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BUILD CONTOUR BANKS WITH A DISC PLOUGH

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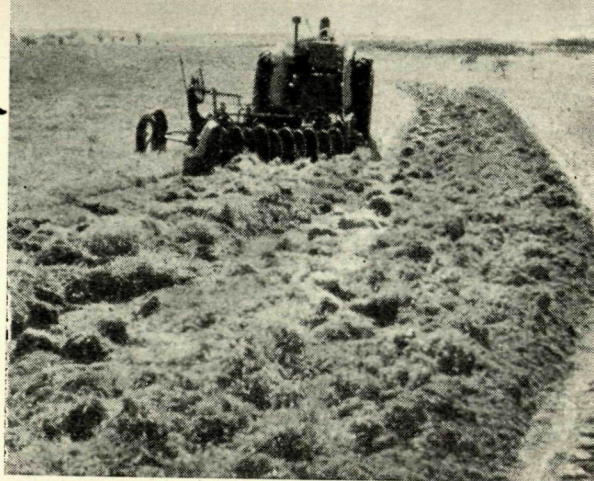


Fig. 1.—Second run, top side. Front discs throwing soil into furrow left by the first or "marker" run. The soil is thrown towards the surveyed line.

THE Soil Conservation Service encourages farmers to help themselves with their soil erosion problems. A number have already carried out their own surveys and constructed the recommended earthworks with small machinery. Many others, however, may not be aware of the possibilities of normal farm implements, and in particular, the disc plough.

Often, to reclaim eroded areas and to control water runoff sufficiently to allow the establishment of soil improving pastures, certain earthworks are necessary. Such earthworks need not be regarded as major construction problems as most farms have some equipment which can be used to build contour banks and other structures.

Contour banks are likely to be the most usual earthworks that farmers would attempt to construct. On a number of properties, successful and economical use has been made of large earthmoving machinery such as road graders and bulldozers. Such machinery is not always readily available and so farmers should have a good knowledge of the possible uses of their normal farm equipment.

Among those farmers wishing to carry out their own bank building, the disc plough should be quite popular because it is essentially a one-man machine—an important consideration when labour shortage is such a big factor.

Any type of disc plough, including the more recent large single-disc models should be suitable, provided the machine is in good working order and is fitted, preferably, with large unworn discs. A plough

that will not make a good job of ploughing will not build a bank easily and economically. The unworn discs enable efficient moving of soil to form a bank 18in. to 20in. high and with a broad flat channel about $1\frac{1}{2}$ times as wide as the plough. The whole operation can be speeded up if the machine is equipped with hydraulic or mechanical quick-lift to enable more convenient and quicker turning at the ends of the bank. If set machines are used, care should be taken when turning, unless the machine is lifted out of the ground. This is particularly the case at the outlet end of the bank where it is desirable not to disturb the soil below the end of the bank.

Bank building is best done when the soil is in a good ploughing condition. Farmers reducing or eliminating the area of fallow will find that the old fallowing time is particularly suited to earthmoving operations. Even with good soil conditions, the time and number of runs required to construct a bank will vary considerably, due especially to the condition of the plough, the size and speed of the tractor, the general skill and experience of the operator and his understanding of the techniques used.

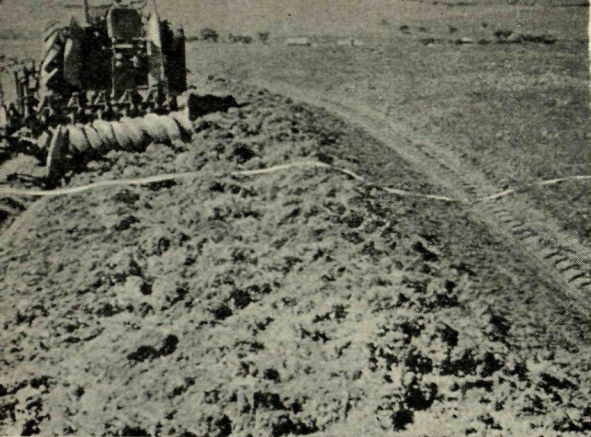


Fig. 2.—Fourth run, top side. This is the second actual soil moving run and is slightly inside the track of the third run. Tape outlines the growing mound of soil

BUILDING METHOD

Generally the method is to move soil from a wide area on to the line surveyed for the bank. It is a "round and round" system, gradually moving sufficient soil on to a central unploughed strip on which the bank is actually built. Practically all the soil is obtained from the top or channel side of the bank.

First Run, Top Side.

