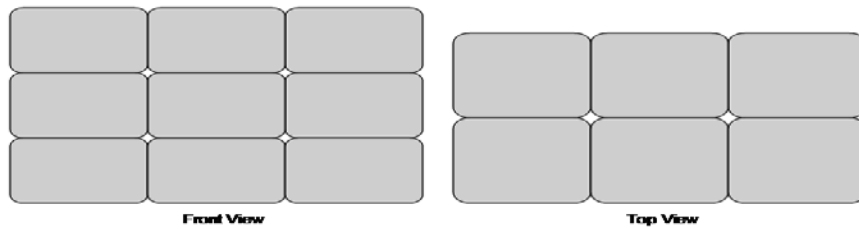


inspection, and use of commodities, including losses and claims, commodity swaps, substitution, etc.

- b. **Stacking of commodities:** Proper stacking is essential to ensure safety in handling, facilitate easy stock control and counts, and quickly identify and remove commodities. A variety of methods can be used, depending on the nature of the warehouse facility, the space available, the type of commodity or equipment to be stored, the packaging used, the individual items volumes and weights, and if the items are of uniform dimension. Four traditional stacking systems are described below:

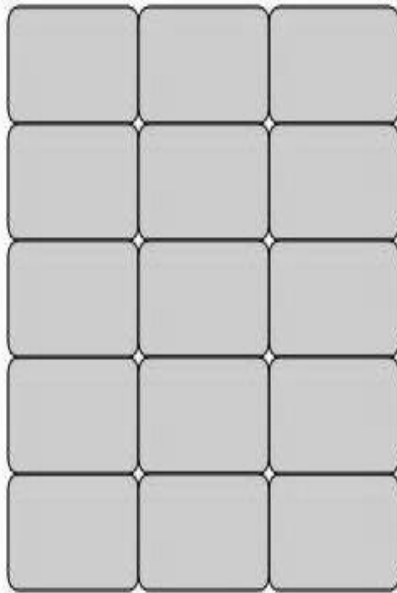
1. Simple Stacking: is a very quick method by which packages are aligned side-by-side on pallets or plastic tarps, and subsequent layers are added using the same alignment axis. This technique is appropriate for goods received in bulk, cartons of oil, wooden boxes (e.g., collapsible jerry cans) with the same dimensions, and for some food packages (e.g., 25 KG bags of cornmeal). The disadvantage is that stack sizes and heights may be quite limited due to stability concerns.



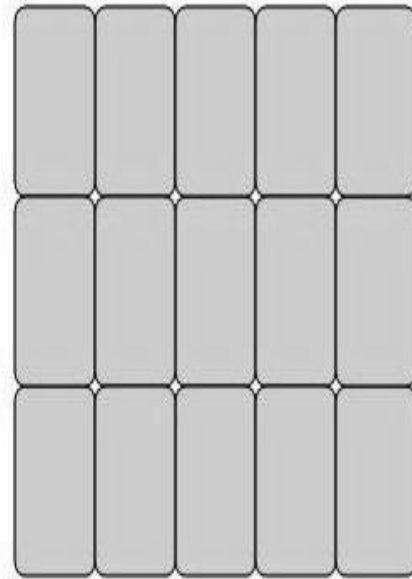
Figures courtesy of CRS Emergency Operations

Figure 8: Different methods of stacking

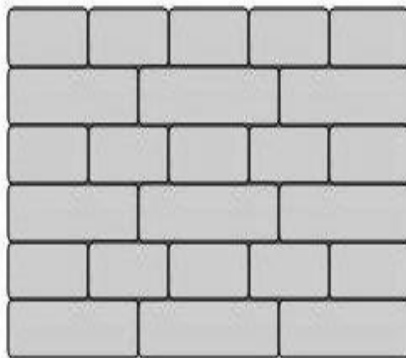
2. Cross Stacking:



