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Farm Dams in the Wheatbelt

By J. E. WATSON, B.Sc., Soil Conservation Adviser

MANY new farm dams are sunk each year in the wheatbelt and much money is spent on them. With continued development of new land, and increasing stock carrying capacity of older land under legume pastures, the need for more water supplies will continue for a long time.

Many farmers will be arranging to have dams excavated before next winter's rains. Some reminders at this time may be of use in planning new dams, and perhaps help to avoid later damage to them.

Let me stress the importance of testing and checking—Guesswork can cause costly mistakes.

The essential requirement is an area of clay ground of sufficient depth, free of rock and above any salt water table. The only way to be sure of this before starting the excavation is to drill test holes. The minimum should be a test hole at the centre and at each corner of the proposed excavation.

In selecting a site for the dam, remember it need not depend only on its natural catchment. Contour drains can be used to collect water from a bigger catchment, or to divert water from a creek or gully up to half a mile from the dam. An alternative is to prepare an area above the dam as a roaded catchment.

Accurate surveying is needed for both and the contour lines should be either fully surveyed or at least roughly checked before the dam is started. For instance by surveying the contour drain, you know whether it will collect water from where it should. You will also know whether it is going to pass through porous soil where water would be lost by absorption into the channel. It may be possible to avoid a patch of sandy soil by surveying the drain further up or down the slope—this could, of course, affect the location of the dam.

To survey contour lines you need a leveling device. If you do not already own a surveying instrument we recommend that you buy or make a hose level.

Even if no contour lines are needed, you should check the levels at the dam site before excavation, and the dam itself after construction.

Always check across the uphill edge of any proposed excavation to make sure the top corners are level. I have seen dams overflowing at one corner whilst the other corner is still high and dry several feet above the water. A simple check of the levels will avoid this.

Also check the vertical fall from the top of the excavation to where the back wall will be. If this fall is more than five feet a special construction effort may be needed to make the wall high enough and well compacted to be safe with this depth of water against it.

When the dam is nearly finished, run a contour line from the overflow point around the inside wall of the dam. The wall should be at least three feet above this line at all places to be safe.

Next consider the spillway. Surplus water must be able to flow out of the dam as fast as it comes in. Otherwise a heavy flow when the dam is full may cause the level in the dam to rise well above overflow level. A restricted spillway may mean that three feet of freeboard is not enough for safety. This is why we do not favour the damming of creeks in the wheatbelt. Most of these creeks have big catchments and can carry large volumes of water in flood. It is difficult to have a spillway which will safely handle those floodwaters. Put the dam away from the creek and divert the water to it by using a small check dam and contour drain. A flood will leave the main dam safe, and damage to the small check dam should not be costly to repair.
Finally, think of the overflow waters themselves. These must not be allowed to flow over cultivated slopes where they can cause serious gully erosion. If a grassed waterway cannot be left below the dam, a contour bank should be used to divert the overflow to a waterway or natural creek.

Perhaps I have made all this sound difficult, but it is straightforward if you plan your dam thoughtfully and make the necessary checks.

If you are planning a new dam I suggest this procedure:

Decide where you need the water and look for suitable holding ground.

Consider the catchment and remember the value of contour drains or roaded catchments where necessary.

Select and peg out the proposed excavation and check the levels of the site and of the contour methods if they are to be used.

If all this is satisfactory then put down the test holes in the excavation site.

When the dam construction is complete check the levels around the dam to make sure it is safe. Do this before the dam sinking equipment leaves the job.

Finally, make sure the overflow waters will not cause damage to cropland.

Leaflets on the hose level, contour drains and roaded catchments are available from the Department of Agriculture district offices for those who would like further information on these aspects.

—from an ABC Radio Talk.
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