

Figure 12. A load of wet grain placed into a bin of dry grain may spoil unless dried, even though the "average" moisture content of the grain is considered safe for storage.

placed in the bin. Probing the center of the bin should indicate the extent to which a center core has formed.

"Hot spots" may be found in any part of the grain mass. These trouble zones usually occur around accumulations of trash or foreign material. However, if a load of relatively wet grain is placed into a bin of dry grain, then wet grain may begin to spoil regardless of the average moisture content of the entire grain mass (Figure 12). When probing a bin, investigate points where the probe has relative difficulty in penetrating. Generally, wet grain or trash offers more resistance to probe penetration than does dry grain. Again, the safety aspects associated with entering a bin of grain are important in that the grain may have bridged across the bin.

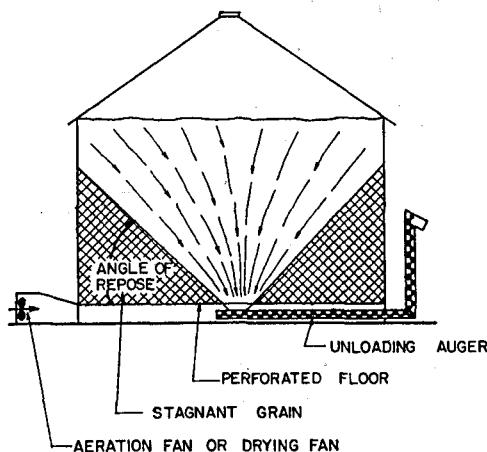


Figure 13. A portion of the grain in a bin (stagnant area) may not be unloaded by gravity flow and forms a natural hopper for incoming grain.

When a typical farm grain bin is unloaded, grain from the top portion of the bin is removed first. The grain will continue to flow until it reaches a natural angle with the bin floor called the angle of repose (Figure 13). The angle of repose usually ranges from 25 to 35 degrees, depending in part on the grain moisture content. A bin may continue to be filled and unloaded without ever removing that portion of the grain in the stagnant areas (Figure 13), as would be the case of a wet holding bin for a dryer. This "stagnant" grain should be carefully examined because it may have a higher moisture content or contain different levels of foreign materials compared to the rest of the grain.

When grain is drying in a bin, a drying front moves in the direction of the airflow. When air is forced from the bottom to the top of the bin (Figure 14), the grain above the drying front remains at essentially the same moisture content as when it entered the bin. The grain below the drying front will have a lower moisture content and will be in equilibrium with the drying air. The level of the drying front may be found by locating the point where the temperature of the grain increases significantly. This level will also be where a probe begins to move more freely through the grain indicating a drier portion of the grain mass has been reached. When examining grain dried in a bin, compare the moisture content a few inches from the surface with that a few feet lower to be sure that the system was allowed to operate until all the grain was dried (Figure 15).

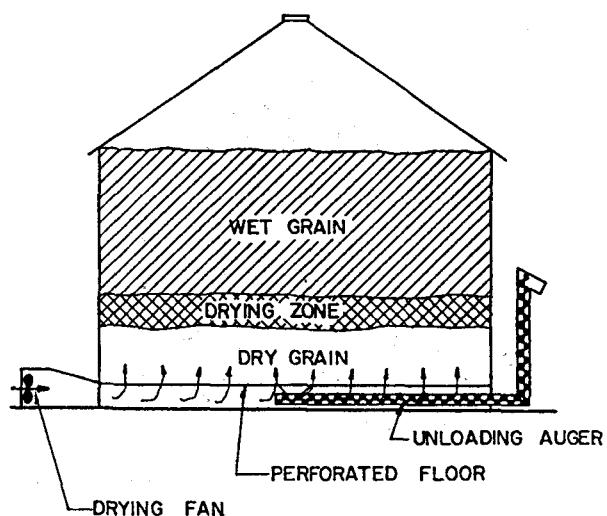


Figure 14. A drying front moves up through the grain in non-stirred, in-bin drying systems.