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Department of Agriculture
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Grain storage—ground dumps

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Whenever your harvesting rate exceeds the rate at which grain is shifted from your farm, a need exists for some form of on-farm storage. If permanent facilities are not available a temporary storage method must be used.

One of the simplest methods is to dump grain directly on the ground. This has been successful in many emergency situations where no other option has existed, but the grain should be moved as soon as possible to minimise losses due to insects, weather, birds and animals.

SITE SELECTION AND PREPARATION

Ground dump sites should be well drained and elevated, with dry, hard-packed soil.

Mowing and raking may be sufficient to clean up the site, or a tractor-mounted blade or grader can be used to skim the surface of the site. Take care not to grade below the surrounding surface as water will collect under the grain. After the site has been prepared, it should be thoroughly wetted and allowed to form a hard, dry surface.

The site should be sprayed with an approved insecticide before dumping to help control grain insects, especially if an old site is to be re-used.

AREA REQUIRED

The plan area required for a ground dump is largely determined by the quantity of grain to be stored and the height to which you can stack using existing grain handling equipment. Table 1 will help you to select suitable dimensions for your ground dump.

Example: You need to hold 250 tonnes of wheat and can stack to a height of 2.5 metres with an auger. From table 1, a ground dump 11 metres wide and 30 metres long will be adequate. When materials other than wheat are to be stored, the bulk densities given in table 2 will allow you to change from tonnes to cubic metres and vice versa.

Table 1. Approximate storage capacity of ground dumps

Stack height (h) metres	Strip width (W) metres	Length of grain dump (L) in metres									
		conical	15 m	20 m	25 m	30 m	35 m	40 m	45 m	50 m	
2.0	9	40	90	130	175	220	260	305	345	390	cubic metres
		30	70	100	130	165	195	230	260	290	tonnes wheat
2.5	11	80	130	200	265	335	400	470	535	605	cubic metres
		60	100	150	200	250	300	350	400	450	tonnes wheat
3.0	13	135	165	260	355	450	545	640	735	830	cubic metres
		100	125	195	270	340	410	480	550	625	tonnes wheat
3.5	15	205		340	470	605	735	870	1000	1135	cubic metres
		155		255	355	455	550	650	750	850	tonnes wheat
4.0	17	300		415	585	760	930	1100	1280	1450	cubic metres
		225		310	440	570	700	830	960	1090	tonnes wheat
4.5	19	425			685	900	1115	1330	1545	1760	cubic metres
		320			515	675	835	995	1160	1320	tonnes wheat

Note: For materials other than wheat, calculate tonnes using bulk densities from Table 2. Table 1 is based on 25° angle of repose and wheat bulk density of 750 kg/m³.

Table 2. Typical bulk densities of grains

Grain	Bulk density kg/m³
Wheat	750
Barley	620
Oats	450
Sorghum	720
Maize	720
Soybean	750
Sunflower	400
Rice (paddy)	620

Bulk density will vary depending upon variety, moisture content, quality and trash content of grain.

DUMPING THE GRAIN

When relatively small amounts of grain are to be dumped (say 20 tonnes) a single conical heap can be used. This is easily formed using a mobile auger.

For larger amounts of grain a long triangular shaped heap can be formed. Filling starts at the top end of the cleared strip and the auger is progressively moved along the centre of the strip as the heap grows.

Mobile bin units or headers fitted with a side delivery auger can be used to stack the grain or level the peak of the dump. The main limitation is the reach of this type of equipment.

A smooth, evenly sloped grain surface will shed water even during heavy rainfall. Ensure that the surface is not disturbed by people or animals after it has been placed. Depressions in the grain surface will channel water into the heap and lead to damage.

Pigs and other feral animals can cause extensive damage to open ground dumps. Temporary electric fencing around the site may help.