This is essentially a marker run close to, and throwing soil on to, the surveyed line. Speed is not necessary at this stage as the aim is to loosen the soil and to determine whether it is suitable for ploughing. The plough is set reasonably deep as with normal ploughing.

First Run, Lower Side.

Same as run on top side but not as close to the surveyed line, so that an unploughed strip about 2-3ft. wide is left along the line.

Second Run, Top Side.

This is also partly a marker run, being a further normal plough width out from the surveyed line—the front discs throwing soil into the furrow left by the previous run.

Second Run, Lower Side.

This is usually made on the same track as the first run. If, from the previous runs, it appears that it may be difficult to obtain sufficient soil, it is advisable to make this second run about one half a plough width further down the slope.

Third Run, Top Side.

This is actually the first of the soil-moving runs. Compared with the second run, the machine is moved downhill slightly, say about the width of the two discs or the width of the furrow.

At this stage the real aim is to move soil as efficiently as possible. This is best achieved by setting the front discs quite deep and the rear ones just above the previous furrow so that the loose soil only is moved towards the surveyed line and no fresh soil is disturbed. The other important factor is to carry out the operation at the greatest speed that the tractor will permit. This ensures that more soil is moved with each run and can reduce the number of times that the same soil has to be moved.

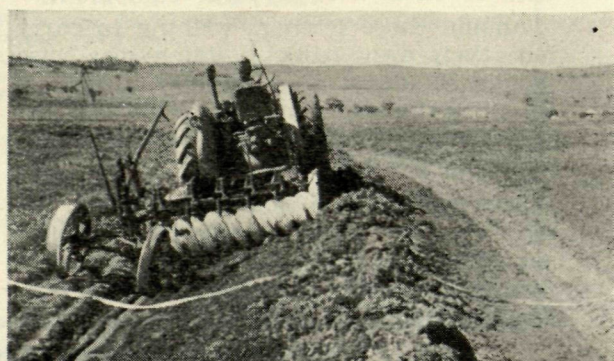
Third Run, Lower Side.

This is usually on the same track as the first and second runs. If, however, the second run was made wider to obtain extra soil this one should be slightly closer to the surveyed line.

Fourth and Following Runs, Top Side.

The fourth and successive runs on the uphill side are each one furrow width nearer the centre and are intended to move as much soil as possible on to the bank line. At the same time, a broad flat channel of good capacity is formed. To achieve this efficiently, it is most desirable to work at high speed. With each run the tractor and plough are working farther up on the bank. This weight of machines on the growing mound of soil assists in making a well-consolidated bank. After about eight or nine runs a good sized bank should result. If, at this stage, the chan-

Fig. 3.—Sixth run, top side. Shows position of tractor and plough relative to the bank already formed



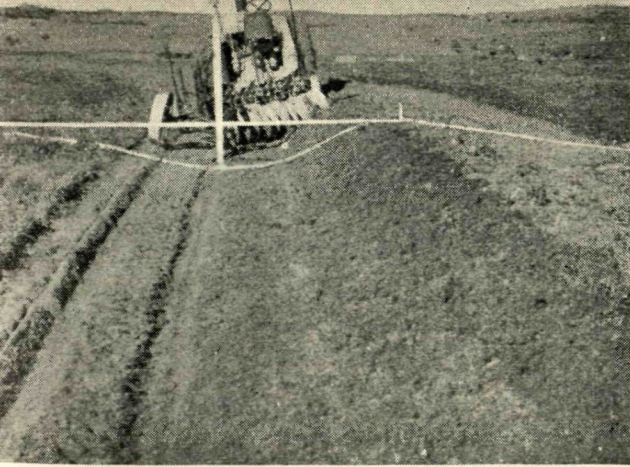


Fig. 4.—Eighth run, top side. Bank almost complete. Weight of tractor on freshly ploughed soil helps to make a solid bank

nel is not cleared of loose soil, or if the bank is not high enough it may be necessary to make two or three fast runs along the channel and on the slope of the bank.

Fourth and Following Runs, Lower Side.

On the lower side the fourth and successive runs should aim to generally "finish off" this section of the bank. By using this "round and round" procedure the lower side is usually complete first and has a steep slope from the top of the bank to original ground level. If a more gentle slope is desired the last few runs can be made successively a little further down the slope so that the new soil cut by the rear discs is thrown on to the lower part of the bank. This procedure should not be necessary if the working on the lower side was more than the normal plough width at the beginning.

After all available soil from the channel side has been thrown up onto the bank, it should be about 18in. to 21in. high with a wide flat channel 6ft. to 8ft. wide depending on the size of the plough. If, at this stage the bank is too small, it is necessary to obtain extra soil by commencing a further series of runs from the outer limits of the previous working.

