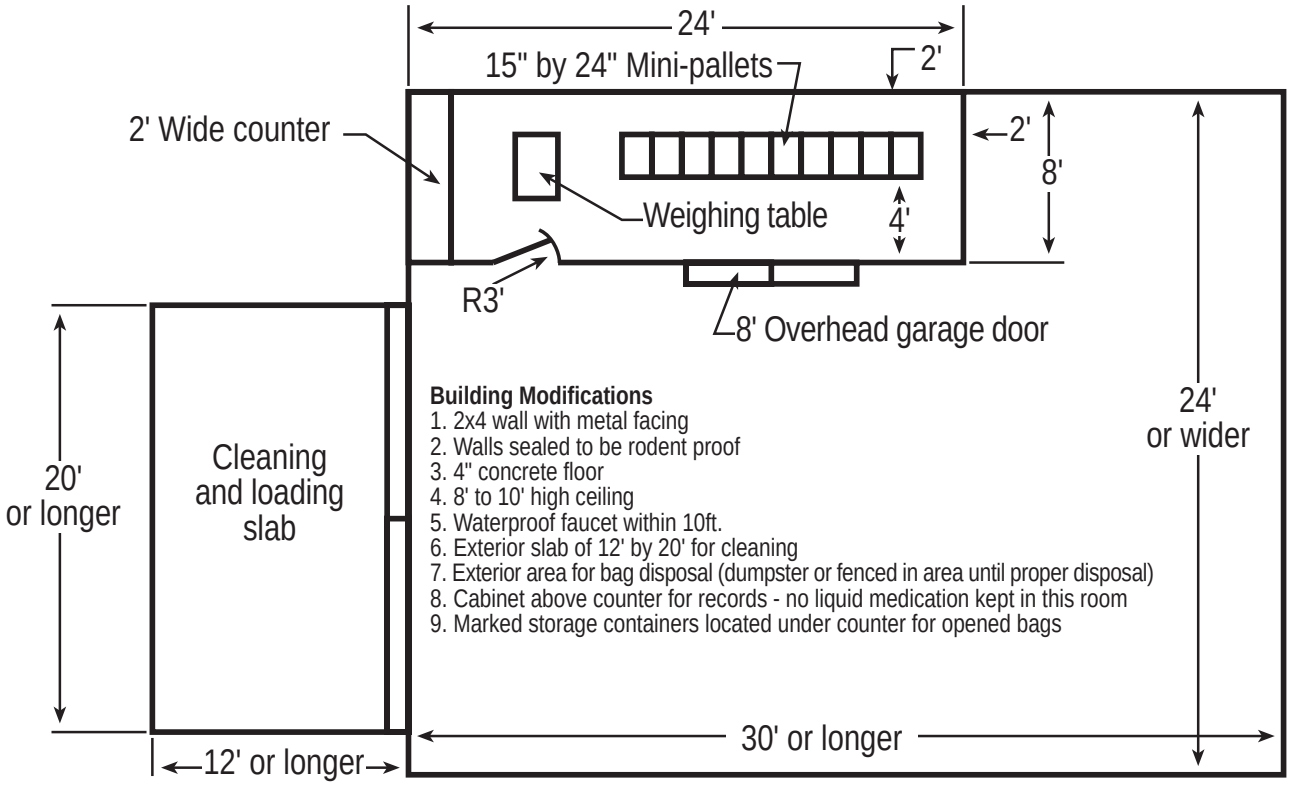


***Figure 2**. Remodelling of a farm building for bagged storage*



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