Top view – odd numbered layers



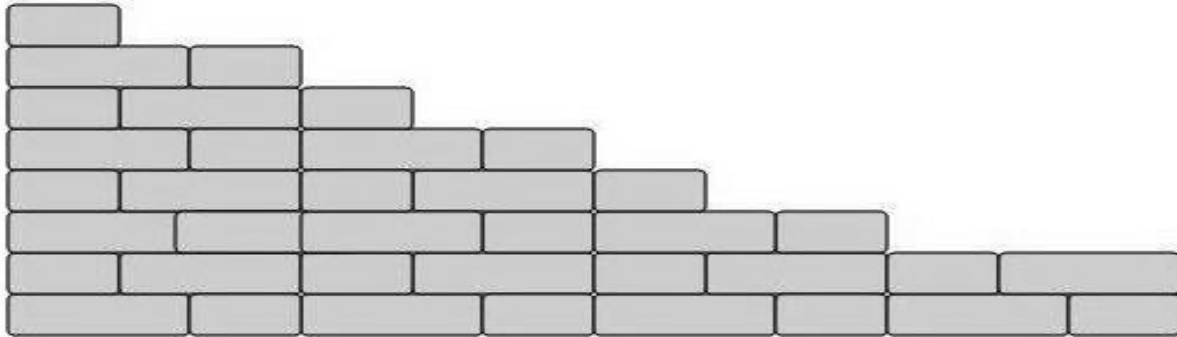
Top view – even numbered layers



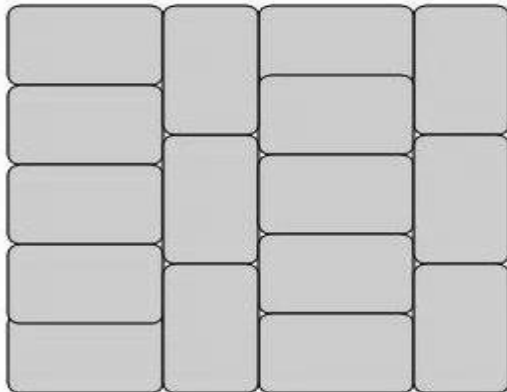
Front view of stack

Cross Stacking is a much better system than Simple Stacking, and produces stacks that are much more stable. Stack the first layer with all packages laid lengthwise on pallets, with the next layer's packages laid widthwise. Alternate subsequent layers. It is important to ensure that each layer contains the same number of packages to facilitate inventory. While this system provides a significant "locking" effect, it still limits stack heights due to stability concerns, particularly for bagged commodities.

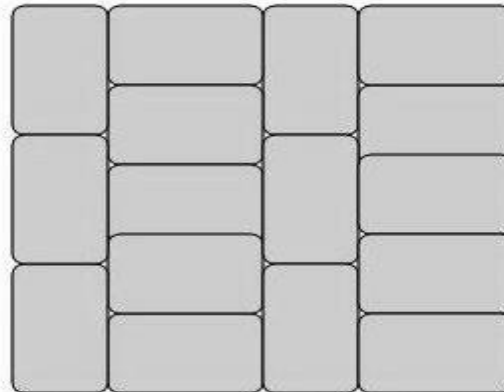
Stepping the stack: to achieve maximum stack size and height, and to safely descend packages from stacks, a proven method is to “step” the stack as shown below. This allows laborers to walk packages up or down the stack, and avoids over-handling of the packages and a potentially unsafe situation. As the stack rises, or at the beginning of an un-stacking operation, a “stairway” can be created on one side of the stack to facilitate the operation. When stacking, the final packages will be placed using ladders with laborers positioned on top of the stack to assist with lifting. During un-stacking, laborers on top of the stack hand down the first packages to other laborers positioned on ladders.



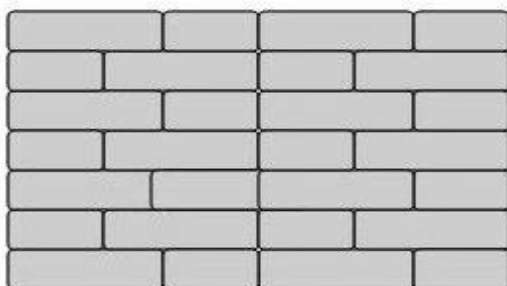
3. Block Stacking:



Top view – odd numbered layers



Top view – even numbered layers



Front view of stack

Block Stacking is generally the best method to use, particularly for bagged commodities. It produces stacks that are much more stable, allows for stacks of maximum height, and provides good aeration. Each layer blends rows of packages laid side-by-side with an adjacent row laid end-to-end. Subsequent layers are simply reversed over the layer below it. Ensure that each layer contains the same number of packages to facilitate inventory.