When using ploughs it is well to keep in mind the following points:—

- (1) Move the soil as few times as possible to avoid breaking down the soil structure.
- (2) Practically all the soil is most easily obtained from the uphill side.

- (3) With each run, attempt to move only as much soil as the machines can handle effectively.
- (4) Do not disturb the topsoil from an area any wider than necessary.
- (5) Uniform cuts are essential, especially on curves, to ensure a bank of uniform height and a channel of correct grade and uniform capacity.

For best results it is essential that the soil is in a good ploughing condition. This is especially desirable because it has to be moved several times. Soil that is too dry soon becomes very powdery and very difficult to handle.

It has been noticed that a plough-built bank and channel usually has a good grass cover within the first year. This is probably due to the fact that all topsoil is not completely removed. The bank itself contains some subsoil and the channel usually has some topsoil scattered over it. This, with extra fertiliser seems to quickly ensure a grass cover which assists in stabilising the bank and makes a safer channel for carrying large volumes of run-off water. Although soil conservation practices aim to greatly reduce run-off by promoting much better and more even absorption of rainfall, there will be, from time to time, some run-off from much of our farmland. Such run-off is most likely to occur during summer storms or high intensity winter rains when normal conservation farming cannot possibly cope with the large quantities of water. Bank channels should always be protected from damage likely to result from flowing water.

Fig. 5.—Lower side is now complete and tractor is driven almost on top of bank for last two or three runs. Fast working clears the channel of loose soil and throws it up on to the bank



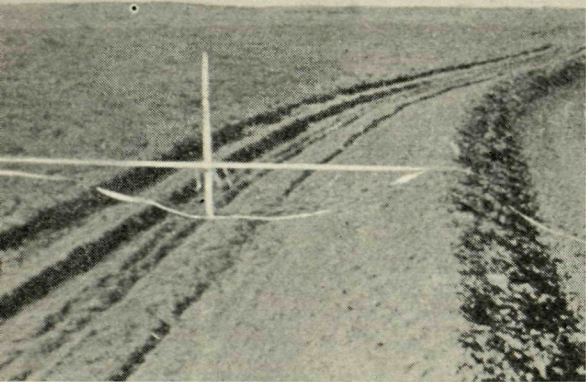


Fig. 6.—Completed bank. Tape outlines total capacity of channel. Note broad flat channel and cross section of bank

When banks are built across minor depressions or filled gullies, "low spots" are likely to occur. There are possible "break-through" points which should always be built up, preferably quite a lot higher than the rest of the bank. For this work the soil should always be taken from the lower side of the bank so that the channel is not disturbed any more than necessary. On a number of occasions, damage has occurred to new works when attention has not been given to such weaknesses. In recent years the availability of farm dozers for wheel tractors has made it much easier to build up sufficient soil on these "low spots."

It is expected that banks built with the plough will usually settle slightly. It is also likely that some damage may be

caused by stock continuing pads over the banks before the soil has become consolidated. In most cases maintenance and repairs to such damage is not a major problem, as a few fast runs with the tractor and plough along the bank will be sufficient to build it up again. Occasionally, it may be necessary to obtain extra soil with a farm-dozer, scoop or grader-ditcher; even a small amount of spade-work will always be worthwhile. On a number of properties, banks built for six or more years have so far required very little maintenance. Quite often it is considered that later building up is not required, as the erosion hazard is lessened due to the effects of improved pastures and contour working. In the first year or so, however, banks should be carefully inspected and maintenance carried out as soon as necessary.

It can be seen that construction of contour earthworks can be a relatively simple and cheap business when there is no additional expense involved in hiring special machinery. Officers of the Soil Conservation Service can assist farmers by advising on erosion problems; by carrying out surveys for contour earthworks, and by demonstrating the use of farm ploughs as earthmoving implements. After each farmer has been assisted with erosion control work in one or two paddocks it is hoped that he may then find himself able to continue the work, including the surveying, on a self-help basis.

CONTROLLING TOMATO DISEASE

New Hybrids Give Promising Results

This season, the spotted or bronze wilt virus disease was even more widespread than usual, and losses in commercial tomato crops were the worst experienced for several years.

Conditions were therefore very favourable for testing new hybrid lines of tomatoes which are being developed for resistance to this disease by the Plant Pathology Branch of the Department of Agriculture.

In a field test conducted at Balcatta, 80 per cent. of the plants of the local susceptible variety were attacked by spotted wilt, whereas in the hybrid lines the test unit showed only 5 per cent. infection and the worst unit 17 per cent.

