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B. a'B. Marsh

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Fencing along a watercourse, as illustrated here, does not interfere with cultivation and contour systems. Such fences prevent stock from crossing the gully and may permit more efficient use of water supplies.

FARM PLANNING

A New Technique

By B. a'B. MARSH, B.Sc. (Agric.), Soil Conservation Adviser

A NEW method for planning farm subdivision is described. Control and prevention of soil erosion, including the use of contour methods where needed, will be made easier on farms planned in this way. Often also, the farm road system will be better placed to give year-round access around the farm, gate sites are better, and usefulness of present watering places increased. The method is based on fencing along natural obstacles to cultivation, on the need to fence areas requiring different grazing management, and on the need to stabilise natural drainage lines.

That fences have indirectly caused erosion has long been realised by farmers and conservationists alike, and a demand for advice on farm planning is developing.

Soil conservationists the world over have developed techniques of farm planning suited to their agriculture. Most of these methods have been based on techniques used in the United States of America.

A common feature of all planning techniques has been the long time needed to collect all the data considered relevant.

We have examined other methods in relation to the planning of Western Australia wheatbelt farms and have developed a method of planning which cuts down so

much on time spent collecting data, that memory can be used very effectively and thus makes detailed mapping even less necessary.

The method evolved has been used on many farms in the sheep and cereal areas as far apart as Dalwallinu, Wickepin, Toodyay and Narembeen. The method is certainly workable and it produces a farm plan which also looks workable and efficient.

The technique has been developed to be suitable for properties which run stock in conjunction with cereal growing. It is based on the importance of fencing correctly and stabilisation of the natural drainage system. So far the technique has been developed for use where the type of

cropping is not diversified and classification of the soil or land use seems unimportant where fencing is concerned. It is felt that some attempt will have to be made in some intensively farmed areas, to modify the technique. It may be necessary to class land according to its best commercial use.

The technique can be discussed under several headings.

LAND USE

Many farm planning methods base the fence layout on the varying need for soil erosion control practices. It is considered here that fences need not separate eroded and non-eroded areas. Fences are used to control and confine stock and for this reason fence positions in some cases are determined by the need for grazing control. It is usually suggested that seepage areas carrying green fodder during the summer months be fenced from the general farm, similarly with salty areas and poorer sandy country, whether arable or non-arable.

TOPOGRAPHY

To a soil conservationist it is obvious that the topography of the farm must be taken into account when designing various aspects of a farm layout. A contour map will show the topography very well, and perhaps many soil conservationists reasoned along these lines in developing farm planning techniques. There are however two other ways of understanding the topography.

- (1) A map of the creeks and depressions, rocky ridges and hills.
- (2) The farm itself is a full scale three dimensional model which can be seen easily and memorised. Contour mapping is discarded because of time factor.

The two other methods are used in the following manner:—

- (1) The natural features are mapped, using the old fencing as a mapping grid; or using an air photo.
- (2) The adviser drives completely over the farm and remains on the farm while compiling the plan with the help of the farmer.

Because land use mapping and contour mapping are eliminated it is possible to compile a plan while in continuous consultation with the farmer, **in one day.**

NATURAL CULTIVATION BOUNDARIES

A method of determining fence lines which it seems, has not been used by other farm planners, was developed in the Western Australian technique. The countryside is naturally divided by numerous obstacles to cultivation such as creeks, gullies and un-eroded depressions (which should never be cultivated) by rocky ridges and by surveyed roads and boundaries. The division of the landscape is further complicated to an unreasonable extent by fences placed without regard to the lie of the land. If many of the fences were placed alongside the natural boundaries, then most of them would be out of the way and cause no extra erosion hazard. Forming a basic fence plan which can be subdivided according to certain basic principles simplifies planning and erosion control. As each soil erosion problem is usually confined within natural obstacles there is seldom a need for taking contour banks through fences. As water supplies are commonly near watercourses this system of fencing makes for efficient use of water supplies.

SUBDIVISION OF THE NATURAL CULTIVATION AREAS

Placing fences along natural boundaries leaves areas which are clear for cultivation and these areas have been termed natural cultivation areas. Usually these require subdivision and this involves a certain amount of compromise between certain requirements.

