

Farm Structures FACTSHEET




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GRAIN, FORAGE AND FEED STRUCTURES



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COMPLETE INSTRUCTIONS

Good storage for farm crops is a sound investment, whether the material being stored is for use on the farm or for sale. Inadequate facilities and improper management can lead to substantial losses due to spoilage, insect and rodent damage, and fire from spontaneous combustion.

Before building new storage facilities, a complete storage and handling system should be designed to meet both present and future requirements and to maximize mechanization.

The number and size of storage buildings depend on the quantity and kinds of grain to be stored. In addition to single-purpose circular grain storage, consider the various rectangular multipurpose buildings; these often provide cheaper grain storage in the larger sizes, and can also be used for temporary storage of implements, fertilizer, bagged seed, etc. Concrete or steel silos are sometimes used for storing dry or high-moisture grains.

PLANNING GRAIN STORAGES

BUILDING SITE Surface and groundwater drainage is essential. Choose an elevated site or, if necessary fill the site with compacted gravel or sand before building. If poor drainage and high groundwater problems are expected, do not construct bin hoppers, leg elevator pits or other facilities below grade.

Arrange the buildings so that grain can be moved mechanically from one to another, or from any building to a vehicle. The storage area should have access to a public road.

STRUCTURAL REQUIREMENTS

FLOORS AND FOUNDATIONS Since grain is heavy, a reinforced concrete floor on the ground is recommended and is usually the most economical. The concrete floor should always be placed over a moisture barrier (such as a sheet of polyethylene) on compacted sand fill.

Where grain must be stored overhead, have a qualified engineer design the supporting structure and footings.


ANCHORING Anchor all bins securely so that no shifting is caused by wind when empty or by the grain when filled. Wood wall studs must also be securely fastened to the sill and plate. In some cases, steel cables or tie-rods must be connected and adjusted tight before grain pressure is applied to the walls.

GRAIN HANDLING Grain is easy to handle mechanically. Arrange bins systematically so that the grain can be moved from one bin to another by horizontal or inclined conveyors (such as augers), often combined with a bucket elevator for vertical lift. Mechanical handling is essential for moving grain from trucks to storage quickly and efficiently, particularly during harvesting and drying operations when time is critical.

Unloading grain from the side of storage bins causes a sharp increase in outward pressure and vertical friction loads on the walls. Always unload flat-bottom bins from the center, not at the wall or access door. If the only available opening is at the side access door, insert an auger into the bin to unload most of the grain from the center.

CARE OF DRY STORED GRAIN Grain should be stored clean and dry, and inspected periodically for hot spots, dampness or other signs of moisture migration or spoilage. Storages over 100 m³ (2800 bu) should have perforated floor ducts for periodic fan aeration, to redistribute or remove moisture that migrates within the grain mass. This moisture may accumulate locally and cause spoilage. Aeration fans should be sized to draw about 1.5 L/(s.m³) (or 0.1 cfm/bu) through the grain. When grain insects or other infestations occur, treat the condition promptly.

RODENTS To control rodents, clean up weeds and debris that can provide hiding places around the grain center. Build all access openings rodent-tight (for ex-



**CANADA
PLAN SERVICE**

The Canada Plan Service prepares detailed plans showing how to construct modern farm buildings, livestock housing systems, storages and equipment for Canadian Agriculture.

This leaflet gives the details for a farm building component or piece of farmstead equipment. To obtain another copy of this leaflet, contact your local provincial agricultural engineer or extension advisor.

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Website: <http://www.cps.gov.on.ca>