A practical guide to building contour banks with a road grader

J E. Watson
IMPORTANT DISCLAIMER

This document has been obtained from DAFWA's research library website (researchlibrary.agric.wa.gov.au) which hosts DAFWA's archival research publications. Although reasonable care was taken to make the information in the document accurate at the time it was first published, DAFWA does not make any representations or warranties about its accuracy, reliability, currency, completeness or suitability for any particular purpose. It may be out of date, inaccurate or misleading or conflict with current laws, polices or practices. DAFWA has not reviewed or revised the information before making the document available from its research library website. Before using the information, you should carefully evaluate its accuracy, currency, completeness and relevance for your purposes. We recommend you also search for more recent information on DAFWA's research library website, DAFWA's main website (https://www.agric.wa.gov.au) and other appropriate websites and sources.

Information in, or referred to in, documents on DAFWA's research library website is not tailored to the circumstances of individual farms, people or businesses, and does not constitute legal, business, scientific, agricultural or farm management advice. We recommend before making any significant decisions, you obtain advice from appropriate professionals who have taken into account your individual circumstances and objectives.

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia and their employees and agents (collectively and individually referred to below as DAFWA) accept no liability whatsoever, by reason of negligence or otherwise, arising from any use or release of information in, or referred to in, this document, or any error, inaccuracy or omission in the information.
A practical guide to...

Building contour banks with a road grader

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

THOUSANDS of miles of contour banks have been built in Western Australia, and most of this earthmoving has been done by tractor and disc plough* or by road grader. This article describes the technique recommended for bank construction with the road grader.

The more powerful (100 horse power or more) road graders of the tandem drive or four wheel drive type are the most suitable. A good deal of power is needed to cut the earth in forming the channel, and to grade and compact it into a bank.

Four runs are normally needed to build a bank and form a channel of good capacity on the uphill side of the bank.

BLADE SETTING:

With hard soil conditions however, five or more runs are often required. Even under ideal conditions four runs are still recommended as there are likely to be some weaker sections which need reinforcing. All the runs are made on the uphill side of the surveyed line.

The blade settings used for normal road work are not the best for bank construction. A better setting is shown below.

This close-up picture shows the upright set of the blade and sharp cutting angle recommended for contour bank construction. On this setting the blade readily cuts into the soil and quickly clears the loose soil into the windrow. The picture was taken on the second run (see next page). It shows the shallow (about 2 inches) cut of the toe of the blade, with the heel in to the maximum depth the machine can handle.

*The technique of contour bank construction with a disc plough was described in an article in the March-April, 1956, issue of this journal. This is available as Bulletin No. 2335.
The picture series on these two pages shows the recommended method of bank building using the standard four runs:

FIRST RUN:

The first run forms a windrow of soil on the survey line. The blade is set in an upright position and at a sharp angle to the line of travel. Both toe and heel of the blade should cut to an even depth of 3 or 4 inches.

SECOND RUN:

The second run straddles the uphill side of the first blade cut. The toe of the blade is set to cut the soil to a depth of one or two inches and the heel of the blade digs as deeply as possible. This gives a cut which is tapered from just below ground surface on the uphill edge, to the final depth of the channel on the lower edge. The windrow of soil is near the centre of the first blade cut.
THIRD RUN:

The third run straddles the second windrow and grades the soil across to the first windrow on the surveyed bank line. The blade is set to scrape a flat channel and cut slightly deeper than the first cut. The upright setting of the blade can be clearly seen in this view.

FOURTH RUN:

The fourth run is on much the same track as the first and third, but cuts 3 or 4 inches deeper than the first cut. The blade is set to leave a flat channel. The final cross section is a gentle taper from the uphill side to a small step (of 3 or 4 inches) into a wide flat channel. The bank should be at least 18 inches high and 5 or 6 feet wide at the base.
BANK CAPACITY

The capacity of a bank refers to the amount of water which can be held in the channel. The cross-sectional area of the channel gives a measure of the bank capacity (shown by the shaded area in the diagram below.)

A channel with 10 square feet cross section (10 feet wide by 1 foot deep), will hold more than 4,000 gallons for each chain of length. Three miles of this bank would hold a million gallons.

In good conditions a grader can construct a mile of bank in two hours. At a rate of, say, £5 an hour three miles of bank will cost £30—not a great outlay to control a million gallons of rainfall. Some shires make road graders available for soil conservation work at special rates as they realise that every million gallons of water kept on the farm is that much less for the road system to handle.

SOIL PREPARATION FOR BANK BUILDING

In moist soil no preparation is required. In clay soils when the soil is soft enough for cutting it may be too sticky for efficient grading. A deep scarifying along the bank line will break up the soil. If the loose soil is allowed to dry for a day or two it will then be suitable for grading.

Much bank building is done in late summer because graders are then more readily available than in the winter months.
when road work must have priority. To
get best results in summer some soil pre-
paration should be carried out. The
contour lines should be surveyed during
the previous winter. A strip 12 to 15 feet
wide above the surveyed line is cultivated
to a depth of 6 inches. In soils likely to
set hard, a second cultivation can be done
in spring to shatter the clods before they
dry out.

With the loosened soil in the fallow strip
(along the surveyed line), a satisfactory
bank can be made at any time during the
summer. It is safest however, to wait until
late summer or autumn, to reduce the risk
of damage by summer storms, as banks
built with dry soil will not be well com-
pacted. The lands between the banks
should be cultivated on the contour as
soon as possible after the first rains, to
promote greater absorption and reduce
run-off.

SOME PRACTICAL HINTS

Bank Lines Marked with Pegs

If the surveyed line is only pegged but
not marked the grader makes the first run
so that the windrow of soil is placed along
the line of pegs.

Bank Lines Marked by a Run with a
Plough or Scarifier

Banks to be built with a grader should
always be marked out by a cultivation run
on the uphill side only of the surveyed line.
The bank is built on the downhill edge of
the cultivated strip.

Bank Endings

The last pegs at both ends of the banks
are often on carefully selected spots. The
bank should be constructed exactly to
these points and not turned up or downhill.
If the line has been marked with plough
or scarifier, wooden or steel pegs should
be used to mark the position of the end
survey pegs.

Gully Filling

Any gullies which cross the bank lines
should be filled in (by plough, grader or
bulldozer) before the banks are built. Extra
soil should be pushed on to the places
where banks cross the filled gullies. After
the banks are built extra soil should be
pushed up (by spade if necessary) at the
gully crossings to allow for sinkage and to
make sure the bank cannot break at these
points.

Road Crossing Over Banks

These should be avoided, if possible. If
they are necessary extra soil must be
pushed on to the downhill side of the bank
to make a long tail, and the crossing shaped
so that vehicles can cross over. The height
of the bank and the capacity of the
channel must be maintained.
STOCK ENCLOSURES

made easy with DOWNEE

PRESSED STEEL RAIL FITTINGS

Cut costs by specifying DOWNEE pressed steel fittings for the erection of: cowshed and milking stalls, cattle pens, abattoirs, warehouse and storage sheds, workshop fittings, etc. Downee does away with the old fashioned and unsatisfactory method of screw joints and welding, which are more subject to corrosion.

Downee fittings are manufactured from high quality steel to standard gas and water pipe sizes. Being galvanised they are suitable for permanent outdoor use. Structures made with Downee can be dismantled and the pipes and fittings re-used for other purposes. For full details contact McPherson's.

From your local storekeeper or

McPherson's LTD.
SUPPLIERS TO INDUSTRY SINCE 1860

532 MURRAY ST., PERTH. PHONE 23 0211.

Please mention the "Journal of Agriculture of W.A." when writing to advertisers.