These are—

- (1) Economy of fencing.
- (2) Convenience of access.
- (3) Water in each paddock, to eliminate damaging movement of stock through gates.
- (4) Economy in water reticulation.
- (5) Convenience in cultivation.
- (6) Safety of tracks, firebreaks, and cultivation.
- (7) Soil erosion control needed.
- (8) Paddock size.
- (9) Movement of stock from remote paddocks.

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All these have to be considered in relation to the farmers own attitude towards erosion control practices. This in turn is governed by his methods of farming, machinery available, the seriousness of the problem, and finance.

With these considerations in mind the fences subdividing natural cultivation areas are placed where possible in order of priority,

- (a) Along ridges and across saddles.
- (b) At right angles to the contour down a hillside.
- (c) Along a contour or graded contour line.
- (d) A combination of these.

Fences so placed do not interfere greatly with contour cultivation. They allow safe disposal of water from formed roads (see *Journal Agric. W.A.* March-April, 1954, p. 203, or leaflet No. 2133). They allow safe ploughing of firebreaks (see *Journal of Agric. W.A.* September-October, 1955, p. 585, or leaflet No. 2291).

Formed roads along ridges and directly up and down hill are fairly direct and safe whereas contour roads can be inconveniently long and tortuous and collect water. Fence lines usually are, and should be the site for farm tracks, as this helps to keep cultivation areas as clear and as large as possible. As each fence has a logical reason for its placement it is easy to site without taking measurements.

THE TECHNIQUE

A map is drawn of the property on a 20 chain per inch scale. Existing fence lines are marked, these being used as a mapping grid. Where no fences exist, more conventional methods of mapping or air photos may have to be used.

A slow trip is made around the farm with the farmer driving. Everything pertaining to water runoff and erosion is noticed, mapped and discussed with the farmer. Erosion control methods are tentatively decided upon, and mapped.

All natural features which are or should be cultivation boundaries, are mapped and discussed. The need for leaving hollows grassed to withstand erosion is stressed. Eroded tracks and firebreaks are pointed out and methods of control

discussed. Also discussed where pertinent, is the necessity for fencing off areas requiring regulated grazing and these are mapped. All water supplies are mapped and in sections of the farm where water is obviously scarce, the possibilities for developing water supplies and for reticulating water are discussed. Help can be given in locating possible earthtank sites and catchment banks and drains.

When the mapping is completed a copy is made of the details without marking in any of the existing fences except those which definitely must not, or cannot, be moved.

The first planning stage involves marking fence lines along probably suitable natural boundaries and around areas requiring regulated grazing such as salt country. Some of these fence lines are deleted later if not wanted. This procedure leaves areas of good land which are clear for cultivation and can be called natural cultivation areas. These areas are subdivided as mentioned previously under the heading "Subdivision of Natural Cultivation Areas." To aid in arriving at a reasonable average paddock size, the farmer's ideas about paddock size are sought. Next to the map a reference square is drawn equal in size to the acreage decided upon. An attempt is made to divide the natural cultivation areas up into paddocks about that size. Smaller paddocks are of course useful near the homestead, and larger ones may be more convenient in the far corners of the farm.

This stage in the planning is difficult and requires the specialist knowledge of the conservationist to be carefully fused with the farmer's more intimate knowledge of his farm.

If it is decided that a contour fence may be more desirable in a particular part (this is not often the case) it may be necessary to drive out to that part of the farm in order to take a rough sight with the dumpy or Abbney level to determine an approximate position. For the sake of brevity many of the finer points have not been discussed here.

When most fence lines have been determined, if all points have been considered, the plan should show main access tracks to all paddocks and around the farm.

All soil erosion control work should be marked roughly.

Follow up visits may be necessary to assist with problems associated with water conservation and erosion control.