REMOVING GRAIN FROM DUMPS

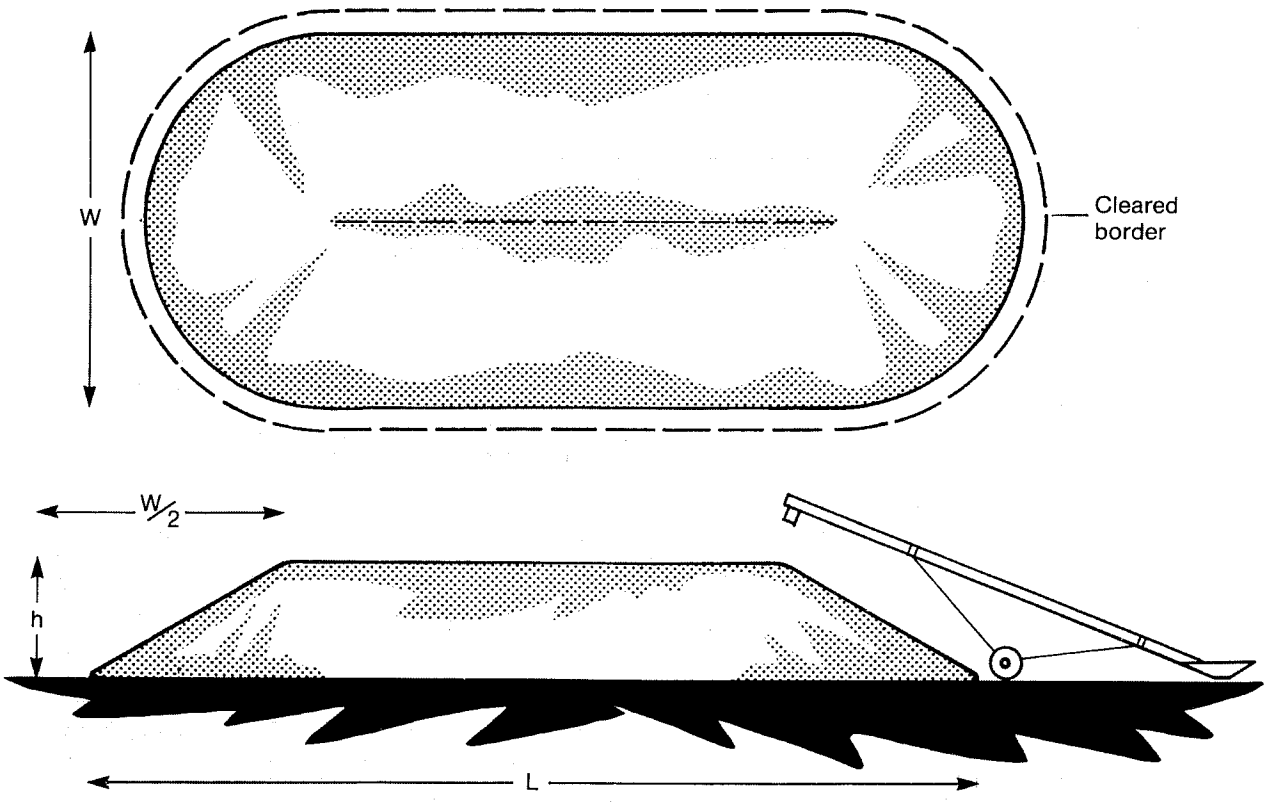
The grain can be removed using a front-end loader or mobile auger. A fixed and guarded cross-sweep on the auger will simplify grain removal. When using an auger, a skid plate under the intake end is usually needed to prevent it digging in due to vibrations.

Work from one end of the dump to the other to retain a uniform shape. This is especially important if the grain is to be moved over several days or weeks. With care, losses during removal of grain can be reasonably low. Losses that do occur are partly offset by the low capital cost involved.

INSECT CONTROL

It is essential that storage sites, grain harvesters, trucks and handling equipment are thoroughly cleaned of grain residue and, if necessary, sprayed with approved insecticide before harvest starts. Fumigation may be needed to reach inaccessible areas in machinery and storages.

Layout of a grain dump. See Table 1 for dimensions L, W and h.



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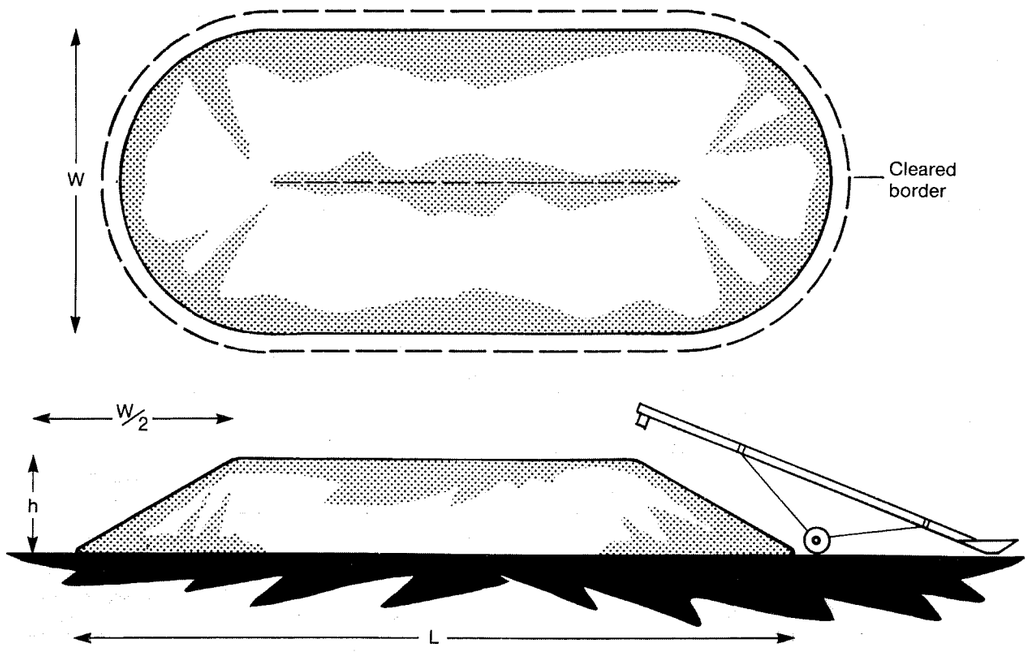

Close attention to insect control both before and after harvest is a sound investment of time and money to prevent infestation of your clean grain.

Grain must always be stored at low moisture content, 12 per cent or below, to minimise deterioration and insect activity. If the grain is likely to be stored for more than six weeks it should be treated with an approved insecticide. Ground dumps cannot be easily fumigated once they become infested.

OTHER AGFACTS

Agfact E3.2, *Temporary grain storage—plastic covered bunkers.*
Agfact E3.4, *Grain storage—steel mesh silos.*

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