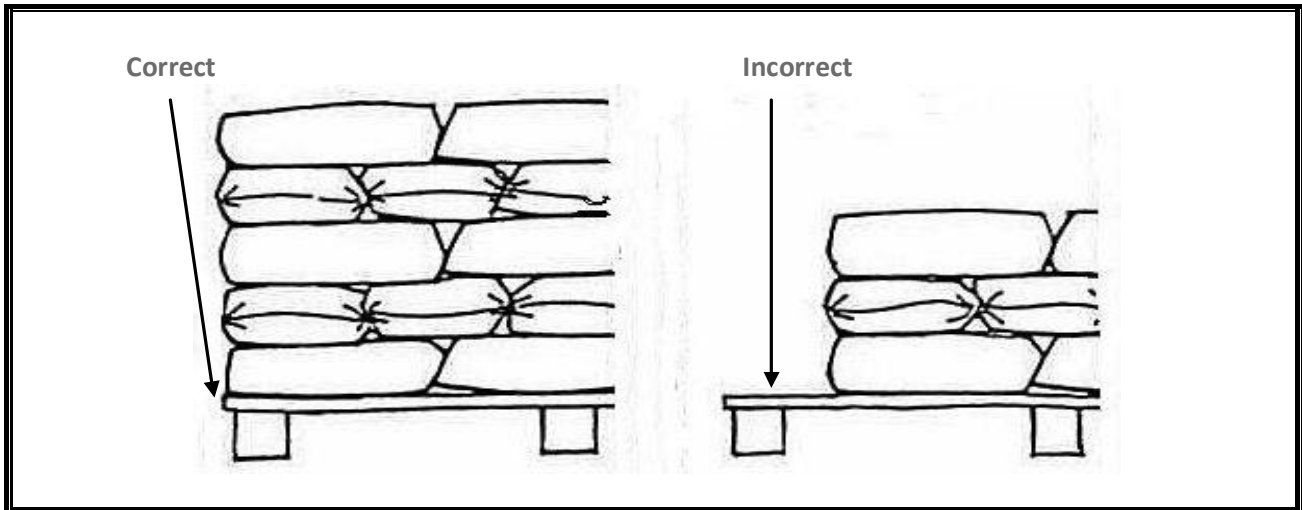


Figure 9: Stacking on pallets

Stacking on Pallets:

To protect the bottom layer of commodities from being damaged by water, flood, or condensation, the warehouse manager must ensure that commodities are stacked on wooden pallets laid on the ground (See Figure 11 below)

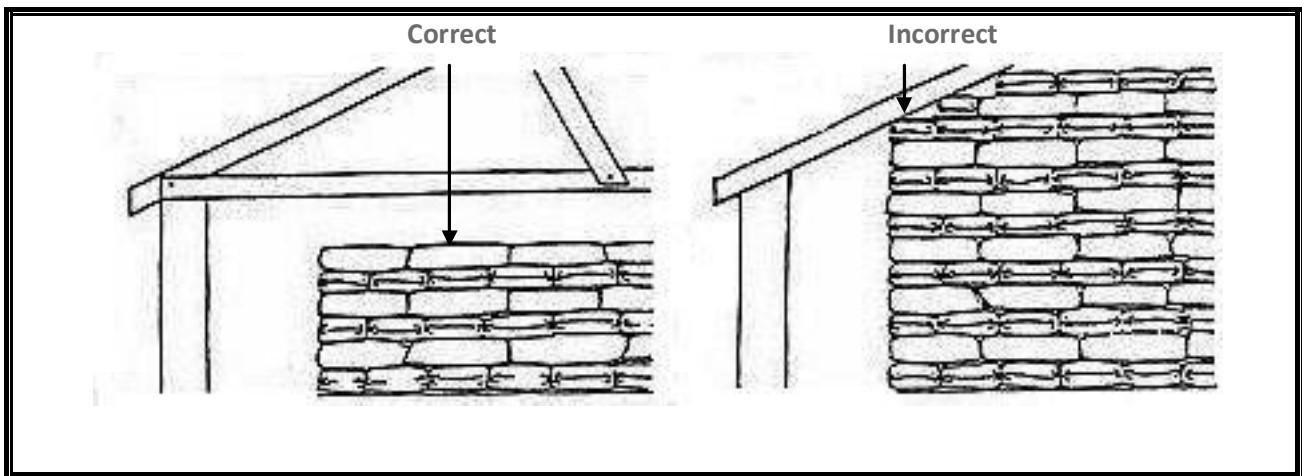


Figure 10: Stacking on Pallets Model 2

Useful Tips

- Fully cover the pallet with the first layer: it is fundamental for maintaining uniform stacks
- Commodity stacks should be flush to the edge of the pallets, and should in no case overhang the pallets
- Bagged commodities should be interlaced and locked so they don't slide or fall out of the stack
- Leave a minimum of one meter between the top of the stack and the roof to avoid overheating, improve aeration, allow for easy package movement, and facilitate inventorying

Each stack of food must have a stack card (bin card) containing the same information found in the warehouse ledger and on the Daily Warehouse Report (See Paragraph b. Stock Records below).