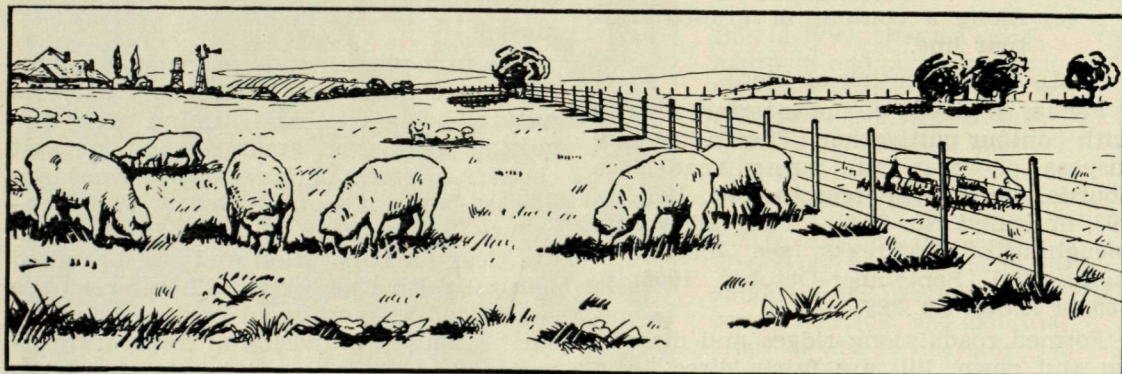
THE FUTURE

The writer feels that the next two decades will see great advances in population size and in agricultural techniques brought about by nuclear power and cheap

fertilisers (particularly nitrogen). The trend would be towards intensive farming with more cultivation.

Such a change will be more easily negotiated on farms where contour practices can be adopted easily and efficiently and where subdivision can proceed logically.

Farm plans adopted using the described technique seem to be very compatible with contour practices and can be further subdivided on a logical basis.



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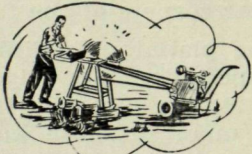
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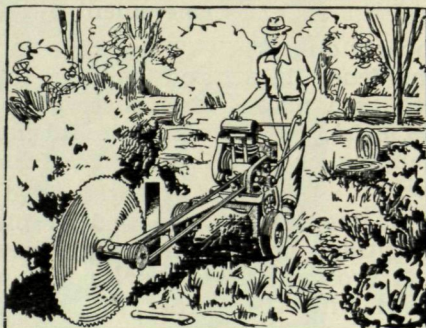
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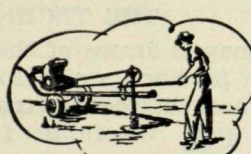
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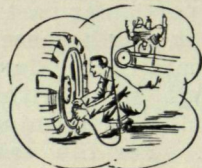
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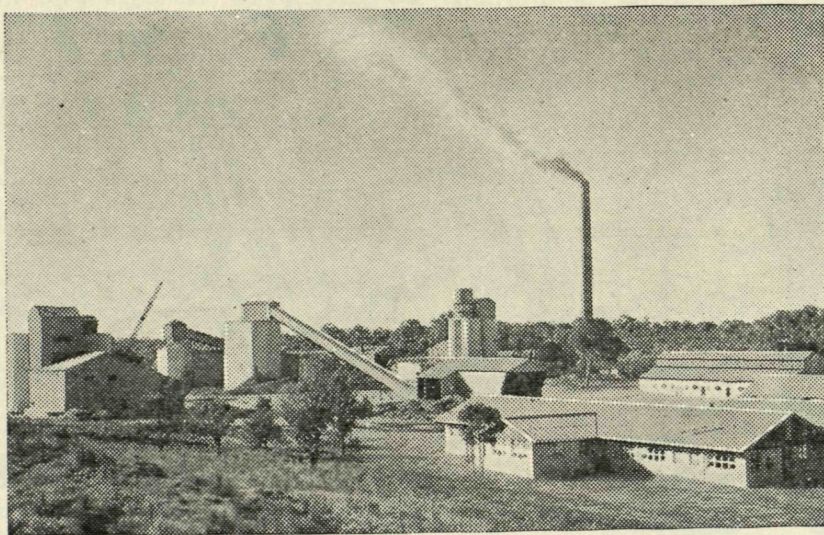
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