The hybrids derive resistance from two American varieties, *Rey de los Tempranos*, and *Manzana*.

INSECT PESTS

Grasshopper outbreaks in various South-West districts caused some concern to growers during January and February. Dieldrin spray is effective against grasshoppers, and where spraying was carried out in accordance with Departmental recommendations effective control was established.

Flea beetles have been troublesome on lawns in the metropolitan area. This insect mainly affects couch lawns but may be controlled by spraying with DDT and other residual insecticides.

Many home gardeners have complained about the activities of leaf-cutting bees which cut neat circles from the leaves of rose bushes and other ornamental plants. Insecticides are of no avail in controlling these insects as they do not eat the leaves but use the material for constructing their nests.

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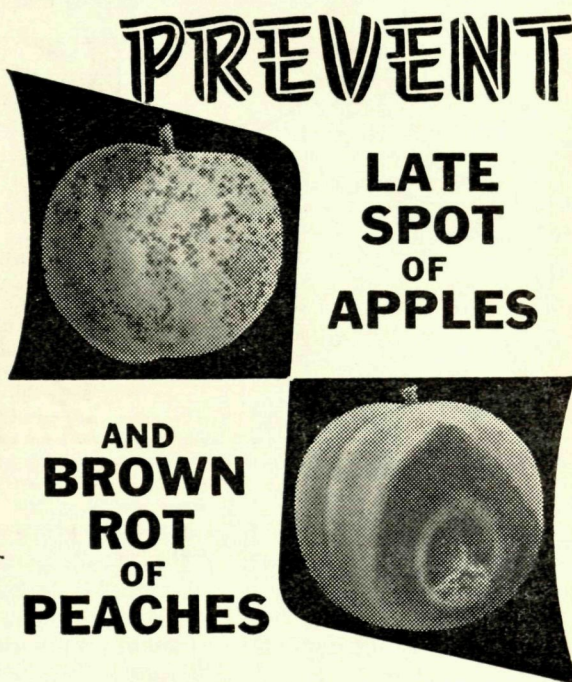
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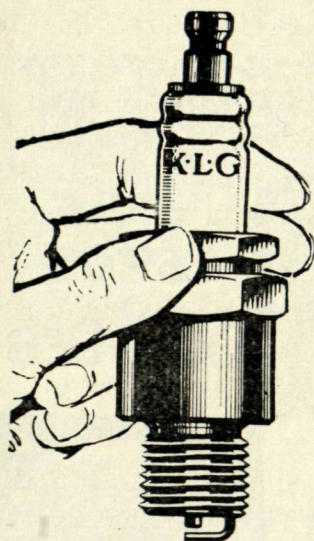
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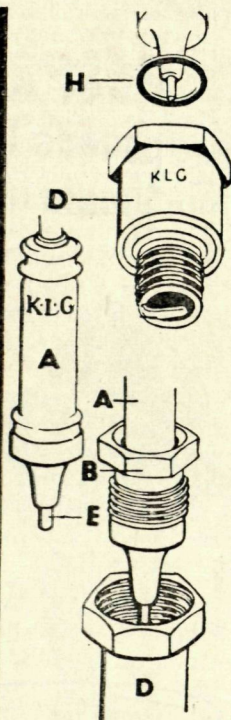
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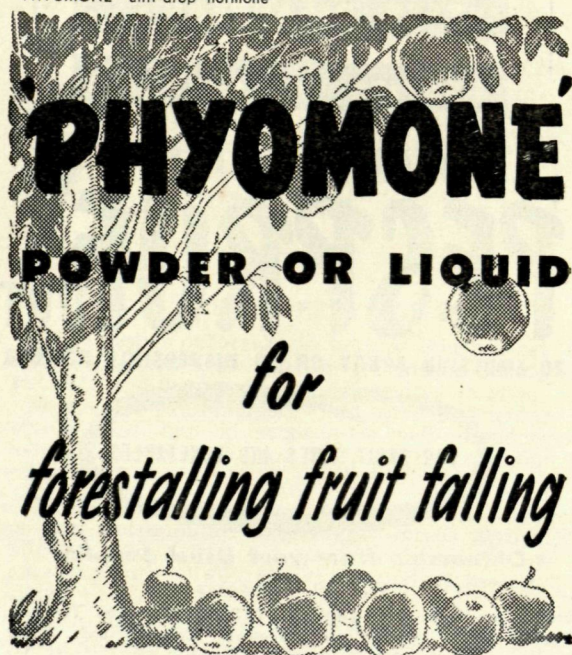
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